

# **EUNIS HABITAT CLASSIFICATION REVISED 2004**

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by Cynthia E Davies, Dorian Moss and Mark O Hill

### **Abstract**

The habitat classification forms an integral part of the European Nature Information System (EUNIS), developed and managed by the European Topic Centre for Nature Protection and Biodiversity (ETC/NPB in Paris) for the European Environment Agency (EEA) and the European Environmental Information Observation Network (EIONET). The EUNIS habitat system consists of a database together with explanatory documentation. EUNIS habitats are arranged in a hierarchy, starting at level 1. They provide a comprehensive typology for the habitats of Europe and its adjoining seas. This report provides full documentation of EUNIS habitats to level 4 for marine habitats and to level 3 for terrestrial and freshwater habitats. Marine habitats, their descriptions, and the criteria for deriving them, were extensively revised following an expert workshop in Helsinki in July 2004. Terrestrial and freshwater habitats were critically reviewed by us in 2004. Many new definitions were added and most of the existing definitions were revised. A few names were changed. The results of these changes are presented as a set of factsheets for habitats at levels 1 to 4 (marine) and levels 1 to 3 (terrestrial and freshwater), accompanied by a key and a glossary. In an annex, the names and index numbers of all EUNIS habitats are listed, including the higher levels.

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# 1 INTRODUCTION

## 1.1 Habitats in the context of the European Nature Information System (EUNIS)

Since the inception of the European Environment Agency there has been a continuous work programme to develop a comprehensive framework for classification of European habitats and to provide descriptions of European habitat types within the framework. The framework includes habitat attributes, which in this context are called ‘parameters’, of which defining parameters are used to distinguish between habitats and descriptive parameters are used to describe the range of geomorphology, salinity, human impacts and so forth that are encompassed within the habitat.

The habitat classification forms an integral part of the European Nature Information System (EUNIS), developed and managed by the European Topic Centre for Nature Protection and Biodiversity (ETC/NPB in Paris) for the European Environment Agency (EEA) and the European Environmental Information Observation Network (EIONET).

The EUNIS web application (<http://eunis.eea.eu.int/index.jsp>) (EEA 2004) provides access to publicly available data in a consolidated database.

The information includes:

- Data on Species, Habitats and Sites compiled in the framework of NATURA2000 (EU Habitats and Birds Directives),
- Data collected from frameworks such as EIONET, data sources or material published by ETC/NPB (formerly the European Topic Centre for Nature Conservation).
- Information on Species, Habitats and Sites taken into account in relevant international conventions or from International Red Lists.
- Specific data collected in the framework of the EEA's reporting activities, which also constitute a core set of data to be updated periodically.

This report presents the EUNIS habitat classification and key updated in October 2004.

## 1.2 Definition and scale of EUNIS habitats

For the purposes of EUNIS, a ‘**habitat**’ is defined as: ‘**a place where plants or animals normally live, characterized primarily by its physical features (topography, plant or animal physiognomy, soil characteristics, climate, water quality etc.) and secondarily by the species of plants and animals that live there**’. Habitats are necessarily defined at a given scale. Some EUNIS habitats such as moss and lichen tundra or deep-sea mud may be of vast extent. Others such as cave entrances or springs, spring brooks and geysers are much smaller. Most but not all EUNIS habitats are in effect ‘**biotopes**’, that is to say ‘**areas with particular environmental conditions that are sufficiently uniform to support a characteristic assemblage of organisms**’. A few EUNIS habitats such as glaciers and highly artificial non-saline standing waters may be devoid of living organisms other than microbes. These features, although not strictly habitats, are included for completeness.

The EUNIS habitat classification is comprehensive. It covers the whole of the European land and sea area, i.e. the European mainland as far east as the Ural Mountains, including offshore islands (Cyprus; Iceland but not Greenland), and the archipelagos of the European Union

Member States (Canary Islands, Madeira and the Azores), Anatolian Turkey and the Caucasus.

In general, the scale selected for the EUNIS habitat classification is that occupied by small vertebrates, large invertebrates, and vascular plants. It is the same as that generally adopted by other European-scale typologies, for example by the Palaearctic habitat classification (Devillers & Devillers-Terschuren, 1996) and is comparable to the scale applied to the classification of vegetation in traditional phytosociology. All but the smallest EUNIS habitats occupy at least 100 m<sup>2</sup>; there is no upper limit to the scale of the largest. At the smaller scale, '**microhabitats**' (features generally occupying less than 1 m<sup>2</sup> that are important for some smaller invertebrates and lower plants) can be described. Examples are decaying wood, found in mature forests and required by invertebrates whose function is decomposition, or animal dung in grassland environments. At the larger scale, habitats can be grouped as '**habitat complexes**', which are frequently-occurring combinations or mosaics of individual habitat types, usually occupying at least 10 ha, which may be inter-dependent. Estuaries, combining tidal water, mud flats, saltmarshes and other littoral habitats, are a good example.

### **1.3 The EUNIS habitat type classification: Description of level 1 habitats**

The EUNIS habitat types are arranged in a hierarchy. Level 1 is the highest. There are 10 level 1 categories, the definitions of which are given below. In the enumeration given here, marine habitats are listed down to level 4, and terrestrial and freshwater habitats to level 3. The reason for this discrepancy is that the original focus of EUNIS was terrestrial, so that the vast range of marine habitats were included in a single level 1 category. Marine habitats at level 2 are broadly equivalent to terrestrial and freshwater habitats at level 1. They are described below in section 1.4.

#### **A Marine habitats**

Marine habitats are directly connected to the oceans, i.e. part of the continuous body of water which covers the greater part of the earth's surface and which surrounds its land masses. Marine waters may be fully saline, brackish or almost fresh. Marine habitats include those below spring high tide limit (or below mean water level in non-tidal waters) and enclosed coastal saline or brackish waters, without a permanent surface connection to the sea but either with intermittent surface or sub-surface connections (as in lagoons). Rockpools in the supralittoral zone are considered as enclaves of the marine zone. Includes marine littoral habitats which are subject to wet and dry periods on a tidal cycle including tidal saltmarshes; marine littoral habitats which are normally water-covered but intermittently exposed due to the action of wind or atmospheric pressure changes; freshly deposited marine strandlines characterised by marine invertebrates. Waterlogged littoral saltmarshes and associated saline or brackish pools above the mean water level in non-tidal waters or above the spring high tide limit in tidal waters are included with marine habitats. Includes constructed marine saline habitats below water level as defined above (such as in marinas, harbours, etc) which support a semi-natural community of both plants and animals. The marine water column includes bodies of ice.

#### **B Coastal habitats**

Coastal habitats are those above spring high tide limit (or above mean water level in non-tidal waters) occupying coastal features and characterised by their proximity to the sea, including coastal dunes and wooded coastal dunes, beaches and cliffs. Includes free-draining supralittoral habitats adjacent to marine habitats which are normally only affected by spray or

splash, strandlines characterised by terrestrial invertebrates and moist and wet coastal dune slacks and dune-slack pools. Excludes supralittoral rock pools and habitats adjacent to the sea which are not characterised by salt spray, wave or sea-ice erosion.

### **C Inland surface waters**

Inland surface waters are non-coastal above-ground open fresh or brackish waterbodies (e.g. rivers, streams, lakes and pools, springs), including their littoral zones. Includes constructed inland freshwater, brackish or saline waterbodies (such as canals, ponds, etc) which support a semi-natural community of both plants and animals; seasonal waterbodies which may dry out for part of the year (temporary or intermittent rivers and lakes and their littoral zones). Freshwater littoral zones include those parts of banks or shores that are sufficiently frequently inundated to prevent the formation of closed terrestrial vegetation. Excludes permanent snow and ice. Note that habitats that intimately combine waterlogged mires and vegetation rafts with pools of open water are considered as complexes.

### **D Mires, bogs and fens**

Wetlands, with the water table at or above ground level for at least half of the year, dominated by herbaceous or ericoid vegetation. Includes inland saltmarshes and waterlogged habitats where the groundwater is frozen. Excludes the water body and rock structure of springs (C2.1) and waterlogged habitats dominated by trees or large shrubs (F9.2, G1.4, G1.5, G3.D, G3.E). Note that habitats that intimately combine waterlogged mires and vegetation rafts with pools of open water are considered as complexes.

### **E Grasslands and lands dominated by forbs, mosses or lichens**

Non-coastal land which is dry or only seasonally wet (with the water table at or above ground level for less than half of the year) with greater than 30% vegetation cover. The vegetation is dominated by grasses and other non-woody plants, including mosses, macrolichens, ferns, sedges and herbs. Includes semiarid steppes with scattered *Artemisia* scrub. Includes successional weedy vegetation and managed grasslands such as recreation fields and lawns. Excludes regularly tilled habitats (I1) dominated by cultivated herbaceous vegetation such as arable fields.

### **F Heathland, scrub and tundra**

Non-coastal land which is dry or only seasonally inundated (with the water table at or above ground level for less than half of the year) with greater than 30% vegetation cover. Tundra is characterised by the presence of permafrost. Heathland and scrub are defined as vegetation dominated by shrubs or dwarf shrubs of species that typically do not exceed 5 m maximum height. Includes shrub orchards, vineyards, hedges (which may have occasional tall trees). Also includes stands of climatically-limited dwarf trees (krummholz) < 3 m high, such as occur in extreme alpine conditions. Includes *Salix* and *Frangula* carrs. Excludes *Alnus* and *Populus* swamp woodland.

### **G Woodland, forest and other wooded land**

Woodland and recently cleared or burnt land where the dominant vegetation is, or was until very recently, trees with a canopy cover of at least 10%. Trees are defined as woody plants, typically single-stemmed, that can reach a height of 5 m at maturity unless stunted by poor climate or soil. Includes lines of trees, coppices, regularly tilled tree nurseries, and tree-crop plantations. Includes *Alnus* and *Populus* swamp woodland and riverine *Salix* woodland. Excludes *Corylus avellana* scrub and *Salix* and *Frangula* carrs. Excludes stands of climatically-limited dwarf trees (krummholz) < 3 m high, such as occur at the arctic or alpine

tree limit. Excludes parkland and dehesa with canopy less than 10%, which are listed under sparsely wooded grasslands E7.

### **H Inland unvegetated and sparsely vegetated habitats**

Non-coastal habitats with less than 30% vegetation cover (other than where the vegetation is chasmophytic or on scree and or cliff) which are dry or only seasonally wet (with the water table at or above ground level for less than half of the year). Subterranean non-marine caves and passages including underground waters. Habitats characterised by the presence of permanent snow and surface ice other than marine ice bodies.

### **I Regularly or recently cultivated agricultural, horticultural and domestic habitats**

Habitats maintained solely by frequent tilling or arising from recent abandonment of previously tilled ground such as arable land and gardens. Includes tilled ground subject to inundation. Excludes shrub orchards, tree nurseries and tree-crop plantations.

### **J Constructed, industrial and other artificial habitats**

Primarily human settlements, buildings, industrial developments, the transport network, waste dump sites. Includes highly artificial saline and non-saline waters with wholly constructed beds or heavily contaminated water (such as industrial lagoons and saltworks) which are virtually devoid of plant and animal life.

## **1.4 EUNIS habitat classification: Description of marine level 2 habitats**

Marine habitats at level 2 are roughly equivalent in the hierarchy to terrestrial habitats at level 1.

### **A1 Littoral rock and other hard substrata**

Littoral rock includes habitats of bedrock, boulders and cobbles which occur in the intertidal zone (the area of the shore between high and low tides) and the splash zone. The upper limit is marked by the top of the lichen zone and the lower limit by the top of the laminarian kelp zone.

### **A2 Littoral sediment**

Littoral sediment includes habitats of shingle (mobile cobbles and pebbles), gravel, sand and mud or any combination of these which occur in the intertidal zone. Littoral sediment is defined further using descriptions of particle sizes - mainly gravel (16-4 mm), coarse sand (4-1 mm), medium sand (1-0.25 mm), fine sand (0.25-0.063 mm) and mud (less than 0.063 mm) and various admixtures of these (and coarser) grades - muddy sand, sandy mud and mixed sediment (cobbles, gravel, sand and mud together).

### **A3 Infralittoral rock and other hard substrata**

Infralittoral rock includes habitats of bedrock, boulders and cobbles which occur in the shallow subtidal zone and typically support seaweed communities. The upper limit is marked by the top of the kelp zone whilst the lower limit is marked by the lower limit of kelp growth or the lower limit of dense seaweed growth. Infralittoral rock typically has an upper zone of dense kelp (forest) and a lower zone of sparse kelp (park), both with an understorey of erect seaweeds.

#### **A4 Circalittoral rock and other hard substrata**

Circalittoral rock is characterised by animal dominated communities (a departure from the algae dominated communities in the infralittoral zone). The circalittoral zone can itself be split into two sub-zones; upper circalittoral (foliose red algae present) and lower circalittoral (foliose red algae absent). The depth at which the circalittoral zone begins is directly dependent on the intensity of light reaching the seabed; in highly turbid conditions, the circalittoral zone may begin just below water level at mean low water springs (MLWS).

#### **A5 Sublittoral sediment**

Sediment habitats in the sublittoral near shore zone (i.e. covering the infralittoral and circalittoral zones), typically extending from the extreme lower shore down to the edge of the bathyal zone (200 m). Sediment ranges from boulders and cobbles, through pebbles and shingle, coarse sands, sands, fine sands, muds, and mixed sediments.

#### **A6 Deep-sea bed**

The sea bed beyond the continental shelf break. The shelf break occurs at variable depth, but is generally over 200 metres. The upper limit of the deep-sea zone is marked by the edge of the shelf. Includes areas of the Mediterranean Sea which are deeper than 200 m but not of the Baltic Sea which is a shelf sea.

#### **A7 Pelagic water column**

The water column of shallow or deep sea, or enclosed coastal waters. Note that because of the strong temporal nature of the pelagic environment, the water column at a given location will be classified differently at different times of the year.

#### **A8 Ice-associated marine habitats**

Sea ice, icebergs and other ice-associated marine habitats.

### **1.5 Development of the classification**

The EUNIS habitat classification is a common reporting language on habitat types at European level, sponsored by the European Environment Agency. It originated from a combination of several habitat classifications - marine, terrestrial and freshwater. The terrestrial and freshwater classification builds upon previous initiatives, notably the CORINE biotopes classification (Devillers & Devillers-Terschuren 1991), the Palaeartic habitats classification (Devillers & Devillers-Terschuren 1996), Annex I of the EU Habitats Directive 92/43/EEC, the CORINE Land Cover nomenclature (Bossard *et al.* 2000), and the Nordic habitat classification (Nordic Council of Ministers 1994). The marine part of the classification was originally based on the BioMar classification (Connor *et al.* 1997), covering the North-East Atlantic. The EUNIS habitat classification introduced agreed criteria for the identification of each habitat unit, while providing a correspondence with these earlier classification systems.

Several of the earlier classifications, notably the CORINE biotopes classification, were strongly based on traditional phytosociology. While phytosociological classifications are well understood by ecologists in many parts of Europe, they are not readily accessible to other biologists and nature conservationists. A valuable step in making phytosociology more accessible to the wider community was the publication of *The Diversity of European Vegetation* (Rodwell *et al.* 2002). However, many habitats are not vegetated, particularly in the marine environment, so that a comprehensive enumeration of habitats cannot be based on



vegetation alone. In updating the EUNIS classification, we have therefore aimed to rely on simple, often physical, descriptions of habitats.

The early process of development of the classification was documented in previous reports by Davies & Moss (1998, 1999). Work at this time concentrated on the development of consistent criteria to distinguish habitats at levels 1, 2 and 3. Habitats which did not fit the criteria were transferred to different parts of the classification to ensure consistency. This stage of the work, which had been developed with a team of experts drawn from different biogeographic regions, was completed with a wide-ranging consultation process in 1998-1999. An internet version of the classification, hosted in the Walloon region of Belgium, was released in 2000. In 2003 EUNIS was mounted on the European Community Clearing House Mechanism website, including the 2003 version of the habitat classification and new functionalities. However, at the beginning of 2004, many terrestrial and freshwater habitats still lacked descriptions in the EUNIS database. Some of the existing descriptions were unclear. Others were verbose or contained difficult technical jargon. For the 2004 edition, the descriptions have been comprehensively revised, down to level 3. In the process of revision, it was decided to change the names of a few units to include habitats (e.g. ice caps) that were not present in the geographical area originally covered by CORINE biotopes. Some further revisions were made, in order to correct some inconsistencies, especially for constructed, industrial and other artificial habitats.

The resulting system of classification is still somewhat transitional. Down to level 3 (terrestrial and freshwater) and level 4 (marine), EUNIS habitats are now based on physiognomic and physical attributes, together with some floristic criteria. Below these levels, habitats have largely been adopted from other systems with little or no modification. Terrestrial habitats have been little altered from their previous state, mostly based on the Palaeartic Habitats Classification (Devillers & Devillers-Terschuren, 1996) which is strongly phytosociological in its basis. Other terrestrial habitats have been added to ensure that all habitats listed in Annex I of the Habitats Directive (European Commission 2003) find a correspondence somewhere in EUNIS habitats. Clearly to bring the lower levels into a consistent EUNIS framework, they should also be revised, preferably without the numerous minor regional variants. Such minor variants, if noted at all, are best handled by crosswalks, linking regional habitat systems to EUNIS.

## **1.6 Development of the marine part of the classification**

The marine part of the classification has been heavily revised since its inception in 1998 (Davies & Moss 1998), first with the addition of Baltic and Mediterranean marine habitats listed by the Helsinki and Barcelona Conventions respectively (Davies & Moss 1999, Helsinki Convention 1998, Barcelona Convention 1998). Further revisions were made in response to proposals made at international workshops concentrating on marine habitats. Workshops were organised in September 1999 and September 2000 by the OSPAR Commission, the International Council for the Exploration of the Sea (ICES) and the European Environment Agency (EEA). The ICES Marine Habitats Mapping Working Group met in April 2001 and again in April 2002. Further amendments were made in response to comments from a number of users of the classification, and in order to update the direct links between the EUNIS classification and other initiatives, notably the Palaeartic habitat classification (Devillers & Devillers-Terschuren 1996), CORINE Land Cover nomenclature (Bossard et al. 2000) and Annex I of the EU Habitats Directive 92/43/EEC (European Commission 1999, 2003).

The classification in its present form results from discussion of proposals for revision made by the EEA (Davies & Moss 2004) in response to proposals received from the OSPAR Biodiversity Committee, and also includes a revision of the UK marine habitat classification (Connor *et al* 2004). To ensure that the EUNIS Habitat classification meets the needs of in the Baltic Sea areas, a series of meetings with Baltic Sea experts was held. The EEA proposals (Davies & Moss 2004) and a paper from workers in the Baltic Sea area were discussed fully in a meeting held in July, 2004. The present classification includes the results of these discussions.

The Baltic experts' meeting concluded that further work is required in order to describe Baltic marine habitats to the same level of detail as that available in the North-East Atlantic, so the October 2004 version of EUNIS habitats represents only a starting point in this process. For the Mediterranean Sea, habitats listed as threatened by the Barcelona Convention (Barcelona Convention 1998) are worked into the classification as appropriate, but these lack any descriptions, neither is there any information on other Mediterranean marine habitats. Information specific to the Black Sea is currently lacking.

The full classification will be posted on the EUNIS website (<http://eunis.eea.eu.int/index.jsp>), together with keys for identification of all habitat types at levels 1, 2 and 3 of the hierarchy, the glossary of terms and background information on the rationale of the classification and history of its development.

## **2 KEY TO THE CLASSIFICATION TO LEVEL 2**

Defining parameters for the units comprising the EUNIS Habitat Classification are held in a database. These defining parameters have been used to develop a key to habitats to level 3, presented on the following pages.

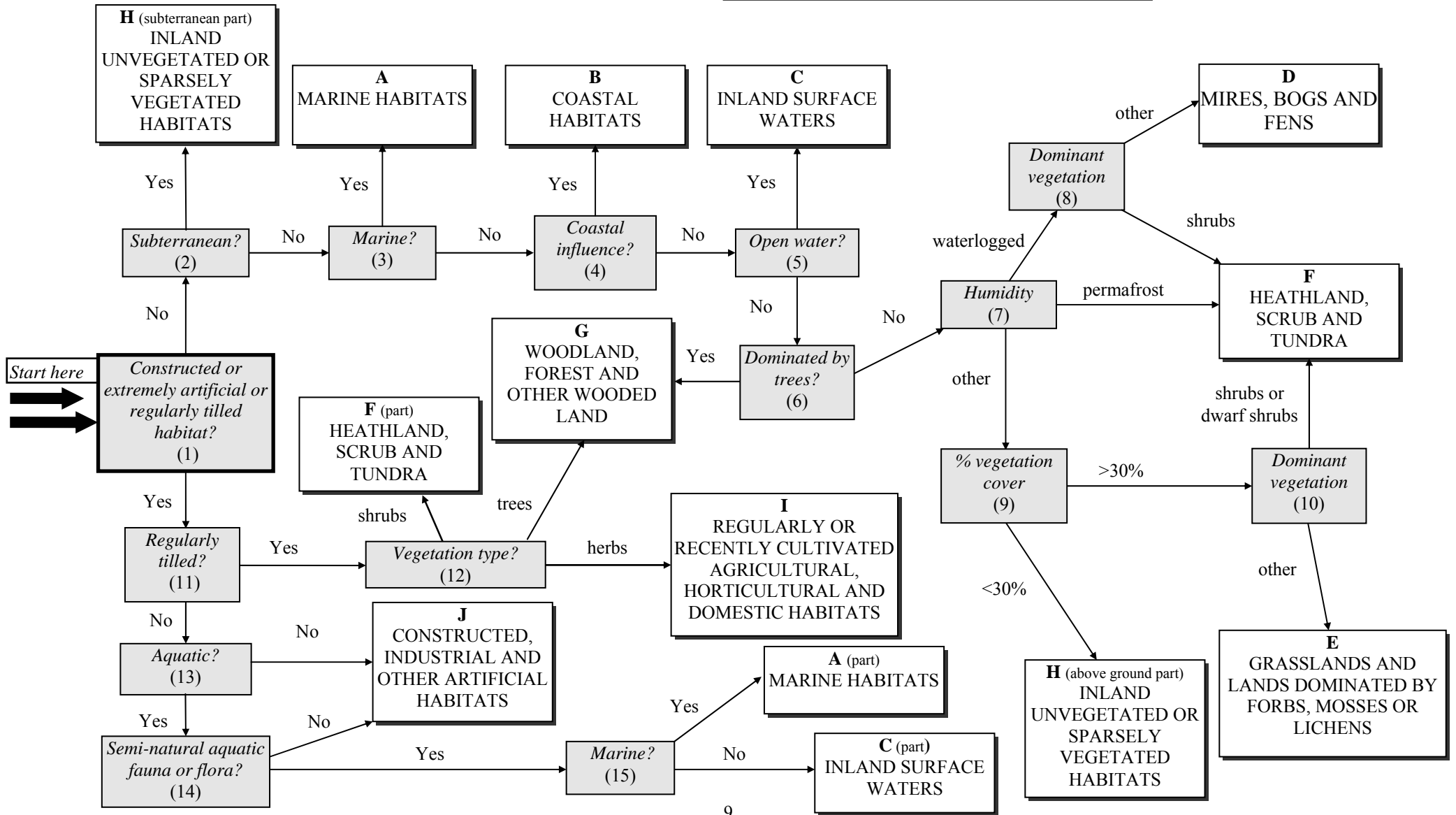
### **2.1 Use of the key**

Criteria diagrams for levels 1 to 3 of the proposed revision of the EUNIS Habitat Classification units are presented with additional detailed explanatory notes accompanying each grey 'decision box'. These numbered notes explain how the decision box is to be applied, and form an integral and essential part of the criteria. Criteria have been developed for all units to level 3. Criteria have also been developed for saltmarshes at level 4. A Glossary of terms is included in this report (Chapter 4). The complete key is available on the website together with a bibliography and the glossary of terms to aid in the interpretation of terminology in the classification.

# EUNIS Habitat Classification: criteria for Level 1

(number) refers to explanatory notes to the key (see following page)

Note: Complex habitats may not readily be located as an entity, as they comprise a number of different habitat units. Complexes are listed under code X.



**Note: Complex habitats may not readily be located as an entity, as they comprise combinations of a number of different habitat units. Complexes are listed under code X.**

Explanatory notes to the key

1. Is the habitat highly artificial, i.e. either constructed or with a man-made substrate; industrial; maintained solely by frequent tilling; or if recently abandoned, then either bare or with pioneer and ruderal vegetation with cover < 30%, (path = *Yes*)? All other habitats follow path = *No*. Note that habitats which originated through extractive industries (quarries, mines, peat diggings etc) or disused constructed surfaces, which have been colonised by natural or semi-natural plant and/or animal communities, including pioneer or ruderal communities with vegetation cover > 30%, follow path = *No*.
2. The criterion separates subterranean non-marine caves and passages and underground waters (path = *Yes*).
3. Marine habitats including marine littoral habitats (path = *Yes*) are distinguished. Note that marine habitats are directly connected to the oceans, i.e. part of the continuous body of water which covers the greater part of the earth's surface and which surrounds its land masses. Marine waters may be fully saline, brackish or almost fresh. Marine habitats include those below spring high tide limit (or below mean water level in non-tidal waters), coastal saltmarshes, and also enclosed coastal saline or brackish waters, without a permanent surface connection to the sea but either with intermittent surface or sub-surface connections (as in lagoons). Waterlogged littoral zones of the sea above the spring high tide limit in tidal waters are included with marine habitats (path = *Yes*). Rockpools in the supralittoral zone are considered as enclaves of the marine zone and follow the marine path. Waterlogged saltmarsh habitats and saline or brackish pools above the mean water level of non-tidal marine waters (parts of the geolittoral) are included with marine habitats and follow path = *Yes*; non-saline habitats above the mean water level in non-tidal waters follow path = *No*. Free-draining supralittoral habitats adjacent to marine habitats normally only affected by spray or splash and old strandlines characterised by terrestrial invertebrates follow path = *No*.
4. Habitats occupying coastal features and characterised by their proximity to the sea (salt spray, wave or ice erosion), including beaches, cliffs, coastal dunes and wooded coastal dunes and dune-slack pools, are separated (path = *Yes*) from other habitats (path = *No*). Note that habitats occupying coastal features but not characterised by salt spray, wave or ice erosion follow path = *No*. Note also that habitats which are characterised primarily by temperature (such as garrigues and phrygnas) rather than by their proximity to the sea also follow path = *No*.
5. Habitats with open water (e.g. rivers, streams, lakes and pools) and the littoral zones of the waterbodies (path = *Yes*) are separated from other terrestrial habitats including those with the water table permanently at or near the surface, but normally without free-standing water. Note that waterlogged habitats with integral pools of open water are considered as complexes. Enclosed coastal saline or brackish waters, without a permanent surface connection to the sea but either with intermittent surface or sub-surface connections (as in lagoons) are categorised under A Marine habitats; dune-slack pools characterised by their proximity to the sea are categorised under B Coastal habitats.
6. Habitats where the dominant vegetation is, or was until very recently, trees, with a canopy cover of at least 10% are distinguished (path = *Yes*) from habitats dominated by other types of vegetation or without vegetation or dominated by animal communities. Trees are typically single-

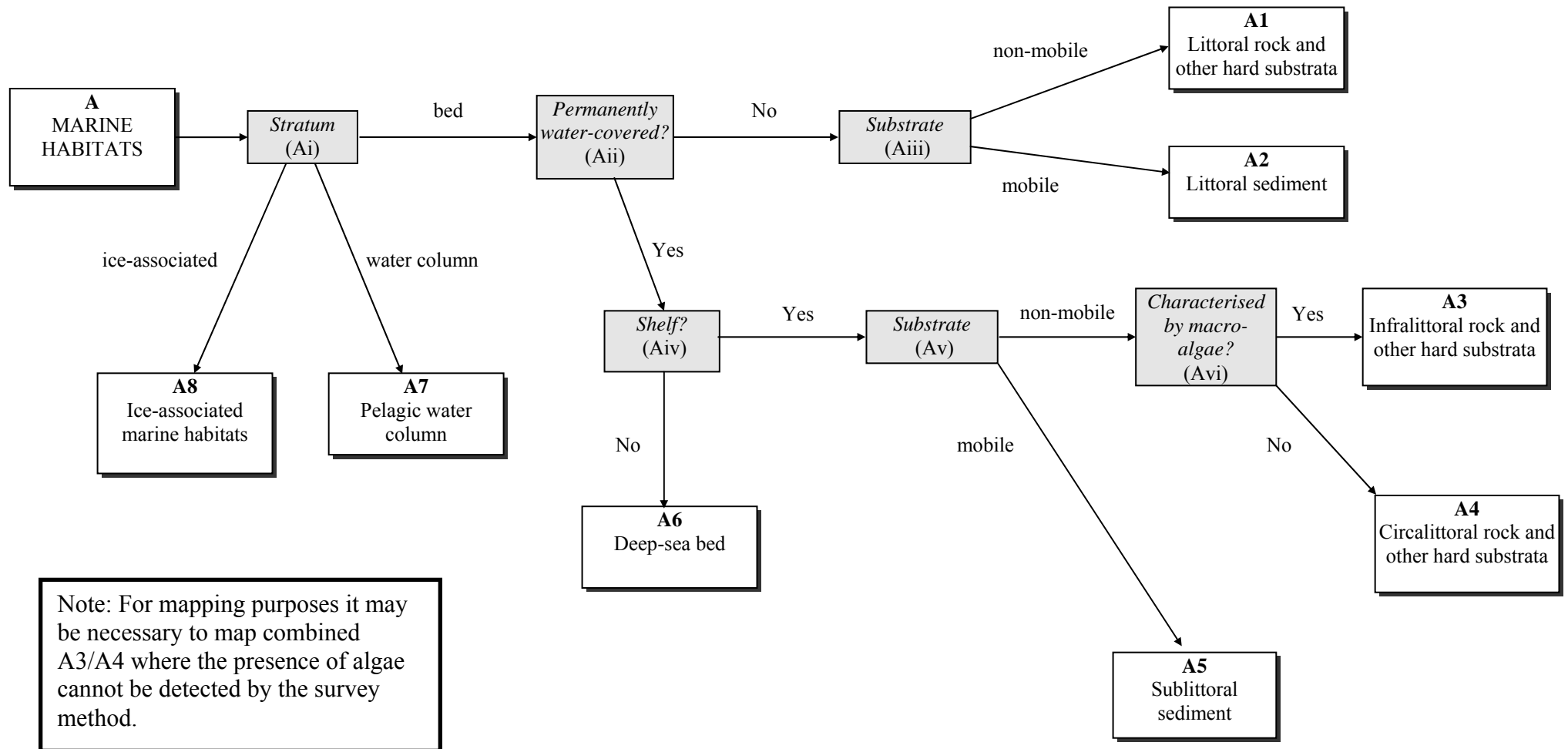
stemmed and are normally able to reach a height of 5 m at maturity but this height may be lower at high latitudes or altitudes. Note that lines of trees, coppices, and very recently clear-felled areas with pre-existing ground cover, not yet re-stocked and with no succession to weedy vegetation follow path = *Yes*. Occasionally tall shrubs, especially some riverine alders (*Alnus*) and willows (*Salix*) may have a woodland-type structure and follow path = *Yes*. Tree heaths, for example tree-like formations of *Erica arborea*, also follow path = *Yes*. Sparsely wooded areas of grassland with canopy cover of 5 - 10%, including parkland, and clear-felled areas with successional weedy communities follow path = *No* and are categorised under E, Grasslands and lands dominated by forbs, mosses or lichens. Hedges which may have occasional tall trees follow path = *No*, and are categorised under F, Heathland, scrub and tundra. Dwarf trees at the arctic and alpine tree limit (i.e. krummholz under conditions where mature individuals are less than 3 m high) follow path = *No*; these are categorised under F, Heathland, scrub and tundra. Canopy cover 10% and height 5 m are taken from the FAO TBFRA 2000 definitions (Temperate and Boreal Forest Resource Assessment 2000). It should be noted that in some areas e.g. the Boreal zone, the normal dividing point is 30%. Statistics produced at a regional scale might reflect this divergence.

7. The criterion separates habitats which are *waterlogged*; those which are characterised by the presence of *permafrost*; and *other*. *Waterlogged* refers to habitats which are saturated, with the water table at or above ground level for at least half of the year, e.g. bogs, marshes, carr vegetation. *Permafrost* relates to habitats where the soil is at a temperature of less than 0°C throughout the year (see glossary). The *other* path should be followed in the case of: habitats which are: always dry; mesic, moist or humid; only seasonally wet; regularly but infrequently flooded or occasionally flooded by extreme weather conditions but which are free-draining; wet but not waterlogged; permanent snow and ice.
8. Waterlogged terrestrial habitats are divided according to the type of dominant vegetation: *shrubs*; or *other*. Note that shrubs refers to larger species such as some willows (*Salix* spp.) but dwarf shrub species (for example ericoid species) follow path = *other*. Note also that habitats dominated by trees (G) are separated earlier (note 6).
9. Habitats with *less than 30%* vegetation cover are separated from those with *greater than 30%* vegetation cover. Note that chasmophytic, scree and cliff vegetation follow path = *<30%*.
10. Habitats with greater than 30% vegetation cover are divided according to the type of dominant vegetation: *shrubs or dwarf shrubs*; or *other* grasses and non-woody vegetation (including bryophytes and lichens where cover is greater than 30%). Note that habitats dominated by trees (G) are separated earlier (note 6).
11. Habitats maintained solely by frequent tilling or arising from recent abandonment of previously tilled ground such as arable land and gardens (path = *Yes*) are distinguished from completely artificial habitats (path = *No*), which are primarily human settlements, industrial developments, transport or waste dump sites or highly artificial waters with wholly constructed beds or heavily contaminated water.
12. Regularly tilled habitats are separated according to dominant vegetation type: *shrub* orchards; *tree* nurseries and tree-crop plantations; and habitats dominated by cultivated herbaceous vegetation (path = *herbs*).
13. Constructed aquatic freshwater, brackish or saline habitats such as marinas, harbours, industrial lagoons, saltworks, canals, ponds and highly artificial waters follow path = *Yes*. Constructed terrestrial habitats including buildings and the transport network follow path = *No*.

