



No. 247

**The Habitats Directive
Atlantic Biogeographical Region**

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**Report of Atlantic Biogeographical Region Workshop,
Edinburgh, Scotland, 13th-14th October 1994.**

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Summary

The five Biogeographical Regions are a key concept in the EC Habitats Directive ([*Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora*](#)). Sites for the protection of habitats listed at Annex I and species listed at Annex II of the Directive, will be selected as Special Areas of Conservation in the context of their Biogeographical Region.

In October 1994 a meeting of scientific representatives from Member States with territory in the Atlantic Biogeographical Region was held, to discuss matters of common concern and to clarify the conservation requirements of in that region. Central to this was the collation of data regarding the presence of the Annex I habitats and Annex II species. This information can be used to characterise the Atlantic Biogeographical Region and will enable the final selection of SACs. This report draws some tentative conclusions from that data and presents synopses of some of the discussions at the meeting.

JNCC Report No. 247: The Habitats Directive Atlantic Biogeographical Region was published in July 1995. The report is being republished in its present form to help provide contextual information to the selection of special areas of conservation in the UK, with only minimal changes to the text to enable the report to be made available in electronic format. Consequently, the codes and names for habitat types, and species names, used in the present report are those used in the original Directive, not those later adopted by [*Council Directive 97/62/EC Adapting to technical and scientific progress Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora*](#).

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1 Introduction

[Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora](#) (hereafter referred to as the ‘Habitats Directive’) was adopted by Member States of the European Community in May 1992. The Directive includes a comprehensive series of measures for conservation laid out in 24 Articles, which aim to conserve biodiversity through the protection of habitats and plant and animal species (Article 2). Under the Directive the main actions are to be taken by individual Member States and of these the most significant task is the designation within each Member State of a series of Special Areas of Conservation (SACs). These SACs are to include sites for *habitat types of community interest* listed at Annex I of the Directive and for *species of community interest* listed at Annex II. The procedures for the selection of sites are set out in Article 4 and the criteria for the selection of these sites are listed at Annex III of the Directive.

Together with the series of Special Protection Areas (SPAs) classified under the 1979 EC Birds Directive ([Council Directive 79/409/EEC on the conservation of wild birds](#)), the SACs will form a site series called *Natura 2000*. The objective of the SACs within the *Natura 2000* network is to maintain or restore *favourable conservation status* for the habitat types listed at Annex I and the species listed at Annex II of the Directive (Article 3).

Although the SACs are a pan-European site series, the Directive recognises five Biogeographical Regions within the European Union (Atlantic, Alpine, Continental, Macaronesian and Mediterranean Regions). With the accession of Finland and Sweden to the EU in 1995 there is an additional region, the Boreal Region, and part of Austria, the third new Member State in 1995, falls within the Pannonic Region. Certain habitats are listed in Annex I of the Directive because they are outstanding examples of the essential characteristics of one or more of these regions (Article 1c), and in finalising the EU list of sites for designation as SACs it is also necessary to consider their importance in the context of the Biogeographical Region in which they occur (Annex III).

In November 1993 scientific representatives of the EU Member States were invited by the Spanish Government and the European Commission to attend a meeting at Sanlúcar de Barrameda in Spain to discuss preparatory work required to implement the Directive. At this meeting it was agreed that a series of further meetings should be held, one for each Biogeographical Region, in order to clarify the conservation requirements in that region and to discuss matters of common concern to the region’s Member States.

In October 1994 the Joint Nature Conservation Committee, Department of the Environment and Directorate General XI of the European Commission hosted a two-day meeting of scientific representatives from each of the Member States with territory in the Atlantic Biogeographical Region (see Appendix 1 for a full list of delegates). Unfortunately a delegate from Ireland was unable to attend the meeting, but suitable data was provided in advance. This report summarises the main conclusions of this meeting.

2 The Atlantic Biogeographical Region – its character and nature conservation significance

2.1 Introduction

The Habitats Directive refers to the Biogeographical Regions on three occasions:

Article 1(c)(iii)

“natural habitat types of Community interest means those that...present outstanding examples of typical characteristics of one or more of the five biogeographical regions...Such habitat types are listed or may be listed in Annex I.”

Article 4(2)

“On the basis of the criteria set out in Annex III (Stage 2) and in the framework both of each of the five biogeographical regions...the Commission shall establish, in agreement with each Member State, a draft list of sites of Community importance”

Annex III Stage 2: 2

*“The assessment of the Community importance of other sites...will take account of...
(e) global ecological value of the site for the biogeographical regions concerned...”*

Consequently there is a legal obligation to take account of these Biogeographical Regions because:

- i) a number of the habitats on Annex I are listed because they typify one or more of the Biogeographical Regions;
- ii) the draft list of Sites of Community Importance will be carried out in the context of Biogeographical Regions and of the EU; and
- iii) the overall ecological value of a site will be assessed relative to the Biogeographical Region and the EU as a whole.

The areas covered by the five Biogeographical Regions were agreed by the EC Habitats Committee which was established under Article 20 of the Directive. The Atlantic Biogeographical Region encompasses the UK, Ireland, and the western parts of Denmark, Germany, the Netherlands, northern Belgium, north-west France, the northern shores of Spain and a small area in the north of Portugal. Although a map showing the boundaries of the Atlantic region was approved in 1993, some aspects of the boundary in Portugal required further clarification. [An amended map of [European biogeographical regions](#), extending coverage to new Member States and accession countries, was published in 1999.]

This section considers the relevance and meaning of this Atlantic Biogeographical Region as a framework for implementation of the Directive.

2.2 Boundaries of the Atlantic Biogeographical Region

There is a long and distinguished history of phytogeographic study concerning the Atlantic Biogeographical Region, including such eminent authors as Allörge and Braun-Blanquet (Roisin 1969; Rivas-Martinez 1990). Although historically a number of boundaries to the Region have been recognised (Roisin 1969), the boundary adopted by the EC Habitats Committee follows closely that of Rivas-Martinez (1990) (other than in northern Portugal). The boundaries of the Atlantic region correspond broadly to the North Atlantic, Britannic, Cantabrian and Oro-Cantabrian provinces of Rivas-Martinez (1990). However, the precise boundaries have been modified slightly to take account of more detailed recommendations from specialists in the individual Member States.

It is important to note that the boundaries of the Biogeographical regions cannot be drawn with absolute precision. As discussed below, outliers of habitats typical of other Biogeographical regions are known to occur in the Atlantic Biogeographical Region. Often these outliers comprise small and isolated examples of individual habitats outside their normal range. There are also examples of typically Atlantic region habitats in other Biogeographical regions. For example, east of the Massif Centrale in France there are significant areas of landscape containing a suite of habitats with Atlantic characteristics.

Rivas-Martinez (1990) differentiated the Atlantic Biogeographical Region into 'bioclimatic belts' or 'thermotypes', namely the Thermocoline, Coline, Montane, Subalpine and Alpine belts. A large proportion of the Atlantic Biogeographical Region would appear to fall into the Coline thermotype, with the Thermocoline mainly in coastal areas. The Subalpine and Alpine thermotypes are associated with extremely cold climates and high levels of wind exposure and are mainly found at high elevation. These are therefore very discontinuous in the Atlantic Region, and are found principally in the United Kingdom, Northern Spain and North Portugal where the main areas of mountains occur. However, in the UK these Subalpine and Alpine thermotypes also occur very locally at, or close to, sea-level, replacing the Thermocoline and Coline thermotypes found elsewhere; here they reflect the more extreme climate of the northern latitudes. This shift of thermotypes is a feature also found outside the EU on the south-western coast of Norway, which has been often identified as having affinities with the Atlantic Biogeographical region.

2.3 Characteristics of the Atlantic Biogeographical Region

Article 1c) iii and Annex III (Stage 2:(e)) of the Directive refer to the characteristics of the Atlantic Biogeographical Region but these are not specified. The most important characteristics of the Atlantic Region that strongly influence its biodiversity are climate, topography/oceanography, animal and plant migrations and distinctive biotic elements.

2.3.1 Climate

The climate of the Atlantic Region is the feature that most clearly distinguishes it from other Biogeographical Regions. The region is dominated by the effects of air masses originating over the Atlantic ocean, whilst its seas are influenced by the circulatory systems of the Atlantic, notably the warm waters of the 'Gulf Stream' (i.e. the North-east Atlantic Drift). This results in a broad, climatic zone that has equable temperatures, with warm winters and cool summers by comparison with continental areas of similar latitude. The climate is also relatively wet, with higher levels of precipitation than the Continental region but with a less marked seasonal precipitation than that of the Mediterranean region. It should be noted that there is evidence of climatic change in Portugal in recent years, where the climate has not followed a strict Atlantic pattern, and this could be a longer-term change.

There is a wide range of local climate variation within the Atlantic Biogeographical Region, but it may be expected that habitats and species most narrowly confined to the Region are present because they can only develop under an Atlantic climate (for example raised and blanket bogs), or because the species are adapted to these climatic conditions (for example *Trichomanes speciosum*, *Sphagnum pylaisii*).

2.3.2 Topography/oceanography

As in other Biogeographical Regions the Atlantic Region embraces a wide range of landscape variation due to differences in geology, geomorphology and land-use. An understanding of this variation is important if we are to interpret the significance of the diversity of the habitats and species encountered.

At a very general level two main divisions of the landscape of the region can be identified:

- a. **The North European Plain** (west Jutland, Netherlands, north Germany, Flanders/Brussels, north-east France, south-east England).

Here the land surfaces are relatively flat, underlain by sedimentary rocks and surface deposits that include clays, sands and gravels of glacial and riverine origin. The landscape is broken mainly by escarpments and the courses of rivers. In these areas land use is generally intensive. Habitats and species have often been severely reduced in abundance and fragmented in the past 50 years. Important areas for biodiversity conservation are mainly associated with coasts, river systems, escarpments and areas where soils are unsuitable for intensive agriculture.

The coasts and adjoining seas are predominantly sedimentary in character with sand dunes, large shallow inlets and bays, mudflats, sandflats and saltmarshes the main features.

- b. **The 'Celtic Fringe'** (Ireland, Wales, Scotland, north and west England, Brittany, Galicia, northern Portugal).

This includes the west of the region which has a more complex land surface and contains some lowlands (e.g. eastern Ireland; Charente, Gironde and Landes, France), but there is a

high proportion of hills. In some areas (e.g. northern Scotland, Galicia, northern Portugal) there are mountains with true alpine vegetation above the natural climatic limit of tree growth. In addition to sedimentary rocks, igneous rocks are a prominent feature. Land use is generally less intensive than in the North European plain and some habitats remain very extensive (e.g. blanket bogs and heaths in north-west Scotland).

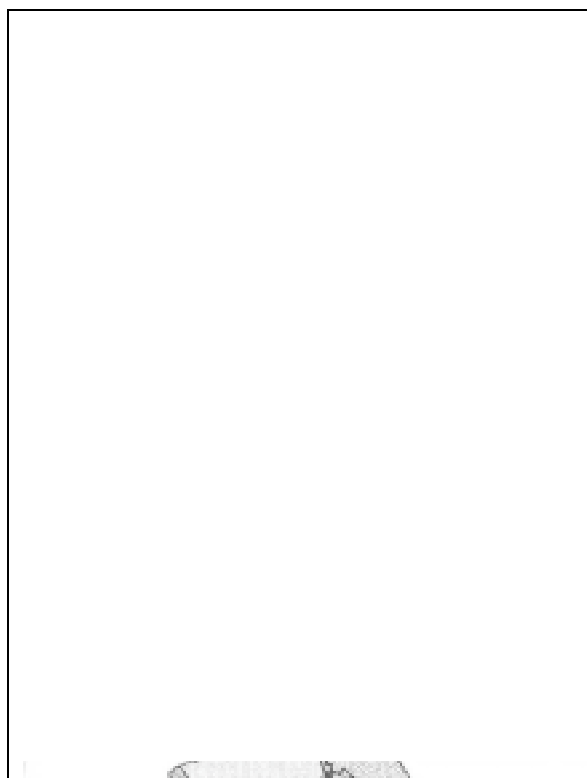
The coasts and sea of this area are also complex and although important areas of sedimentary habitat occur, the Celtic Fringe is more strongly characterised by erosional and hard rock features, notably sea cliffs and reefs.

2.3.3 Animal and plant migrations

Contemporary and ancient movements of plants and animals also give ecological coherence to the Atlantic region, and are relevant to understanding the high nature conservation value of certain habitat types and species populations.

Many bird migrations, and to a lesser degree movements of fish and other vertebrates, take place within the Atlantic Region thus linking sites in different Member States. The 'East Atlantic Flyway' is one of the most important waterbird migration routes of the world and takes place largely through the Atlantic Biogeographical Region (see Figure 2.1). This route is intensively used by the many waterfowl that breed in Arctic, sub-Arctic and temperate regions as they fly south to overwinter in southern Europe and the western seaboard of Africa. It is estimated that at least 3,208,000 waders alone winter along the Atlantic coasts of Europe (Smit & Piersma 1989).

Figure 2.1 Geographical extent of the East Atlantic Flyway system



(Source: Smit & Piersma 1989).

Over longer time scales, particularly since glaciation last occurred in the northern latitudes of the European Union approximately 10,000 years ago, movements of more sedentary organisms such as plants and molluscs are apparent. Many species that were once perhaps widespread and abundant in the open post-glacial landscape are now scarce and widely scattered in refugia. A good example of this is provided by the *Erica vagans* heaths of Belle-Isle and Isle de Groix, Brittany and the Lizard District of Cornwall, which are almost certainly relicts of a once more continuous distribution of *E. vagans* across Europe. Certain mollusc species of the genus *Vertigo* appear to be similar relicts of a more extensive distribution in Europe, after the close of the last glacial period.

These ancient refugia and links by migration are important in understanding our shared conservation responsibilities within the European Community, as they have a strong influence upon the ecological character of habitats and the genetics of species.

2.3.4 Distinctive biotic elements

Flora. The combination of contemporary factors and paleoenvironmental influences upon the Atlantic Biogeographical Region has produced a distinctive flora, containing elements confined to or centred upon the Atlantic Region. This subject has been reviewed by Roisin (1969) who identified a distinct Atlantic Element in the European flora, divided into three sub-elements:

- i) 'Eu-Atlantic species' with a distribution confined to the Atlantic Biogeographical Region or rare outside it.
- ii) 'Sub-Atlantic species' with their maximum frequency within the Atlantic Biogeographical Region, but passing beyond its boundaries into Mediterranean or Continental Europe.
- iii) 'Eury-Atlantic species' with a distribution confined to the Atlantic climatic region of both Europe and North America.

Roisin (1969) recognised that certain species could be classified within each of these sub-elements, and these are listed in Appendix 2. The total number of these species is as follows:

Category	Number of species	% of total Atlantic species
Eu-Atlantic	95	49
Sub-Atlantic	88	45
Eury-Atlantic	12	6
Total	195	100

This is almost certainly an underestimate of the number of species in the Atlantic floristic element, for Roisin omitted from his lists the small number of endemic species found in the UK, along with all the species of critical taxa such as *Sorbus*, *Hieracium*, *Rubus fruticosus* and *Taraxacum*. Amongst plant species there is also likely to be a long list of bryophyta which are characteristic of the Atlantic Region (Ratcliffe 1968).

Fauna. The avifauna of Europe is well studied and there are twelve birds that are known to have all or mostly all their European breeding localities within the Atlantic Biogeographical Region. These are listed in Table 1 below.

Table 1: Breeding birds with an Atlantic distribution in the European Community

<i>Fulmarus glacialis</i>	fulmar
<i>Hydrobates pelagicus</i>	storm-petrel
<i>Oceanodroma leucorhoa</i>	Leach's storm-petrel
<i>Sula bassana</i>	gannet
<i>Fulica cristata</i>	crested coot
<i>Catharacta skua</i>	great skua
<i>Larus fuscus graellsii</i>	lesser black-backed gull
<i>Sterna dougallii</i>	roseate tern
<i>Motacilla flava flavissima</i>	yellow wagtail
<i>Motacilla alba yarrellii</i>	pieb wagtail
<i>Loxia scotica</i>	Scottish crossbill
<i>Lagopus lagopus scoticus</i>	red grouse

(Source: Hagemeyer & Blair, in prep.)

Outside their breeding season many of these birds may be found in other parts of Europe. There are also a number of bird species which have all or the majority of their wintering population in the Atlantic Region. These particularly include those species that breed in the Arctic and Boreal Regions and which winter along the northern part of the East Atlantic flyway, such as the Greenland white-fronted goose *Anser albifrons flavirostris* and the Greenland population of barnacle goose *Branta leucopsis*. Birds such as bar-tailed godwit *Limosa lapponica* and knot *Calidris canutus* also use the Atlantic Region as a staging post during their migration along the flyway, for several weeks or months each year depending upon weather conditions. At that time all, or the majority, of several biogeographical populations of these species may be residing in the Atlantic Biogeographical Region.

Further work is required to identify non-avian vertebrates and invertebrates which particularly characterise the Atlantic Biogeographical Region.

3 Annex I habitats and Annex II species in the Member States of the Atlantic Biogeographical Region

3.1 Introduction

In preparation for the meeting in October 1994 of Member States with territory in the Atlantic Biogeographical Region, information on distribution of Annex I habitats and Annex II species was compiled. This data will assist Member States and the European Commission in the selection of sites in the Atlantic Biogeographical Region for eventual designation as Special Areas of Conservation .

3.2 Methods

A questionnaire was sent to the national scientific authorities in the nine Member States with territory in the Atlantic Biogeographical Region. This questionnaire listed all Annex I habitats and Annex II species on the Directive, and requested that the authority indicate if the habitat or species was present in the Atlantic Biogeographical Region of the Member State. In the case of species, authorities were asked to indicate if the species occurs as a native resident, vagrant, re-introduction or introduction.