14. Constructed aquatic habitats (such as marinas, harbours, canals and ponds etc) which support a semi-natural aquatic fauna and flora follow path = *Yes*. Constructed aquatic habitats which are virtually devoid of plant and animal life or which have an un-naturally restricted species list or which are dominated by exotic species follow path = *No*. Highly artificial saline habitats such as industrial lagoons and saltworks or habitats with heavily contaminated water follow path = *No*.
15. Constructed marine habitats with semi-natural fauna or flora (path = *Yes*), are separated from inland constructed non-marine surface water habitats with semi-natural fauna or flora (path = *No*). (See note 3 for definition of marine).

## A: EUNIS Habitat Classification: criteria for marine habitats (A) to Level 2

Note that the key to Level 1 shows two pathways to reach habitat type A: these are recombined here. (number) refers to explanatory notes to the key (see following page).



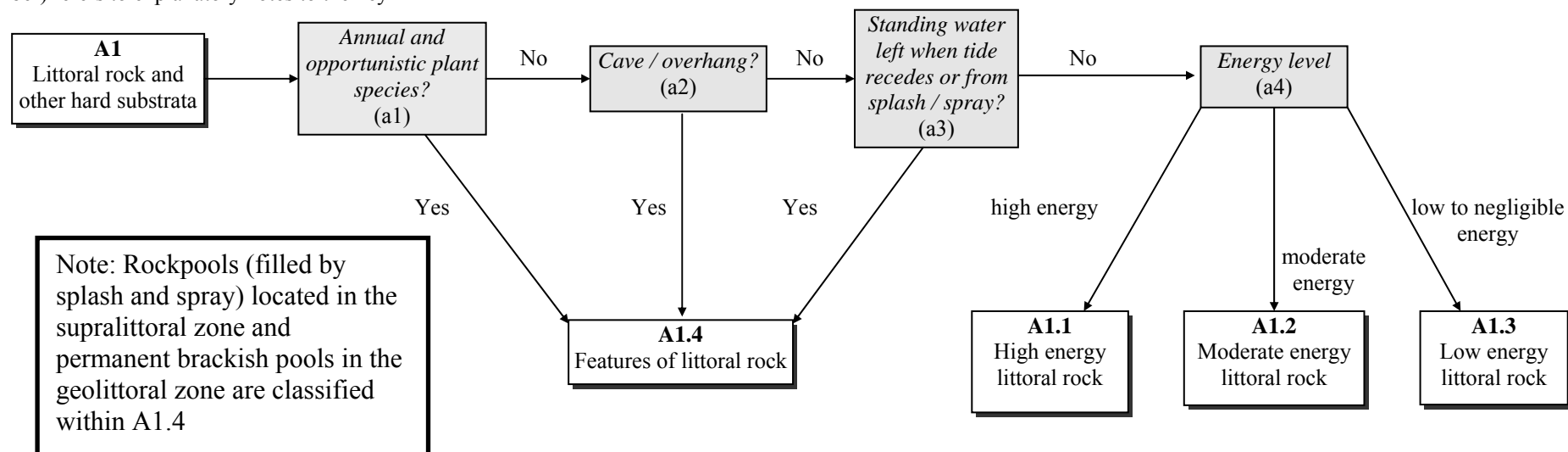


**The criterion distinguishes between strata: the sea bed of non-tidal, inter-tidal and sub-tidal waters; the water column of shallow or deep sea, or enclosed coastal waters; and ice or ice-associated marine habitats.**

- Ai. Is the bed permanently covered by water (path = *Yes*), or either regularly exposed at some stage in the tidal cycle (littoral / inter-tidal), subjected to frequent non-tidal change in water level, or above the high water mark but with a high water table (path = *No*)? Note that under extreme conditions the uppermost fringe of the 'permanently water-covered' zone may be exposed. Note that saltmarsh pools, rockpools (filled by splash and spray) located in the supralittoral and permanent brackish pools affected by spray in the waterlogged Baltic geolittoral zone follow path = *No*.
- Aii. *Non-mobile* substrates include continuous hard and soft bedrock and also non-mobile boulders, rocks and consolidated cobbles, non-mobile artificial substrates and compacted soft substrates such as clay and peat; *mobile* substrates include substrates such as mobile cobbles, pebbles, sand and mud. Non-mobile rock which is overlain by some deposited sediments follows path = *non-mobile*. Biogenic reefs on sediment follow path = *mobile*. Mosaics of mobile and non-mobile substrates should be considered as complex X31 comprising units from A2 and A1.
- Aiii. This criterion separates sublittoral zones of the shelf (including infralittoral and circalittoral zones) (path = *Yes*), from the deep seabed, beyond the shelf break (path = *No*). The shelf break occurs at variable depth, but is generally over 200 m. The upper limit of the deep-sea zone is marked by the edge of the shelf. The Baltic Sea is a shelf sea and follows path = *Yes*. Areas of the Mediterranean Sea which are deeper than 200 m follow path = *No*. Note that all sublittoral caves follow path = *Yes* irrespective of depth.
- Aiv. *Non-mobile* substrates include continuous hard and soft bedrock and also non-mobile boulders, rocks and consolidated cobbles, non-mobile artificial substrates and compacted soft substrates such as clay and peat; *mobile* substrates include substrates such as mobile cobbles, pebbles, sand and mud. Non-mobile rock which is overlain by some deposited sediments follows path = *non-mobile*. Biogenic reefs on sub-littoral sediment follow path = *mobile*. Sub-littoral mosaics of mobile and non-mobile substrates should be considered as complex X32 or X33 comprising units from A5 and A3 and/or A4.
- Av. Infralittoral zones characterised by foliose or filamentous macro-algae, within the euphotic zone in relatively shallow sub-tidal or non-tidal water, are separated (path = *Yes*) from deeper animal-dominated circalittoral zones (path = *No*). Circalittoral zones are below deeper sub-tidal or non-tidal water with insufficient light penetration to allow algae to dominate; however encrusting algae and very sparse foliose or filamentous algae may be present in the upper circalittoral. Note that habitats in the euphotic zone, normally dominated by foliose or filamentous macro-algae but which as a result of storm damage or heavy grazing are characterised by encrusting algae, follow path = *Yes*. Note also that sublittoral caves or overhangs physically located within the infralittoral zone but where conditions are the same as at deeper levels of the seabed (i.e. total darkness, no hydrodynamic action and constant temperature) should follow path = *No*. Note: for mapping purposes it may be necessary to map combined A3/A4 where the presence of algae cannot be detected by the survey method.

## A1: EUNIS Habitat Classification: criteria for littoral rock and other hard substrata (A1) to Level 3

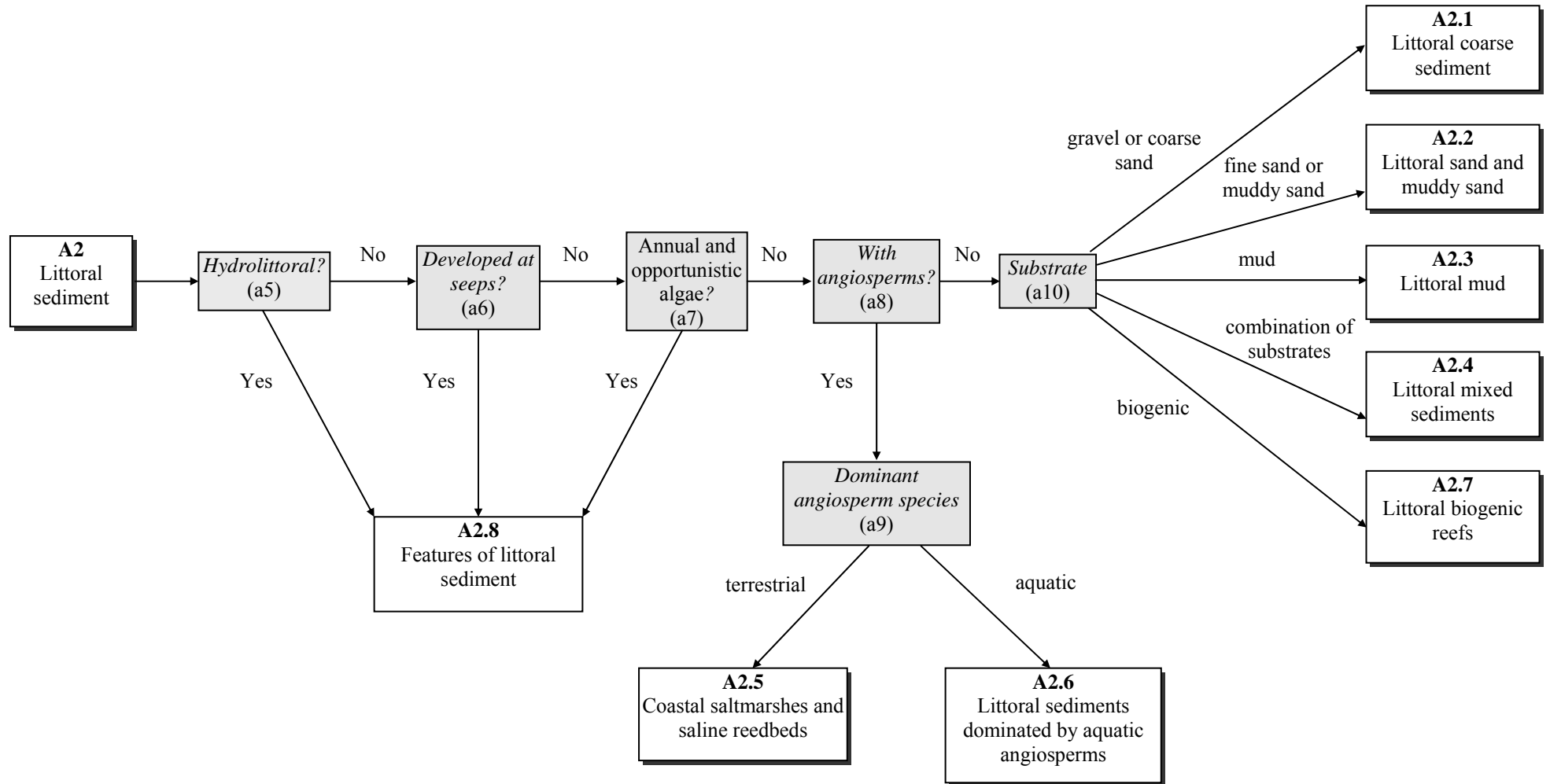
(number) refers to explanatory notes to the key



- a1. Habitats subject to irregular disturbance and thus dominated by annual species (ephemeral or opportunistic algae such as *Enteromorpha* or annual vascular plants) are separated (path = *Yes*). ‘Irregular disturbance’ includes: irregularly fluctuating water levels in non-tidal water (e.g. Baltic hydrolittoral); considerable freshwater run-off; unstable rock; sand-scoured rock. Habitats with more perennial communities, for example where water levels fluctuate on a regular cycle (tidal littoral) follow path = *No*.
- a2. Habitats developed either in littoral rock caves or underneath overhangs are separated (path = *Yes*).
- a3. Rock pools (depressions filled by standing water left when tide recedes or by splash and spray, including those located in the supralittoral or geolittoral zone) (path = *Yes*) are distinguished from areas which are periodically submerged and drained.
- a4. The criterion separates out habitats which have *high energy* status caused by wave action, currents or tidal streams from those with *moderate energy* or *low to negligible energy*. The energy status is that impacting on the area concerned at the relevant scale. Thus there may be enclaves of different energy status caused by localised variation in relief (e.g. steeper rock in more moderately exposed or even sheltered areas). Note that ‘*high energy*’ includes wave exposure classes extremely exposed, very exposed or exposed OR tidal streams/currents classes very strong or strong; ‘*moderate energy*’ includes wave exposure class moderately exposed OR tidal streams/currents class moderately strong; and ‘*low to negligible energy*’ includes wave exposure classes sheltered, very sheltered, extremely sheltered or ultra sheltered OR tidal streams/currents classes weak or very weak or without any tidal stream or current. (See glossary.)

**A2: EUNIS Habitat Classification: criteria for littoral sediment (A2) to Level 3**

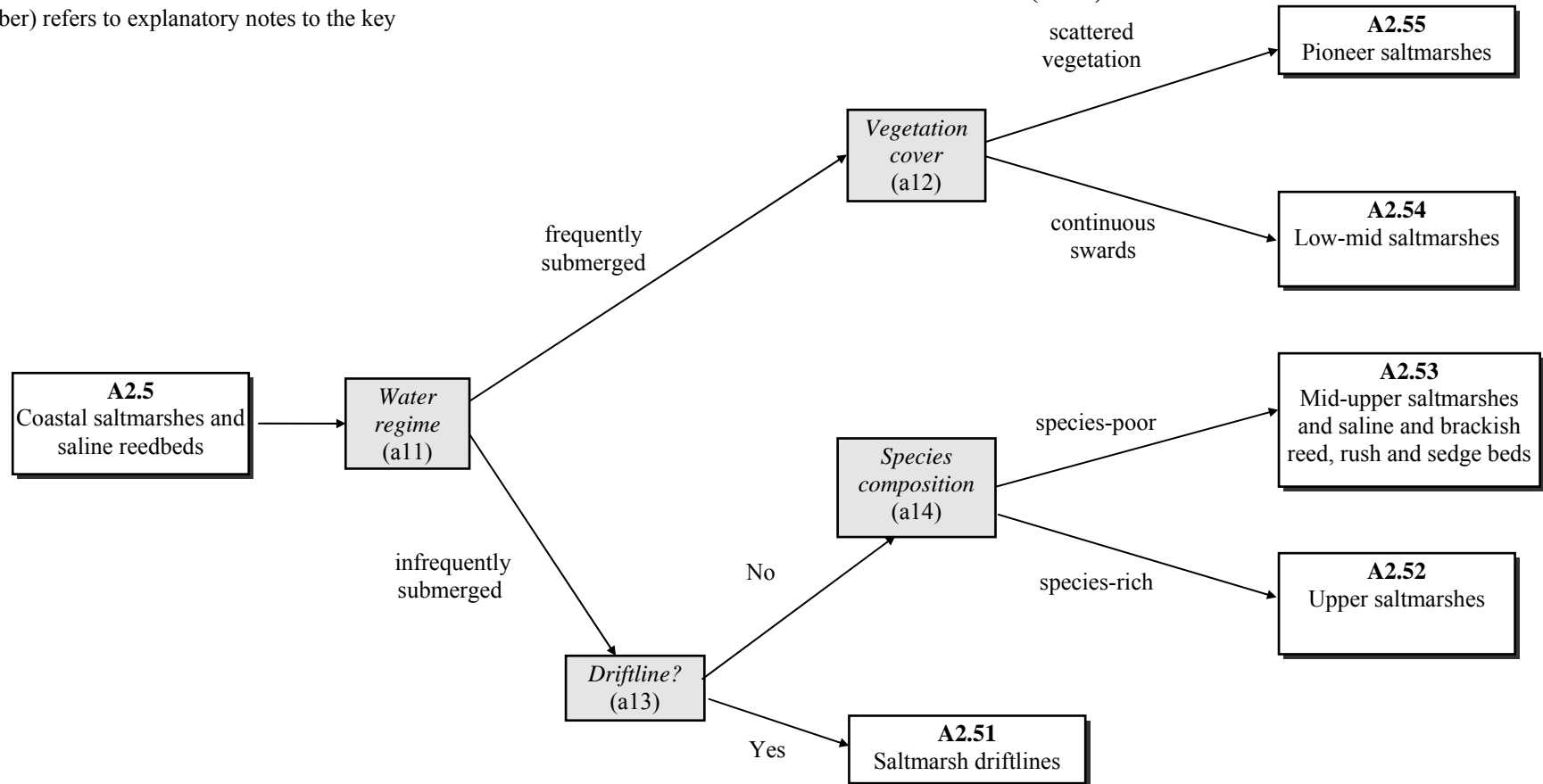
(number) refers to explanatory notes to the key (see following page).



- a5. Sedimentary shores of non-tidal, reduced salinity waters which are below the mean water level and normally water-covered, but which are regularly or occasionally exposed by the action of wind (hydrolittoral zone in the Baltic) are separated (path = *Yes*) from littoral habitats below the high water mark in tidal water (path = *No*).
- a6. Littoral habitats characterised by the presence of gases or liquids bubbling or seeping through sediments are distinguished (path = *Yes*).
- a7. Areas which are characterised by pioneer or ephemeral red and green algae because of variations in salinity and/or siltation (path = *Yes*) are separated.
- a8. Habitats dominated by aquatic (e.g. *Zostera* spp.) or terrestrial (e.g. *Salicornia* spp.) angiosperms, (path = *Yes*) are distinguished from those dominated by algae or animal communities.
- a9. Angiosperm-dominated habitats are differentiated between those whose dominant species are entirely *aquatic* but which can tolerate occasional emersion (e.g. *Zostera* spp., *Ruppia* spp., *Posidonia*), and those which are primarily *terrestrial* but can tolerate varying amounts of immersion (e.g. *Salicornia* spp., *Spartina* spp.).
- a10. Habitats are divided on the basis of the dominating particle size of the substrate. *Gravel or coarse sand* > 1 mm grain size (including shingle and mobile cobbles); *fine sand or muddy sand* ≤ 1 mm with ≤30% silt (less than 0.063 mm grain size); *mud* >30% less than 0.063 mm grain size; *combination of substrates* – veneers or intimate mixtures of mobile substrates with different particle size; or *biogenic* structures on sediment (e.g. *Sabellaria* reefs and mussel beds). Note that mosaics of mobile and non-mobile substrates are considered as complex X31 comprising units from A2 and A1.

## A2.5: EUNIS Habitat Classification: criteria for coastal saltmarshes and saline reedbeds (A2.5) to Level 4

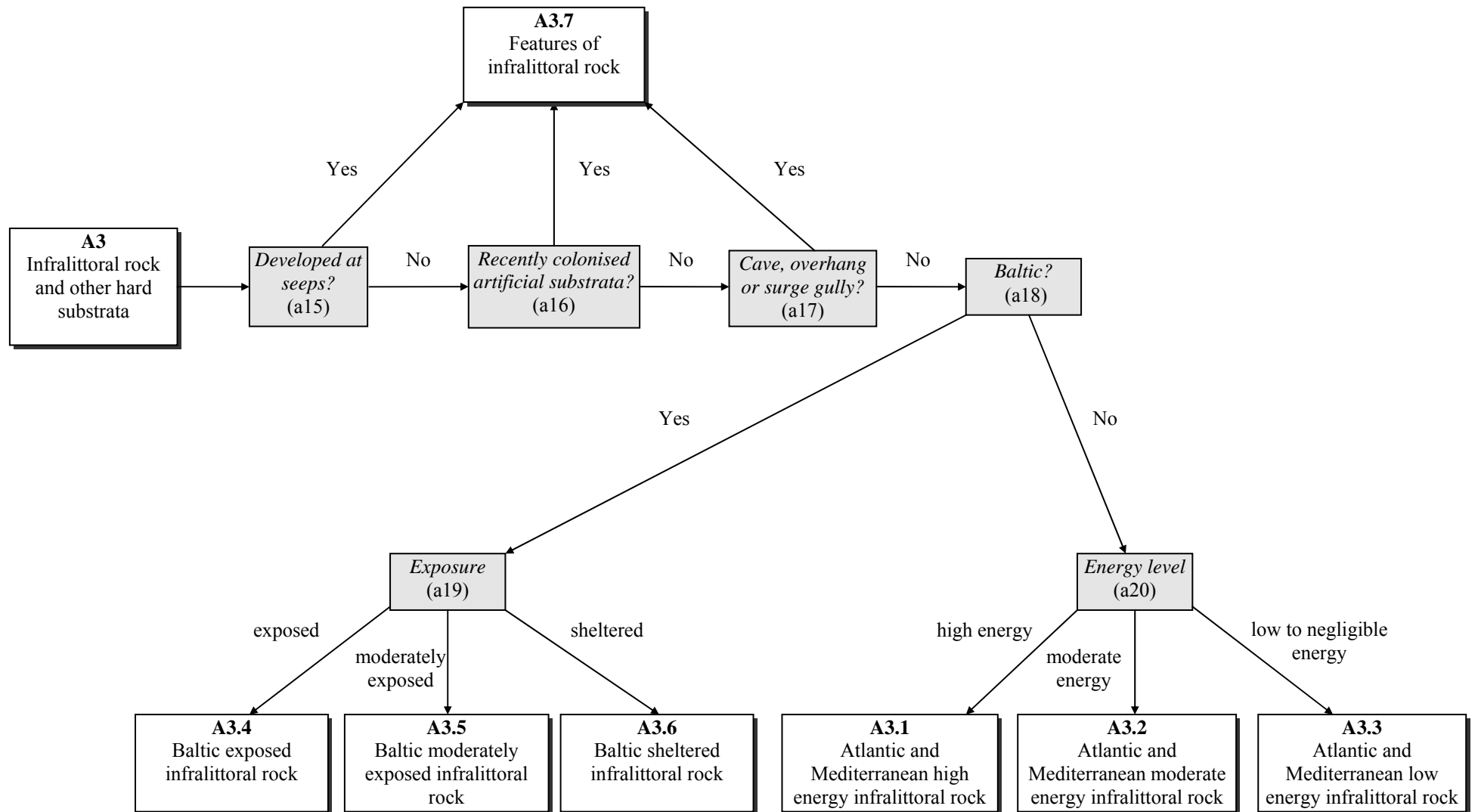
(number) refers to explanatory notes to the key



- a11. Saltmarsh habitats are separated according to the water regime (determined by the position on the shore), between those *frequently submerged*, with soil moisture and salinity relatively constant, and *infrequently submerged*, with soil moisture and salinity variable.
- a12. Habitats with pioneer vegetation dominated by annual or perennial species with <30% vegetation cover (path = *scattered vegetation*) are separated from those with more-or-less *continuous swards*.
- a13. Driftline vegetation of saltmarshes (the highest zone, characterised by annual nitrophiles) is separated (path = *Yes*).
- a14. *Species-poor* saltmarshes and reedbeds (pure stands or those dominated by a few species) are distinguished from those which are *species-rich*, with a wide range of communities, and a rich flora, not dominated by any one species.

**A3: EUNIS Habitat Classification: criteria for infralittoral rock and other hard substrata (A3) to Level 3**

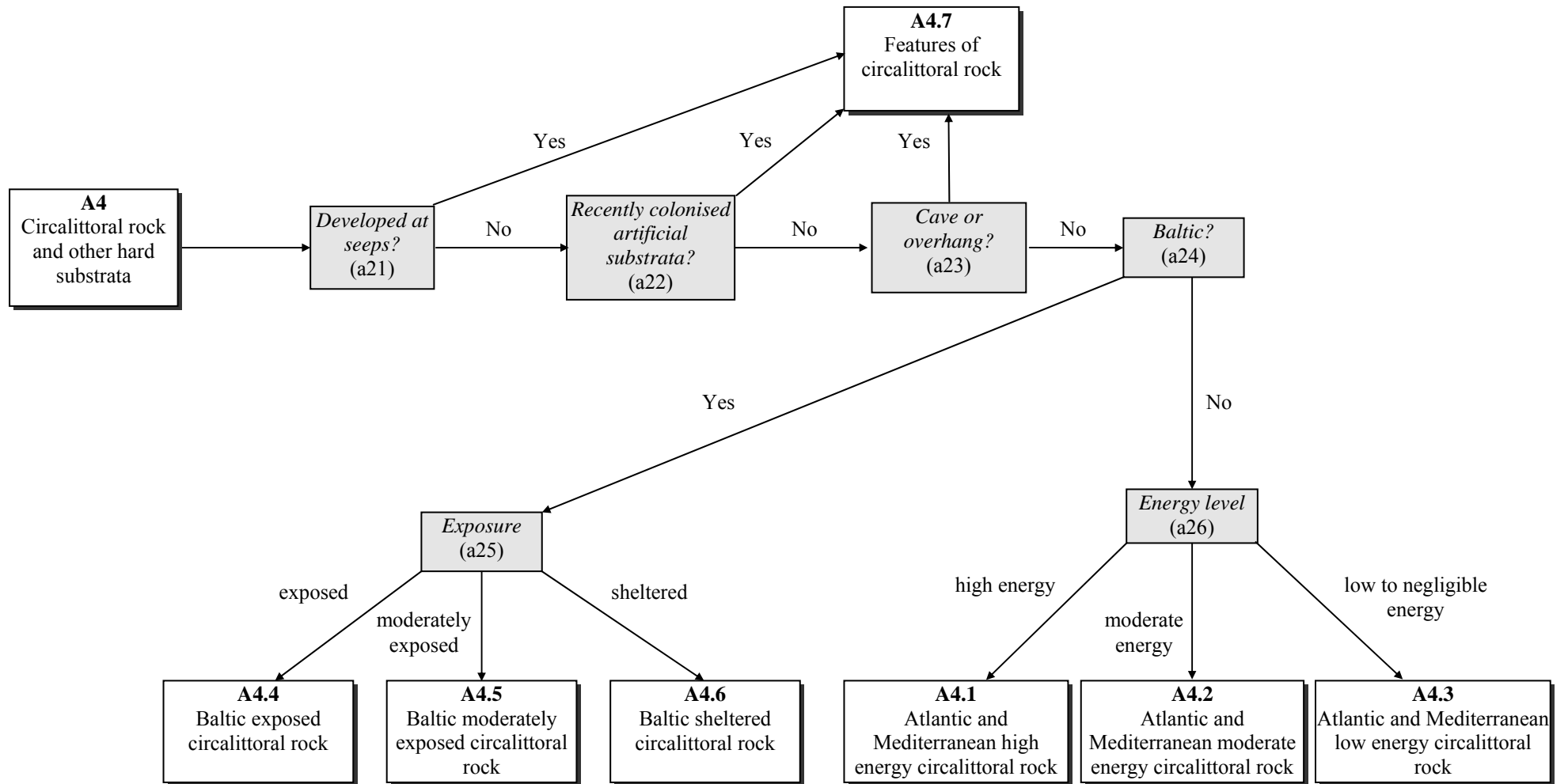
(number) refers to explanatory notes to the key (see following page).



- a15. Habitats in hard substrata in the infralittoral zone characterised by the presence of seeping or bubbling gases, oils or water are distinguished (path = *Yes*).
- a16. Recently colonised artificial hard substrata in the infralittoral zone are distinguished (path = *Yes*).
- a17. Habitats developed in rock caves, underneath wave or tide-disturbed overhangs in the infralittoral zone or in wave-scoured surge gullies are separated (path = *Yes*).
- a18. Infralittoral habitats in the Baltic Sea (as defined by the Helsinki Convention, from and including the Kattegat eastward to the Bothnian Bay, Gulf of Finland and Gulf of Riga) are separated (path = *Yes*) from other geographical sea areas. The Baltic Sea is effectively a vast estuary with sills, characterised by a stable reduced salinity gradient, lack of tides and reduced fetch energy.
- a19. The criterion separates out habitats in the Baltic infralittoral zone which are *exposed* to wave action, currents or ice scouring from those only *moderately exposed* or *sheltered*. The exposure status is that impacting on the area concerned at the relevant scale. Thus there may be enclaves of different exposure status caused by localised variation in relief (e.g. steeper rock in more moderately exposed or even sheltered areas). Note that '*exposed*' has an effective fetch of greater than 25 km; '*moderately exposed*' has an effective fetch of 5 – 25 km; and '*sheltered*' has an effective fetch less than 5 km.
- a20. The criterion separates out habitats in the infralittoral which have *high energy* status caused by wave action, currents or tidal streams from those with *moderate energy* or *low to negligible energy*. The energy status is that impacting on the area concerned at the relevant scale. Thus there may be enclaves of different energy status caused by localised variation in relief (e.g. steeper rock in more moderately exposed or even sheltered areas). Note that '*high energy*' includes wave exposure classes extremely exposed, very exposed or exposed OR tidal streams/currents classes very strong or strong; '*moderate energy*' includes wave exposure class moderately exposed OR tidal streams/currents class moderately strong; and '*low to negligible energy*' includes wave exposure classes sheltered, very sheltered, extremely sheltered or ultra sheltered OR tidal streams/currents classes weak or very weak or without any tidal stream or current. (See glossary.)

**A4: EUNIS Habitat Classification: criteria for circalittoral rock and other hard substrata (A4) to Level 3**

(number) refers to explanatory notes to the key (see following page).



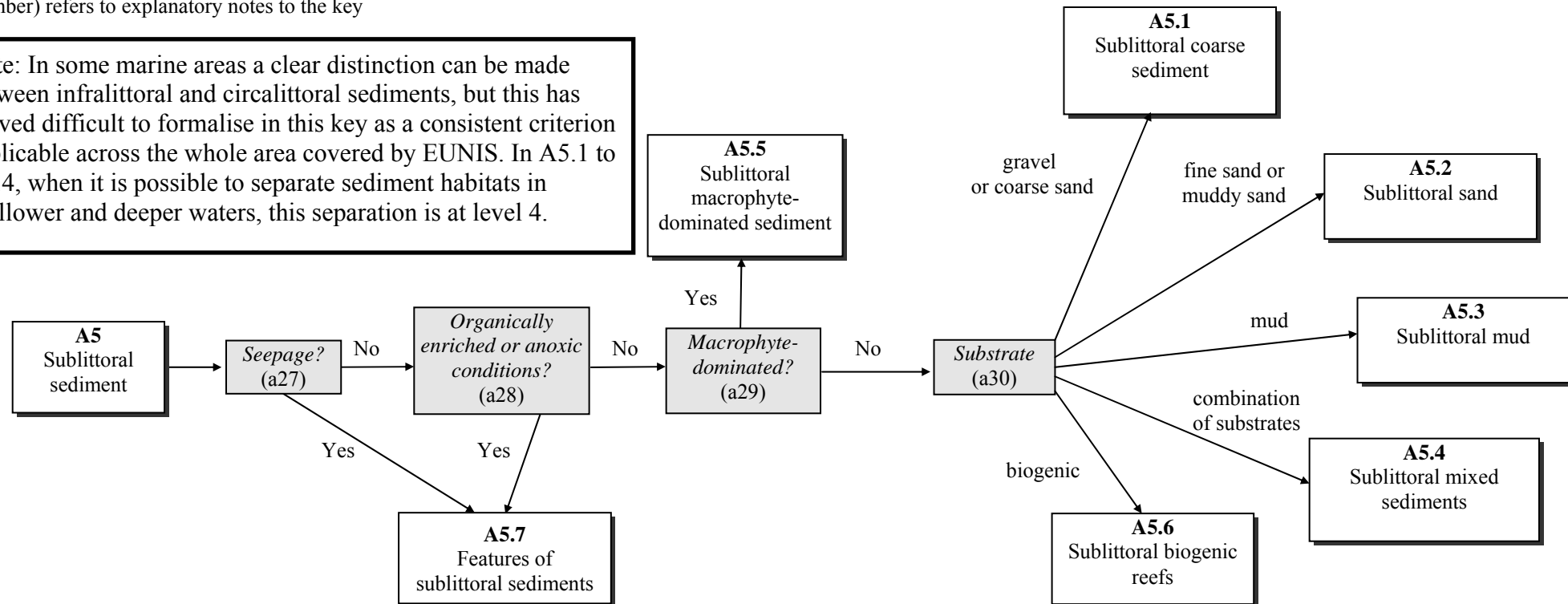


- a21. Habitats in hard substrata in the circalittoral zone characterised by the presence of seeping or bubbling gases, oils or water are distinguished (path = *Yes*).
- a22. Recently colonised artificial hard substrata in the circalittoral zone are distinguished (path = *Yes*).
- a23. Habitats developed in rock caves or underneath overhangs in the circalittoral zone are separated (path = *Yes*).
- a24. Circalittoral habitats in the Baltic Sea (as defined by the Helsinki Convention, from and including the Kattegat eastward to the Bothnian Bay, Gulf of Finland and Gulf of Riga) are separated (path = *Yes*) from other geographical sea areas. The Baltic Sea is effectively a vast estuary with sills, characterised by a stable reduced salinity gradient, lack of tides and reduced fetch energy.
- a25. The criterion separates out habitats in the Baltic circalittoral zone which are *exposed* to wave action or currents from those only *moderately exposed* or *sheltered*. The exposure status is that impacting on the area concerned at the relevant scale. Thus there may be enclaves of different exposure status caused by localised variation in relief (e.g. steeper rock in more moderately exposed or even sheltered areas). Note that ‘exposed’ has an effective fetch of greater than 25 km; ‘moderately exposed’ has an effective fetch of 5 – 25 km; and ‘sheltered’ has an effective fetch less than 5 km.
- a26. The criterion separates out habitats in the circalittoral which have *high energy* status caused by wave action, currents or tidal streams from those with *moderate energy* or *low to negligible energy*. The energy status is that impacting on the area concerned at the relevant scale. Thus there may be enclaves of different energy status caused by localised variation in relief (e.g. steeper rock in more moderately exposed or even sheltered areas). Note that ‘*high energy*’ includes wave exposure classes extremely exposed, very exposed or exposed OR tidal streams/currents classes very strong or strong; ‘*moderate energy*’ includes wave exposure class moderately exposed OR tidal streams/currents class moderately strong; and ‘*low to negligible energy*’ includes wave exposure classes sheltered, very sheltered, extremely sheltered or ultra sheltered OR tidal streams/currents classes weak or very weak or without any tidal stream or current. (See glossary.)