The information received from each Member State country was entered onto a spreadsheet in QuattroPro for Windows (version 1.0).

3.3 Results

3.3.1 Habitats

Appendix 3a shows those habitats that were recorded in the Atlantic Biogeographical Region of each Member State. Of the 168 habitats that are listed on Annex I of the Directive, 117 have been positively identified in the Atlantic Biogeographical Region. The largest numbers of these are coastal and forest habitats (Figure 3). A further three habitats (11.34 *Posidonia* beds, 18.22 Vegetated sea cliffs of the Mediterranean coasts (with endemic *Limonium* spp.) and 16.224 Dunes with *Euphorbia terracina*) have not yet been positively identified in the Atlantic Biogeographical Region but may occur.

Appendix 3b lists those habitats which occur in the Atlantic Region in only one, two or three Member States. Of the total number of these habitats over 45% (56 in total) are recorded in three or fewer countries. 30 of these habitats are found in only one Member State within the Atlantic Region.

The habitats of the Atlantic Region are extremely varied and include geographical outliers of habitats found predominantly in other Biogeographical regions, such as the Mediterranean coastal habitats or Alpine habitats. Those Member States that have the highest number of habitats e.g. UK (82), France (74) and Spain (69) all support a number of these outlying habitats.

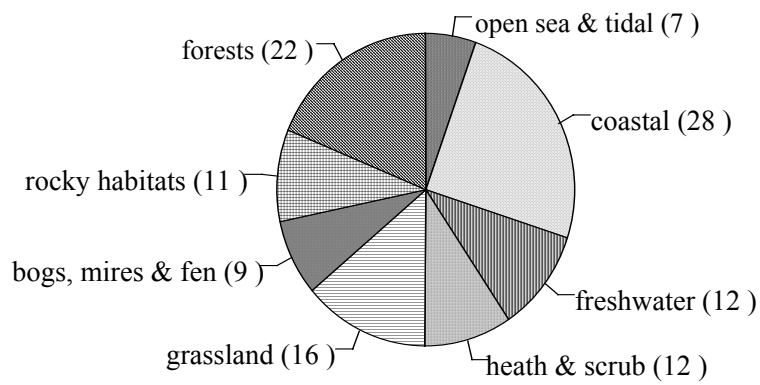
Some habitats and species in the Atlantic Biogeographical Region are apparently very rare and/or limited in geographical range, e.g. 31.234 Dry coastal heaths with *Erica vagans* and *Ulex maritimus*, 42.51 Caledonian forests. The available data suggest the conservation importance of several habitat types needs re-appraisal. For example, 54.2 Alkaline fens are now reported as rare in all parts of the Region and are unlikely to be extensive in other Biogeographical Regions.

3.3.2. Species

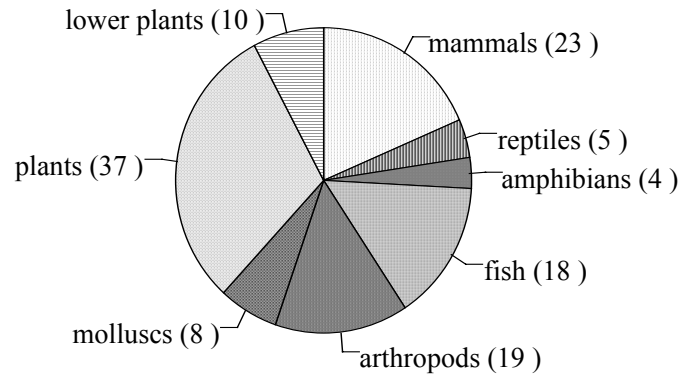
Appendix 4a shows the species that were recorded as present in the Atlantic Biogeographical Region of each Member State. Of the 623 species on Annex II of the Directive, 124 are known to occur in the Atlantic Biogeographical region (Figure 4). A further five species (the arthropods *Coenympha oedippus*, *Cucujus cinnaberinus*, *Plebicula golgus* and the plants *Thesium ebracteatum* and *Ophioglossum polyphyllum*) may occur in the Atlantic Biogeographical Region, but are awaiting confirmation. The largest numbers of species occur in Spain (63), France (58) and Germany (54).

Appendix 4b lists those species that occur in the Atlantic Biogeographical Region in three or fewer Member States. Of the 131 species that may occur in the Atlantic region over 70% (98) occur in three or fewer Member States. Around 40% (53 species) occur in only one Member State; Spain and France support the largest number of these species.

Figure 3: Number of Annex I habitats in Atlantic Biogeographical Region



**Figure 4: Number of Annex II species
in Atlantic Biogeographical Region**



3.4. Problems of interpretation.

For some habitats and species there is uncertainty about their status within the Atlantic Biogeographical Region (see Appendices 3a and 4a). For habitats this relates in part to difficulty of interpreting a number of Annex I habitats as they may have been defined differently in individual Member States. Examples include 13.2 Estuaries, where the CORINE biotopes classification implies that estuaries are the sub-tidal channel only; 15.12 *Spartina* swards, where all species may not be of equal conservation value; and 37.31 *Molinia* meadows. In many cases the difficulties of identification are expected to be resolved in the *Interpretation Manual of Annex I habitats* that is being prepared by Directorate-General XI of the European Commission (Commission of the European Communities 1995).

For some species there are also problems. In several Member States some species have not been positively recorded in recent years, and without concerted survey work the presence of that species is doubtful. A number of species are also known to occur as vagrants or reintroductions in some countries, e.g. the fish *Acipenser sturio* and the turtle *Caretta caretta*.

4 Conclusions

It was agreed that the meeting of the Member States with territory in the Atlantic Biogeographical Region was greatly beneficial and yielded extremely useful information to inform decisions about site selection. All nine Member States involved provided data on the presence or absence of habitats and species, although the extent of data available for certain taxonomic groups and habitat types varies between Member States and also within some Member States. Consequently the provision of data on the extent of habitats and species within the Atlantic Biogeographical Region is problematic. At present only estimates of the area of most habitat types are available in most Member States, and for species frequency of occurrence data is held rather than population data. Due to disparities in this information, it was considered more valuable to use the information on the presence or absence of habitat types and species rather than semi-quantitative estimates in developing an overview of the biogeography of the Region. Appendix 5 presents the conclusions of the Atlantic Biogeographical Region Meeting relating to the evaluation and definition of sites for eventual designation as SACs.

However, the very basic data collated is useful in setting the context of the presence of habitat and species of the Atlantic Biogeographical Region. It was agreed that the compilation of similar presence/absence data for the other Biogeographical Regions would be useful, and that the model presented here would be put forward as a framework for doing so. This would demonstrate which Biogeographical Region(s) is the predominant locus for given habitat or species types, and which Regions support outliers of habitats and species more commonly found in other Biogeographical Regions of the European Union. A tentative assessment of the habitats and species most characteristic of the Atlantic Biogeographical Region is presented below. Further clarification will be possible when similar analyses have been completed within the other Biogeographical Regions.

4.1 Characteristic habitats and species of the Atlantic Biogeographical Region

Table 2 is a first attempt to define those Annex I habitats and Annex II species that are found exclusively in the Atlantic Biogeographical Region (i.e. Eu-Atlantic *sensu* Roisin 1969), or have their most extensive and representative development there (i.e. Sub-Atlantic *sensu* Roisin 1969).

Table 2 Annex I Habitats and Annex II Species confined to or concentrated within the Atlantic Biogeographical Region – a tentative assignment of habitats and species to the Eu-Atlantic and Sub-Atlantic Biogeographic Elements of Roisin (1969)

Annex I Habitats

Eu-Atlantic.

- 15.13. Atlantic salt meadows (*Glauco-Puccinellietalia*).
 16.24. Eu-Atlantic decalcified fixed dunes (*Calluno-Ulicetalia*).
 16.29. Wooded dunes of the Atlantic coast.
 1A. Machairs.
 22.11. x Oligotrophic waters containing few minerals of the Atlantic sandy plains with
 22.31. amphibious vegetation: *Lobelia*, *Littorella* and *Isoetes*.
 – Turloughs (Ireland).
 31.11. Northern Atlantic wet heaths with *Erica tetralix*.
 31.12. Southern Atlantic wet heaths with *Erica ciliaris* and *Erica tetralix*.
 31.234. Dry coastal heaths with *Erica vagans* and *Ulex maritimus*.
 52.1 and 52.2. Blanket Bogs.
 62.4. Limestone pavements.
 41.12. Beech forests with *Ilex* and *Taxus*, rich in epiphytes (*Illici-Fagion*).
 41.53. Old acidophilous oak woods with *Quercus robur* on sandy plains.
 41.53. Old oak woods with *Ilex* and *Blechnum* in the British Isles.
 42.51. Caledonian forest

Sub-Atlantic.

- 18.21. Vegetated sea cliffs of the Atlantic and Baltic coasts (particularly hard rock cliffs; soft moraine cliffs are typical of the Baltic coast in the Continental Region).
 16.23. Decalcified fixed dunes with *Empetrum nigrum*.
 31.2. Dry heaths (all subtypes).
 51.1. Active raised bogs.
 51.2. Degraded raised bogs (still capable of natural regeneration).

Annex II species.

Eu-Atlantic.

Trichomanes speciosum
Gentianella anglica

Sphagnum pylaisii
Rumex rupestris

Sub-Atlantic.

Halichoerus grypus
Phoca vitulina

Salmo salar
Austropotamobius pallipes

4.2 Outlying habitats and species of other Biogeographical Regions

As mentioned previously, certain habitats typical of other Biogeographical Regions are found in the Atlantic Region outside their main region of occurrence. These include the Annex I habitats 15.15 Mediterranean salt meadows, 15.16 Mediterranean and thermo-halophilous scrubs, 22.34 Mediterranean temporary ponds, 36.41 to 36.45 Alpine calcareous grasslands, 45.2 *Quercus suber* forests and 45.3 *Quercus ilex* forests. As a general rule it is to be expected that such habitats outside the main region of occurrence will lack the full suite of character species. However, they are significant as illustrations of the ecological features important to the development of the habitat type, and may have distinctive features associated with their atypical geographical location as well as being important for the conservation of the range of the habitat is required under Article 1(e) of the Habitats Directive.

Similar parallels with regard to Annex II species also exist, for example there is a single outlying population of the alpine snail *Vertigo genesii* in Northern England, and populations of beaver *Castor fiber* in Brittany.

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Appendix 1: List of delegates attending meeting of Atlantic Biogeographical Region in Edinburgh, Scotland, 14th-16th October 1994

United Kingdom

Mrs Hilary Neal (Department of the Environment) (Chair)

Dr John Hopkins (Joint Nature Conservation Committee)

Dr John Miles (Scottish Office)

European Commission

Mr Olivier Diana (DGXI)

Dr Michael O'Briain (DGXI)

Spain

Mr Juan Carlos Simón (ICONA)

Dr Javier Loidi (University of the Basque Country)

Portugal

Dr João Alves (Instituto da Conservação da Natureza)

Professor Francisco Barreto-caldas (Univesidade do Porto)

Dr Francisco Amaral (Instituto da Conservação da Natureza)

Netherlands

Dr Johan Thissen (National Reference Centre for Nature Management)

Germany

Dr Axel Ssymank (Bundesamt für Naturschutz)

France

Dr Jacques Bardat (Secrétariat de la Faune et de la Flore)

Professor Maurice Le Demezet (Secrétariat de la Faune et de la Flore)

Denmark

Dr Claus Goldberg (Ministry of the Environment)

Ms Anne-Marie Rasmussen (Ministry of the Environment)

Belgium

Dr Martin Hermy (Instituut voor Natuurbehoud)

Dr Catherine Yourassowsky (Ministère de la Région Wallone)

Observers (UK)

Mr Tim Birley (Scottish Office)

Mr Robert Campton (Department of the Environment, Northern Ireland)

Dr Andy Clements (English Nature)

Dr Cameron Easton (Scottish Office)

Mr John Gilmour (Scottish Office)

Dr Keith Hiscock (Joint Nature Conservation Committee)

Mr David Milne (Scottish Office)

Dr Derek Muirison (Scottish Office Agriculture and Fisheries Department)

Mr Eamon Murphy (Scottish Office)

Dr Sandy Kerr (Scottish Natural Heritage)

Mr Mark Osborne (Ministry of Agriculture, Fisheries and Food)

Dr Howard Platt (Department of the Environment, Northern Ireland)

Dr Geoff Radley (Joint Nature Conservation Committee)

Professor Joyce Tait (Scottish Natural Heritage)

Conference Administration (UK)

Mr Roger Bolt (Joint Nature Conservation Committee)

Mr Robert Vagg (Department of the Environment)

Ms Susan Davies (Joint Nature Conservation Committee)

Translators

Ms Christine Gros Lambert (Integrated Language Services)

Mrs Sylvie Slater (Integrated Language Services)

Appendix 2: The Atlantic Floristic Element (Roisin 1969)

1. EU-ATLANTIC SUB-ELEMENT

1.a Ibero-Aquitanian

Alyssum arenarium L.
Silene thorei DUF.
Laserpitium dufourianum ROUY
Seseli bayonnense GRIS.
Ptychotis thorei G.G.
Angelica heterocarpa LL.
Hieracium eriophorum ST. AM.

Statice dubyaei G.G.
Erythraea conferta PERS.
Linaria thymifolia D.C.
Allium ericetorum TH.
Scilla lilio-hyacinthus L.
Potamogeton variifolius TH.

1.b Ibero-Aquitanian-South Armorican

Dianthus gallicus PERS.
Ulex gallii PLAN.
Astragalus bayonnensis LOIS.
Saxifraga umbrosa L.
Saxifraga geum L.
Saxifraga hirsuta L.
Eryngium viviparum J.GAY
Peucedanum lancifolium LANG.
Galium arenarium LOIS.
Galium neglectum LE GALL.
Artemisia crithmifolia D.C.
Cirsium filipendulum LANG.

Erica mediterranea L.
Erica mackaii HOOK
Duboezia polifolia DON.
Statice binervosa SM.
Statice dodartii GIR.
Erythraea portensis HOF.
Omphalodes littoralis LEHM.
Linaria arenaria D.C.
Rumex rupestris LE. GALL.
Narcissus calathinus RED.
Glyceria foucaudi COSTE

1.c Ibero-Aquitano-Ligerian

Helianthemum alyssoides VENT.
Potentilla montana BROU.
Carduncellus mitissimus (L.) D.C.

Euphrasia jaubertiana BOR.
Agrostis ericetorum P.B.

1.d Ibero-Aquitano-Armorican

Ranunculus lenormandi F.SCH.
Meconopsis cambrica VIG.
Brassica oleracea (L.) HUDS.
Viola lusitanica BROU.
Peplis boraei JORD.
Spergularia lebeliana ROUY.
Hypericum linarifolium VAHL.
Ulex nanus FORST.
Pyrus cordata DESV.
Peucedanum gallicum LAT.
Erica ciliaris L.
Erica vagans L.

Anchusa sempervirens L.
Pulmonaria longifolia BAST.
Sibthorpia europaea L.
Scrophularia scorodonia L.
Pinguicula lusitanica L.
Euphorbia hyberna L.
Euphorbia portlandica L.
Muscari lelievrii BOR.
Agrostis setacea CURT.
Airopsis agrostidea D.C.
Polystichum aemulum P.F.

1.e Mid-Atlantic

Silene maritima WITH.
Corydalis claviculata D.C.
Sedum anglicum HUDS.
Genista anglica L.
Ulex europaeus L.
Ononis maritima DUM.
Anthyllis maritima SCHW.
Vicia orobus L.
Hypericum helodes L.
Oenanthe fluviatilis COL.

Lobelia urens L.
Cirsium anglicum D.C.
Scilla verna L.
Endymion nutans DUM.
Narthecium ossifragum HUDS.
Asparagus prostratus DUM.
Carex binervis SM.
Carex laevigata SM.
Carex trinervis DEGL.
Deschampsia discolor R.SCH.

Erica tetralix L.
Erica cinerea L.
Wahlenbergia hederacea REICH.

Koeleria albescens D.C.
Festuca dumetorum L.
Bromus hordeaceus G.G.

1.f Boreo-Atlantic

Cochlearia anglica L.
Pirola serotina MEL.

Statice bahusiensis FR.
Erythraea capitata WILD.

2. SUB-ATLANTIC SUB-ELEMENT

2.a Atlantic-Mediterranean

Helleborus foetidus L.
Ranunculus tripartitus D.C.
Ranunculus nodiflorus L.
Erodium maritimum SM.
Arenaria controversa BOIS.
Cerastium tetrandrum CURT.
Trigonella ornithopodioides D.C.
Ornithopus perpusillus L.
Saxifraga hypnoides L. ssp. *continentalis* E.
Oenanthe crocata L.
Helosciadium inundatum KOCH
Doronicum plantagineum L.
Crepis suffreniana (D.C.) LL.
Carduus tenuiflorus CURT.

Statice lychnidifolia GIR.
Anagallis tenella L.
Cicendia pusilla GRIS.
Cicendia filiformis DEL.
Linaria supina DESF.
Scrophularia aquatica HUDS.
Illecebrum verticillatum L.
Salix atrocinerea BROT.
Anthericum planifolium (L.) VAND.
Juncus heterophyllus DUF.
Carex strigosa HUDS.
Carex mairii COS.
Scirpus multiculmis SM.
Asplenium marinum L.
Isoetes delalandei LL.

2.b Atlantic-Mediterranean-Montane

Ilex aquifolium L.