## A5: EUNIS Habitat Classification: criteria for sublittoral sediment (A5) to Level 3

(number) refers to explanatory notes to the key

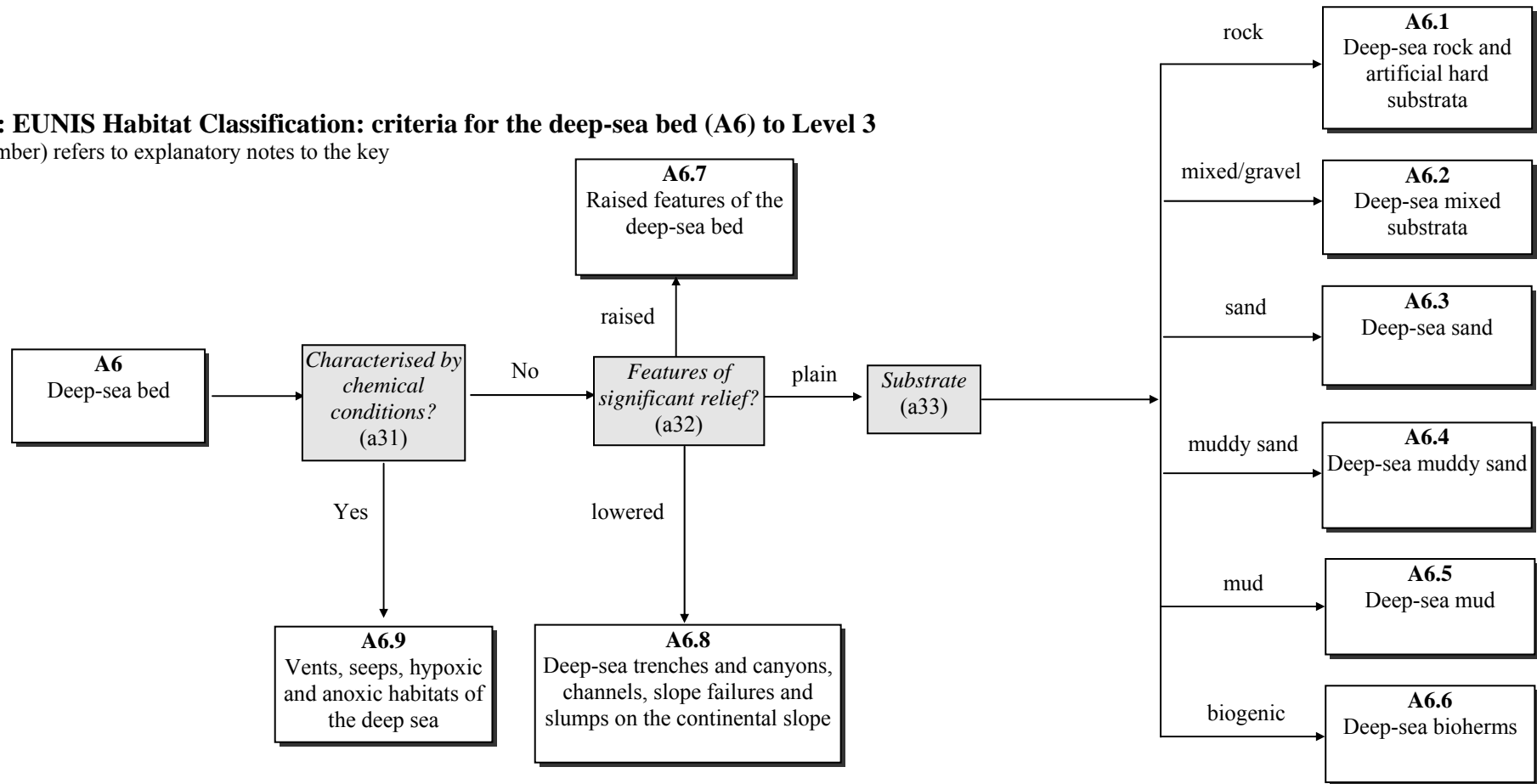
Note: In some marine areas a clear distinction can be made between infralittoral and circalittoral sediments, but this has proved difficult to formalise in this key as a consistent criterion applicable across the whole area covered by EUNIS. In A5.1 to A5.4, when it is possible to separate sediment habitats in shallower and deeper waters, this separation is at level 4.



- a27. Sublittoral habitats characterised by the presence of gases or liquids bubbling or seeping through sediments are distinguished (path = *Yes*).
- a28. Sublittoral sediments which are organically-enriched or permanently or periodically anoxic are separated (path = *Yes*).
- a29. Habitats dominated by aquatic angiosperm or algal macrophytes (path = *Yes*) are distinguished from those dominated by animal communities, with or without algae.
- a30. Habitats are divided on the basis of the dominating particle size of the substrate. *Gravel or coarse sand* > 1 mm grain size (including shingle and mobile cobbles); *fine sand or muddy sand* ≤ 1 mm with ≤30% silt (less than 0.063 mm grain size); *mud* >30% less than 0.063 mm grain size; *combination of substrates* - veneers or intimate mixtures of mobile substrates with different particle size; or *biogenic* structures on sediment. Note that sublittoral mosaics of mobile and non-mobile substrates are considered as complex X32 or X33 comprising units from A5 and A3 and/or A4.

## A6: EUNIS Habitat Classification: criteria for the deep-sea bed (A6) to Level 3

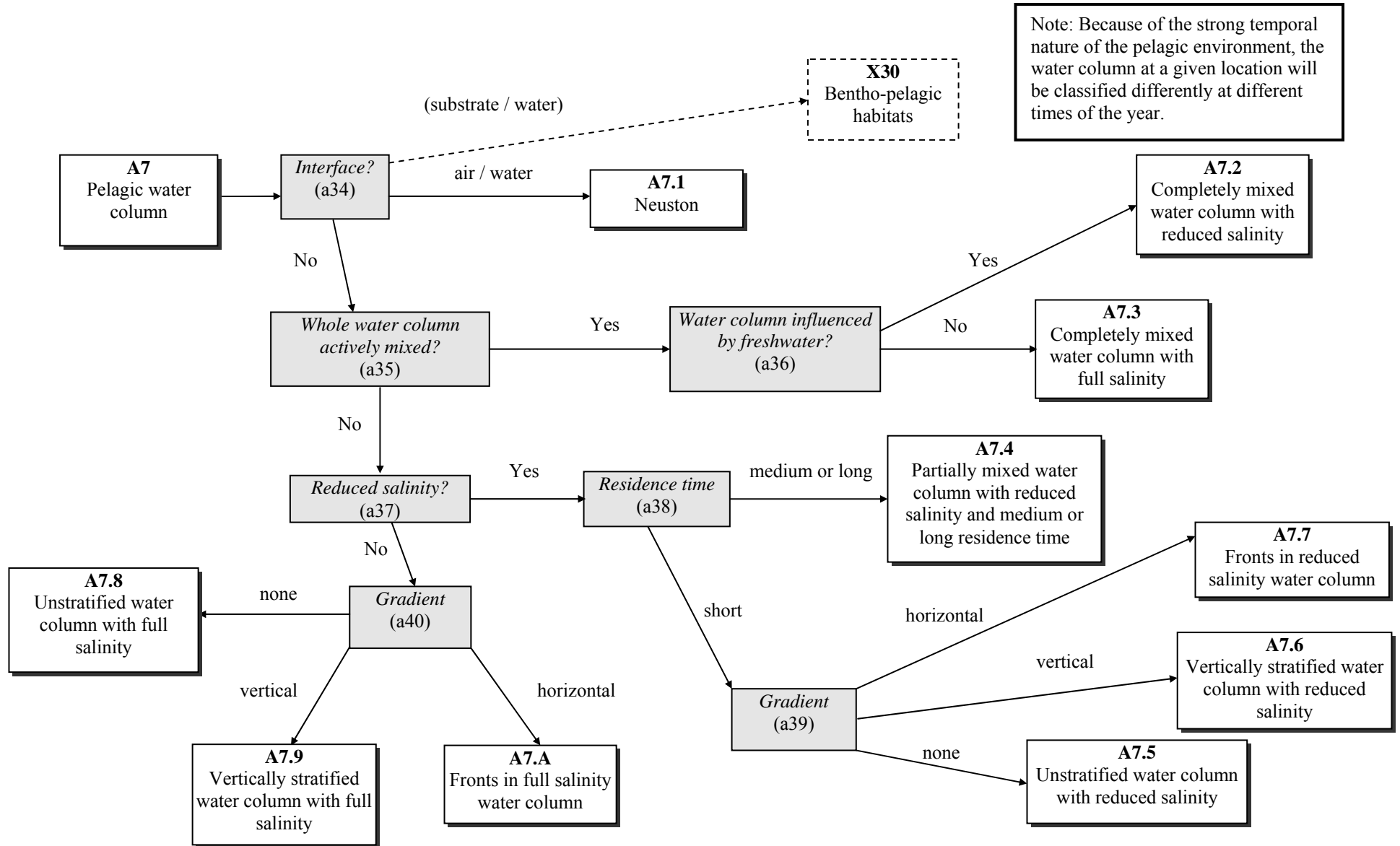
(number) refers to explanatory notes to the key



- a31. Deep-sea habitats characterised by chemical conditions are separated (path = *Yes*): these include the presence of seeping or bubbling gases or liquids, hypoxic and/or anoxic conditions in the water column above and interface habitats on the deep-sea bed where reducing conditions exist, not generally associated with drastically elevated temperatures, including the carcasses of large cetaceans.
- a32. Habitats on the deep-sea bed are separated according to their relief: regions with significant elevation (>200 m) in relation to their surroundings (path = *raised*); those significantly below the deep-sea bed (such as deep ocean trenches, often greater than 6000 m depth with an active margin reduction zone) and downslope or along-slope channels on the deep-sea bed (path = *lowered*); and the deep-sea bed plain (path = *plain*).
- a33. Deep-sea benthic habitats are separated into those with substrates predominantly *rock* (or artificial hard substrates); of mixed particle size or predominantly gravel (*mixed/gravel*); *sand*; *muddy sand*; *mud*; or *biogenic* (e.g. coral reefs and sponge beds).

### A7: EUNIS Habitat Classification: criteria for pelagic water column (A7) to Level 3

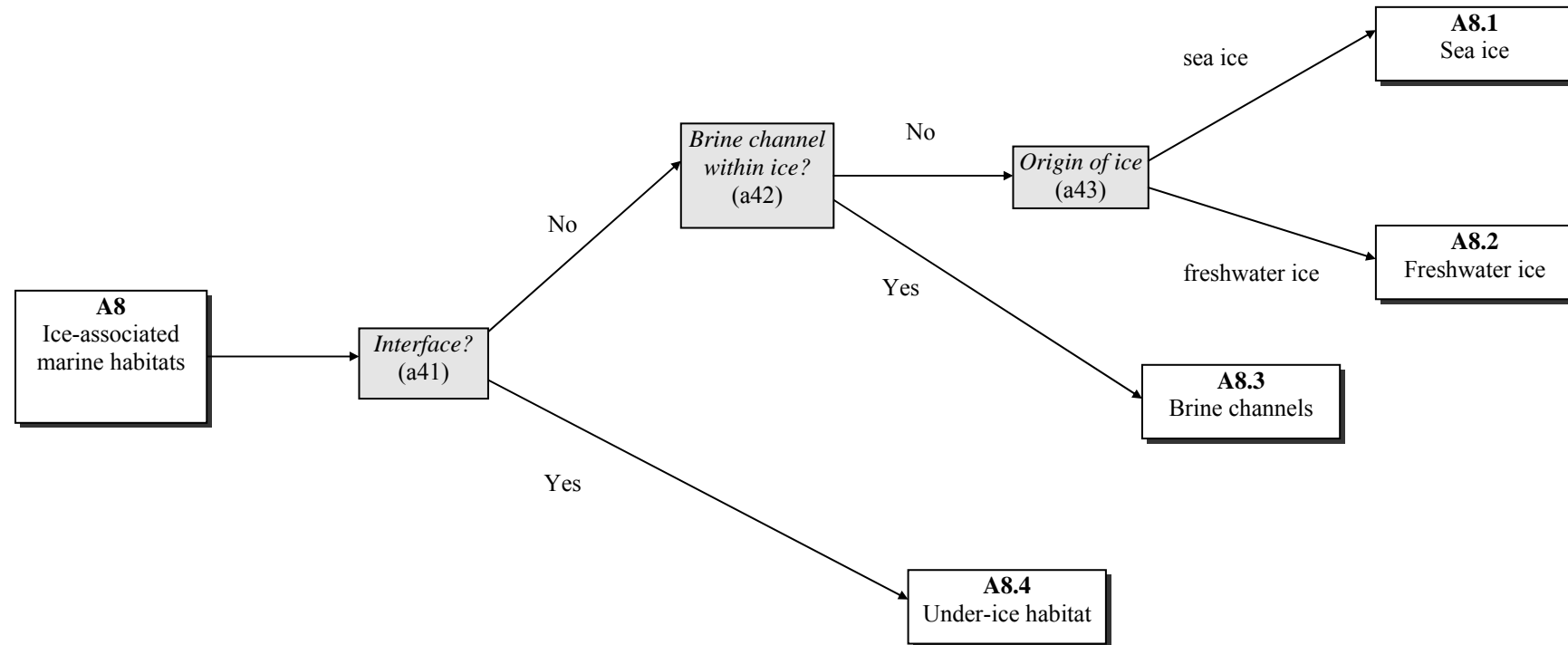
(number) refers to explanatory notes to the key (see following page).



- a34. Is the habitat developed at the interface between *air / water*; or in the main water column (path = *No*)? Note that where the habitat is developed at the interface between the substrate and water it is best described as complex X30 - a combination of units from A1 to A6 with units from A7.
- a35. Is the water column completely and actively mixed, usually due to its relatively shallow nature, (Path = *Yes*), or is it unmixed or only partially mixed because the depth of the water body is greater than the depth of mixing (Path = *No*)?
- a36. Is the water column influenced by freshwater i.e. is the salinity reduced relative to the adjacent fully marine seawater (Path = *Yes*)? These units are usually found in relatively shallow, coastal situations, and are the result of river inflow or ice melt. Note that some discretion should be used in the interpretation of ‘adjacent’, for example in the Baltic Sea, ‘adjacent’ fully marine seawater is reached only in the Kattegat.
- a37. Water columns which are not fully mixed and which have reduced salinity relative to the adjacent fully marine seawater are separated (Path = *Yes*). These units are usually found in deeper coastal water situations and are the result of river inflow or ice melt. Note that some discretion should be used in the interpretation of ‘adjacent’, for example in the Baltic Sea, ‘adjacent’ fully marine seawater is reached only in the Kattegat.
- a38. Partially mixed reduced salinity waters with a *short* residence time are separated from those with *medium or long* residence times. Short residence time is defined as changing diurnally, medium residence time is greater than daily and up to about 14 days (based on the time required for the phytoplankton population to double) and long residence time lasting longer than 14 days.
- a39. Reduced salinity habitats with short residence time are distinguished by the type and degree of gradient: those with pronounced *vertical* stratification (e.g. caused by seasonal temperature changes, river discharge influence or ice-melt); *horizontal* gradients giving rise to fronts; and those with very weak gradients or *none*. Note that units with vertical stratification are separated at level 4 by the cause and degree of persistence of the gradient – e.g. seasonal temperature gradients or persistent salinity gradients etc. Units with horizontal stratification are separated at level 4 by the degree of persistence of the stratification.
- a40. Full salinity habitats characterised by the degree and direction of gradient are distinguished: those with pronounced *vertical* stratification (e.g. caused by atmospheric temperature); *horizontal* gradients giving rise to fronts; and those with very weak gradients or *none*. Note that units with horizontal stratification are separated at level 4 by the degree of persistence of the stratification – ephemeral such as eddies, gyres and upwellings; seasonal upwellings; or persistent water mass interfaces.

### A8: EUNIS Habitat Classification: criteria for ice-associated marine habitats (A8) to Level 3

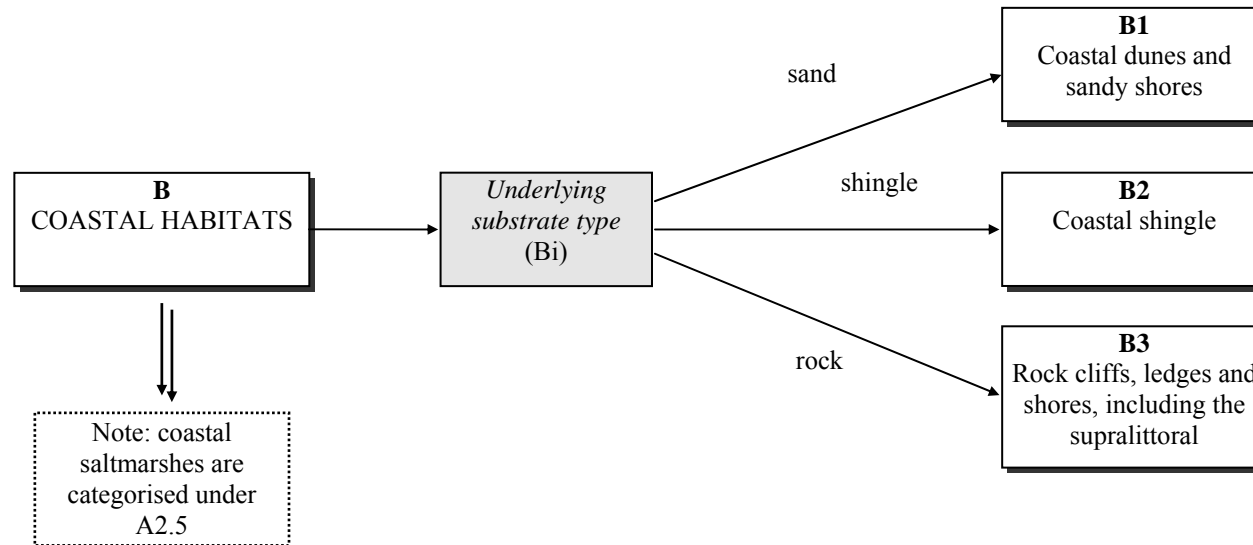
(number) refers to explanatory notes to the key



- a41. Is the habitat developed at the interface between the lower surface of the ice and the water column below (path = *Yes*), or is it on the upper surface of or within the ice itself (path = *No*)?
- a42. Is the habitat developed within the ice matrix in a three-dimensional network of tubes and channels containing brine solution, characterised by low light intensity, low temperature and high salinity (path = *Yes*)?
- a43. Is the ice of freshwater origin, originating from a glacier (path = *freshwater ice*), or is it frozen seawater (path = *sea ice*)?

## B: EUNIS Habitat Classification: criteria for coastal habitats (B) to Level 2

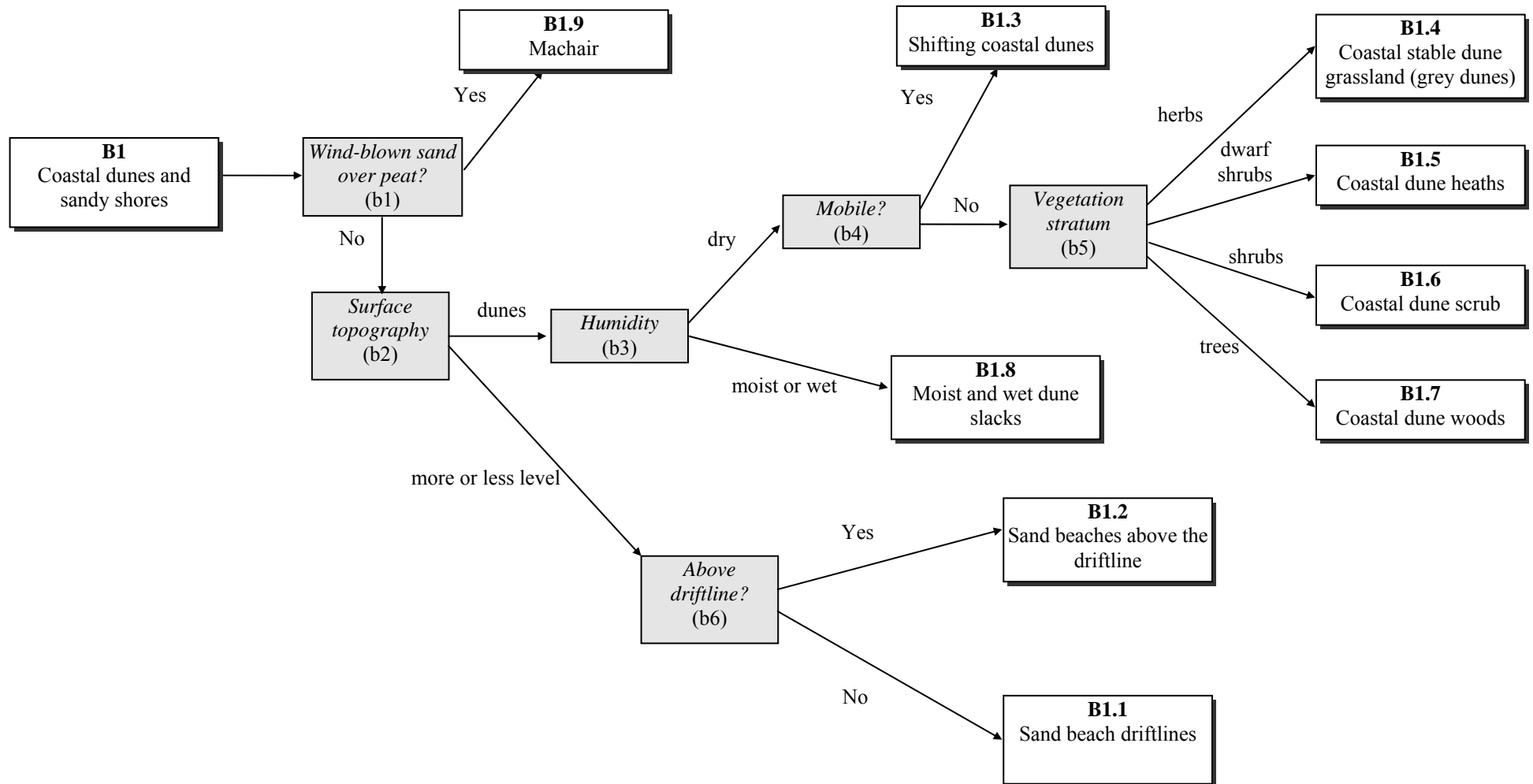
(number) refers to explanatory notes to the key



Bi. Coastal habitats are divided on the basis of underlying substrate (which may be overlain with superficial deposits): *sand* substrates form coastal dune and sand habitats; *shingle* substrates form mobile or stable shingle beaches and banks; *rock* substrates (which include non-mobile boulders) comprise sea and coastal lagoon cliffs and rocky sea shores including the supra-littoral spray zone. Note that dune-slack pools follow path = *sand*.

**B1: EUNIS Habitat Classification: criteria for coastal dunes and sandy shores (B1) to Level 3**

(number) refers to explanatory notes to the key (see following page).

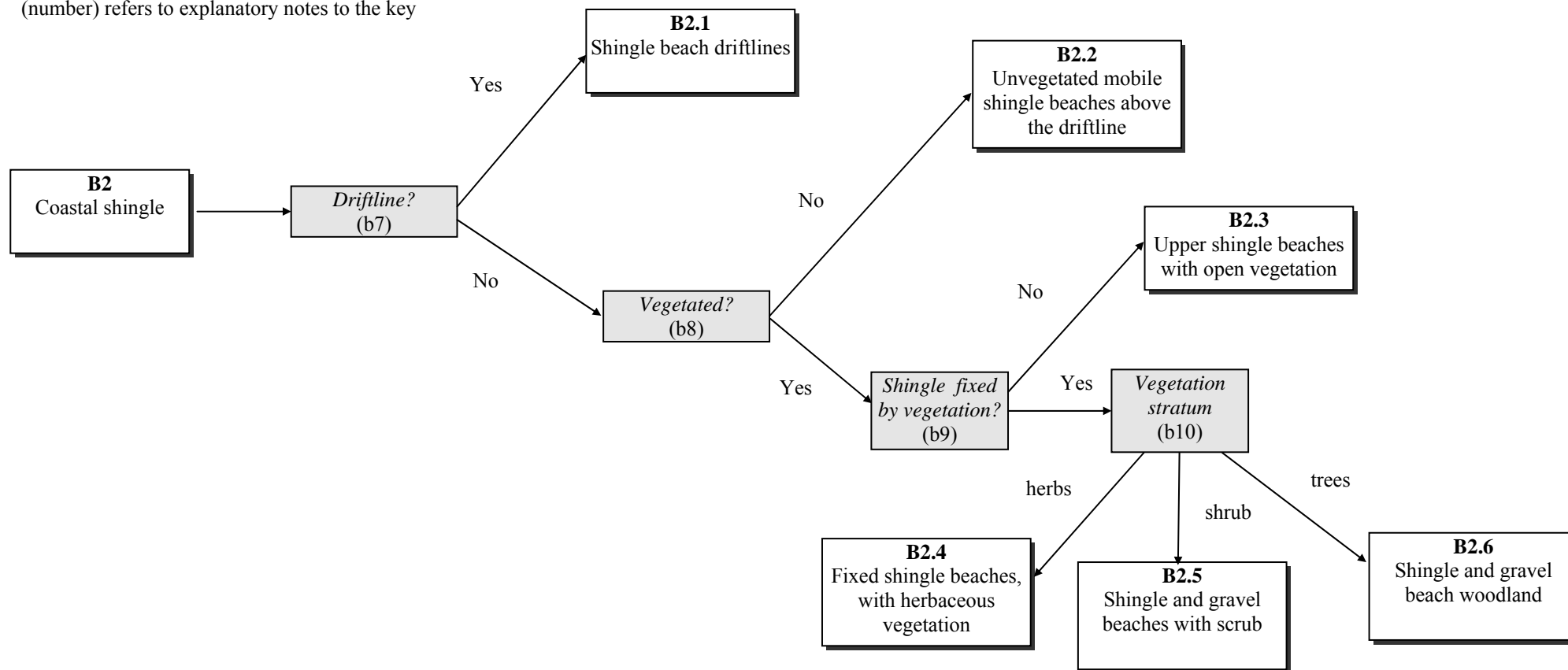




- b1. Machair (characterised by wind-blown calcareous sand with a predominance of shell fragments usually over peat, a low proportion of sand-binding vegetation and a long history of agricultural use) (path = *Yes*), is distinguished from other coastal sand habitats. Note that a machair complex is defined comprising units from B1, C and I.
- b2. The topography of the surface distinguishes the abrupt mounds and hollows of sand *dunes* from *more or less level* sand beach habitats.
- b3. *Dry* sand dunes are distinguished from *moist or wet* dune slacks including dune-slack pools.
- b4. Unvegetated mobile sand dunes (path = *Yes*) are separated from dunes which have become stabilised by vegetation.
- b5. Predominant vegetation type is used to distinguish between: dune grassland (*herbs*); dune heath (predominantly ericaceous *dwarf shrubs*); dune scrub (*shrubs*); and dune woodland (*trees*).
- b6. Driftline habitats characterised by lines of wave-deposited organic material colonised by annual angiosperms are distinguished (path = *No*) from mobile sand beaches above the driftline. Note that freshly deposited driftlines characterised by marine invertebrates and without annual vegetation are included in A2.

## B2: EUNIS Habitat Classification: criteria for coastal shingle (B2) to Level 3

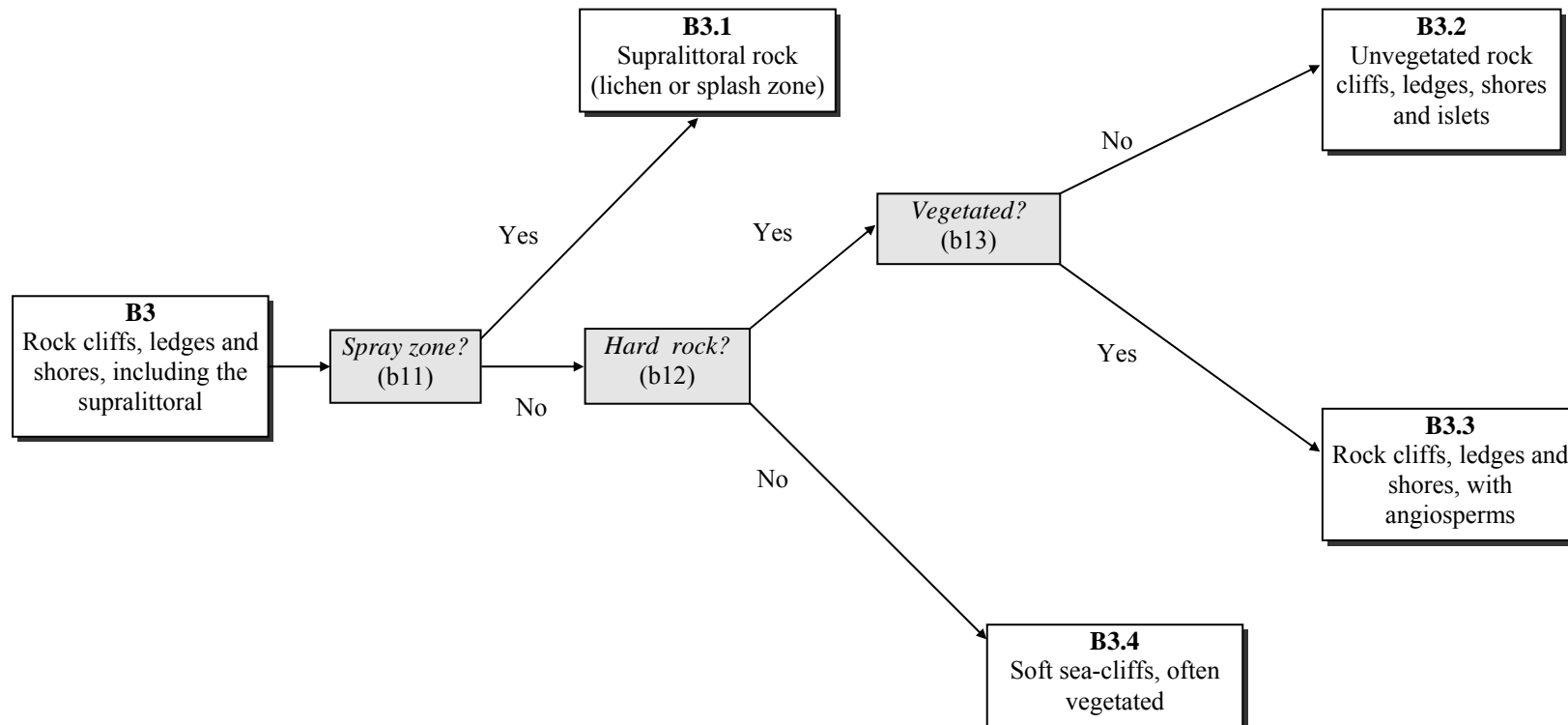
(number) refers to explanatory notes to the key



- b7. Driftline habitats characterised by lines of wave-deposited organic material are distinguished (path = *Yes*) from mobile or stabilised shingle beaches above the driftline.
- b8. Unvegetated mobile shingle beaches (path = *No*) are separated from more stable vegetated coastal shingle habitats.
- b9. Fixed shingle habitats with vegetation of grasses or heaths (path = *Yes*) are distinguished from more open communities dominated by other herbaceous species on substrates which may be more mobile.
- b10. Predominant vegetation type is used to distinguish between: shingle and gravel beach grassland, (*herbs*); shingle and gravel beach scrub (*shrubs*); and shingle and gravel beach woodland (*trees*).

### B3: EUNIS Habitat Classification: criteria for rock cliffs, ledges and shores, including the supralittoral (B3) to Level 3

(number) refers to explanatory notes to the key



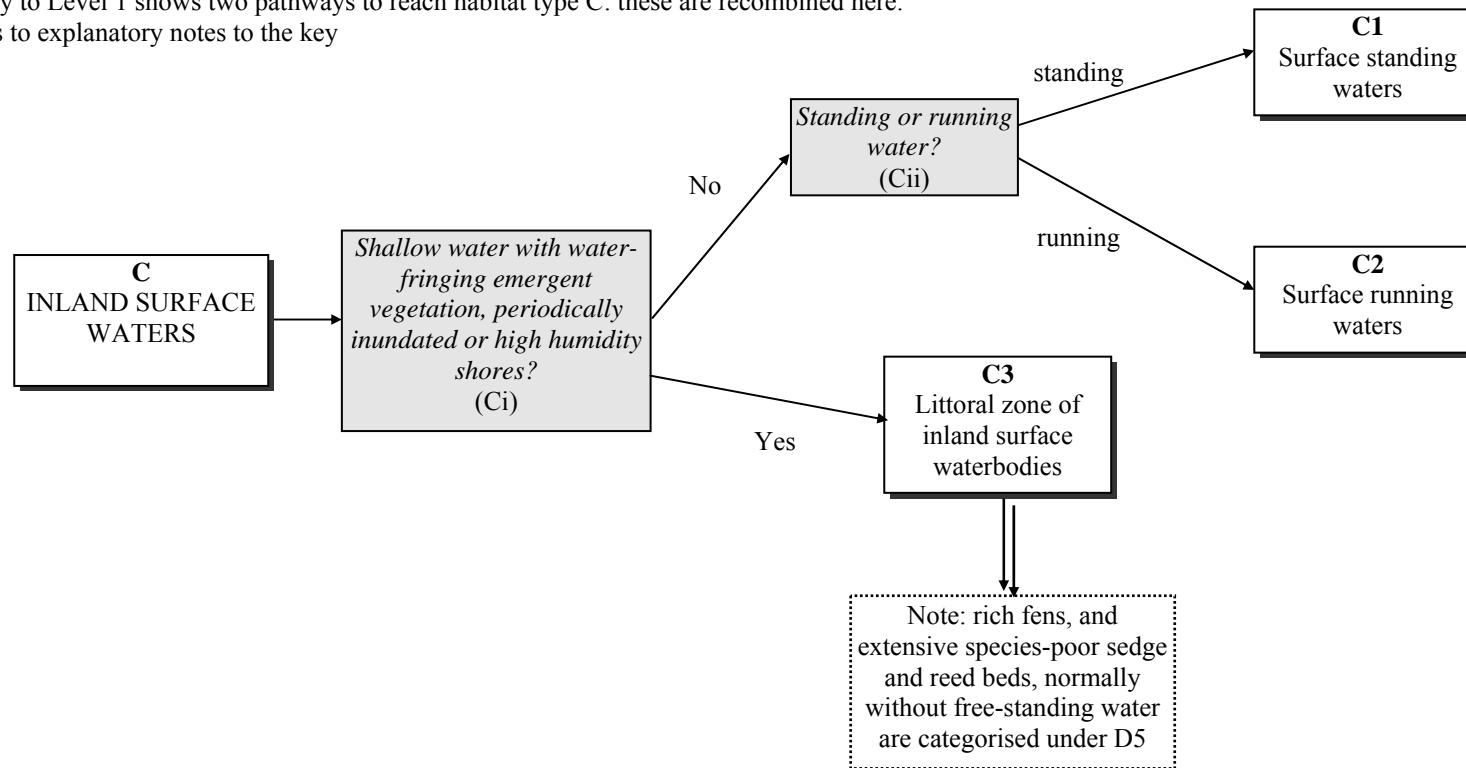
b11. The lichen or spray zone above the high tide mark (or above the mean water level where non-tidal) (path = *Yes*) is distinguished from rock habitats not regularly affected by spray. Note that rock pools in the supralittoral are classified in A with littoral rock pools.

b12. Hard rock cliffs and ledges (path = *Yes*) are distinguished from cliffs of relatively soft, unconsolidated material.

b13. Unvegetated coastal hard rock cliffs and ledges (path = *No*) are separated from rocky habitats with angiosperm vegetation (path = *Yes*).