Primula vulgaris HUDS.

2.c Sub-Atlantic with Mediterranean irradiations

Ranunculus ololeucos LL.
Sinapis cheiranthus (VILL.) KOCH
Lepidium heterophyllum BENTH.
Polygala calcarea F. SCH.
Arenaria montana L.
Tamarix anglica WEB.
Cistus hirsutus LAMK.
Ornithopus roseus DUF.
Carum verticillatum KOCH.

Anthemis nobilis L.
Erica lusitanica RUD.
Lithospermum diffusum LAG.
Orobanche rapum-genistae THUI.
Lathraea clandestina L.
Herniaria maritima LINK.
Thesium humifusum D.C.
Quercus toza BOSC.
Avena sulcata J. GAY

2.d Sub-Atlantic *sensu stricto*

Helleborus viridis L. ssp. *occidentalis* REUT.
Ranunculus hederaceus L.
Cochlearia danica L.
Polygala serpyllacea WEI.
Elatine hexandra D.C.
Sagina subulata PRESL.
Hypericum pulchrum L.
Hypericum desetangii LAM.
Genista pilosa L.
Sarothamnus scoparius KOCH.
Potentilla sterilis L.
Chrysosplenium oppositifolium L.
Saxifraga hypnoides L.
Helosciadium repens KOCH

Conopodium denudatum KOCH

Jasione perennis L.
Lysimachia nemorum L.
Pulmonaria tuberosa SCHR.
Linaria striata D.C.
Digitalis purpurea L.
Teucrium scorodonia L.
Scutellaria minor L.
Galeopsis dubia LEERS.
Pedicularis silvatica L.
Pinguicula grandiflora LMK.
Narcissus pseudo-narcissus L.
Juncus kochii F.SCH.
Alisma natans L.
Scirpus caespitosus L. ssp. *germanicus*
(PALLA) BROD.
Agropyrum boreoatlanticum SM.

Galium hercynicum WEI.
Lonicera periclymenum L.
Centaurea nigra L.
Senecio aquaticus HUDS.
Cirsium tuberosum ALL.

3. EURY-ATLANTIC SUB-ELEMENT

Lobelia dortmanna L.
Polygonum raii BAB.
Atriplex arenaria WOODS.
Atriplex babingtonii WOODS.
Myrica gale L.
Carex arenaria L.

Aira praecox L.
Aira multiculmis DUM.
Isoetes echinospora DUR.
Pilularia globulifera L.

Rhynchospora fusca R.S.
Ammophila arenaria LINK.
Spartina stricta ROTH.
Atropis maritima GRIS.
Hymenophyllum unilaterale BOR.
Hymenophyllum tunbridgense SM.

Appendix 3a: Annex I habitats in the Atlantic Biogeographical Region

Code:	Habitat:	UK	IRL	DK	F	NL	D	B	E	P
	COASTAL AND HALOPHYTIC HABITATS									
	Open sea and tidal areas									
11.25	Sandbanks which are slightly covered by sea water all the time	●	●	●	●	●	●	●	●	●
11.34	<i>Posidonia</i> beds									○
13.2	Estuaries	●	●	●	●	●	●	●	●	●
14	Mudflats and sandflats not covered by seawater at low tide	●	●	●	●	●	●	●	●	●
21	Lagoons	●	●	●	●		○		●	●
	Large shallow inlets and bays	●	●	●	●	●	●		●	
	Reefs	●	●		●		●			
	Marine 'columns' in shallow water made by leaking gases	○		●						
	Sea cliffs and shingle or stony beaches									
17.2	Annual vegetation of drift lines	●	●	○	●		●		●	●
17.3	Perennial vegetation of stony banks	●	●	●	●		●		●	●
18.21	Vegetated sea cliffs of the Atlantic and Baltic coasts	●	●	●	●		●		●	●
18.22	Vegetated sea cliffs of the Mediterranean coasts (with endemic <i>Limonium</i> spp.)									○
	Atlantic and continental saltmarshes and salt meadows									
15.11	<i>Salicornia</i> and other annuals colonising mud and sand	●	●	●	●	●	●	●	●	●
15.12	<i>Spartina</i> swards (<i>Spartinion</i>)	●	●	●	●	●	●	●	●	●
15.13	Atlantic salt meadows (<i>Glauco-Puccinellietalia</i>)	●	●	●	●	●	●	●	●	○
15.14	Continental salt meadows (<i>Puccinellietalia distantis</i>)	●					●			
	Mediterranean and thermo-Atlantic saltmarshes and salt meadows									
15.15	Mediterranean salt meadows (<i>Juncetalia maritimi</i>)	●			●				●	●
15.16	Mediterranean and thermo-Atlantic halophilous scrubs (<i>Arthrocnemetalia fruticosae</i>)	●			●				●	●
15.17	Iberia halo-nitrophilous scrubs (<i>Peango-Salsoletea</i>)								●	
	Salt and gypsum continental steppes									
15.18	Salt steppes (<i>Limonietalia</i>)									●
	COASTAL SAND DUNES AND CONTINENTAL DUNES									
	Sea dunes of the Atlantic, North Sea and Baltic Coasts									
16.211	Embryonic shifting dunes	●	●	●	●	●	●	●	●	●
16.212	Shifting dunes along the shoreline with <i>Ammophila arenaria</i> (white dunes)	●	●	●	●	●	●	●	●	●
16.221 to 16.227	Fixed dunes with herbaceous vegetation (grey dunes)	●	●	●	●	●	●	●	●	●
16.23	Decalcified fixed dunes with <i>Empetrum nigrum</i>	●	○	●	●	●	●			
16.24	Eu-atlantic decalcified fixed dunes (<i>Calluno-Ulicetea</i>)	●	●		●			●	●	●
16.25	Dunes with <i>Hippophae rhamnoides</i>	●	●	●	●	●		●		
16.26	Dunes with <i>Salix arenaria</i>	●	●	●	●	●	●	●		●
16.29	Wooded dunes of the Atlantic coast	○		●	●	●	●	●		
16.31 to 16.35	Humid dune slacks	●	●	●	●	●	●	●		
1A	Machairs (* machairs in Ireland)	●	●							
	Sea dunes of the Mediterranean coast									
16.223	<i>Crucianellion maritimae</i> fixed beach dunes									●
16.224	Dunes with <i>Euphorbia terracina</i>									○
16.228	<i>Malcolmietalia</i> dune grasslands									●
16.27	Dune juniper thickets (<i>Juniperus</i> spp.)	●		●						
16.29 x 42	Wooded dunes with <i>Pinus pinea</i> and/or <i>Pinus pinaster</i>									●
	Continental dunes, old and decalcified									
64.1 x 31.223	Dry sandy heaths with <i>Calluna</i> and <i>Genista</i>			●	●	●	●	●		○
64.1 x 31.227	Dry sandy heaths with <i>Calluna</i> and <i>Empetrum nigrum</i>			●		●	●			○
64.1 x 35.2	Open grassland with <i>Corynephorus</i> and <i>Agrostis</i> of continental dunes	●		●		●	●	●		○

Code:	Habitat:	UK	IRL	DK	F	NL	D	B	E	P
	FRESHWATER HABITATS									
22.11 x 22.31	Oligotrophic waters containing very few minerals of Atlantic sandy plains with amphibious vegetation: <i>Lobelia</i> , <i>Littorella</i> and <i>Isoetes</i>	●	●	●	●	●	●	●	●	○
22.11 x 22.34	Oligotrophic waters containing very few minerals of West Mediterranean sandy				●				●	
22.12 x (22.31 and	Oligotrophic waters in medio-European and perialpine area with amphibious vegetation: <i>Littorella</i> or <i>Isoetes</i> or annual vegetation on exposed banks	●		●	●		●	○		
21.12 x 22.44	Hard oligo-mesotrophic waters with benthic vegetation of <i>chara</i> formations	●	●		●	●	●			●
22.13	Natural eutrophic lakes with <i>Magnopotamion</i> or <i>Hydrocharition</i> -type vegetation	●	●	●	●	●	●	●	●	●
22.14	Dystrophic lakes	●	○	●	●	●	●		●	○
22.34	Mediterranean temporary ponds	●			●				●	
	Turloughs (Ireland)		●							
	Running water									
24.221 and 24.222	Alpine rivers and the herbaceous vegetation along their banks	○							●	
24.224	Alpine rivers and their ligneous vegetation with <i>Salix elaeagnos</i>								●	
24.4	Floating vegetation of <i>Ranunculus</i> of plain and submountainous rivers	●	●	●	●	●	●	●	●	●
24.52	<i>Chenopodium rubri</i> of submountainous rivers		●		●		●		●	●
	TEMPERATE HEATH AND SCRUB									
31.11	Northern Atlantic wet heaths with <i>Erica tetralix</i>	●	●	●	●	●	●	●	●	●
31.12	Southern Atlantic wet heaths with <i>Erica ciliaris</i> and <i>E. tetralix</i>	●			●				●	●
31.2	Dry heaths (all subtypes)	●	●	●	●	●	●	●	●	●
31.234	Dry coastal heaths with <i>Erica vagans</i> and <i>Ulex maritimus</i>	●			●				●	
31.4	Alpine and subalpine heaths	●	●		●				●	
31.622	Sub-Arctic willow scrub	●								
31.7	Endemic oro-Mediterranean heaths with gorse								●	
	SCLEROPHYLLOUS SCRUB (MATORRAL)									
	Sub-Mediterranean and temperate									
31.82	Stable <i>Buxus sempervirens</i> formations on calcareous rock slopes (<i>Berberidion</i> p)	●			●					
31.842	Mountain <i>Genista purgans</i> formations								●	
31.88	<i>Juniperus communis</i> formations on calcareous grasslands or heaths	●	●	●	●	●	●	●		
	Mediterranean arborescent matorral									
32.131 to 32.135	Juniper formations			●						
32.18	Matorral with <i>Laurus nobilis</i>								●	
	NATURAL AND SEMI-NATURAL GRASSLAND FORMATIONS									
	Natural grasslands									
34.11	Karstic calcareous grasslands (<i>Alyso-Sedion albi</i>)		○		●					
34.12	Xeric sand calcareous grasslands (<i>Koelerion glaucae</i>)			●	●	●	●	○		
34.2	Calaminarian grasslands	●	●			●	●	●		
36.32	Siliceous alpine and boreal grassland	●								
36.36	Siliceous <i>Festuca indigesta</i> Iberian grasslands								●	●
36.41 bis 3	Alpine calcareous grasslands	●							●	
	Semi-natural dry grasslands and scrub facies									
34.31 to 33.34	On calcareous substrates (<i>Festuco-Brometalia</i>) (*important orchid sites)	●	●	●	●	●	●	●	●	
34.31 to 34.34	On calcareous substrates (<i>Festuco-Brometalia</i>)	●	●			●	●	○	●	
34.5	Pseudosteppe with grasses and annuals (<i>Thero-Brachypodietea</i>)								●	
35.1	Species-rich <i>Nardus</i> grassland, on siliceous substrates in mountain areas (and	●	●	○	●	●	●		●	●
	Semi-natural tall-herb humid meadows									
37.31	<i>Molinia</i> meadows on chalk and clay (<i>Eu-Molinion</i>)	●		○	●		●	●	●	
37.4	Mediterranean tall-herb and rush meadows (<i>Molinio-Holoschoenion</i>)								●	●
37.7 and 37.8	Eutrophic tall herbs	●			●	●	●	●	●	
	<i>Cnidion venosae</i> meadows liable to flooding			○			●			
	Mesophile grasslands									
38.2	Lowland hay meadows (<i>Alopecurus pratensis</i> , <i>Sanguisorba officinalis</i>)	●	●		●	●	●	●	●	●
38.3	Mountain hay meadows (British types with <i>Geranium sylvaticum</i>)	●			●					●

Code:	Habitat:	UK	IRL	DK	F	NL	D	B	E	P
	RAISED BOGS AND MIRES AND FENS									
	Sphagnum acid bogs									
51.1	Active raised bogs	●	●	●	●	○	●	●		●
51.2	Degraded raised bogs (still capable of natural regeneration)	●	●		●	●	●	●		
52.1 & 52.2	Blanket bog (*active only)	●	●						●	
54.5	Transition mires and quaking bogs	●	●	●	●	●	●	●	●	
54.6	Depressions on peat substrates (Rhynchosporion)	●	●	●	●	●	●	●	●	○
	Calcareous fens									
53.3	Calcareous fens with <i>Cladium mariscus</i> and <i>Carex davalliana</i>	●	●		●	●	●	○	●	
54.12	Petrifying springs with tufa formations (<i>Cratoneurion</i>)	●	●		●		●	●	●	
54.2	Alkaline fens	●	●	●	●	●	●	●	●	
54.3	Alpine pioneer formations of <i>Caricion bicoloris-atrofuscae</i>	●								
	ROCKY HABITATS AND CAVES									
	Scree									
61.1	Siliceous scree	●	●						●	
61.2	Eutric scree	●	●						●	
61.3	Western Mediterranean and alpine thermophilous scree								●	○
61.5	Medio-European siliceous scree				●					
61.6	Medio-European calcareous scree				●					
	Chasmophytic vegetation on rocky slopes									
62.1 and 6	Calcareous sub-types	●	●	●					●	
62.2	Silicicolous sub-types	●	●		●		●		●	●
62.3	Pioneer vegetation of rock surfaces	○	●		●		●		●	●
62.4	Limestone pavements	●	●						●	
	Other rocky habitats									
65	Caves not open to the public	●	●		●		●	●	●	
	Submerged or partly submerged sea caves	●	●				●		●	
	FORESTS									
	Forests of temperate Europe									
41.11	<i>Luzulo-Fagetum</i> beech forests				●	●	●	●	●	
41.12	Beech forests with <i>Ilex</i> and <i>Taxus</i> , rich in epiphytes (<i>Ilici-Fagion</i>)	●			●	●	●		●	●
41.13	<i>Asperulo-Fagetum</i> beech forests	●		○	●	●	●			
41.16	Calcareous beech forest (<i>Cephalanthero-Fagion</i>)				●		●	●		
41.24	<i>Stellario-Carpinetum</i> oak-hornbeam forests	●			●	●	●	●		
41.26	<i>Galio-Carpinetum</i> oak-hornbeam forests						●	○		
41.4	<i>Tilio-Acerion</i> ravine forests	●			●	●				
41.51	Old acidophilous oak woods with <i>Quercus robur</i> on sandy plains	●		●	●	●	●	●		
41.53	Old oak woods with <i>Ilex</i> and <i>Blechnum</i> in the British Isles	●	●							
41.86	<i>Fraxinus angustifolia</i> woods									●
42.51	Caledonian forest	●								
44.A1 to 4	Bog woodland	●	●	●	●	●	●	●		
44.3	Residual alluvial forests (<i>Alnion glutinoso-incanae</i>)	●	●		●	●	●	●	●	●
44.4	Mixed oak-elm-ash forests of great rivers				●	●	●	○		
	Mediterranean deciduous forests									
41.6	Galicio-Portuguese oak woods with <i>Quercus robur</i> and <i>Quercus pyrenaica</i>				●				●	●
41.9	Chestnut woods								●	●
44.17	<i>Salix alba</i> and <i>Populus alba</i> galleries								●	●
	Mediterranean sclerophyllous forests									
45.2	<i>Quercus suber</i> forests				●				●	
45.3	<i>Quercus ilex</i> forests				●				●	
45.8	Forests of <i>Ilex aquifolium</i>	○							●	
	Mediterranean mountainous coniferous forests									
42.A71 to	<i>Taxus baccata</i> woods	●	●							
42.8	Mediterranean pine forests with endemic Mesogean pines, including <i>Pinus mugo</i> and <i>Pinus leucodermis</i>				●					
	Total number of habitats (including those that 'May occur')	82	58	46	74	48	63	46	69	52

Appendix 3b: Annex I habitats in the Atlantic Biogeographical Region that occur in three or fewer Member States

Habitats that occur in only one member state

Code:	Habitat:
-	<i>Posidonia</i> beds ¹
-	Marine 'columns' in shallow water made by leaking gases ²
18.22	Vegetated sea cliffs of the Mediterranean coasts (with endemic <i>Limonium</i> spp.) ¹
15.17	Iberia halo-nitrophilous scrubs (<i>Peango-Salsoletia</i>)
15.18	Salt steppes (<i>Limonietalia</i>)
16.223	<i>Crucianellion maritimae</i> fixed beach dunes
16.224	Dunes with <i>Euphorbia terracina</i> ¹
16.228	<i>Malcolmietalia</i> dune grasslands
16.29 x 42.8	Wooded dunes with <i>Pinus pinea</i> and/or <i>Pinus pinaster</i>
-	Turloughs (Ireland)
24.211 and 24.222	Alpine rivers and the herbaceous vegetation along their banks ²
24.224	Alpine rivers and their ligneous vegetation with <i>Salix elaeagnos</i>
31.622	Sub-Arctic willow scrub
31.7	Endemic oro-Mediterranean heaths with gorse
31.842	Mountain <i>Genista purgans</i> formations
32.131 to 32.135	Juniper formations
32.18	Matorral with <i>Laurus nobilis</i>
34.11	Karstic calcareous grasslands (<i>Alyso-Sedion albi</i>) ¹
36.32	Siliceous alpine and boreal grassland
34.5	Pseudosteppe with grasses and annuals (<i>Thero-Brachypodietea</i>)
	<i>Cnidion venosae</i> meadows liable to flooding ²
54.3	Alpine pioneer formations of <i>Caricion bicoloris-atrofuscae</i>
61.3	Western Mediterranean and alpine thermophilous scree ²
61.5	Medio-European siliceous scree
61.6	Medio-European calcareous scree
41.26	<i>Galio-Carpinetum</i> oak-hornbeam forests ²
41.86	<i>Fraxinus angustifolia</i> woods
42.51	Caledonian forest
45.8	Forests of <i>Ilex aquifolium</i> ²
42.8	Mediterranean pine forests with endemic Mesogean pines, including <i>Pinus mugo</i> and <i>Pinus leucodermis</i>
Total number of habitats:	30