## C: EUNIS Habitat Classification: criteria for inland surface waters (C) to Level 2

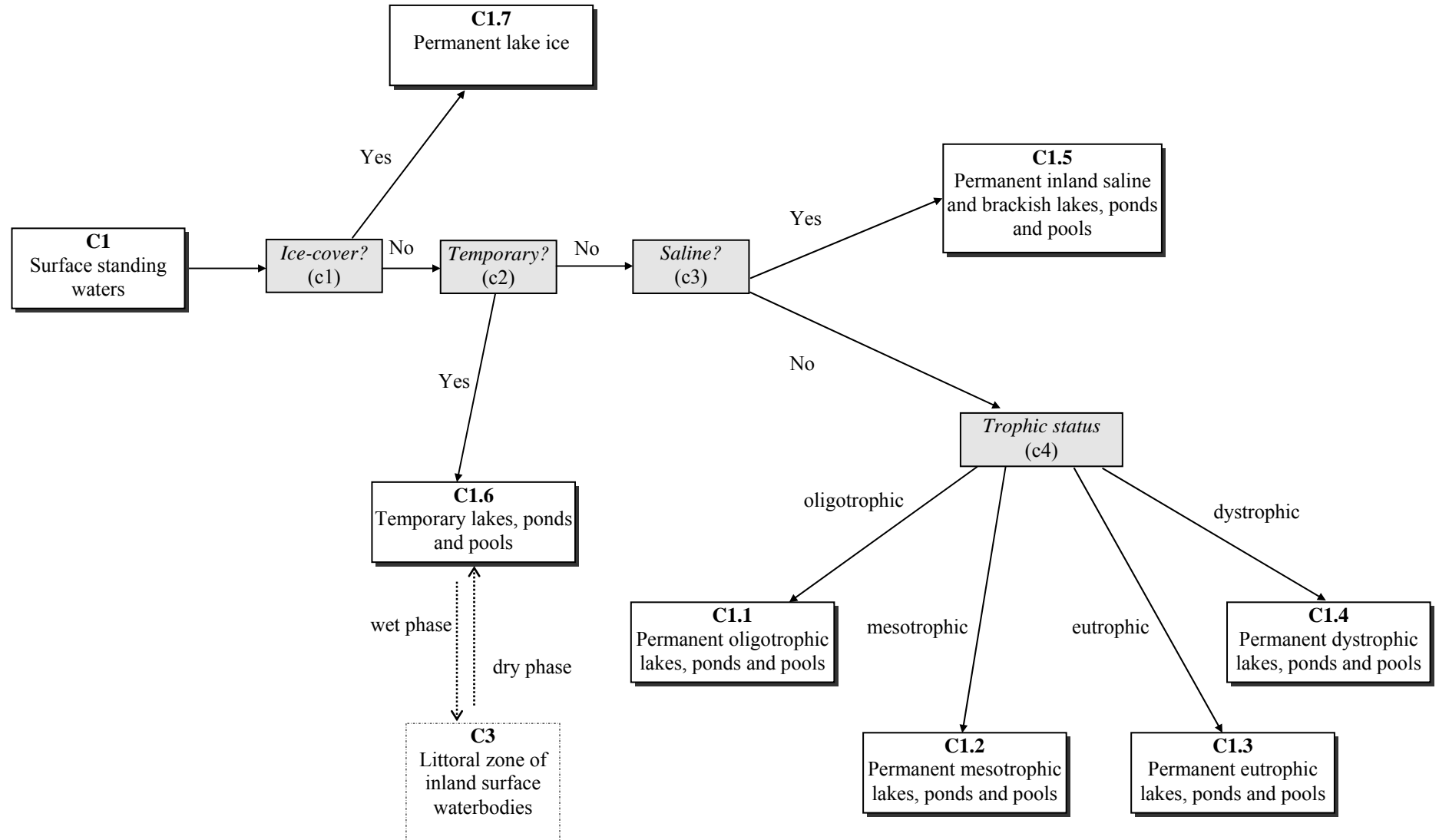
Note that the key to Level 1 shows two pathways to reach habitat type C: these are recombined here.  
(number) refers to explanatory notes to the key



- Ci. Periodically inundated shores adjacent to surface water habitats (without vegetation or with ephemeral or amphibious herbs), littoral zones with high humidity which may be due to steam or spray, or narrow (< 5 m wide) bands of permanent water fringing emergent vegetation (path = *Yes*) are separated from the fully aquatic components of waterbodies (path = *No*). Note that temporary streams with no defined boundaries, completely covered by littoral-type vegetation follow path = *Yes*. Note also that sedge or reed beds normally without free-standing water are categorised under D5.
- Cii. Is the waterbody *standing* (with no perceptible flow such as lakes, ponds, or extremely slow-moving parts of rivers etc.); or *running* (with perceptible flow, such as rivers, streams, springs, etc.)? Note that standing waters include semi-natural canals, temporary standing waters and seasonally dry lake beds; running waters include temporary or intermittent streams.

**C1: EUNIS Habitat Classification: criteria for surface standing waters (C1) to Level 3**

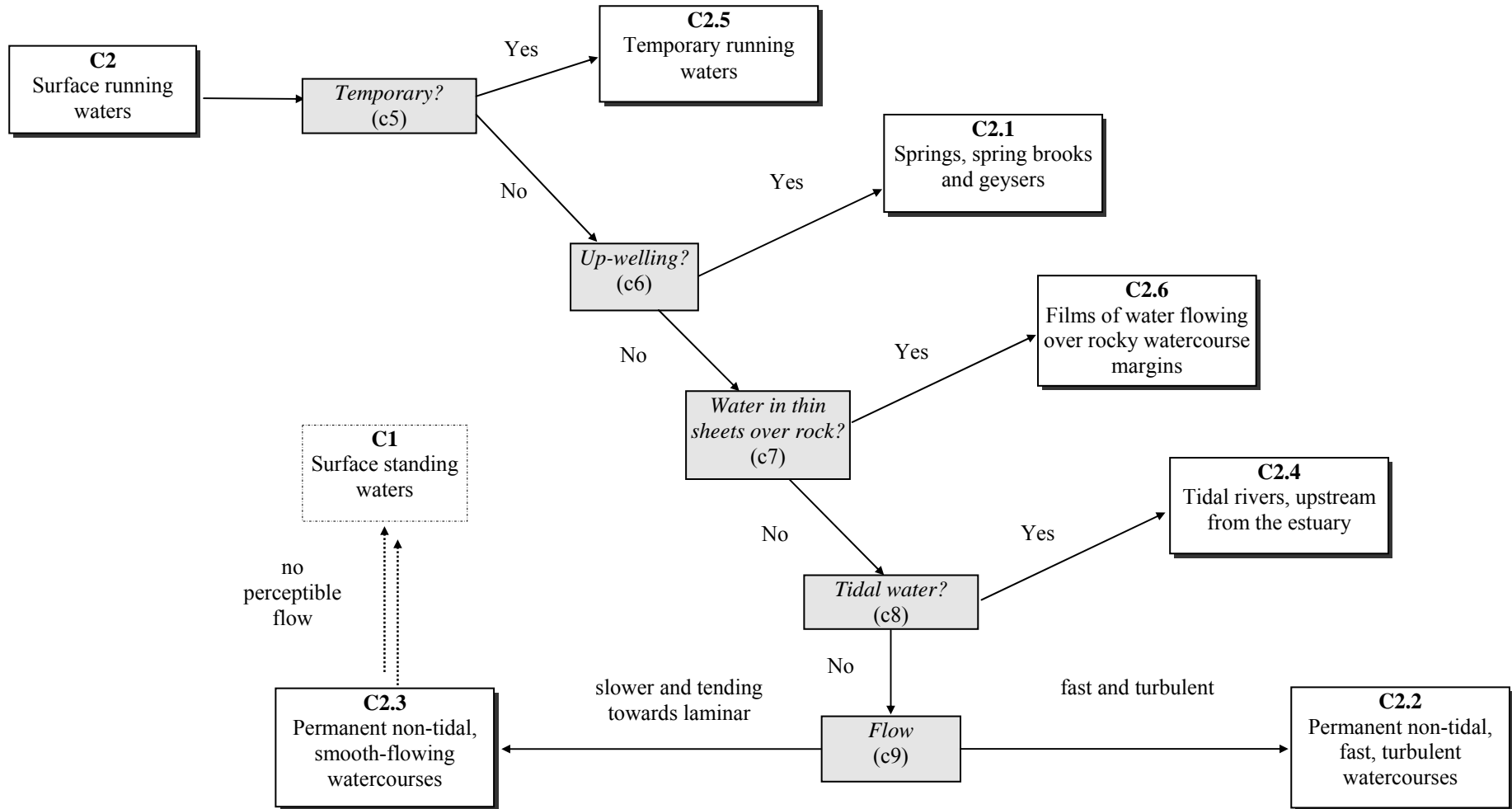
(number) refers to explanatory notes to the key (see following page).



- c1. Permanent or almost permanent ice formations of lakes (continuous ice sheets that cover the entire surface for all of the year or which recede to part of the lake during summer accompanied or replaced by floating ice blocks, rafts and hummocks) (path = *Yes*) are distinguished from waterbodies with open water, which may or may not have occasional ice cover.
- c2. Seasonal and otherwise temporarily-filled lakes, ponds and pools (path = *Yes*) are separated from surface water of more permanent character. Note that the wet phase only of temporary standing waters is characterised here. The habitat in its dry phase is normally characterised under C3. Note that temporarily flooded meadows and riverine forests are characterised as grassland and forest respectively.
- c3. Inland saline and brackish lakes and pools are separated (path = *Yes*) from waterbodies with freshwater.
- c4. Standing waters are separated on the basis of their trophic status; *oligotrophic* waters, of low nutrient status, usually on hard, acid rock with high oxygen concentration in the hypolimnion; *mesotrophic* waters, intermediate between oligotrophic and eutrophic waters; *eutrophic* waters with high productivity and potentially low oxygen concentration in the hypolimnion; *dystrophic* waters which are rich in humus, often with a brown colour.

**C2: EUNIS Habitat Classification: criteria for surface running waters (C2) to Level 3**

(number) refers to explanatory notes to the key (see following page).

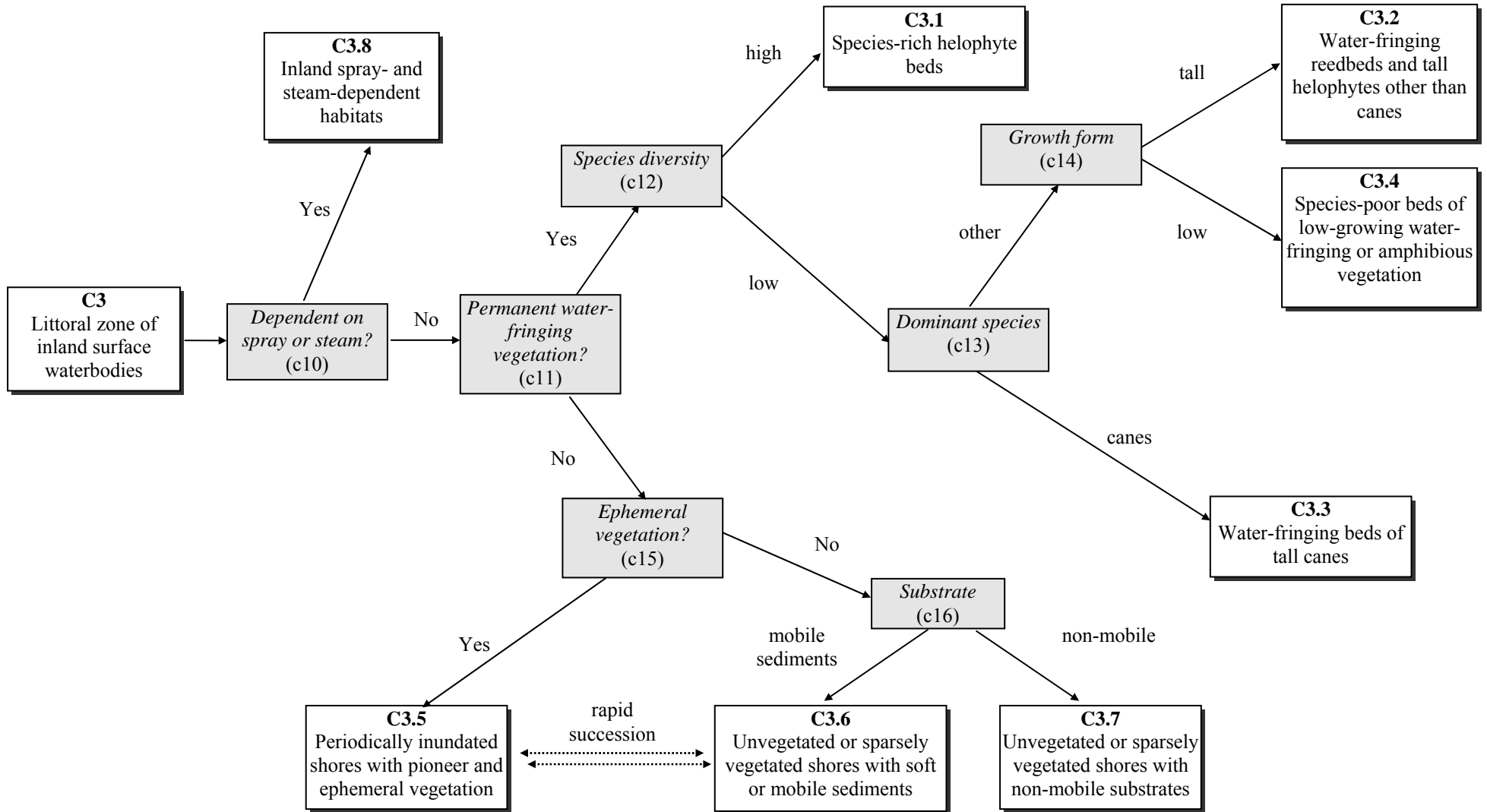


- c5. Seasonal and otherwise temporary running surface waters (path = *Yes*) are separated from surface running waters of more permanent character.
- c6. Springs and geysers where the flow is caused by up-welling from the substrate and the stream immediately below, where the temperature regime is similar to the source water and significantly different from the surroundings, are distinguished (path = *Yes*).
- c7. Habitats characterised by thin layers of moving water over rock surfaces adjacent to open water are distinguished (path = *Yes*) from the main open waterbody with which they are associated.
- c8. Tidal rivers and streams (which may or may not be brackish) upstream of the estuary are distinguished (path = *Yes*) from running water not affected by tides. Note that estuarine waters, with variable salinity usually greater than 0.5 ppt, are categorised under A and estuaries as complex X01.
- c9. Watercourses where the flow-rate is *fast and turbulent* are distinguished from rivers where flow is *slower and tending towards becoming laminar*. Note that where flow is fast and turbulent, the oxygen concentration is high, and the bed usually composed of rocks, stones or gravel with only occasional sandy and silty patches; where flow is slower, oxygen concentration deficits may occur at times, and normally the substrate is mainly sand and mud. Rivers that are fast but with laminar flow follow path = *slower and tending towards becoming laminar*.



**C3: EUNIS Habitat Classification: criteria for littoral zone of inland surface waterbodies (C3) to Level 3**

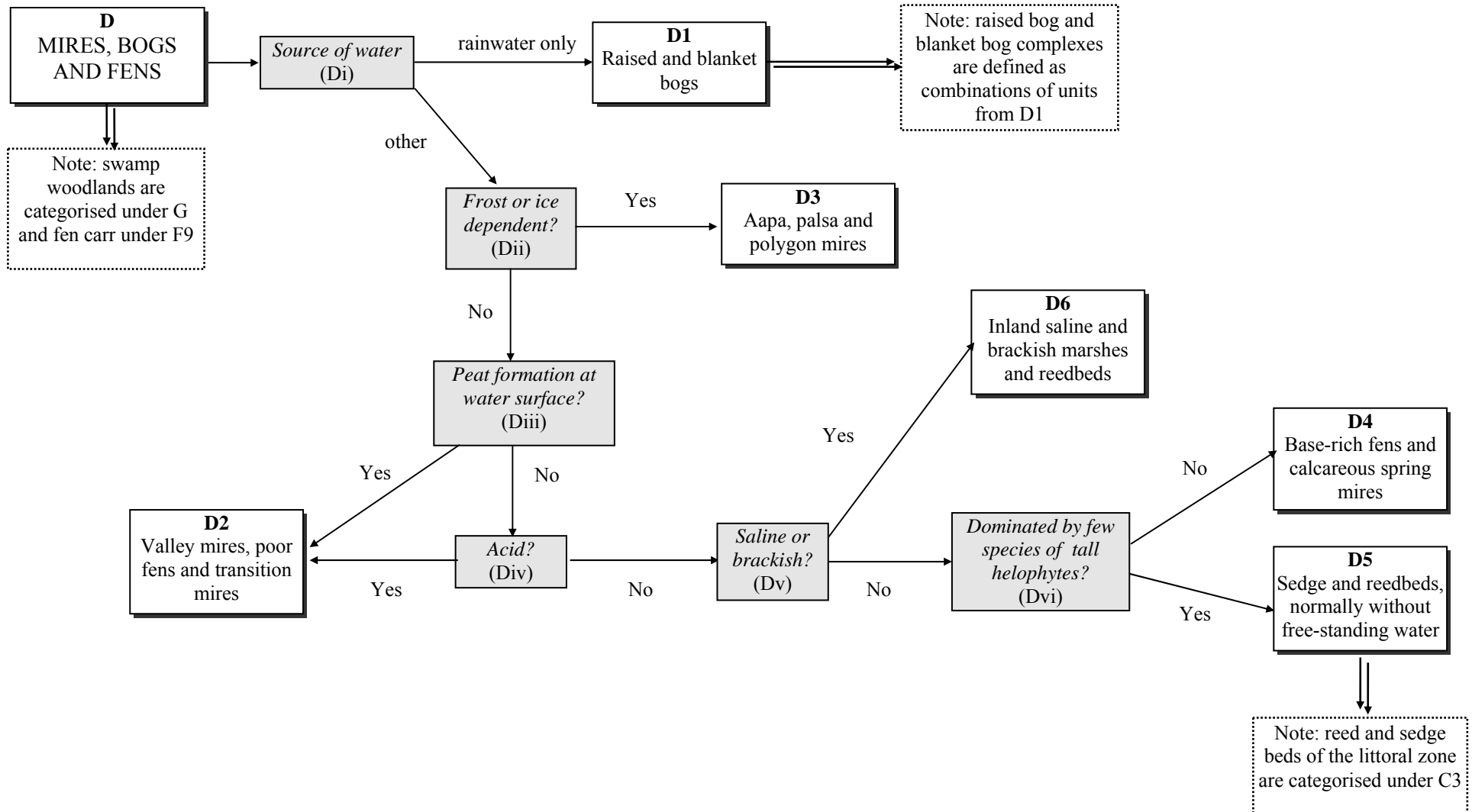
(number) refers to explanatory notes to the key (see following page).



- c10. Habitats dependent on spray or steam alongside waterfalls, geysers, and hot springs are separated (path = *Yes*). Note that the spray zone of the supralittoral marine zone is categorised under B.
- c11. Areas with significant cover by permanent water-fringing or amphibious vegetation normally in shallow water, but which may occasionally be subject to drying out (path = *Yes*) are separated from periodically inundated shores which are either unvegetated or characterised by ephemeral, seasonal or very sparse vegetation.
- c12. Habitats with amphibious or helophytic vegetation of reeds or other graminoids and other helophytes (plants rooted in, but emergent from, mud or water) which may be dominated by a single species, but which also have associated layers of diverse smaller herbaceous species (species diversity = *high*), are distinguished from habitats which are dominated by one or two plant species and whose species diversity is relatively *low*.
- c13. Habitats with low species diversity where the dominant species are *canes* (e.g. *Arundo* sp., *Saccharum ravennae*) are separated from those with reeds or *other* helophytes.
- c14. Species-poor water-fringing beds of *tall* emergent vegetation with no associated lower herb layer are separated from species-poor habitats with *lower-growing* emergent or amphibious vegetation
- c15. Areas with pioneer vegetation and ephemeral annual vegetation (path = *Yes*) are separated from more or less unvegetated emergent banks and shores subject to periodic inundation.
- c16. Unvegetated periodically inundated shores and emergent banks are separated according to their substrate. *Mobile sediments* (such as mud, sand and mobile gravel) are distinguished from *non-mobile* hard or firm substrates including rock, boulders, artificial hard, consolidated clay and peat. Note that rapid succession between the habitat comprising unvegetated mobile sediment (C3.7) and ephemeral vegetation (C3.6) is likely and periods of inundation or submersion may cause reversal of the succession.

## D: EUNIS Habitat Classification: criteria for mires, bogs and fens (D) to Level 2

Note that mire bog, and fen habitats do not include wet heaths, moist grasslands, and riverine or swamp woodlands, which follow separate paths at Level 1. (number) refers to explanatory notes to the key (see following page).

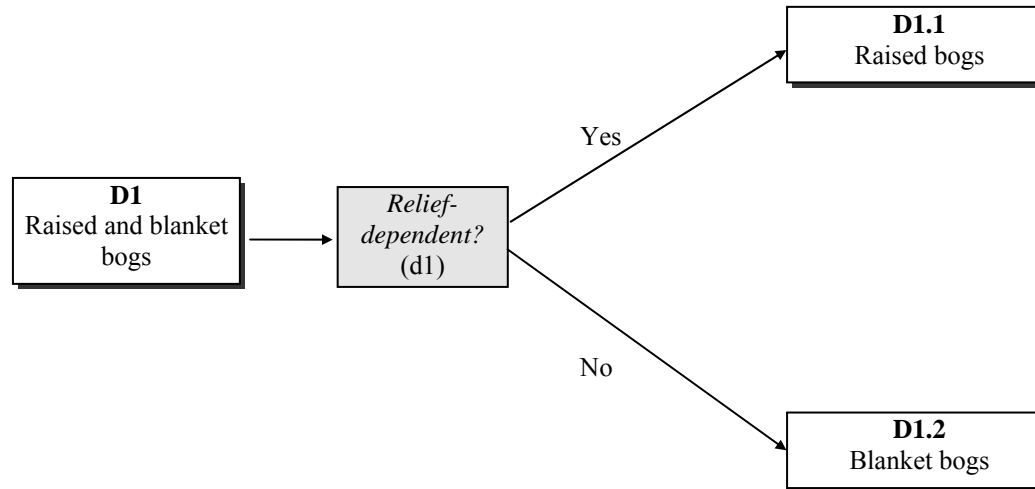


- Di. The criterion separates habitats on the basis of the source of their water supply: completely or primarily ombrogenous (*rainwater only*) from *other* sources which are combinations of ombrogenous, soligenous (run-off) and topogenous (groundwater) but where the ombrogenous water supply is of less importance.
- Dii. Mires whose formation and maintenance is completely dependent on the action of frost or ice are separated (path = *Yes*).
- Diii. Transition mires in which the water table is at or near the surface and peat forms a floating raft at the water surface are distinguished (path = *Yes*).
- Div. Mires in which the peat formation occurs in waterlogged ground are separated if they have a predominantly acid water supply (path = *Yes*).
- Dv. Marshes and reedbeds with a saline or brackish water supply (> 0.5 parts per thousand salt) (path = *Yes*) are distinguished from freshwater habitats (path = *No*).
- Dvi. Separates topogenous and soligenous habitats dominated by few species of tall helophytes (plants rooted below the water table but with emergent aerial shoots), typically species-poor extensive sedge and reed beds (path = *Yes*), from habitats dominated by low-growing vegetation on shallow organic or mineral substrates, which is typically species-rich vegetation of fens (path = *No*). Note: reed and sedge beds of the littoral zone (usually less than 5 m wide) rooted in open water with associated aquatic species are categorised under C3.

### D1: EUNIS Habitat Classification: criteria for raised and blanket bogs (D1) to Level 3

(number) refers to explanatory notes to the key

Note: the complete raised bog system is treated as a complex (X04). The vegetation of the raised bog is included within D1.1, and the open water elements (raised bog pools and lagg) within C1.4. A blanket bog complex (X28) has been defined comprising elements of D and C.

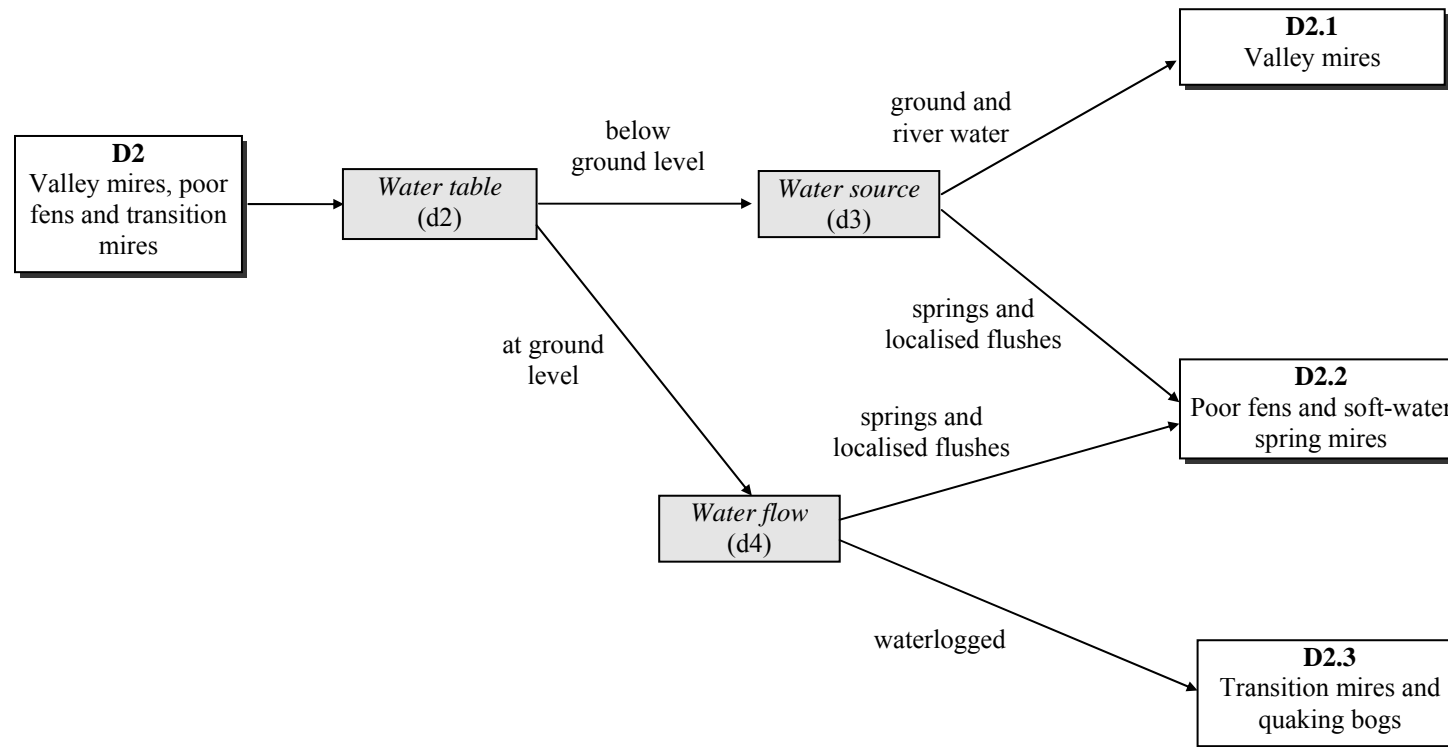


- d1. The criterion separates blanket bogs which follow but do not depend upon the topography, developing on flat or gently sloping ground with poor surface drainage (path = *No*) from raised bogs which are dependent upon the topography for their initial development, forming over depressions or on slopes (path = *Yes*). Raised bogs include a number of topographic types such as saddle and sloping bogs, and also condensation mires<sup>1</sup> (classified as D1.13).

<sup>1</sup>There are about 20 examples of condensation mires, an outstanding mire type, in the Alps and the Jura mountains, some of them up to 5 ha in size. They have developed on rock slides where, due to the cold air efflux from the cave system inside the rock slide, the water condenses on the surface. This condensation water is the basis for the formation of big *Sphagnum capillifolium* hummocks which merge together and thus form a peat layer of about 2 m depth. Being only supplied by atmospheric water it belongs to D1.

## D2: EUNIS Habitat Classification: criteria for valley mires, poor fens and transition mires (D2) to Level 3

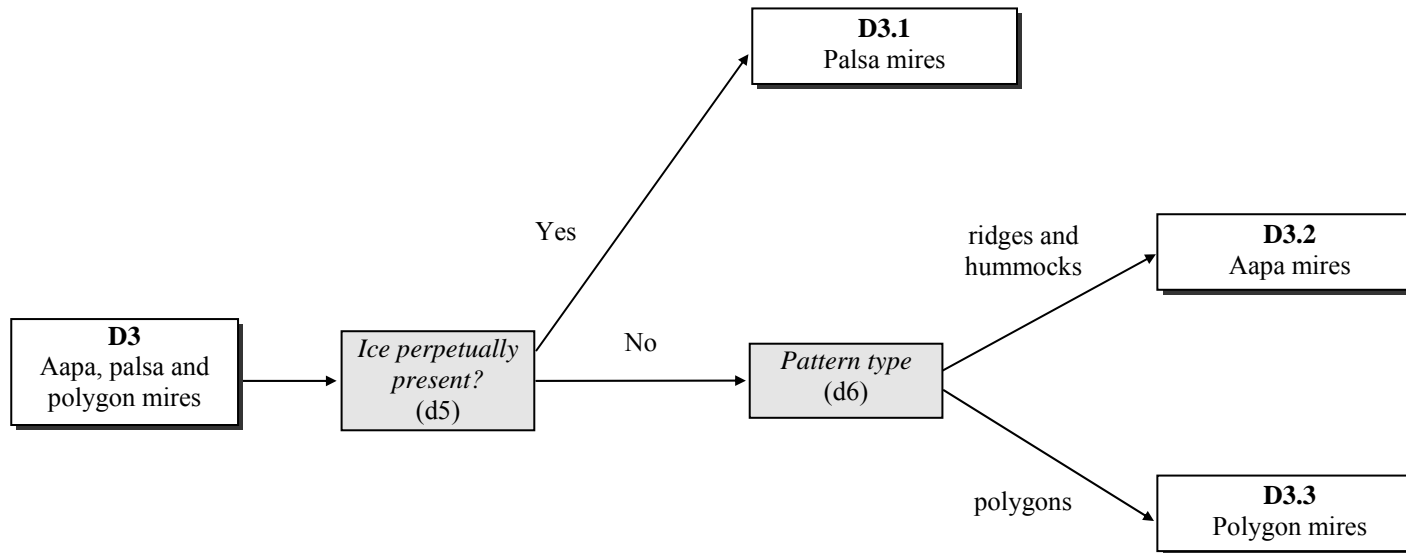
(number) refers to explanatory notes to the key



- d2. Transition mires where the water table is *at ground level*, where peat forms mostly in water, are distinguished from valley bogs and poor fens, where the water table is *below ground level* and peat forms in more-or-less saturated conditions.
- d3. Poor fens (acid flushes dominated by small sedges and often sphagna) developing on a slope and fed with water flowing laterally from *springs and localised flushes* are distinguished from valley mires (peat areas maintained by *ground and river water*).
- d4. Transition mires and quaking bogs where the ground is *waterlogged* are distinguished from poor fens fed with water flowing laterally from *springs and localised flushes*.

### D3: EUNIS Habitat Classification: criteria for aapa, palsa and polygon mires (D3) to Level 3

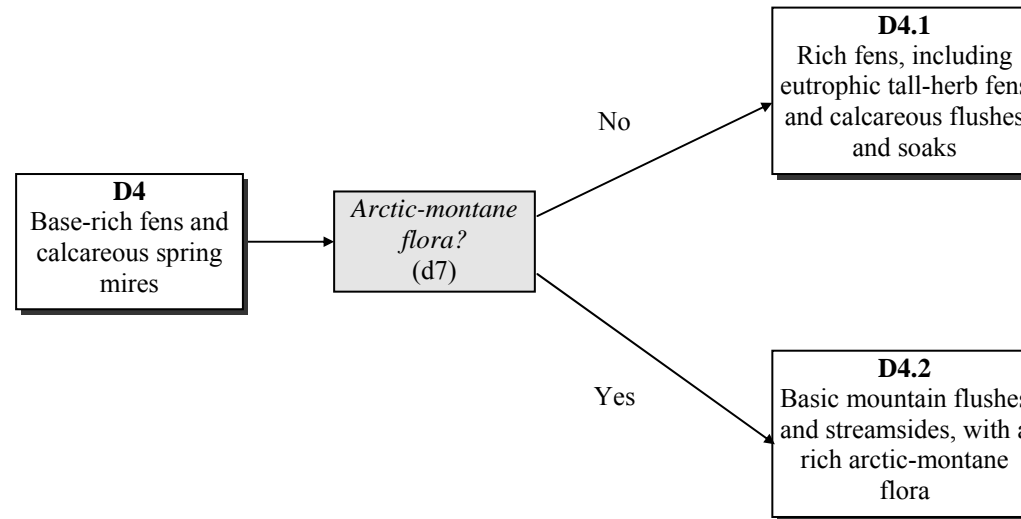
(number) refers to explanatory notes to the key



- d5. Mires developing in permafrost zones where ice is present as a central solid ice core in a raised butte (path = *Yes*), are separated.
- d6. Patterned frost-dependent mires are separated between aapa mires consisting of *ridges and hummocks* with alternating hollows, transverse to the slope, and mires characterised by structures of large *polygons*, 10 to 30 m in diameter, formed by the juxtaposition of dry ridges, 0.3 to 0.5 m high, and wet hollows.

**D4: EUNIS Habitat Classification: criteria for base-rich fens and calcareous spring mires (D4) to Level 3**

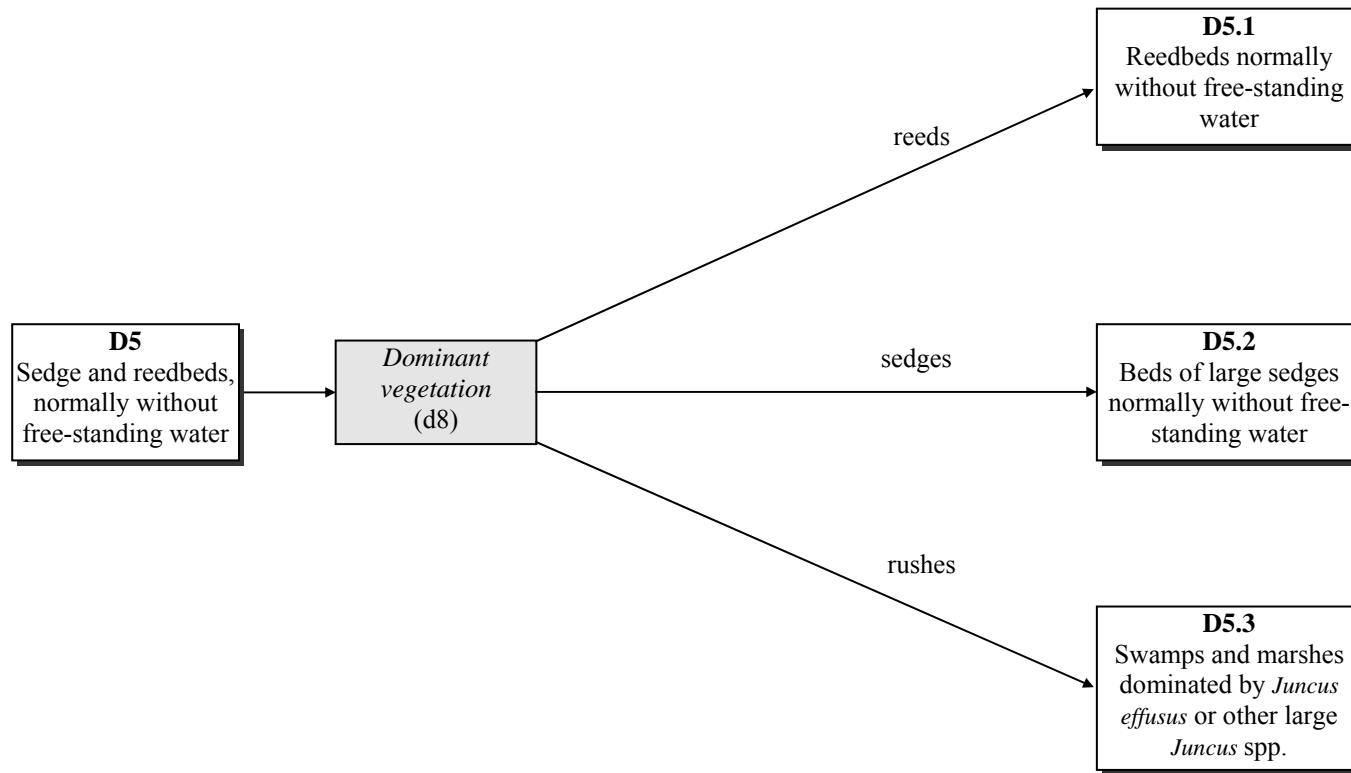
(number) refers to explanatory notes to the key



d7. Habitats with small sedge fen and related vegetation of mountains maintained in an open condition by water movement and / or freeze thaw action are separated (path = *Yes*). Note that the habitat type may extend to lower altitudes in colder, northern parts of Europe.



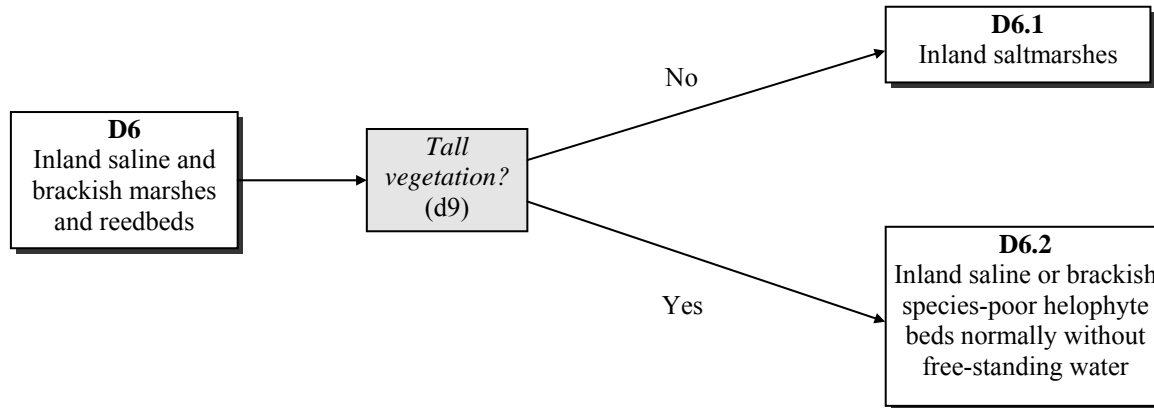
**D5: EUNIS Habitat Classification: criteria for sedge and reedbeds, normally without free-standing water (D5) to Level 3**  
(number) refers to explanatory notes to the key



- d8. Species-poor sedge and reed beds are separated according to the dominant vegetation type: *reeds* (including e.g. *Phragmites*, *Scirpus* and *Typha*); *sedges* (*Carex* and *Cyperus*); and *rushes* (*Juncus*).

**D6: EUNIS Habitat Classification: criteria for inland saline and brackish marshes and reedbeds (D6) to Level 3**

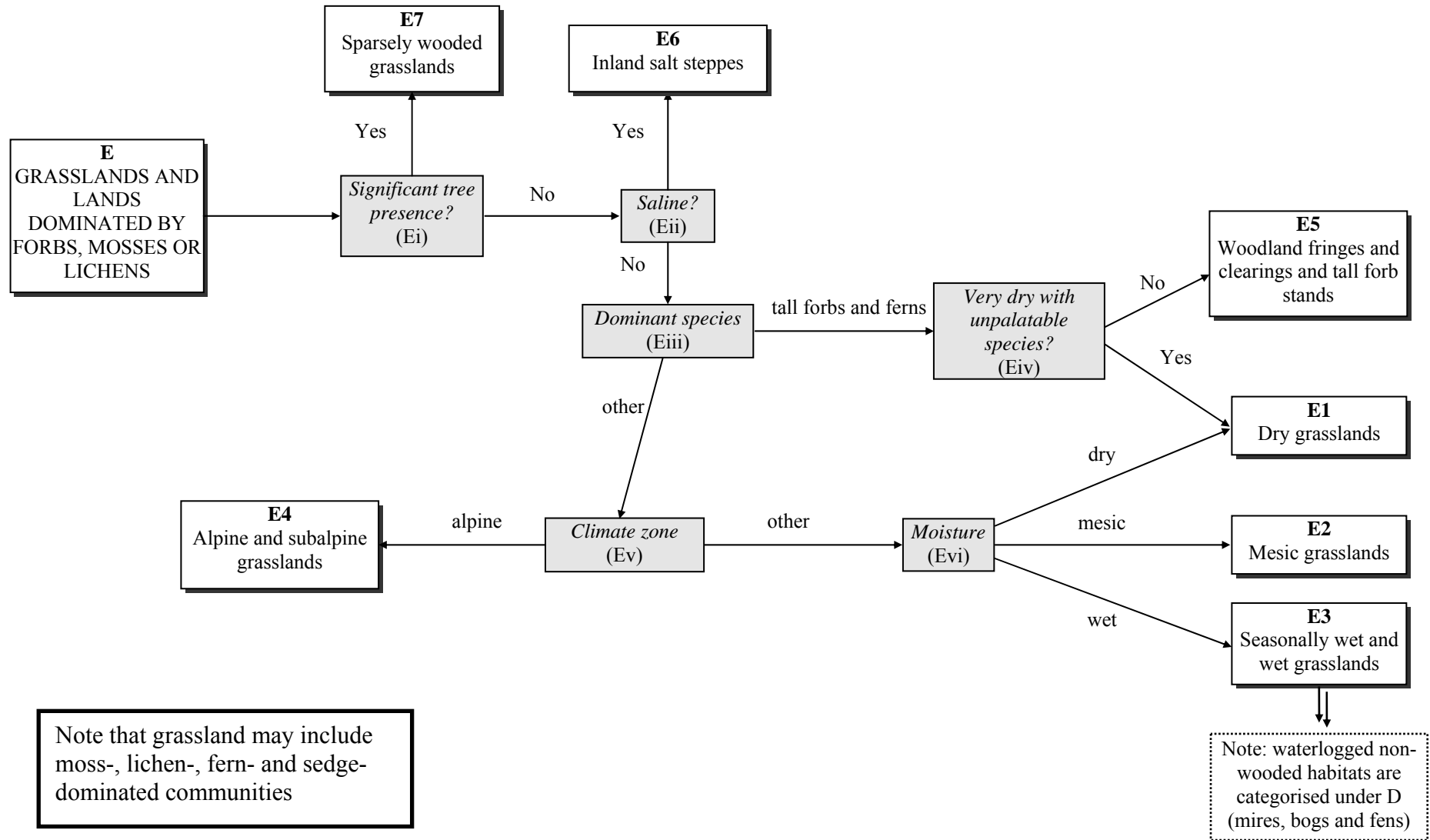
(number) refers to explanatory notes to the key



- d9. Vegetation dominated by few species of tall-growing graminoid macrophytes tolerant of saline or brackish conditions (path = *Yes*) are distinguished from habitats characterised by salt-dependent low-growing vegetation.

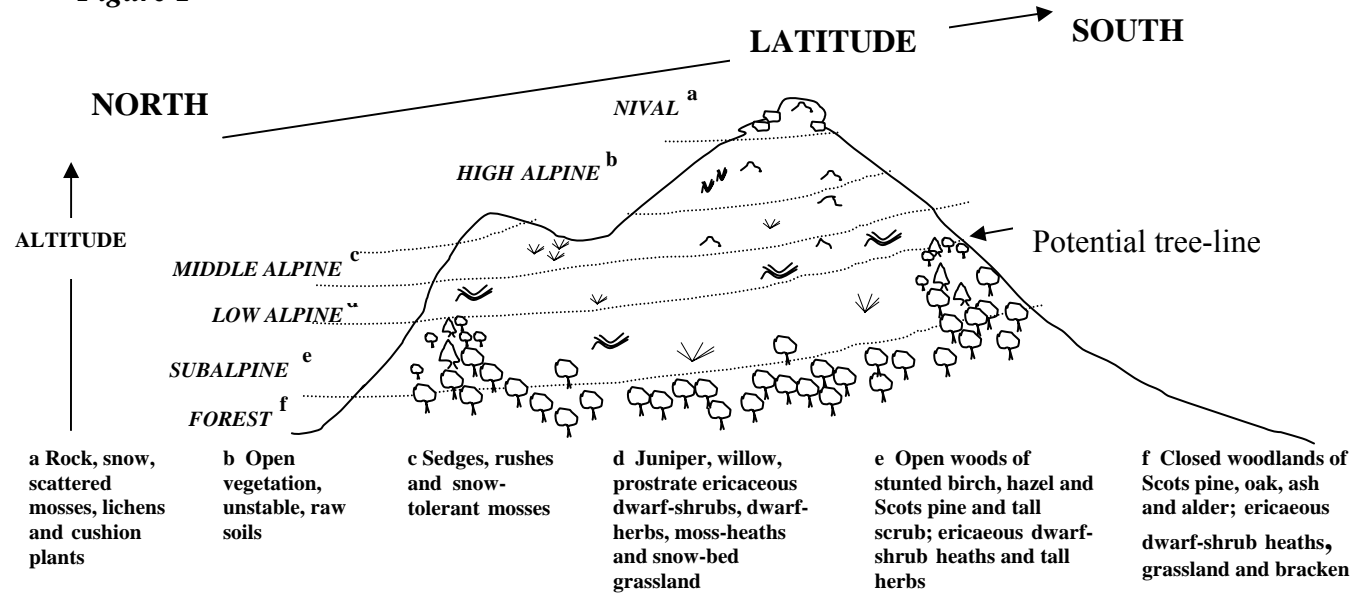
**E: EUNIS Habitat Classification: criteria for grasslands and lands dominated by forbs, mosses or lichens (E) to Level 2**

(number) refers to explanatory notes to the key (see following page).



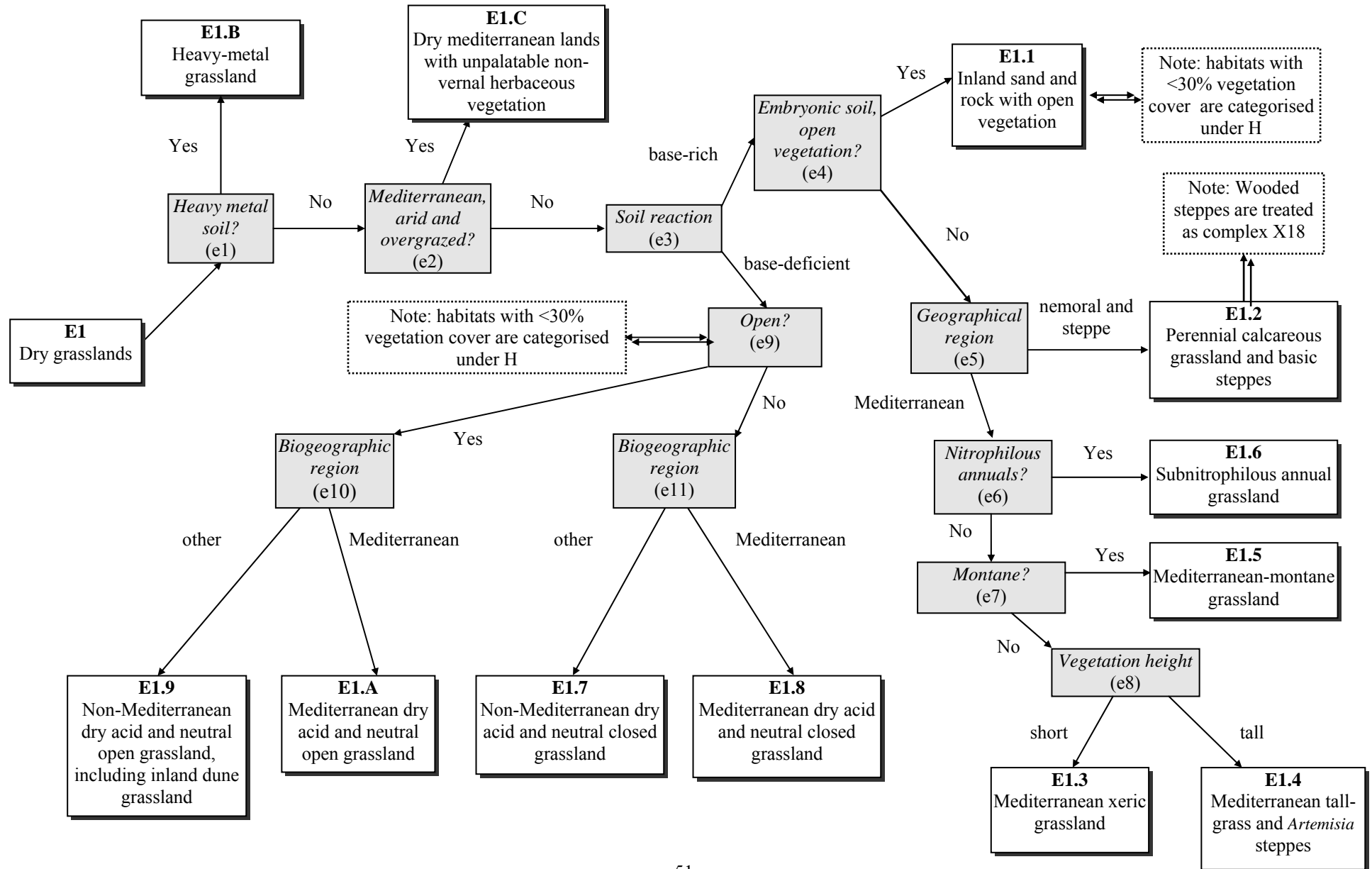
- Ei. Grasslands which have a significant tree presence, i.e. canopy cover between 5 - 10%, are separated (path = *Yes*).
- Eii. Grasslands and herb-dominated habitats on saline soils (path = *Yes*) are distinguished.
- Eiii. Habitats dominated by *tall forbs or ferns* are distinguished from habitats where the dominant vegetation type is *other* low-growing herbs, especially grasses, but also bryophytes and lichens (where cover is greater than 30%). Note that land colonised by weeds follows path = *tall forbs or ferns*.
- Eiv. Very dry over-grazed Mediterranean habitats (*ermes*), characterised by unpalatable tall herb species, are distinguished (path = *Yes*).
- Ev. Climate zone separates *alpine* grasslands from *other* grassland habitats which are more typical of montane, collinar or lowland levels. Alpine grasslands are typically found towards or beyond the forest limit but below permanent snow generally at higher altitudes in the mountains of Europe, although they may penetrate to lower altitudes, especially at higher latitudes and in the oceanic parts of Europe. (*See figure 1.*)
- Evi. Seasonally *wet* and wet grasslands which have some affinities with wetlands, but which are not permanently waterlogged (Level 1, criterion note 7) are distinguished from predominantly *dry* grasslands and from *mesic* grasslands (including non-alpine bracken fields) which are usually mesotrophic or eutrophic.

Figure 1



### E1: EUNIS Habitat Classification: criteria for dry grasslands (E1) to Level 3

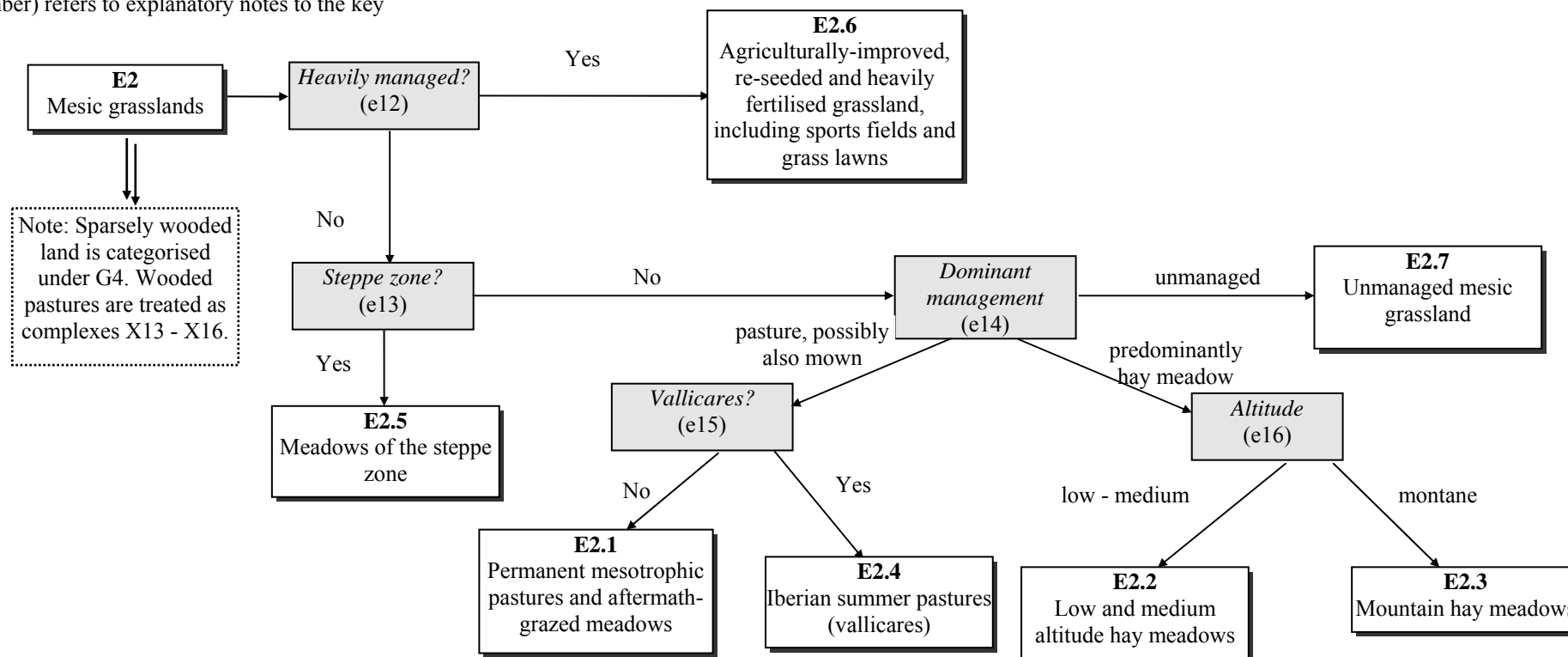
(number) refers to explanatory notes to the key (see following page).



- e1. Grasslands with metalliferous soils are separated (path = *Yes*) from those on calcareous, neutral or acid soils without a high heavy metal content.
- e2. Very dry over-grazed Mediterranean habitats (*ermes*), characterised by unpalatable tall herb species, are distinguished (path = *Yes*).
- e3. *Base-rich* grasslands are distinguished from *base-deficient* dry grassland habitats.
- e4. Habitats on embryonic sandy or detritic soil with open pioneer vegetation (path = *Yes*) are distinguished from those on more developed soils. Note that very sparsely vegetated scree habitats are categorised under H2 and sparsely vegetated sandy ground under H5.3.
- e5. Perennial grasslands, often nutrient-poor and species-rich, on calcareous and other basic soils of the *nemoral and steppe* zones and of adjacent parts of the subboreal and submediterranean zones are separated from grasslands of the *Mediterranean* zone.
- e6. Mediterranean grasslands dominated by annuals on somewhat enriched soils are separated (path = *Yes*) from perennial grasslands and xeric annual grasslands on poor dry soils (path = *No*).
- e7. Open perennial grasslands of the montane thermophilous oak level of the Mediterranean climatic zone are separated (path = *Yes*).
- e8. *Short* xerophile Mediterranean grasslands, typically composed of grasses less than 60 cm high, are distinguished from *tall* Mediterranean grasslands and *Artemisia* steppes.
- e9. Open acid and neutral grasslands, usually pioneer formations developing on sand, including inland dunes, are separated (path = *Yes*). Note that habitats with <30% vegetation cover are categorised under H.
- e10. *Mediterranean* dry open acid and neutral grasslands are separated from those in *other* biogeographic regions.
- e11. *Mediterranean* dry closed acid and neutral grasslands are separated from those in *other* biogeographic regions.

## E2: EUNIS Habitat Classification: criteria for mesic grasslands (E2) to Level 3

(number) refers to explanatory notes to the key

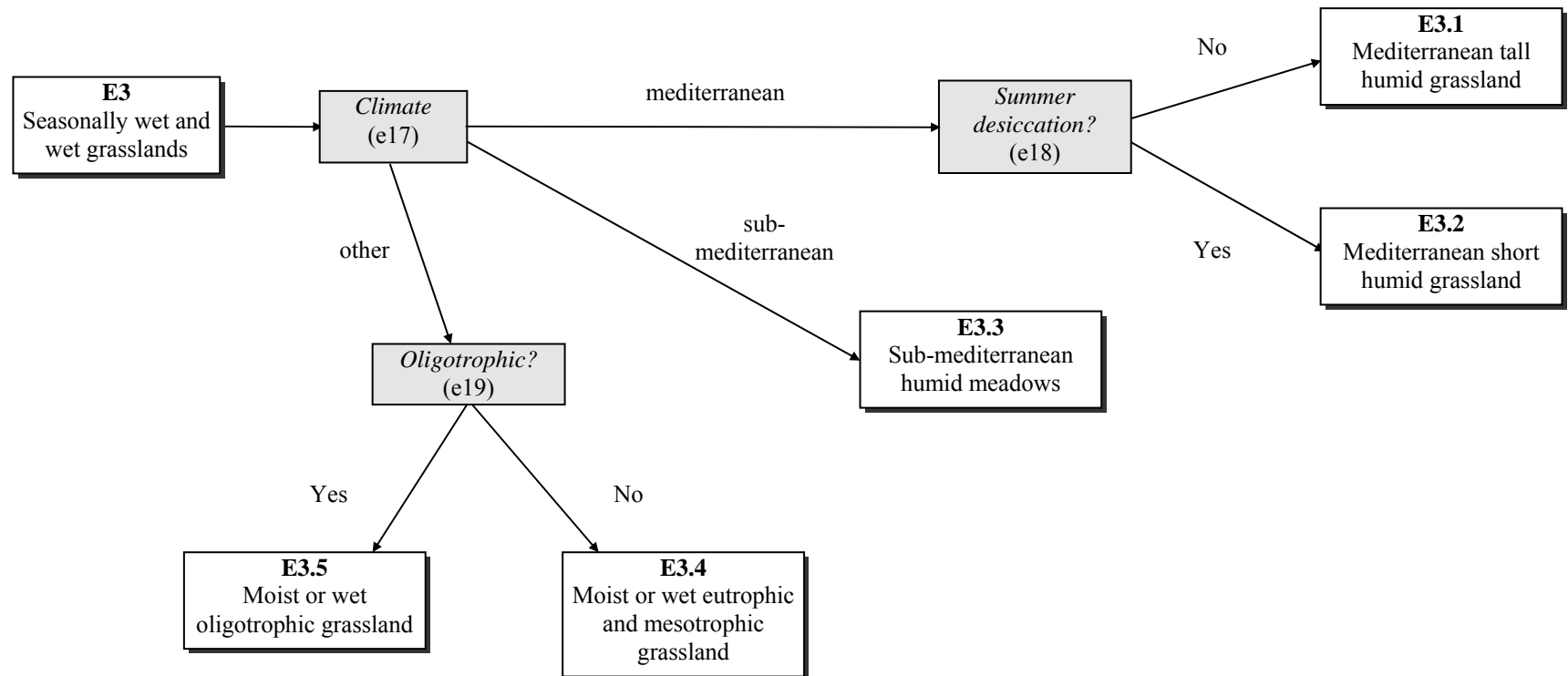


- e12. The criterion separates intensively grazed or frequently mown, re-seeded and heavily fertilised grasslands (usually with restricted species composition) including sports fields and lawns (path = *Yes*) from less heavily managed habitats.
- e13. Mesophile lowland and montane pasture and hay meadows of the Sarmatic, eastern Pontic and Siberian steppe zone are separated (path = *Yes*).
- e14. Habitats are distinguished by the present or recent dominant management regime. *Pastures*, which are *possibly also mown* but the dominant management is grazing are separated from hay meadows where the predominant activity is mowing (path = *predominantly hay meadows*). *Unmanaged* grasslands show no evidence of recent management.
- e15. Distinctive *vallicares* are separated (path = *Yes*). These are summer pastures of the Iberian peninsula, characterised by poor drainage, brief flooding and rapid desiccation, usually supporting perennial grasslands with *Agrostis castellana* or annual grasslands with *Agrostis pourretii*.
- e16. *Low to medium* altitude hay meadows are distinguished from those in *montane* areas, usually above 600 m altitude.



### E3: EUNIS Habitat Classification: criteria for seasonally wet and wet grasslands (E3) to Level 3

(number) refers to explanatory notes to the key



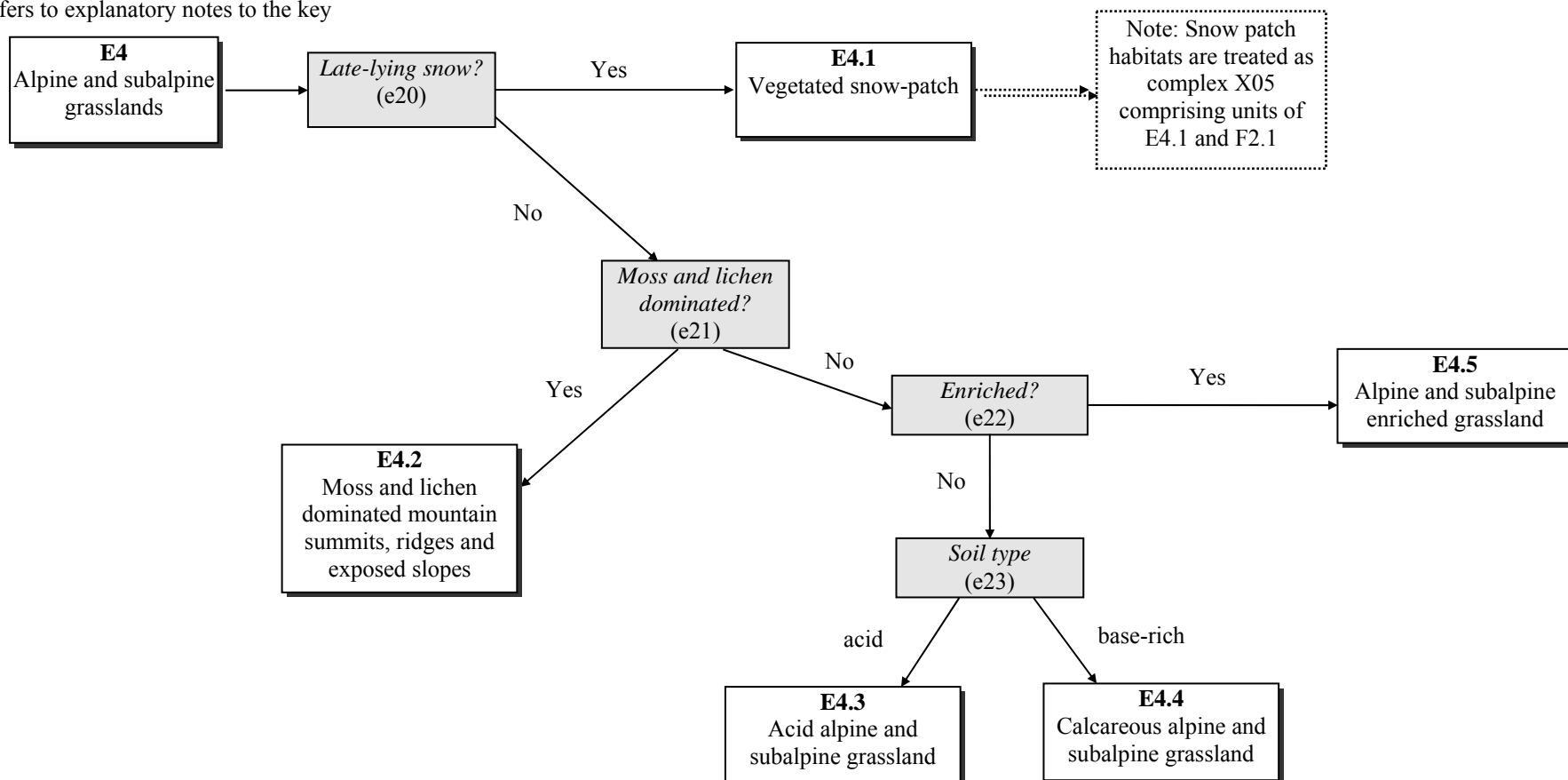
e17. The criterion separates out habitats with *mediterranean*; *sub-mediterranean*; or *other* climate types.

e18. Short-herb communities subject to alternating extreme conditions of inundation and summer desiccation (path = *Yes*) are distinguished from tall grassland in permanently humid conditions.

e19. Nutrient-poor (often acid) grasslands (path = *Yes*) are separated from meso- and eutrophic habitats. Note that nutrient-poor grasslands may be rich in chalk.

### E4: EUNIS Habitat Classification: criteria for alpine and subalpine grasslands (E4) to Level 3

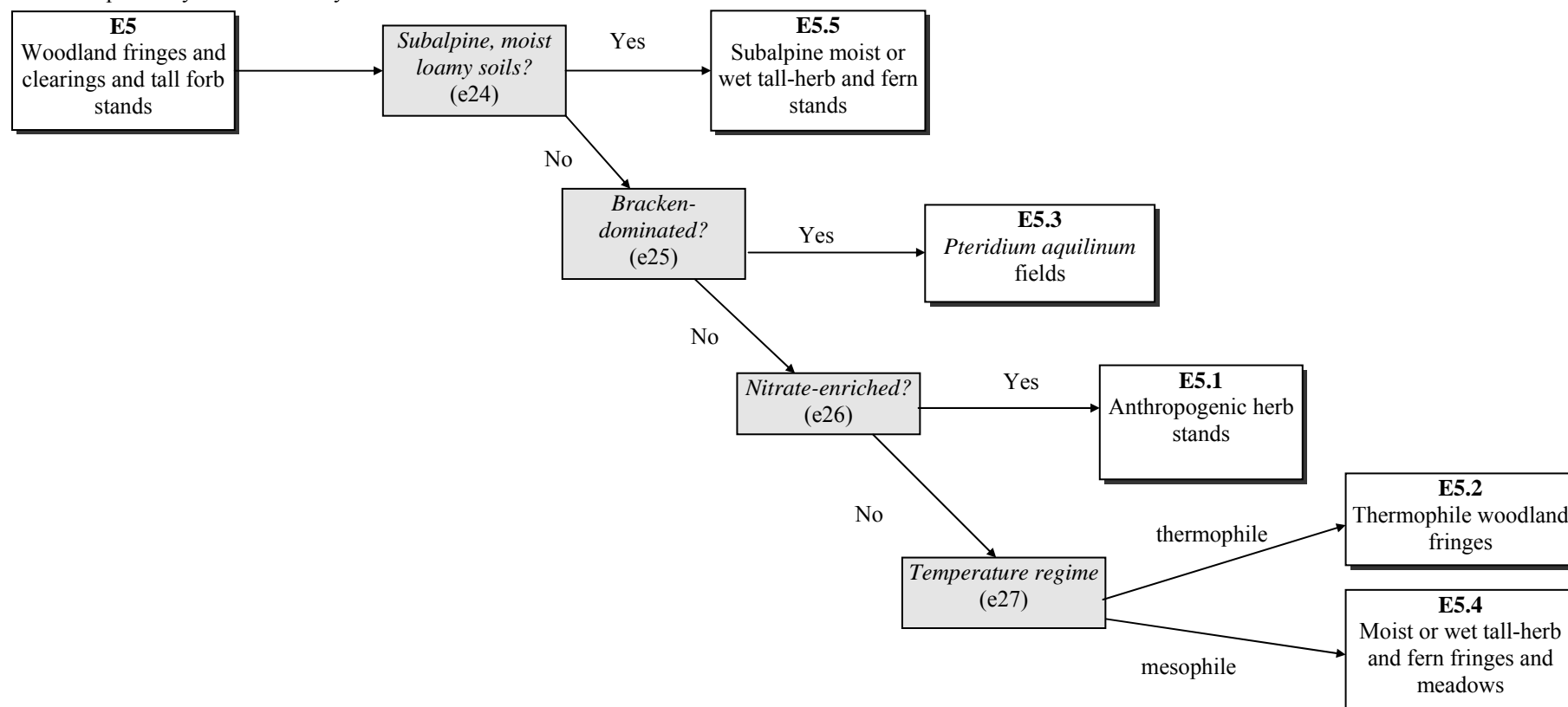
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- e20. Grassland habitats of areas that retain late-lying snow (i.e. areas retaining snow for longer than usual for that latitude and altitude) are separated (path = *Yes*). Note that permanently snow or ice covered habitats are categorised under H4.
- e21. Relatively snow-free exposed summits, slopes and ridges dominated by mosses and lichens are separated (path = *Yes*).
- e22. Enriched (fertilised or manured) alpine and sub-alpine grassland habitats are separated (path = *Yes*). Note that manuring can be by concentrations of grazing animals.
- e23. *Acid* alpine grasslands are distinguished from alpine grassland habitats on *base-rich* soils.