¹ = may occur

² = may occur in at least one other Member State

Habitats that occur in only two member states

Code:	Habitat:
15.14	Continental salt meadows (<i>Puccinellietalia distantis</i>)
1A	Machairs (*machairs in Ireland)
16.27	Dune juniper thickets (<i>Juniperus</i> spp.)
22.11 x 22.34	Oligotrophic waters containing very few minerals of West Mediterranean sandy plains with <i>Isoetes</i>
31.82	Stable <i>Buxus sempervirens</i> formations on calcareous rock slopes (<i>Berberidion</i> p.)
36.36	Siliceous <i>Festuca indigesta</i> Iberian grasslands
36.41 to 36.45	Alpine calcareous grasslands
37.4	Mediterranean tall-herb and rush meadows (<i>Molinio-Holoschoenion</i>)
41.53	Old oak woods with <i>Ilex</i> and <i>Blechnum</i> in the British Isles
41.9	Chestnut woods
44.17	<i>Salix alba</i> and <i>Populus alba</i> galleries
45.2	<i>Quercus suber</i> forests
45.3	<i>Quercus ilex</i> forests
42.A71 to 42.A73	<i>Taxus baccata</i> woods
Total number of habitats:	14

Habitats that occur in only three member states

Code:	Habitat:
64.1 x 31.227	Dry sandy heaths with <i>Calluna</i> and <i>Empetrum nigrum</i> ²
22.34	Mediterranean temporary ponds
31.234	Dry coastal heaths with <i>Erica vagans</i> and <i>Ulex maritimus</i>
38.3	Mountain hay meadows (British types with <i>Geranium sylvaticum</i>)
52.1 and 52.2	Blanket bog (active only)
61.1	Siliceous scree
61.2	Eutric scree
62.4	Limestone pavement
41.16	Calcareous beech forest (<i>Cephalanthero-Fagion</i>)
41.1	<i>Tilio-Acerion</i> ravine forests
44.4	Mixed oak-ash-elm forests of great rivers ²
41.6	Galicio-Portuguese oak woods with <i>Quercus robur</i> and <i>Quercus pyrenaica</i>
Total number of habitats:	12

¹ = may occur² = may occur in at least one other Member State

Appendix 4a: Annex II species in the Atlantic Biogeographical Region

Member state:	UK	IRL	DK	F	NL	D	B	E	P
MAMMALS									
<i>Barbastella barbastellus</i>	●			●	●	●	●	●	
<i>Canis lupus</i>									●
<i>Capra pyrenaica pyrenaica</i>								●	
<i>Castor fiber</i>				●	R				
<i>Galemys pyrenaicus</i>								●	●
<i>Halichoerus grypus</i>	●	●		●	●	●			
<i>Lutra lutra</i>	●	●	●	●	E	●	R	●	●
<i>Microtus oenonomus arenicola</i>					●	●			
<i>Miniopterus schreibersi</i>				●				●	
<i>Mustela lutreola</i>				●				●	
<i>Myotis blythi</i>								●	
<i>Myotis bechsteini</i>	●			●	●	●	●	●	
<i>Myotis dasycneme</i>			●		●	○	●		
<i>Myotis emarginatus</i>				●	●		●	●	
<i>Myotis myotis</i>	E			●	●	●	●	●	
<i>Phoca vitulina</i>	●	●	●	●	●	●			
<i>Phocoena phocoena</i>	●	●	●	●	●	○		●	
<i>Rhinolophus euryale</i>				●				●	●
<i>Rhinolophus ferrumequinum</i>	●			●	E		○	●	●
<i>Rhinolophus hipposideros</i>	●	●		●	E	●		●	●
<i>Rhinolophus mehelyi</i>				●					
<i>Tursiops truncatus</i>	●	●		●	E	○		●	
<i>Ursus arctos</i>								●	
REPTILES									
<i>Caretta caretta</i>	V					V/A			
<i>Emys orbicularis</i>	A			●		V/A		○	
<i>Lacerta monticola</i>				●				●	
<i>Lacerta schreiberi</i>								●	
<i>Mauremys leprosa</i>								●	
AMPHIBIANS									
<i>Bombina bombina</i>						●			
<i>Bombina variegata</i>				●	●	●	○		
<i>Chioglossa lusitanica</i>								●	●
<i>Triturus cristatus</i>	●		●	●	●	●	●		
FISH									
<i>Acipenser sturio</i>	V	●		●	E	○			●
<i>Alosa spp.</i>	●	●	●	●	●	●		●	●
<i>Aspius aspius</i>						●			
<i>Barbus maridionalis</i>								●	
<i>Chondrostoma polyiepis</i>								●	●
<i>Chondrostoma toxostoma</i>								●	
<i>Cobitis taenia</i>	●			●	●	●	●		
<i>Coregonus oxyrhynchus</i>	E		●		E				
<i>Cottus ferruginosus</i>			●						
<i>Cottus gobio</i>	●			●	●	●	●	●	
<i>Lampetra fluviatilis</i>	●	●	●	●	●	●	●		
<i>Lampetra planeri</i>	●	●	●	●	●	●	●	●	
<i>Misgurnis fossilis</i>			●		●	●	●		
<i>Petromyzon marinus</i>	●	●	●	●	●	●		●	●

● = present ○ = may occur
E = extinct V = vagrant

A = established alien

R = reintroduction

Member state:	UK	IRL	DK	F	NL	D	B	E	P
<i>Rutilus arcasii</i>									●
<i>Rutilus macrolepidotus</i>									●
<i>Rhodeus sericeus amarus</i>	A			●	●	●	●		
<i>Salmo salar</i>	●	●	●	●	E	●		●	●
ARTHROPODS									
<i>Austropotamobius pallipes</i>	●	●		●		○			
<i>Callimorpha quadripunctata</i>				●		●			
<i>Cerambyx cerdo</i>	E				●	●	○	●	
<i>Coenagrion mercuriale</i>	●			●	E	●	○	○	
<i>Coenonympha oedippus</i>						E	○		
<i>Cucujus cinnaberinus</i>						○			
<i>Dytiscus latissimus</i>					○	●	○		
<i>Eriogaster catax</i>					●			●	
<i>Euphydryas aurinia</i>	●	●	●	●		●	○	●	●
<i>Graeslisia isabeilae</i>								●	
<i>Graphoderus bilineatus</i>					●	●	○		
<i>Leucorrhina pectoralis</i>					●	●	●		
<i>Limoniscus violaceus</i>	●								
<i>Lucanus cervus</i>	●			●	●	●	●	●	●
<i>Lycaena dispar</i>	E			●	●	●			
<i>Maculinea nausithous</i>					R	●		●	
<i>Maculinea teleius</i>				●	R	●	○		
<i>Ophiogomphus cecilla</i>			●		E	●			
<i>Osmoderma eremita</i>				●		●	○		
<i>Oxygastra curtisii</i>	E			●		●		○	
<i>Plebicula golgus</i>								○	
<i>Rosalia alpina</i>				●				●	
MOLLUSCS									
<i>Elona quimperiana</i>				●				●	
<i>Geomalacus maculosus</i>		●						●	●
<i>Margaritifera margaritifera</i>	●	●	●			●		●	
<i>Unio crassus</i>					●	●		○	
<i>Vertigo angustior</i>	●	●	●		●	●	●		
<i>Vertigo genesii</i>	●								
<i>Vertigo geyeri</i>	●	●	○			●			
<i>Vertigo moulinsiana</i>	●	●	○		●	●	●	○	
PLANTS									
PTERIDOPHYTA									
<i>Botrychium simplex</i>						●			
<i>Culcita macrocarpa</i>								●	●
<i>Dryopteris corleyi</i>								●	
<i>Isoetes boryana</i>				●					
<i>Marsilea quadrifolia</i>				●					●
<i>Ophioglossum polyphyllum</i>									○
<i>Trichomanes speciosum</i>	●	●		●				●	●
<i>Woodwardia radicans</i>								●	●
ANGIOSPERMAE									
<i>Aldrovanda vesiculosa</i>				●					
<i>Angelica heterocarpa</i>				●					
<i>Armeria pseudarmeria</i>	A								
<i>Apium repens</i>	●			●	●	●	●		
<i>Aster pyrenaicus</i>								●	
<i>Biscutella neustriaca</i>				●					