### E5: EUNIS Habitat Classification: criteria for woodland fringes and clearings and tall forb stands (E5) to Level 3

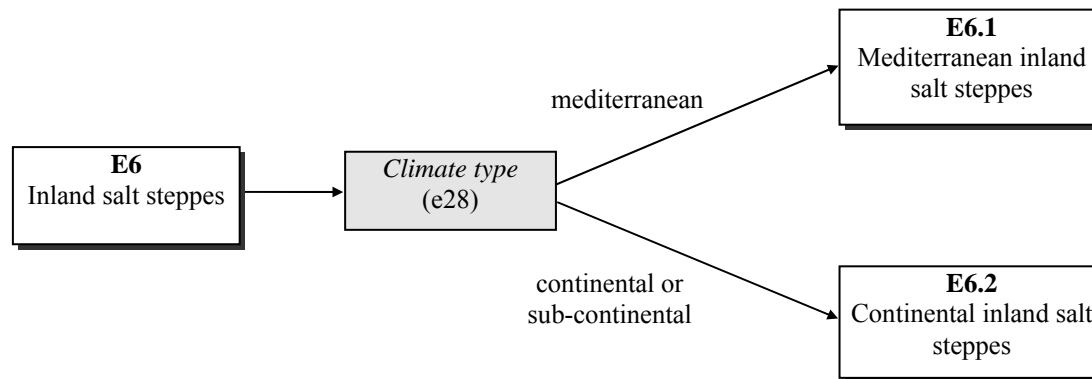
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- e24. Habitats with moist loamy soils typically at subalpine altitudes, but occasionally extending to alpine or montane levels are separated (path = *Yes*).
- e25. Habitats dominated by bracken (*Pteridium aquilinum*) are separated (path = *Yes*).
- e26. Anthropogenic forb-rich, often nitrate-enriched habitats colonised by or planted with weeds or forbs such as nettles and willow herbs (*Urtica dioica*, *Epilobium* spp.), other ruderal species or legumes (which are not on cropland) are separated (path = *Yes*).
- e27. Tall herb and fern habitats of boreal, alpine and nemoral climates with humid soils e.g. on stream sides or in damp meadows, or with shade, are separated (path = *mesophile*) from those of woodland edges with more thermophilous character, in which *Geranium sanguineum*, *Origanum vulgare* and *Vincetoxicum hirundinaria* are commonly present.

**E6: EUNIS Habitat Classification: criteria for inland salt steppes (E6) to Level 3**

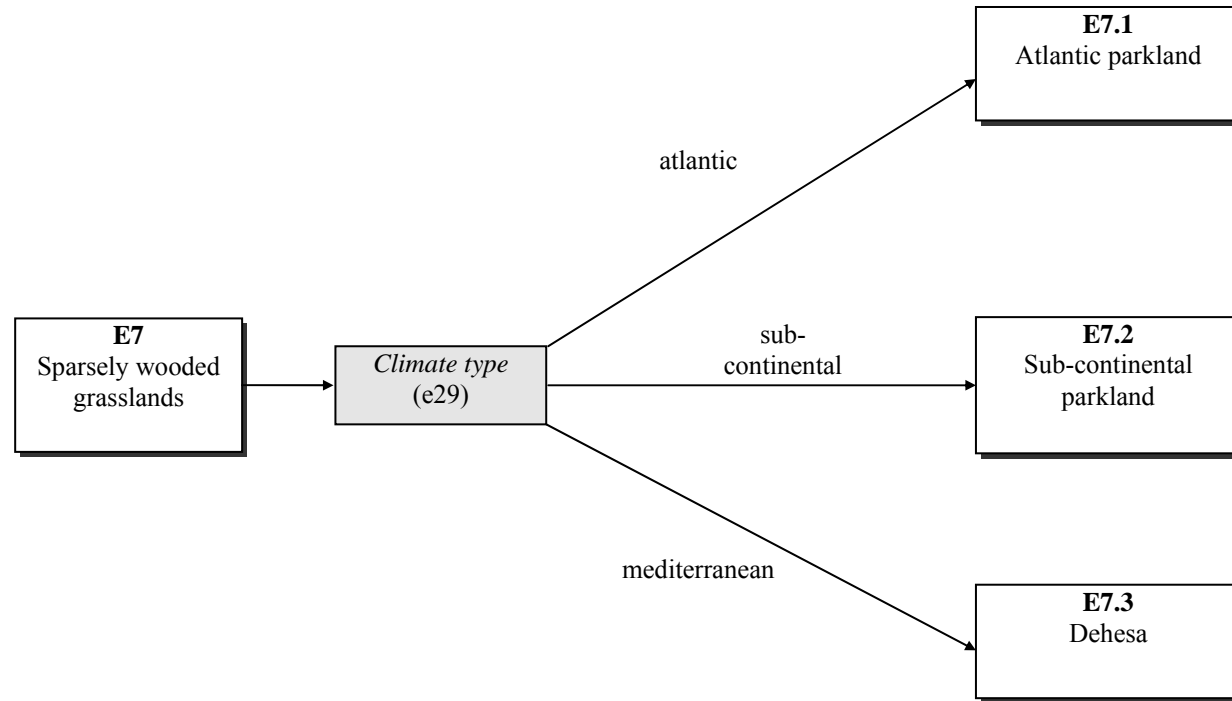
(number) refers to explanatory notes to the key



e28. Inland saline grassland and herb-dominated habitats characteristic of two climate types are distinguished: *mediterranean*; and *continental or sub-continental*.

**E7: EUNIS Habitat Classification: criteria for sparsely wooded grasslands (E7) to Level 3**

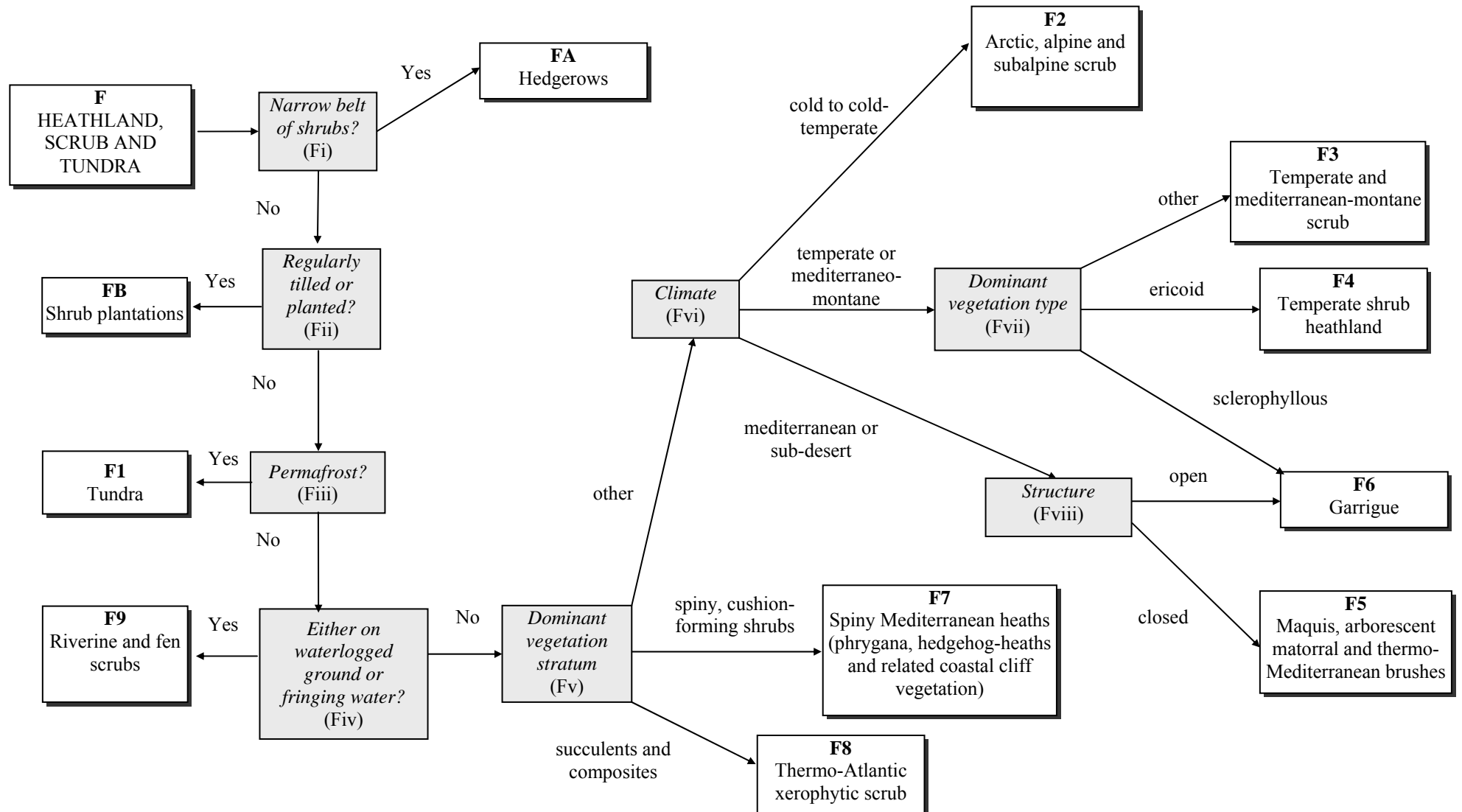
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e29. Sparsely wooded grasslands (canopy cover 5 - 10% trees) characteristic of three climate types are distinguished: *atlantic*; *sub-continental*; and *mediterranean*.

## F: EUNIS Habitat Classification: criteria for heathland, scrub and tundra (F) to Level 2

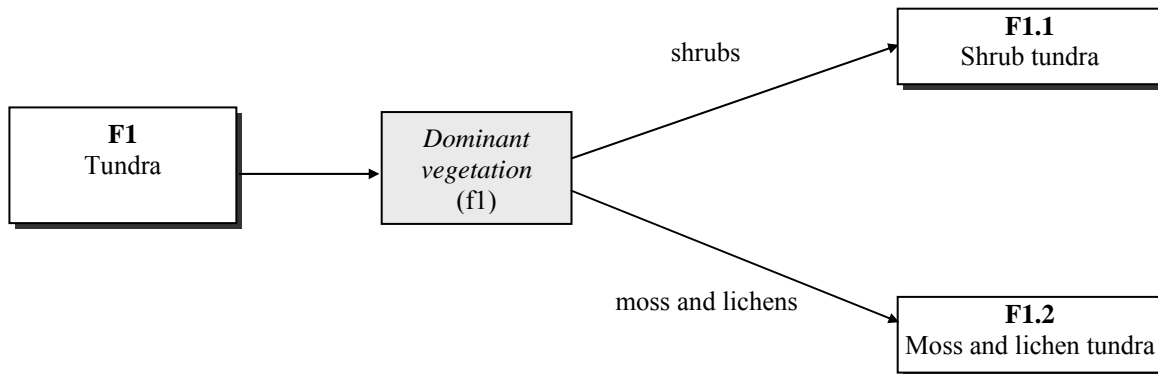
Note that the key to Level 1 shows two pathways to reach habitat type F: these are recombined here.  
(number) refers to explanatory notes to the key (see following page).



- Fi. Hedgerows, comprising narrow linear belts of shrubs, which may or may not be managed, with or without occasional trees, are distinguished (path = *Yes*). Note that shrubby habitats of forest edges are classified under G.
- Fii. Shrub plantations which are cultivated regularly, but not necessarily annually (vineyards, fruit orchards and tea plantations), are distinguished (path = *Yes*).
- Fiii. Tundra habitats characterised by the presence of permafrost are separated (path = *Yes*).
- Fiv. Scrubs and thickets on waterlogged ground or fringing temporary or permanent rivers and streams are separated (path = *Yes*) from other shrub habitats in drier areas.
- Fv. Habitats are separated on the basis of the vegetation type: *succulents and composites* (members of the family Compositae); and *spiny, cushion-forming shrubs*; and *other* shrubs and low trees. Note that ‘low trees’ are defined as tree species when they are restricted in their growth form (and which may be prostrate).
- Fvi. This criterion separates habitats characterised by their temperature regime, but this may operate at a variety of geographical and altitudinal scales: *cold to cold-temperate* climate in the arctic, alpine or subalpine zones; *temperate or mediterraneo-montane* climate in warmer areas in the arctic or alpine and subalpine zones or cooler areas of the mediterranean region (i.e. warm temperate areas of the mountains of the mediterranean region); and *mediterranean or sub-desert* climates in the Mediterranean zone.
- Fvii. Habitats with a temperate or mediterraneo-montane climate are separated according to their dominant vegetation type: *ericoid* shrubs; *sclerophyllous* shrubs; or *other* broadleaved deciduous or coniferous shrubs and low trees.
- Fviii. Garrigue is distinguished from maquis and matorral: garrigue always has an *open* vegetation and some bare ground, usually with many annuals and geophytes and dominated by vernal species, usually with some patches of shrubs (e.g. *Cistus*, *Lavendula*, *Rosmarinus* and *Stoechas*) and there may be some larger shrubs and scattered trees present; maquis and matorral comprise more *closed* vegetation, usually with 100% cover, mainly shrubs with few annuals and some geophytes, trees are nearly always present, some of which may be in shrub form.

**F1: EUNIS Habitat Classification: criteria for tundra (F1) to Level 3**

(number) refers to explanatory notes to the key

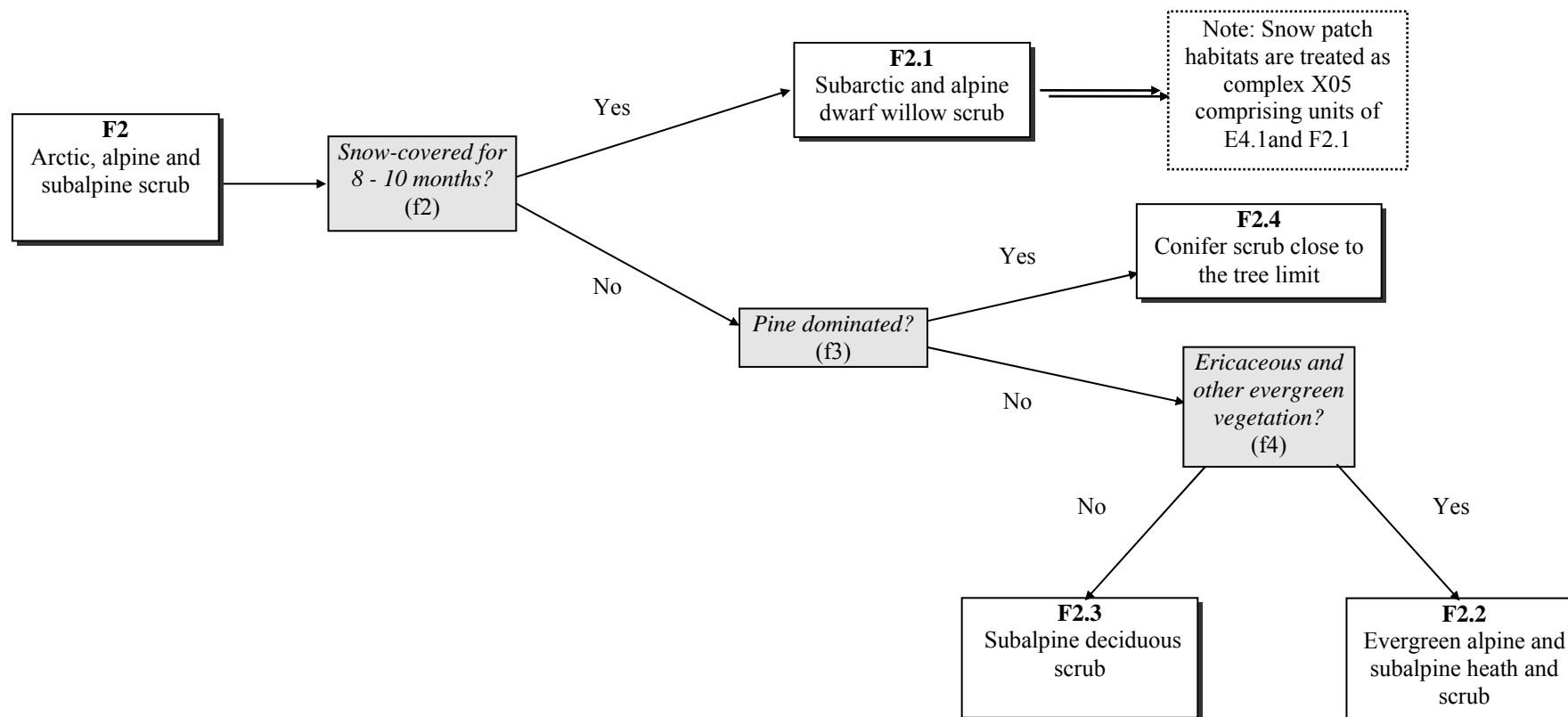


f1. Tundra habitats are distinguished by their dominant vegetation types: *shrubs* or *moss and lichens*.



## F2: EUNIS Habitat Classification: criteria for arctic, alpine and subalpine scrub (F2) to Level 3

(number) refers to explanatory notes to the key



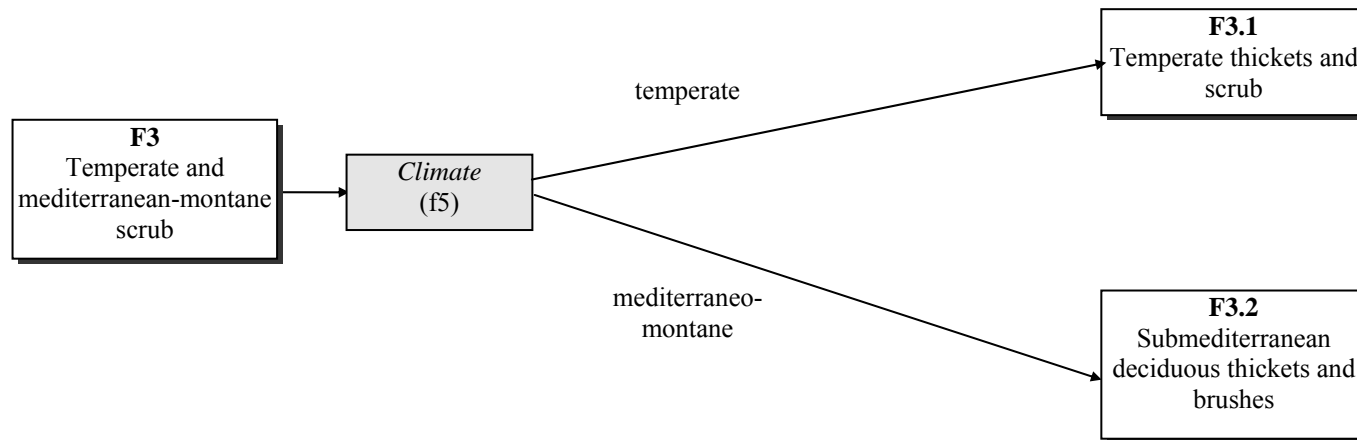
f2. Habitats characterised by species tolerant of snow cover for most of the year are distinguished (path = *Yes*).

f3. Habitats in the subalpine zone dominated by dwarf needle-leaved trees (primarily *Pinus mugo*) are separated (path = *Yes*).

f4. Evergreen vegetation largely dominated by ericoids is separated (path = *Yes*) from deciduous scrubs developed in areas sheltered by snow from wind and frost. These latter areas are normally characterised by the permanent presence of moving water, allowing turnover of nutrients and preventing accumulation of mor.

**F3: EUNIS Habitat Classification: criteria for temperate and mediterranean-montane scrub (F3) to Level 3**

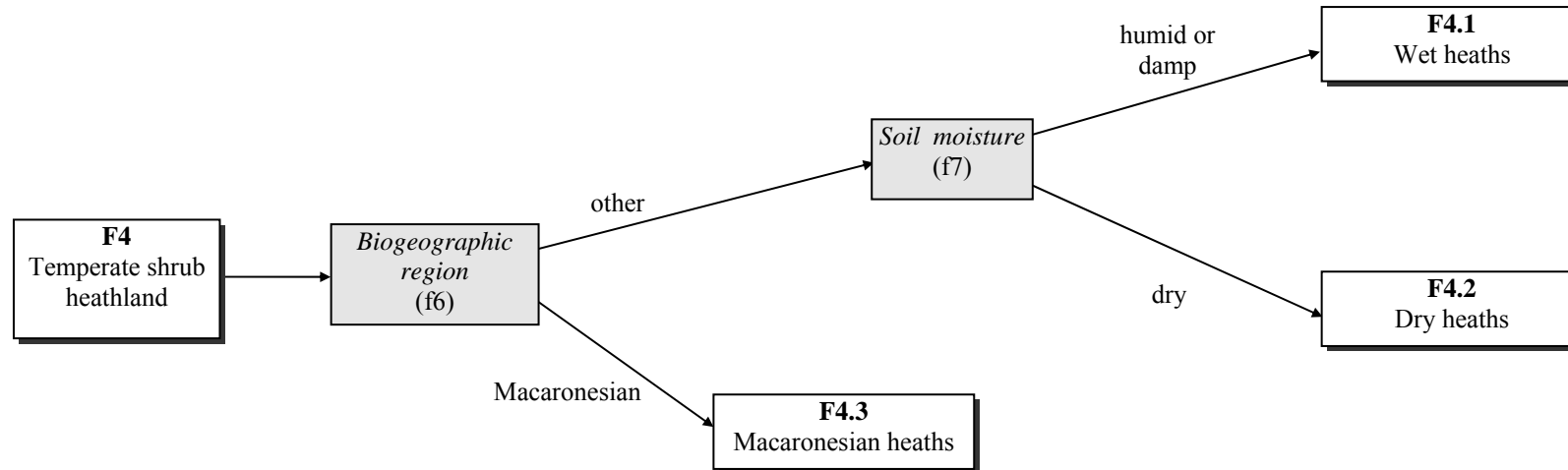
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- f5. Habitats in *temperate* and warmer *mediterraneo-montane* climatic zones are distinguished. Note that localised microclimate conditions may allow the temperate unit to appear in the Mediterranean zone, in which case follow path = *temperate*.

#### F4: EUNIS Habitat Classification: criteria for temperate shrub heathland (F4) to Level 3

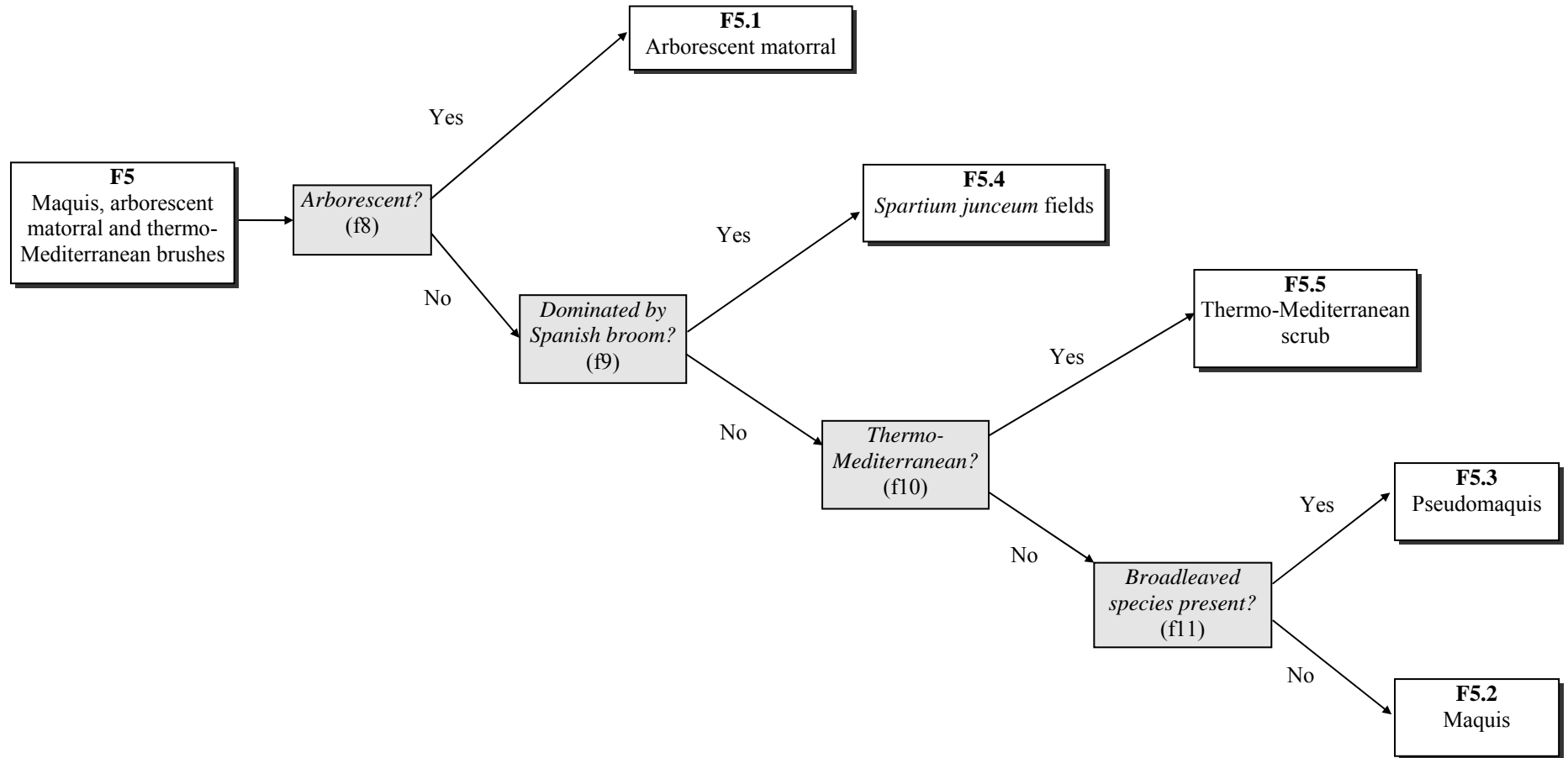
(number) refers to explanatory notes to the key



- f6. The criterion separates temperate heaths of the *Macaronesian* biogeographic region from those occurring in Atlantic, Continental, Boreal or Alpine zones (path = *other*).
- f7. Heathlands are distinguished by the soil moisture: *humid or damp* (usually peaty soils); or *dry* (usually podzolic soils, but may be peat).

**F5: EUNIS Habitat Classification: criteria for maquis, arborescent matorral and thermo-Mediterranean brushes (F5) to Level 3**

(number) refers to explanatory notes to the key



f8. Matorral characterised by arborescent species is separated (path = *Yes*).

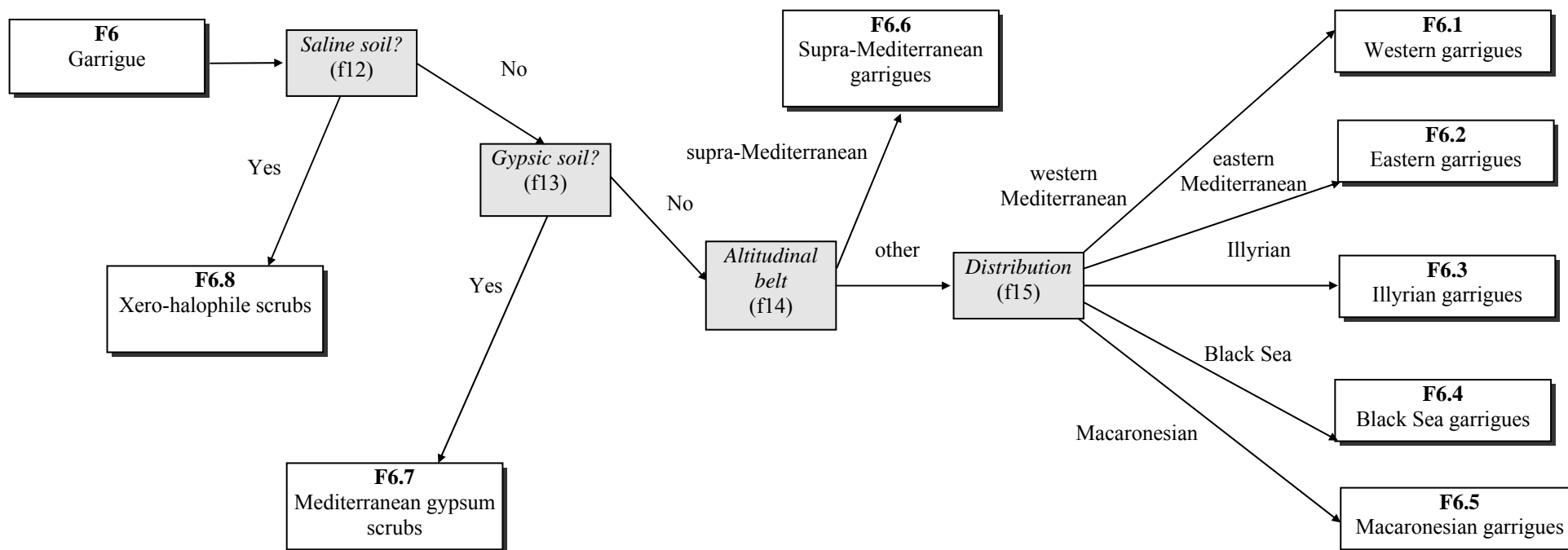
f9. Habitats dominated by Spanish broom (*Spartium*) are distinguished (path = *Yes*).

f10. Brush habitats characteristic of the thermo-Mediterranean altitudinal belt are distinguished (path = *Yes*).

f11. Pseudomaquis (broadleaved or deciduous species found together with sclerophyllous species) is distinguished (path = *Yes*).

## F6: EUNIS Habitat Classification: criteria for garrigue (F6) to Level 3

(number) refers to explanatory notes to the key



f12. Scrub habitats with species characteristic of very dry, saline soils are separated (path = *Yes*).

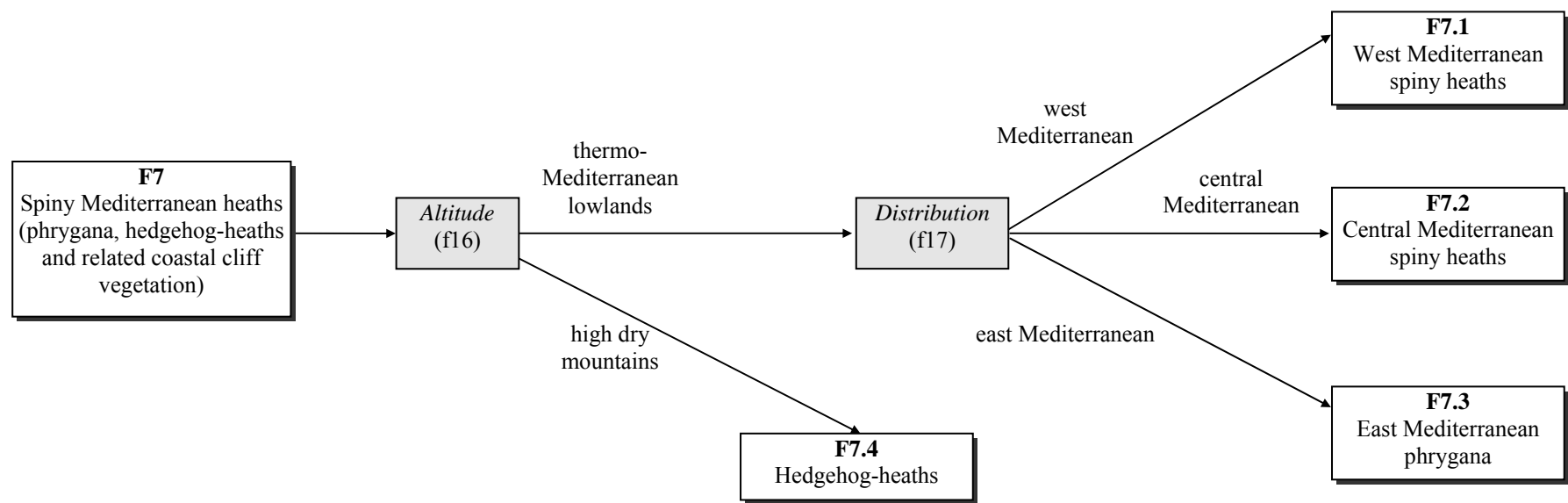
f13. Garrigues occupying gypsum-rich soils, characterised floristically by the presence of numerous gypsophilous species, and usually very open, are distinguished (path = *Yes*).

f14. Garrigues of the *supra-Mediterranean* altitudinal belt (degradation stage of thermophile deciduous forest) are separated from *other* garrigue formations.

f15. Garrigues are distinguished on the basis of their geographical location, which is related to their species composition. The five groups are: *western Mediterranean* found in Iberia, France, Italy and large western islands; *eastern Mediterranean* found in Greece, Cyprus and western Anatolia; *Illyrian* found in the northern Balkan peninsula from Albania northwards; *Black Sea* in the Pontic region; and *Macaronesian* in the Canary Islands, Azores and Madeira.