● = present ○ = may occur
E = extinct V = vagrant

A = established alien

R = reintroduction

Member state:	UK	IRL	DK	F	NL	D	B	E	P
<i>Centaurea borjae</i>								●	
<i>Centaurea somedanum</i>								●	
<i>Coleanthus subtilis</i>				●					
<i>Cypripedium calceolus</i>	●					●		●	
<i>Eryngium alpinum</i>				●					
<i>Eryngium viviparum</i>								●	●
<i>Festuca elegans</i>									●
<i>Festuca henriquesii</i>									●
<i>Gentianella anglica</i>	●								
<i>Jasione lusitanica</i>									●
<i>Liparis loeselii</i>	●		●	●	●	●	●		
<i>Luronium natans</i>	●		●	●	●	●	●		
<i>Najas flexilis</i>	●	●	●						
<i>Narcissus asturiensis</i>								●	○
<i>Narcissus cyclamineus</i>								●	●
<i>Narcissus pseudonarcissus subsp. nobilis</i>								●	●
<i>Oenanthe conioides</i>						●			
<i>Omphalodes kuzinskyana</i>								●	
<i>Omphalodes littoralis</i>				●					
<i>Rumex rupestris</i>	●			●					
<i>Saxifraga hirculus</i>	●	●	●						
<i>Sisymbrium supinum</i>				●					
<i>Soldeneila villosa</i>								●	
<i>Thesium ebracteatum</i>						○			
<i>Thorella verticillatinundata</i>				●					●
<i>Veronica micrantha</i>								●	●
<i>Viola hispida</i>				●					
LOWER PLANTS									
<i>Bruchia vogesiaca</i>								●	
<i>Buxbaumia viridis</i>	●							●	
<i>Dichelyma capillaceum</i>				●					
<i>Dicranum viride</i>						●			
<i>Drepanocladus vernicosus</i>	○	●			E	●	●	●	
<i>Jungermannia handelii</i>								●	
<i>Marsupella profunda</i>	●								●
<i>Meesia longiseta</i>			●						
<i>Petalophyllum ralfsii</i>	●	●							
<i>Sphagnum pylaisii</i>				●				●	
Total number of species (excluding vagrants or aliens)	40	24	24	58	32	54	30	63	32

Appendix 4b: Annex II species that occur in the Atlantic Biogeographical Region in three or fewer Member States

Species that occur in only one member state

MAMMALS	PLANTS
<i>Canis lupus</i>	<i>Aldrovanda vesiculosa</i>
<i>Capra pyrenaica pyrenaica</i>	<i>Angelica heterocarpa</i>
<i>Castor fiber</i>	<i>Aster pyrenaicus</i>
<i>Myotis blythi</i>	<i>Biscutelia neustriaca</i>
<i>Rhinolophus mehelyi</i>	<i>Botrychium simplex</i>
<i>Ursos arctos</i>	<i>Centaurea borjajae</i>
	<i>Centaureum somedanum</i>
REPTILES	<i>Coleanthus subtilis</i>
<i>Emys orbicularis</i>	<i>Dryopteris corleyi</i>
<i>Lacerta schreiberi</i>	<i>Eryngium alpinum</i>
<i>Mauremys leprosa</i>	<i>Festuca elegans</i>
	<i>Festuca henriquesii</i>
AMPHIBIANS	<i>Gentianella anglica</i>
<i>Bombina bombina</i>	<i>Isoetes boryana</i>
	<i>Jasione lusitanica</i>
FISH	<i>Narcissus asturiensis</i> ²
<i>Aspius aspius</i>	<i>Oenanthe conioides</i>
<i>Barbus meridionalis</i>	<i>Oenanthe kuzinskyana</i>
<i>Chondrostoma toxostoma</i>	<i>Omphalodes littoralis</i>
<i>Coregonus oxyrhynchus</i>	<i>Ophioglossum polyphyllum</i> ¹
<i>Cottus ferruginosus</i>	<i>Sisymbrium supinum</i>
<i>Rutilus arcasii</i>	<i>Soldeneila villosa</i>
<i>Rutilus macrolepidotus</i>	<i>Thesium ebracteatum</i>
	<i>Viola hispida</i>
ARTHROPODA	
<i>Coenonympha oedippus</i> ¹	LOWER PLANTS
<i>Cucujus cinnaberinus</i> ¹	<i>Bruchia vogesiaca</i>
<i>Dytiscus latissimus</i> ²	<i>Dichelyma capillaceum</i>
<i>Graeslisia isabeilae</i>	<i>Dicranum viride</i>
<i>Limniscus violaceus</i>	<i>Jungermannia handelii</i>
<i>Plebicula golgus</i> ¹	<i>Meesia longiseta</i>
MOLLUSCS	
<i>Vertigo genesii</i>	
Total number of species:	53

¹ = may occur

² = may occur in at least one other Member State

Species that occur in only two member states

MAMMALS	MOLLUSCS
<i>Galemys pyrenaicus</i>	<i>Elona quimperiana</i>
<i>Microtus oenconomus arenicola</i>	<i>Unio crassus</i> ²
<i>Miniopterus schreibersi</i>	
<i>Mustela lutreola</i>	PLANTS
	<i>Culcita macrocarpa</i>
REPTILES	<i>Eryngium viviparum</i>
<i>Lacerta monticola</i>	<i>Marsilea quadrifolia</i>
	<i>Narcissus cyclamineus</i>
AMPHIBIANS	<i>Narcissus pseudonarcissus</i> subsp. <i>nobilis</i>
<i>Chioglossa lusitanica</i>	<i>Rumex rupestris</i>
	<i>Thorella verticillatinundata</i>
FISH	<i>Veronica micrantha</i>
<i>Chondrostoma polyeipis</i>	<i>Woodwardia radicans</i>
ARTHROPODS	LOWER PLANTS
<i>Callimorpha quadripunctata</i>	<i>Buxbaumia viridis</i>
<i>Eriogaster catax</i>	<i>Marsupella profunda</i>
<i>Graphoderus bilineatus</i> ²	<i>Petalophyllum ralfsii</i>
<i>Maculinea nausithous</i>	<i>Sphagnum pylaisii</i>
<i>Maculinea teleius</i> ²	
<i>Ophiogomphus cecilla</i>	
<i>Osmoderma eremita</i> ²	
<i>Oxygastra curtisii</i> ²	
<i>Rosalia alpina</i>	
Total number of species:	31

Species that occur in only three member states

MAMMALS	MOLLUSCS
<i>Myotis dasycneme</i> ²	<i>Geomalacus maculosus</i>
<i>Rhinolophus euryale</i>	<i>Vertigo geyeri</i> ²
AMPHIBIANS	PLANTS
<i>Bombina variegata</i> ²	<i>Cyripedium calceolus</i>
	<i>Najas flexilis</i>
FISH	<i>Saxifraga hirculus</i>
<i>Acipenser sturio</i> ²	
ARTHROPODS	
<i>Austropotamobius pallipes</i> ²	
<i>Cerambyx cerdo</i> ²	
<i>Coenagrion mercuriale</i> ²	
<i>Leucorrhina pectoralis</i>	
<i>Lycaena dispar</i>	
Total number of species:	14

¹ = may occur² = may occur in at least one other Member State

Appendix 5: Conclusions of the Meeting of Member States of the Atlantic Biogeographical Region (13-14 October 1994, Edinburgh)

Provision of information

1. Acknowledging that the quality and extent of information about habitat types and species varies within the Region, Member States will provide information to the Commission in the Natura 2000 data entry form using the best scientific information available at the time according to the format agreed by the Habitats Committee.

Balancing the national lists

2. Acknowledging that outstanding single interest sites in terms of quality, extent or range make an important contribution to the Natura 2000 network, special emphasis will be given to identifying and delimiting sites containing complexes of interests on Annexes I and II as valuable ecological functional units.
3. Member States will give significant additional emphasis in number and area to sites containing priority habitat types and species.
4. In considering the degree of representativity of Annex I habitat types on individual sites, Member States will take account of the best examples in extent and quality of the main type (which is most characteristic of the Member State) and its main variants, having regard to geographical range.
5. Acknowledging that sites containing Annex I habitat types and Annex II species at the centre of their range will make an important contribution to Natura 2000, Member States will take responsibility for proposing sites containing habitats and species that are particularly rare in that Member State, with a view to preserving the range.
6. It is acknowledged that certain habitat types and species listed in Annexes I and II are relatively common and extensive in certain Member States. These Member States will have particular responsibility for proposing a proportion of the resource that is sufficient to contribute significantly to the maintenance of the habitat types and species at a favourable conservation status.
7. Where Annex II species' populations are too small to be naturally viable, or where the species occur only as vagrants or reintroductions, Member States may exclude them from consideration for site selection.
8. Artificial areas need not be excluded from site selection if they have spontaneously given rise to Annex I habitat types or host Annex II species and if it is considered that they have exceptional value.

Defining boundaries

9. It is acknowledged that different Member States will have different approaches to the definition of boundaries (e.g. the inclusion of buffer zones within the site), according to the habitat type or species concerned and the legal and management measures necessary to protect and extend the landscape context.

¹ = may occur

² = may occur in at least one other Member State