**F7: EUNIS Habitat Classification: criteria for spiny Mediterranean heaths (phrygana, hedgehog-heaths and related coastal cliff vegetation) (F7) to Level 3**

(number) refers to explanatory notes to the key

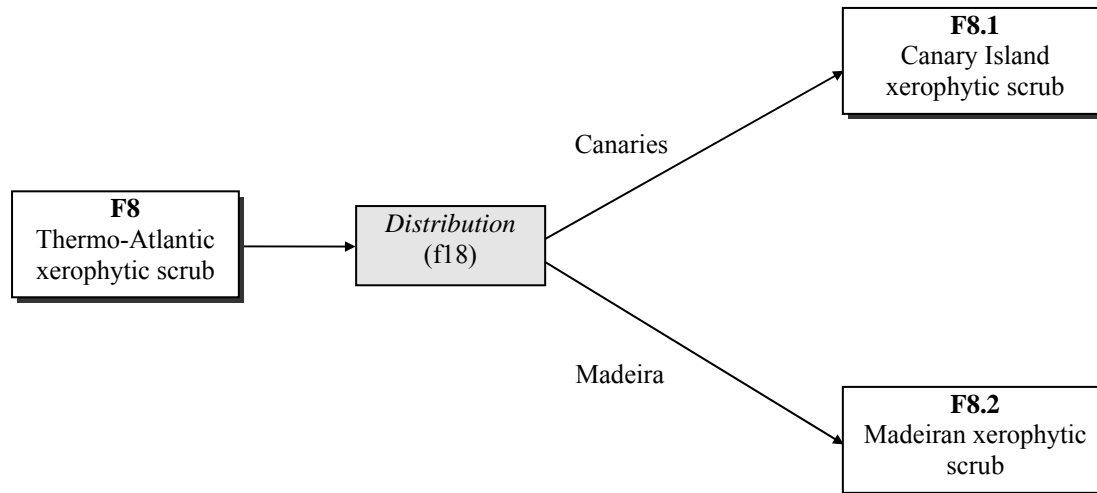


f16. Habitats are separated by the species composition characteristic of *thermo-Mediterranean lowland* areas and of *high dry mountains*. Thermo-Mediterranean phryganas are sclerophyllous scrubs and are often summer-deciduous.

f17. ‘Phrygana’ habitats are separated according to the species composition characteristic of different parts of the Mediterranean biogeographic region: *west Mediterranean* phryganas are usually characterised by *Astragalus massiliensis* or *Anthyllis hermanniae*; *central Mediterranean* phryganas may be dominated by a variety of species; *east Mediterranean* phryganas are widespread and diverse.

**F8: EUNIS Habitat Classification: criteria for thermo-Atlantic xerophytic scrub (F8) to Level 3**

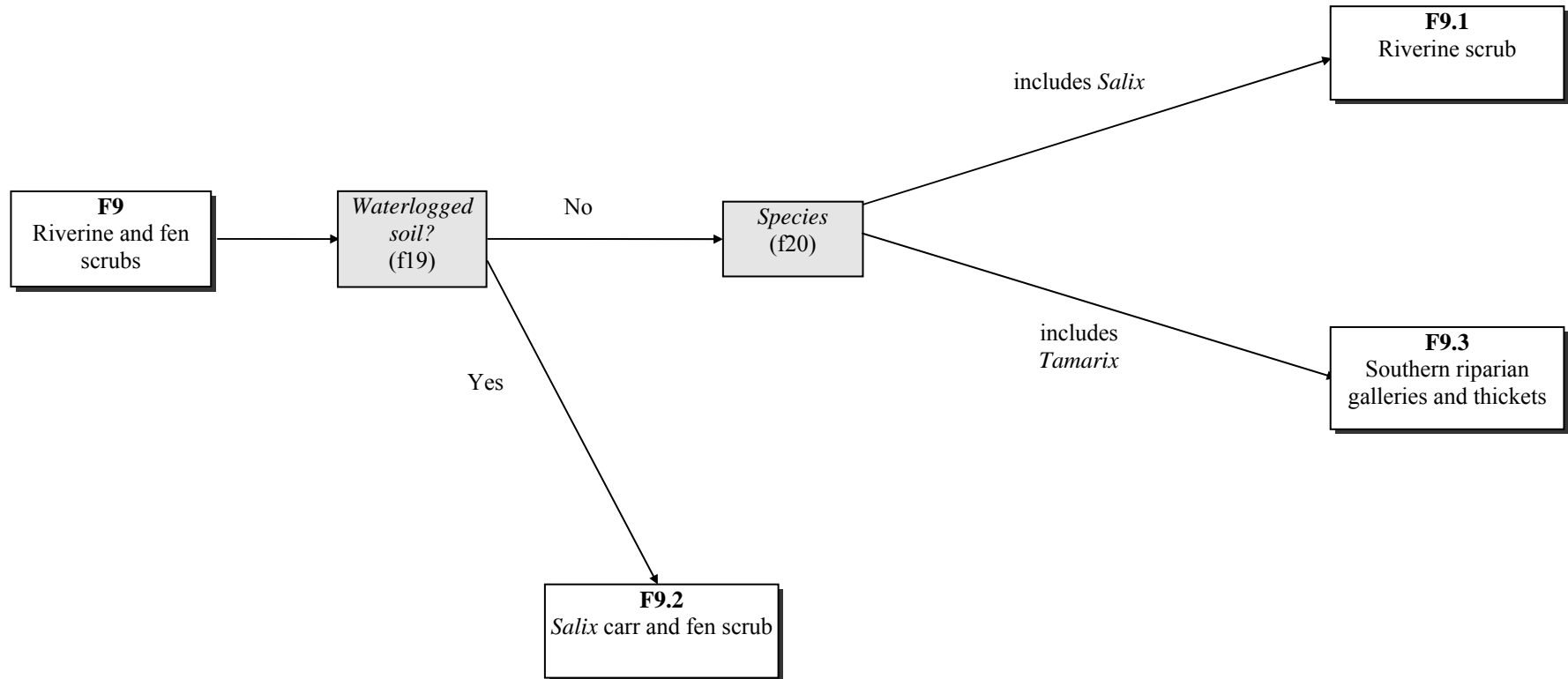
(number) refers to explanatory notes to the key



f18. Xerophytic habitats dominated by succulents, rosette-forming *Aeonium* spp. and composites are separated on the basis that the geographical locations support a large number of different endemic species; to the *Canaries*; or to *Madeira* and the Selvagen Islands.

### F9: EUNIS Habitat Classification: criteria for riverine and fen scrubs (F9) to Level 3

(number) refers to explanatory notes to the key



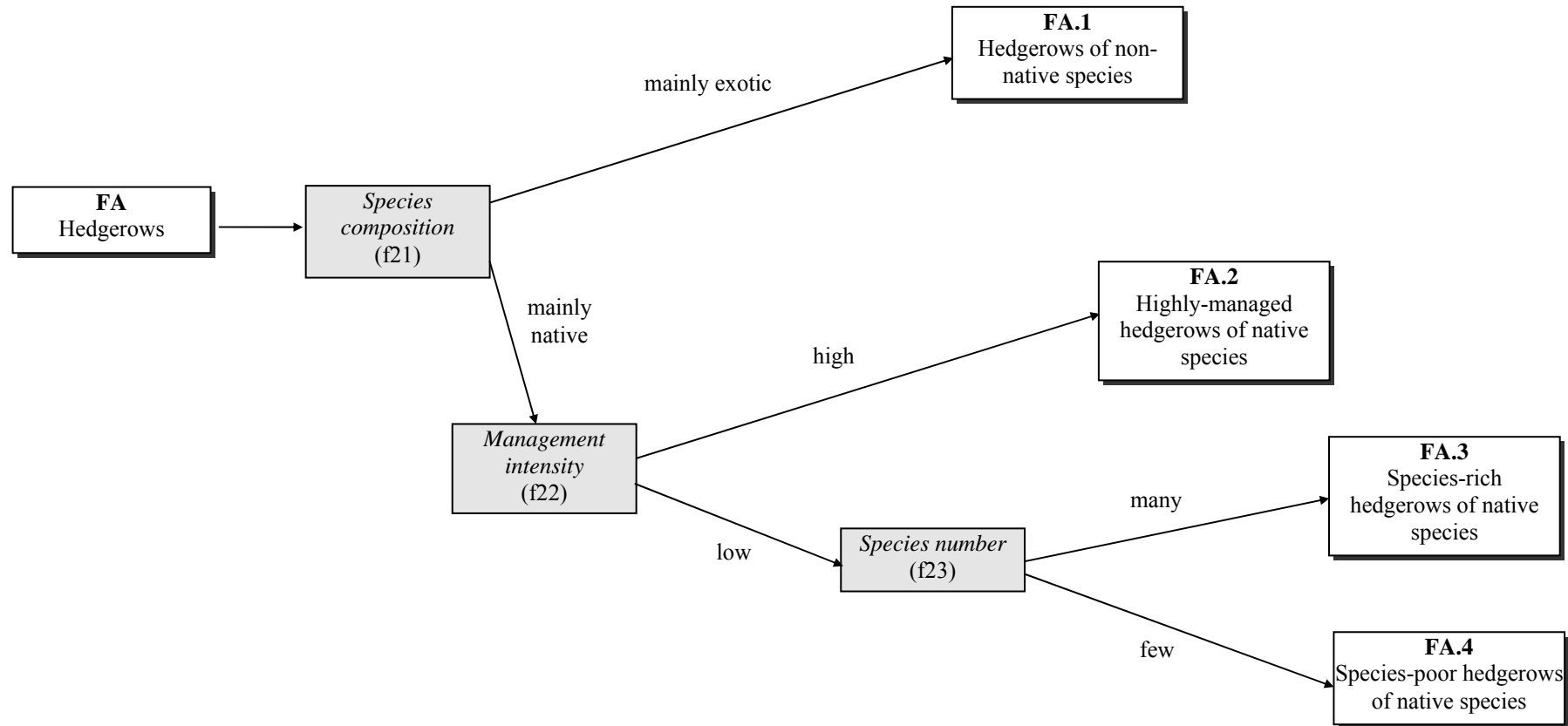
f19. Scrub habitats on poorly drained waterlogged ground such as fens (path = *Yes*) are separated from scrubs alongside permanent or temporary waterbodies.

f20. Scrubs usually alongside alpine or lowland permanent or temporary waterbodies and comprising mainly willows (*includes Salix* spp) (sometimes with *Myricaria germnanica*, *Hippophaea rhamnoides*, *Myrica gale* and *Frangula alnus*) are separated from riverine scrubs more typical of the thermo-Mediterranean climate, such as tamarisk (*includes Tamarix*) or *Nerium oleander*, *Vitex agnus-castus*, *Securinegia*, *Prunus* or *Viburnum*. Note that the willow scrubs may occur in warmer climates as well.



**FA: EUNIS Habitat Classification: criteria for hedgerows (FA) to Level 3**

(number) refers to explanatory notes to the key



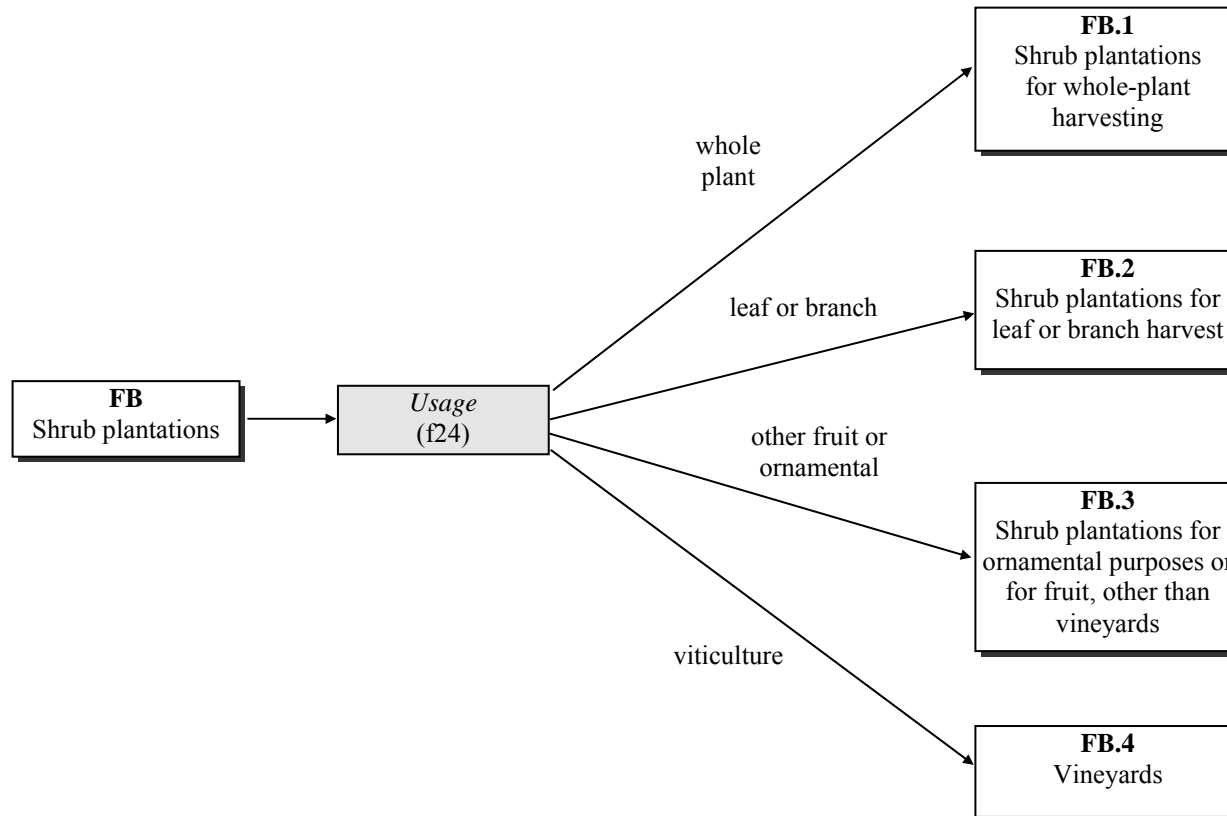
f21. Hedgerows are separated between those mainly composed of species exotic to their location (e.g. Californian Leyland Cypress *Cupressocyparis leylandii*) (path = *mainly exotic*), and those mainly consisting of native species (path = *mainly native*).

f22. Hedgerows mainly of native species managed intensively (e.g. by regular trimming) (path = *high*) are separated from those subject to little or no management (path = *low*).

f23. Hedges which are rich in shrub species and ground flora (path = *many*) are separated from those dominated by one or two shrub species (path = *few*).

**FB: EUNIS Habitat Classification: criteria for shrub plantations (FB) to Level 3**

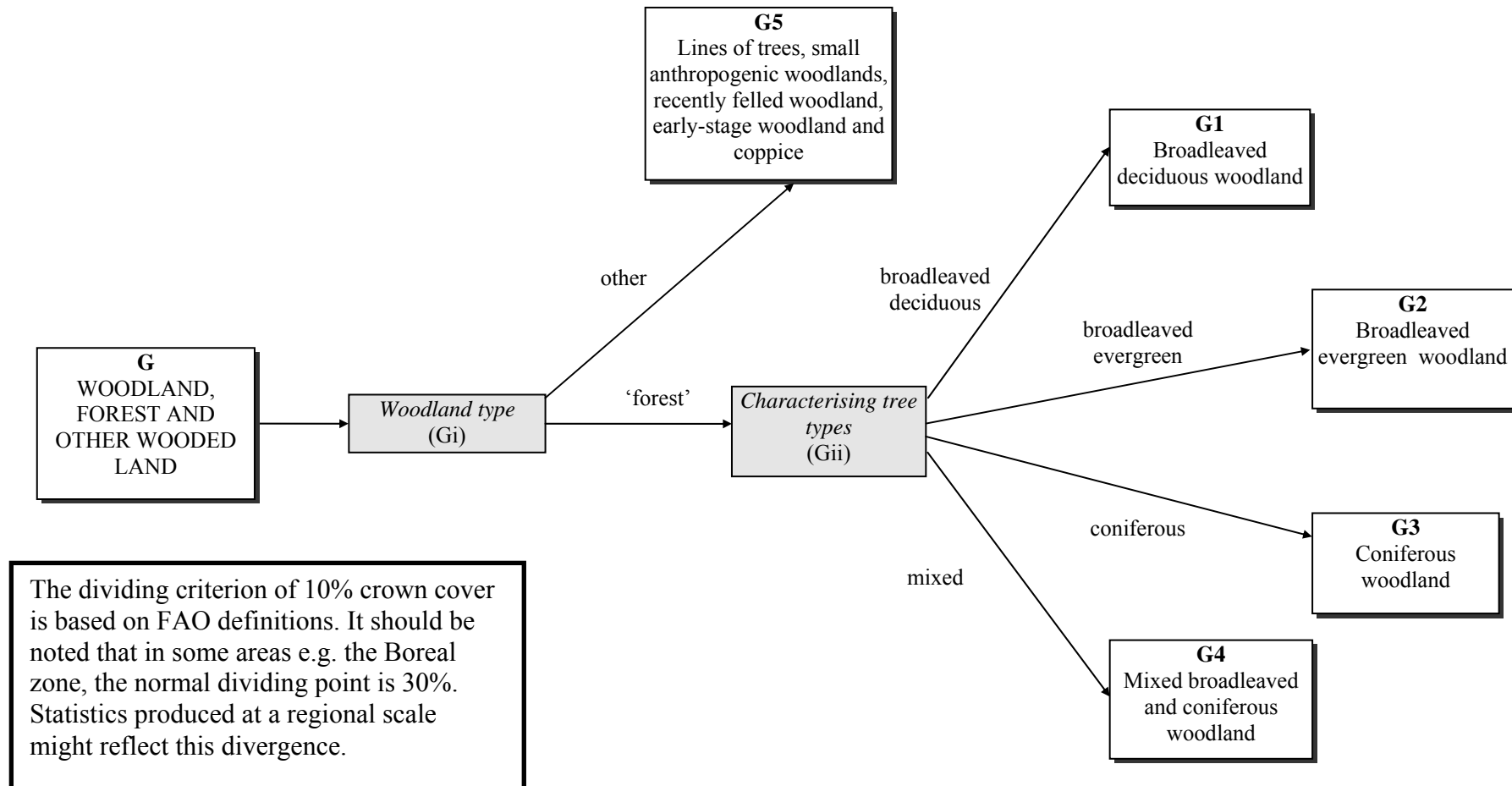
(number) refers to explanatory notes to the key



f24. Shrub plantations are separated on the basis of their usage: for *whole plant* harvesting, such as horticultural shrub nurseries; for *leaf or branch* harvest, such as osiers or tea; for ornamental purposes e.g. flowers, or fruit other than vines (path = *other fruit or ornamental*); vines, usually for wine production (path = *viticulture*).

**G: EUNIS Habitat Classification: criteria for woodland, forest and other wooded land (G) to Level 2**

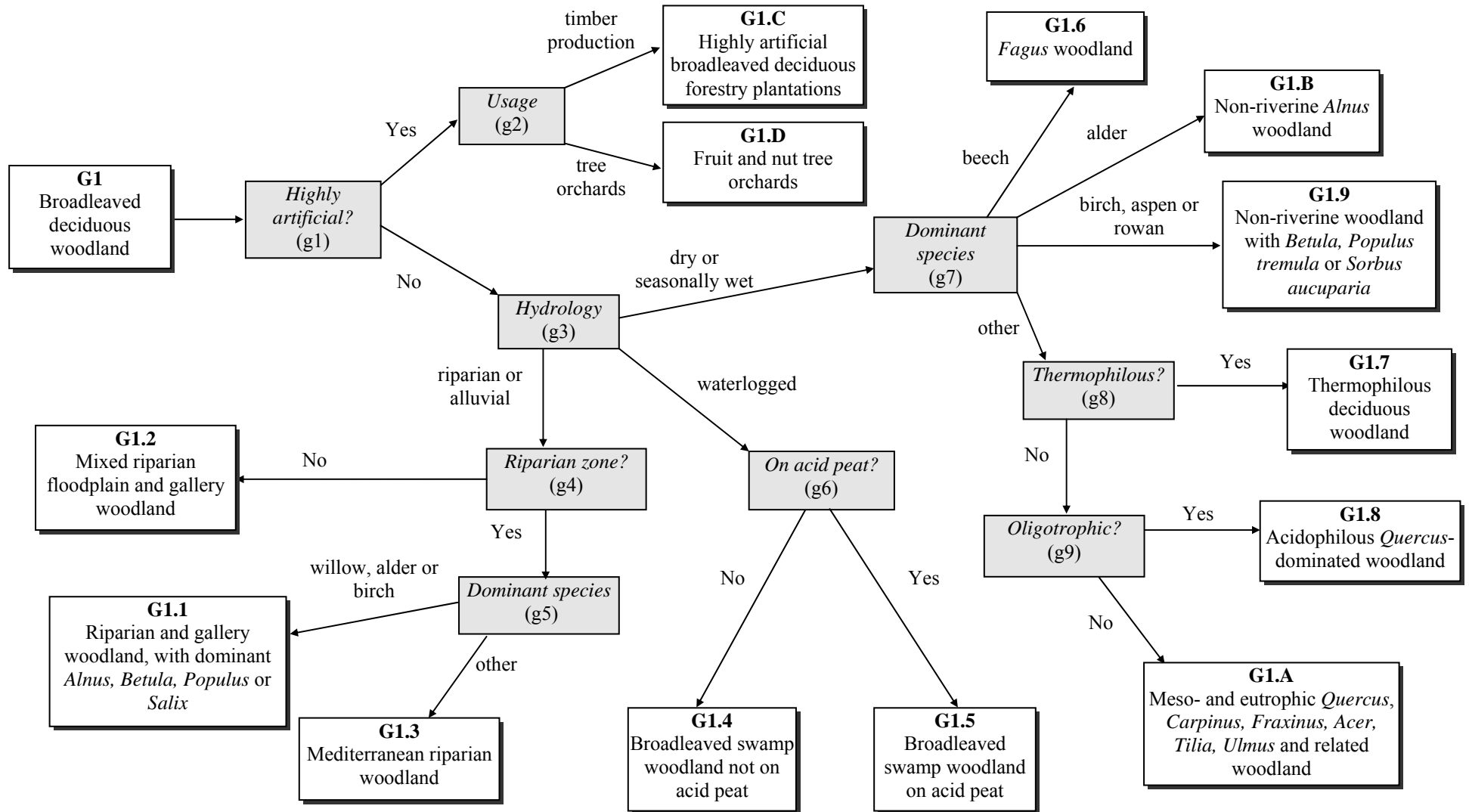
(number) refers to explanatory notes to the key (see following page).



- Gi. 'Forest' habitats are separated from *other* wooded habitats. 'Forest' habitats are defined as: natural stands of area greater than 0.5 ha and crown cover greater than 10% and tree height greater than 5 m; natural stands of area less than 0.5 ha and crown cover greater than 10% and tree height greater than 5 m with more or less natural ground flora (i.e. not heavily influenced by man through management or damage); plantations of area greater than 0.5 ha and crown cover greater than 10% and tree height greater than 5 m. *Other* wooded land includes: natural stands of area less than 0.5 ha and crown cover greater than 10% and tree height greater than 5 m heavily influenced by man through management or damage (small, intensively managed woods and small woods strongly influenced by anthropogenic activities); young natural stands with trees of height less than 5 m and potential crown cover of greater than 10%; plantations of young trees with potential crown cover of greater than 10% and tree height less than 5 m; plantations of area less than approximately 0.5 ha with potential crown cover of greater than 10% and tree height greater than 5 m; areas normally part of the forest area but temporarily unstocked as a result of human intervention or natural causes; coppice; narrow lines of mature trees, such as avenues and windbreaks. Note that Dwarf trees at the arctic and alpine tree limit (i.e. krummholz under conditions where mature individuals are less than 3 m high) are included in F, Heathland scrub and tundra. Note that areas of grassland with trees where the crown cover is 5 -10 % are categorised under E7.
- Gii. Forest is characterised by the dominant tree types, which may be mixtures of species within the categories *broadleaved deciduous*; *mixed broadleaved and coniferous*; *broadleaved evergreen*; and *coniferous*. Note that broadleaved woodland is defined as wooded land on which more than 75% of the tree crown cover consists of broadleaved species and that coniferous woodland is defined as wooded land on which more than 75% of the tree crown cover consists of coniferous species (based on FAO definition). Mixed woodland is defined as wooded land on which neither coniferous, nor broadleaved species account for more than 75% of the crown cover.

**G1: EUNIS Habitat Classification: criteria for broadleaved deciduous woodland (G1) to Level 3**

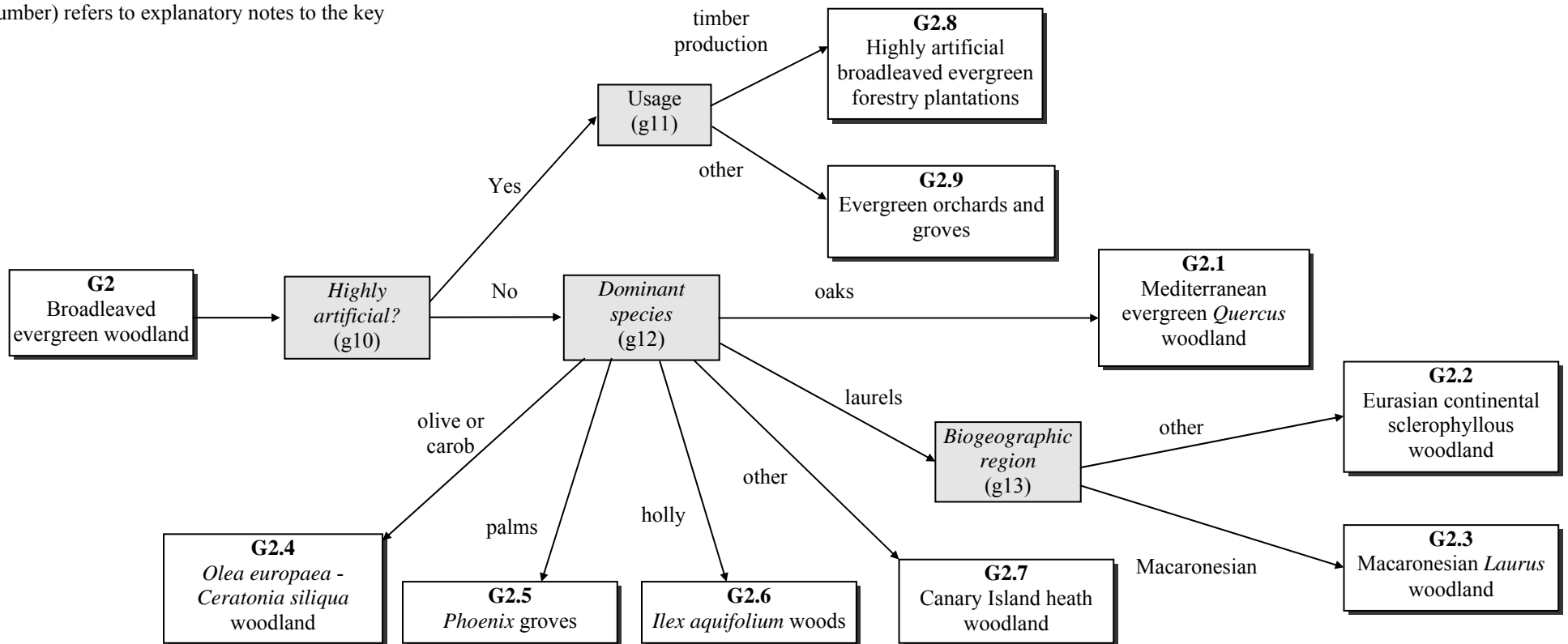
(number) refers to explanatory notes to the key (see following page).



- g1. Highly artificial broadleaved deciduous forests (often of exotic species) of uniform age and structure, completely dependent on man's operations and with impoverished associated communities (path = *Yes*) are separated from less highly managed habitats.
- g2. Highly artificial forestry plantations normally used primarily for *timber production* (including for fibre and wood-pulp) are separated from fruit and nut *tree orchards*. Note that shrub orchards are categorised under FB.
- g3. Three hydrological regimes are distinguished: *waterlogged* (permanently wet, with the water table at or close to the surface), *riparian or alluvial* (dependent on flowing water, giving rise to a high water table and subject to occasional flooding) and *dry or seasonally wet*.
- g4. Riparian woods with one or few dominant species, typically alder, birch, poplar or willow (*Alnus* spp., *Betula* spp., *Populus* spp. or *Salix* spp.) (path = *Yes*) are distinguished from mixed flood-plain and river-terrace forests, sometimes structurally complex and species-rich, often including ash, oak or elm (*Fraxinus* spp., *Quercus* spp., *Ulmus* spp.).
- g5. Riparian woodlands dominated by *willow*, *alder* and *birch* (*Salix* spp., *Alnus* spp., *Betula* spp.) are separated from riparian woodland habitats characteristic of the Mediterranean climate dominated by *other* species including ash, plane and elm (*Fraxinus* spp., *Platanus* spp., *Ulmus* spp.). Note that Mediterranean willow woods follow path = *willow, alder or birch*.
- g6. Broadleaved swamp woodlands are distinguished between those growing on acid peat (path = *Yes*) and those formed under neutral or basic conditions (path = *No*).
- g7. Dry and seasonally wet woodland habitats are separated according to their dominant species: *beech* (*Fagus* spp.); *alder* (*Alnus* spp.); *birch* (*Betula* spp.), *aspen* (*Populus tremula*) or *rowan* (*Sorbus aucuparia*); and *other*.
- g8. Woodlands characterised by thermophilous species, e.g. downy oak *Quercus pubescens*, eastern hornbeam *Carpinus orientalis*, chestnut *Castanea sativa*, hop hornbeam *Ostrya carpinifolia* (path = *Yes*) are distinguished from those of other climatic types.
- g9. Woodlands characteristic of oligotrophic soils, usually with acidophilous species, are separated (path = *Yes*) from those on more meso- to eutrophic substrates. Note that birch may be present but never dominant in habitat units in G1.8. More or less pure stands of birch are included under G1.9.

## G2: EUNIS Habitat Classification: criteria for broadleaved evergreen woodland (G2) to Level 3

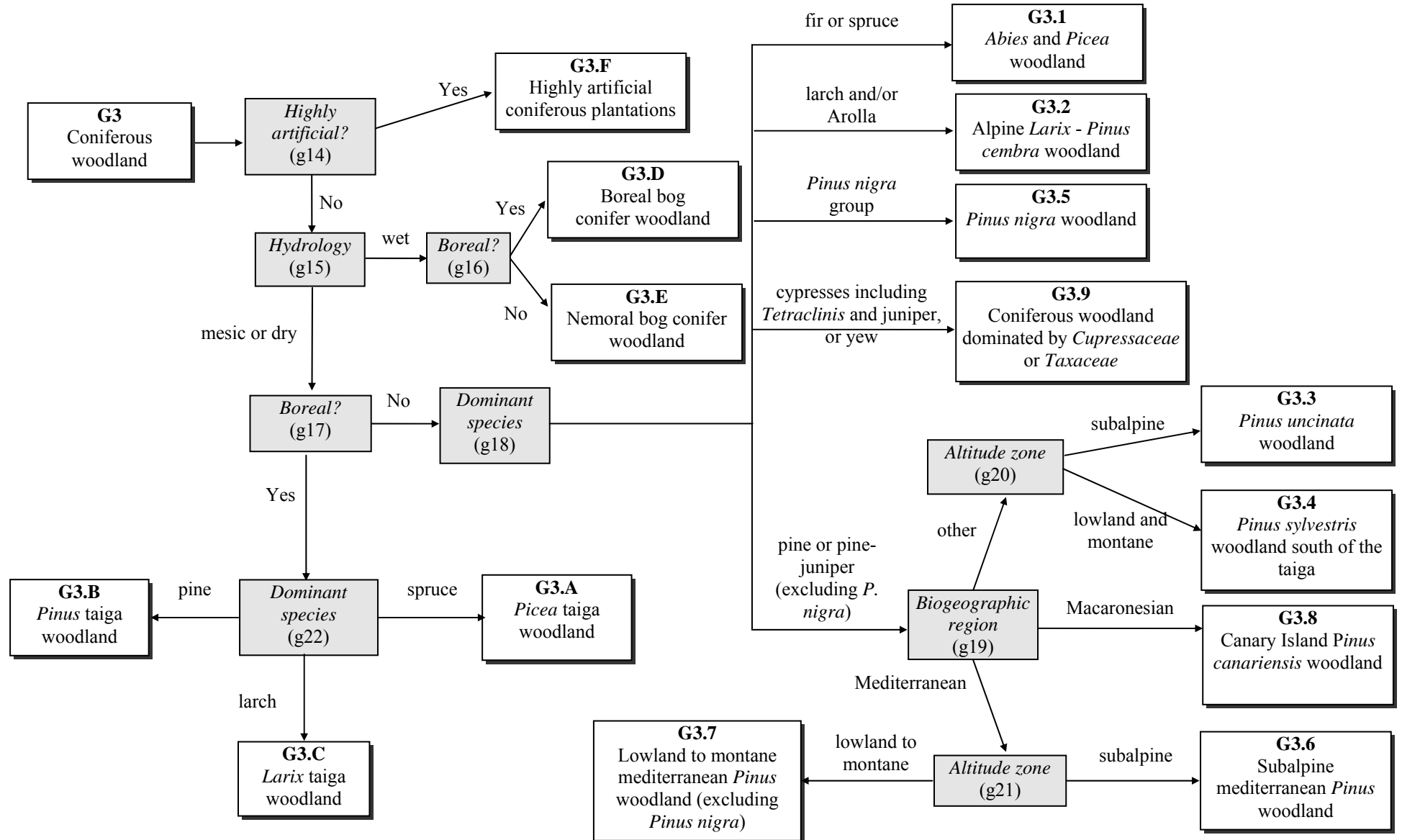
(number) refers to explanatory notes to the key



- g10. Highly artificial broadleaved evergreen forests (often of exotic species) of uniform age and structure, completely dependent on man's operations and with impoverished associated communities (path = *Yes*) are separated from less highly managed habitats.
- g11. Highly artificial evergreen forestry plantations normally primarily used for *timber production* are separated from those used for *other* purposes (including olive groves and palm plantations).
- g12. Habitats are separated according to their dominant species: evergreen *oaks* (*Quercus*); *laurels* (*Laurus*); *holly* (*Ilex*); *palms* (*Phoenix*); *olive* (*Olea europaea*) or *carob* (*Ceratonia siliqua*); and *other* very tall, forest-like formations dominated by *Erica arborea*, *Myrica faya*, *Arbutus canariensis* or *Visnea moccanera*.
- g13. Laurel (*Laurus*)-dominated habitats characteristic of the *Macaronesian* biogeographic region are separated from those of the Mediterranean and Atlantic regions (path = *other*).

### G3: EUNIS Habitat Classification: criteria for coniferous woodland (G3) to Level 3

(number) refers to explanatory notes to the key (see following page).

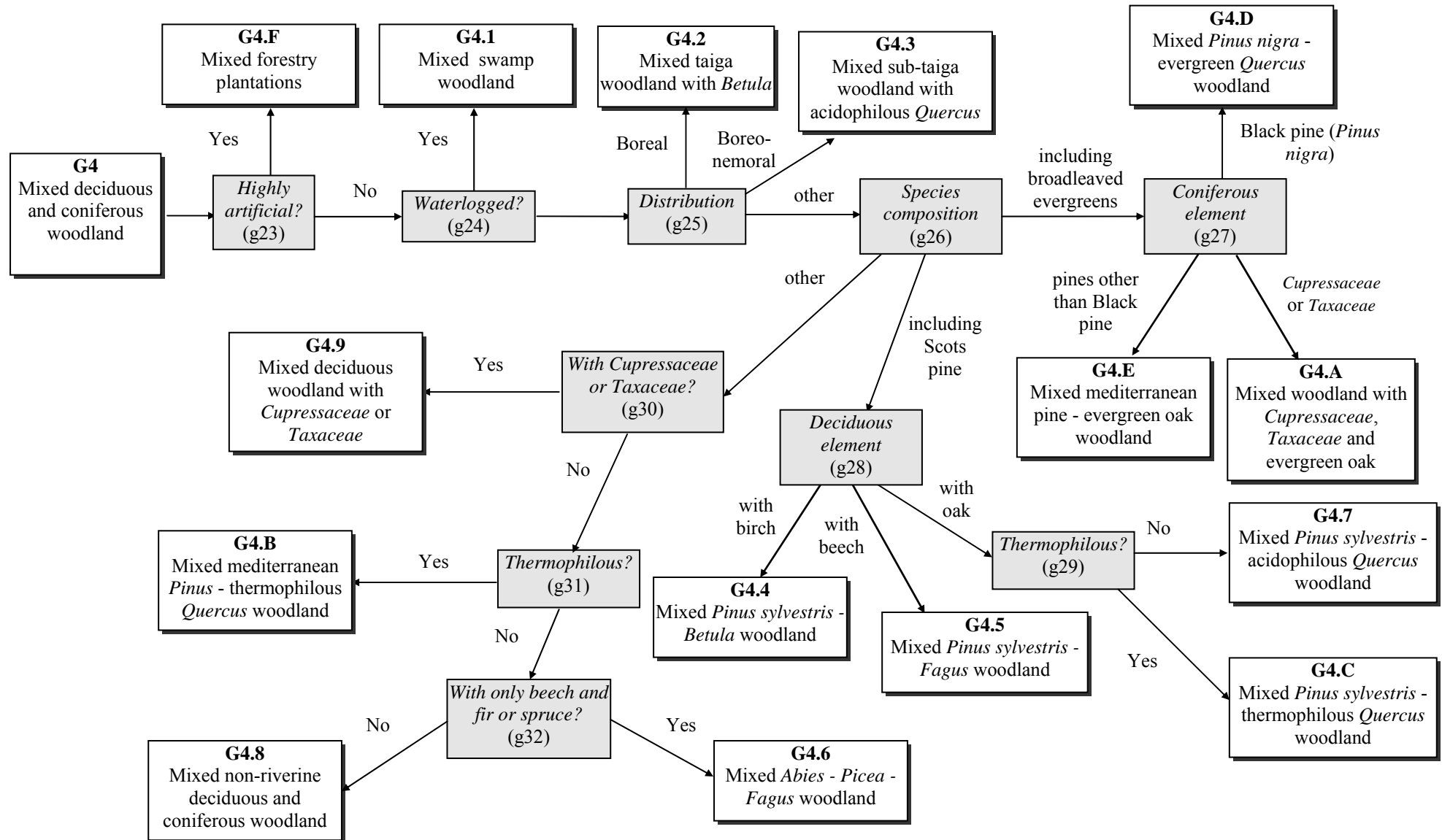




- g14. Highly artificial coniferous forests (often of exotic species) of uniform age and structure, completely dependent on man's operations and with impoverished associated communities (path = *Yes*) are separated from less highly managed habitats.
- g15. Two hydrological regimes are distinguished: *wet* (with the water table at or close to the surface for at least half the year); and *mesic or dry*.
- g16. Wet coniferous woodland habitats characteristic of the Boreal zone are distinguished (path = *Yes*).
- g17. Mesic or dry coniferous woodland habitats characteristic of the Boreal zone are distinguished (path = *Yes*).
- g18. Mesic and dry non-Boreal habitats are separated according to their dominant species groups: *fir* (*Abies* spp.) or *spruce* (*Picea* spp.); *larch* (*Larix* spp.) and/or *Arolla* (*Pinus cembra*); *Pinus nigra* group (*Pinus nigra*, *Pinus dalmatica*, *Pinus laricio*, *Pinus pallasiana*); *cypresses* (*Cupressus* and *Tetraclinis*), *juniper* (*Juniperus*) or *yew* (*Taxus baccata*); *pine* or *pine-juniper* (excluding *P. nigra*).
- g19. Pine (*Pinus*) and juniper (*Juniperus*)-dominated woodlands are separated between biogeographic region: *Mediterranean*; *Macaronesian* and *other* (Atlantic, Continental, Alpine, etc.)
- g20. Pine woodlands in the *subalpine* altitude zone (usually dominated by *Pinus uncinata*) are distinguished from those in the *lowland and montane* altitude zones usually dominated by *Pinus sylvestris*. Note that *Pinus sylvestris* forests may occur in the subalpine zone but follow path = *lowland and montane*.
- g21. Mediterranean pine woodlands other than of *Pinus nigra* are separated by altitude into a group in the montane and *subalpine* zones close to the tree-line (dominated by *Pinus heldreichii* (= *Pinus leucodermis*), *Pinus peuce*) and thermophilous pine woodlands in *lowland to montane* situations (dominated by *Pinus halepensis*, *P. pinea* and *P. pinaster*).
- g22. Coniferous woodlands of the taiga zone are separated between those dominated by *spruce*; by *pine*; and by *larch*.

### G4: EUNIS Habitat Classification: criteria for mixed deciduous and coniferous woodland (G4) to Level 3

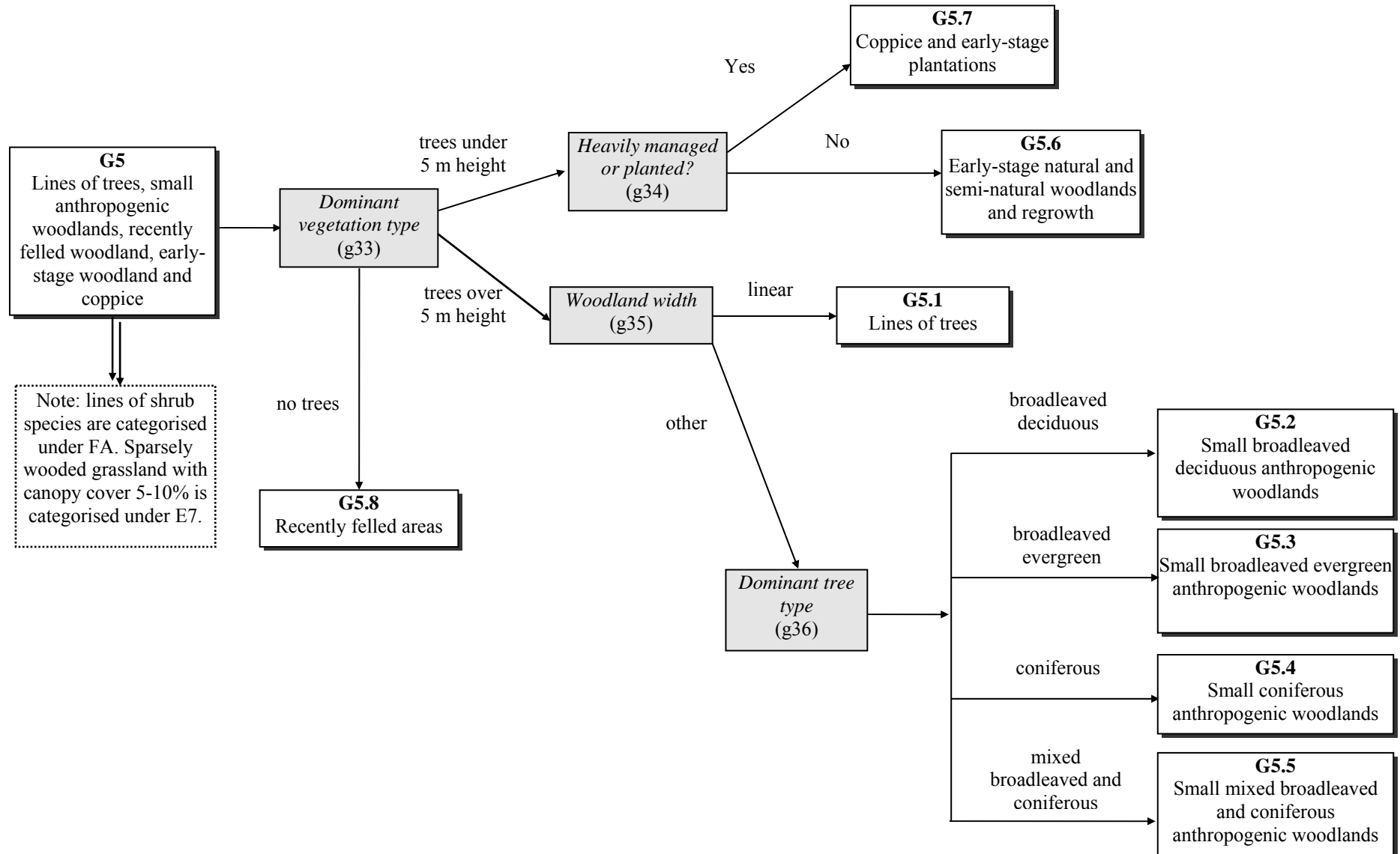
(number) refers to explanatory notes to the key (see following page).



- g23. Highly artificial mixed broadleaved deciduous and coniferous forests (often of exotic species and of uniform age and structure), completely dependent on man's operations and with impoverished associated communities (path = *Yes*) are separated from less highly managed habitats.
- g24. Habitats which are waterlogged (permanently wet, with the water table at or close to the surface) are separated (path = *Yes*) from those with other hydrological regimes.
- g25. Coniferous woodland characteristic of the *Boreal* zone with an admixture of birch; or of the *Boreo-nemoral* zone with an admixture of other deciduous species (usually oaks); are separated from *other* mixed woodlands.
- g26. The dominant species or species type separates three categories of mixed woodlands: those *including broadleaved evergreens*; those *including Scots pine* (*Pinus sylvestris*); and those where the species composition comprises *other* species.
- g27. Mixed woodland habitats including broadleaved evergreen species are separated according to the main coniferous species present: with cypresses and yews (*Cupressaceae* or *Taxaceae*); with mixed *pines other than Black pine* (*Pinus nigra*); and those including *Black pine* (*Pinus nigra*).
- g28. Mixed woodland habitats including Scots pine (*Pinus sylvestris*) are separated according to the main deciduous species present: those *with oaks*; those *with beech*; and those *with birch*.
- g29. Woodland habitats characterised by a mixture of Scots pine and thermophilous oak species are separated (Path = *Yes*).
- g30. Habitats characterised by a mixture of deciduous tree species and cypresses or yews (*Cupressaceae* or *Taxaceae*) are distinguished (path = *Yes*).
- g31. Habitats characterised by a mixture of pines, juniper and thermophilous oak species are separated (Path = *Yes*).
- g32. Other mixed coniferous and deciduous woodland habitats are separated according to their species composition: those with only beech and fir or spruce are separated (path = *Yes*) from those with combinations of the deciduous species birch, aspen or rowan and occasionally some beech together with fir, spruce or pine.

**G5: EUNIS Habitat Classification: criteria for lines of trees, small anthropogenic woodlands, recently felled woodland, early-stage woodland and coppice (G5) to Level 3**

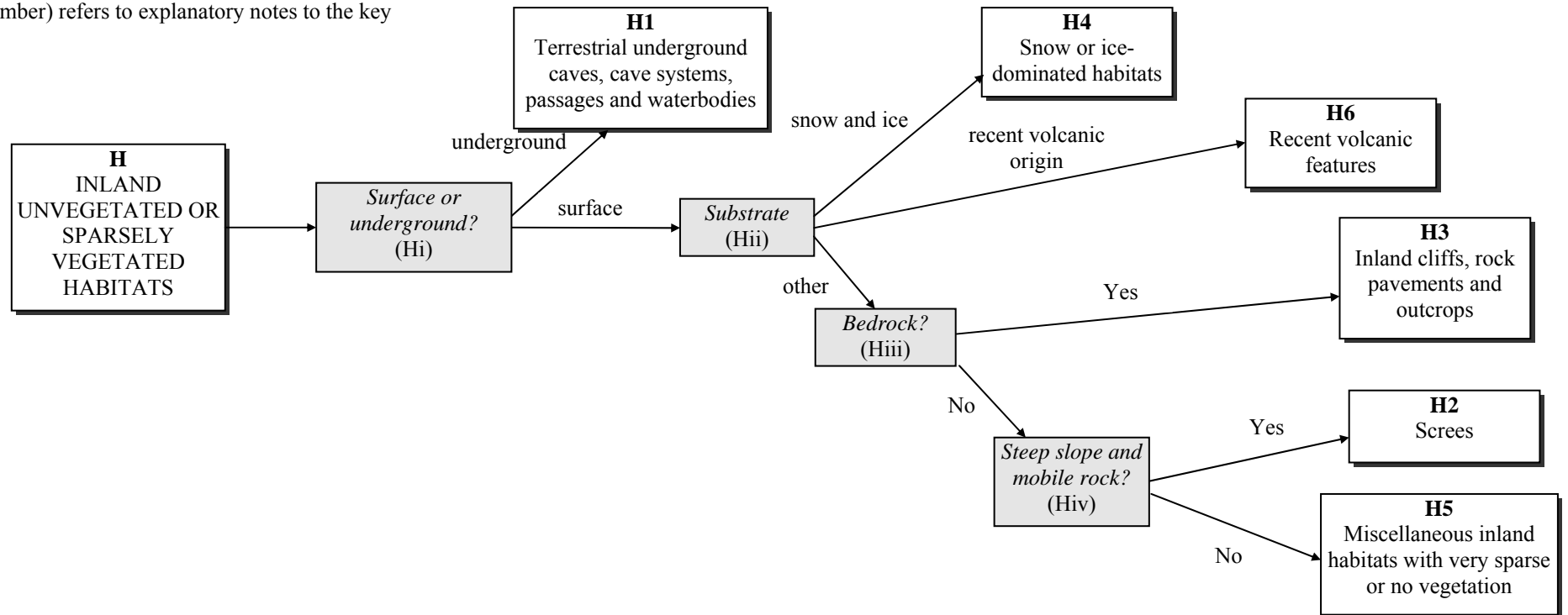
(number) refers to explanatory notes to the key (see following page).



- g33. The dominant vegetation type separates three categories of these miscellaneous woodlands: *trees under 5 m height* (including young stages of forest re-growth or early colonisation by tree species, trees planted for early whole tree harvesting, such as Christmas trees, and coppice, where tree species are artificially maintained in the shrub phase); areas normally part of the forest area but very recently clear-felled and not yet restocked and with no succession to weedy vegetation or temporarily unstocked due to natural causes such as wind-throw, (path = *no trees*); or *trees over 5 m height*.
- g34. Young plantations and woodlands maintained in the young stage through coppicing are separated (path = *Yes*) from stands of young trees arising from natural colonisation or forest regrowth.
- g35. More or less continuous lines of trees and *linear* plantations comprising one to three distinct lines of trees, such as windbreaks and avenues, are separated from *other* small, intensively managed woods, small woods strongly influenced by anthropogenic activities and small plantations. Small woodlands are those up to about 0.5 ha in extent. Tree cover may often comprise completely or partially non-native species.
- g36. Small anthropogenic woods and small plantations (less than about 0.5 ha in extent) are characterised by the dominant tree types, which may be mixtures of species within the categories *broadleaved deciduous*; *broadleaved evergreen*; *coniferous*; and *mixed broadleaved and coniferous*. Small natural and semi-natural woodlands are characterised with their larger counterparts in G1 – G4. Note that broadleaved woodland is defined as wooded land on which more than 75% of the tree crown cover consists of broadleaved species and that coniferous woodland is defined as wooded land on which more than 75% of the tree crown cover consists of coniferous species (based on FAO definition). Mixed woodland is defined as wooded land on which neither coniferous, nor broadleaved species account for more than 75% of the crown cover.

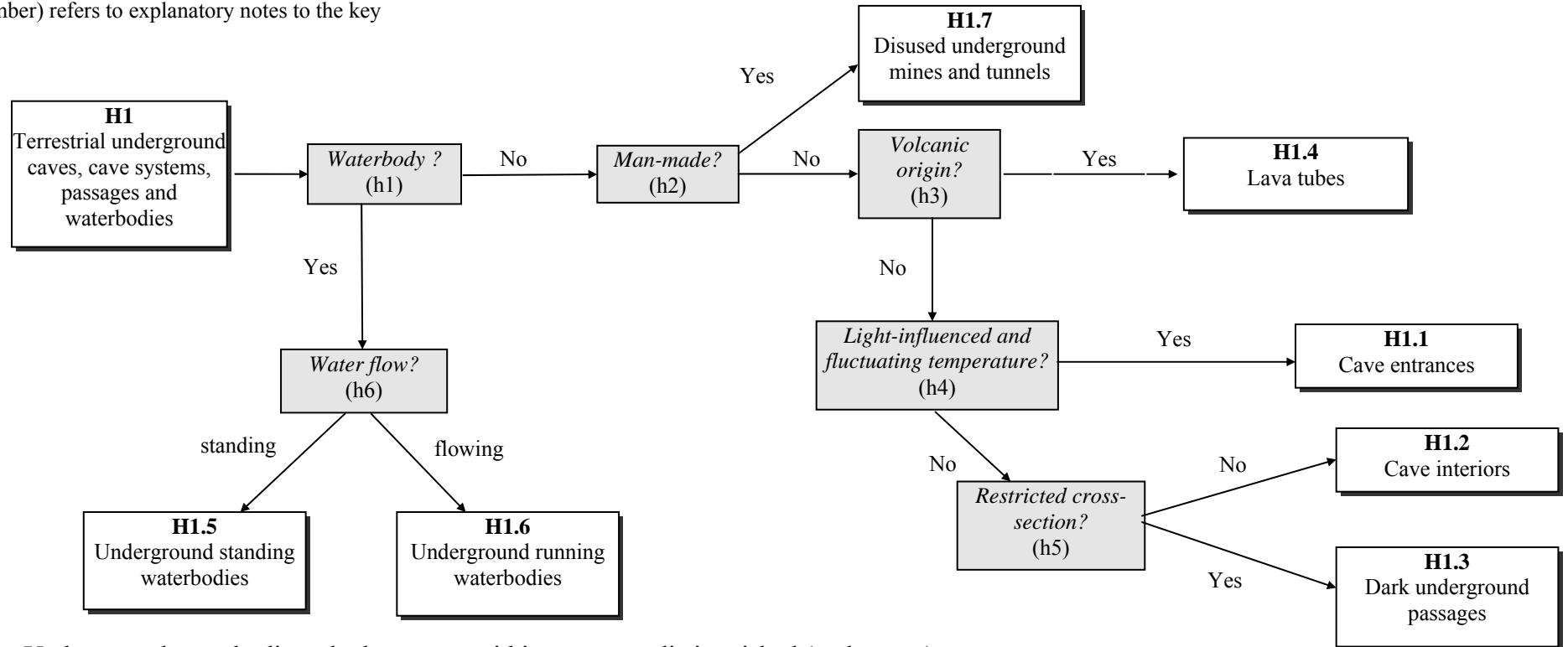
## H: EUNIS Habitat Classification: criteria for inland unvegetated or sparsely vegetated habitats (H) to Level 2

Note that the key to Level 1 shows two pathways to reach parts of habitat type H: these are recombined here. (number) refers to explanatory notes to the key



- Hi. Natural *underground* systems are separated from *surface* habitats irrespective of other criteria. Note that disused man-made underground systems which have been colonised by natural or semi-natural communities are also included here. Note also that caves in glaciers follow path = *surface*.
- Hii. Habitats with unvegetated or sparsely vegetated surfaces are separated on the nature of the dominating substrate type. Three types are distinguished: *snow and ice*; *recent volcanic origin*; and *other* substrates. Note that non-permanent snow patches are included with alpine grasslands (E4).
- Hiii. Cliffs and rock pavements comprising exposed horizontal or vertical bedrock are separated (path = *Yes*).
- Hiv. Screes consisting of mobile rocks and rock fragments on steep slopes are separated (path = *Yes*) from all other unvegetated or sparsely vegetated inland habitats.

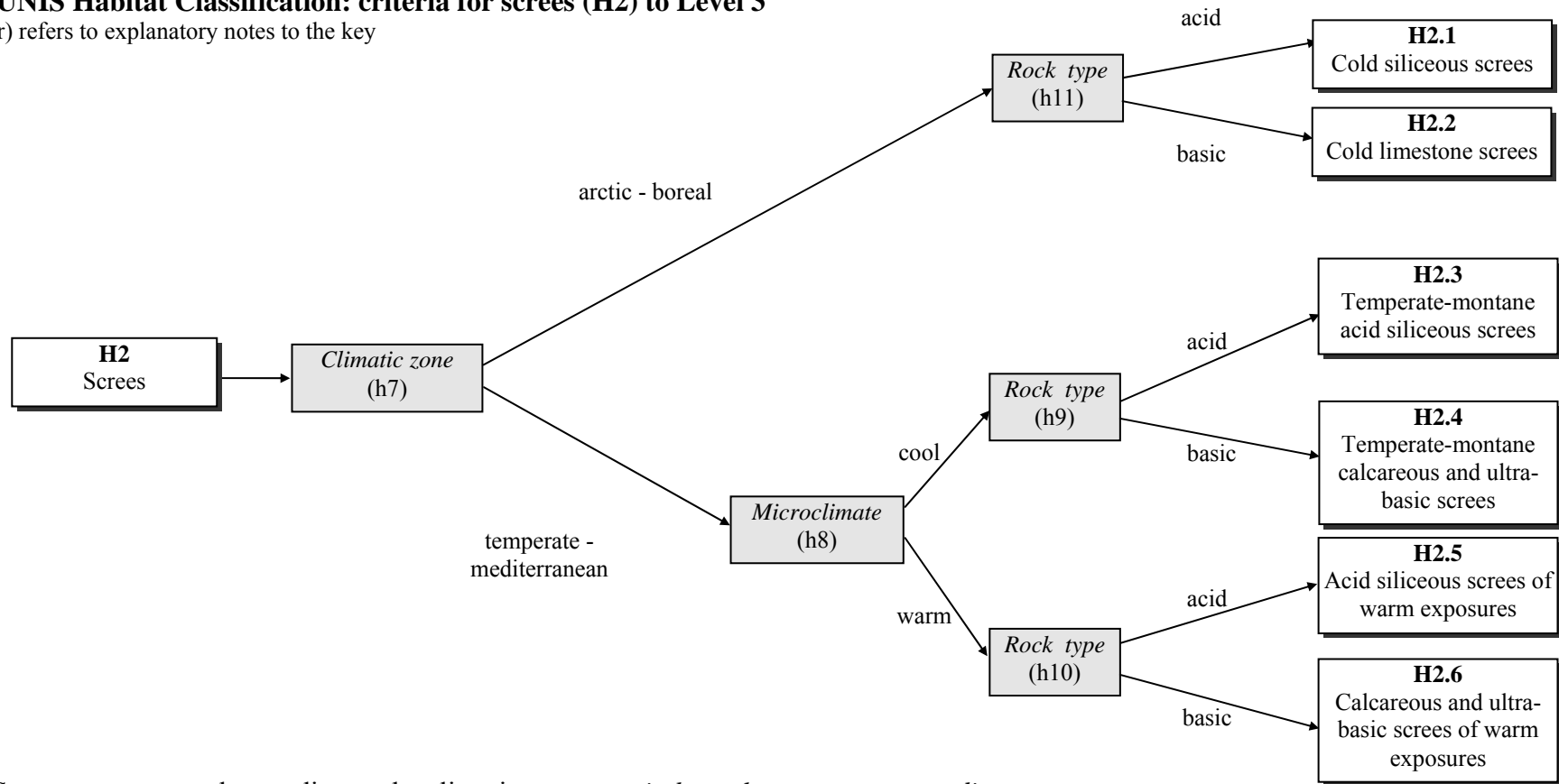
**H1: EUNIS Habitat Classification: criteria for terrestrial underground caves, cave systems, passages and waterbodies (H1) to Level 3**  
 (number) refers to explanatory notes to the key



- h1. Underground waterbodies whether or not within caves are distinguished (path = *Yes*).
- h2. Disused mines and man-made passages, including tunnels, often with smoothed or constructed surfaces (path = *Yes*) are distinguished from natural subterranean habitats. Note that active mines are characterised under J3.1
- h3. Caves formed from hollow basaltic tubes which result from the cooling of the surface of lava flows whose molten interior continued to flow are separated (path = *Yes*) from systems resulting from the action of water.
- h4. Cave entrances which are influenced by light, and subject to fluctuating temperature, and which are unlikely to support a specialised fauna are separated (path = *Yes*) from cave interiors and passages beyond the reach of light and with a stable temperature.
- h5. Passages restricted in cross-section in comparison with the spaces which they connect are separated (path = *Yes*).
- h6. *Standing* waterbodies are separated from *flowing* waterbodies.

## H2: EUNIS Habitat Classification: criteria for screes (H2) to Level 3

(number) refers to explanatory notes to the key



h7. Screens are separated according to the climatic zone: *arctic-boreal*; or *temperate-mediterranean*.

h8. Screens with a *warm* microclimate such as on south-facing exposures are distinguished from those with a *cooler* microclimate.

h9. *Acid* siliceous rocks in the temperate-mediterranean climatic zones but with a cool microclimate are distinguished from *basic* rock habitats. Note that basic includes calcareous, ultra-basic (serpentine) and dolomitic rocks.

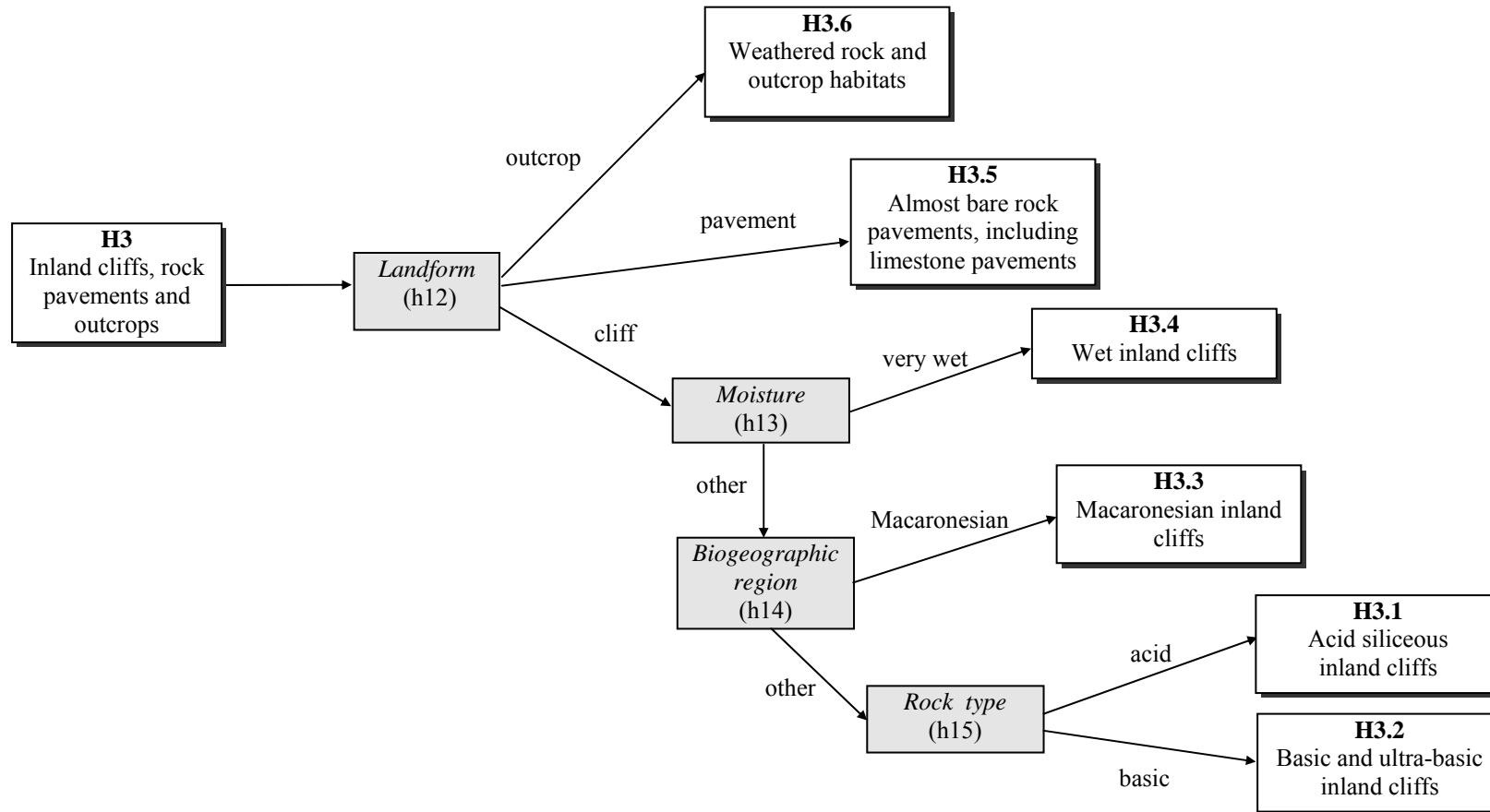
h10. *Acid* siliceous rocks in the temperate-mediterranean climatic zones and with a warm microclimate are distinguished from *basic* rock habitats. Note that basic includes calcareous, ultra-basic (serpentine) and dolomitic rocks.

h11. *Acid* siliceous rocks in the boreal climatic zone are distinguished from *basic* rock habitats. Note that basic includes calcareous, ultra-basic (serpentine) and dolomitic rocks.



### H3: EUNIS Habitat Classification: criteria for inland cliffs, rock pavements and outcrops (H3) to Level 3

(number) refers to explanatory notes to the key



h12. Rock *outcrops* are separated from more or less horizontal rock *pavements* and more or less vertical *cliffs*.

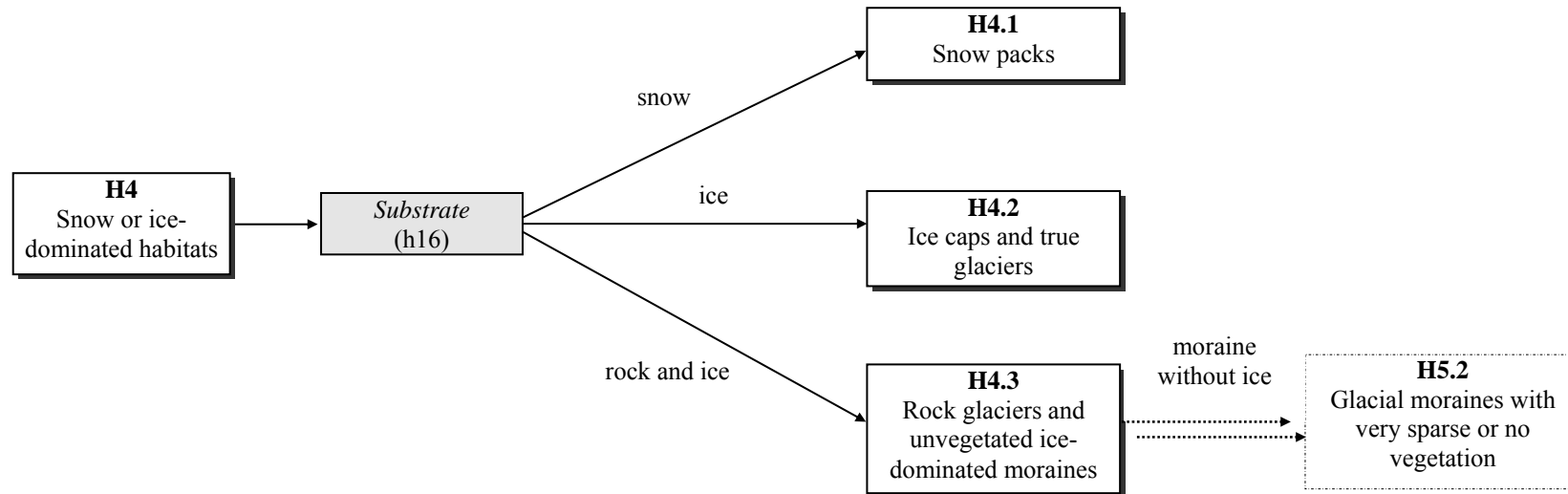
h13. *Very wet* cliffs, usually with characteristic vegetation, are distinguished from *other* cliffs.

h14. Cliffs with chasmophytic vegetation characteristic of the *Macaronesian* biogeographic region are distinguished from *others*.

h15. Inland cliffs including their chasmophytic vegetation are separated according to rock type: *acid* siliceous, and *basic* (comprising calcareous and ultra-basic) types are distinguished.

#### H4: EUNIS Habitat Classification: criteria for snow or ice-dominated habitats (H4) to Level 3

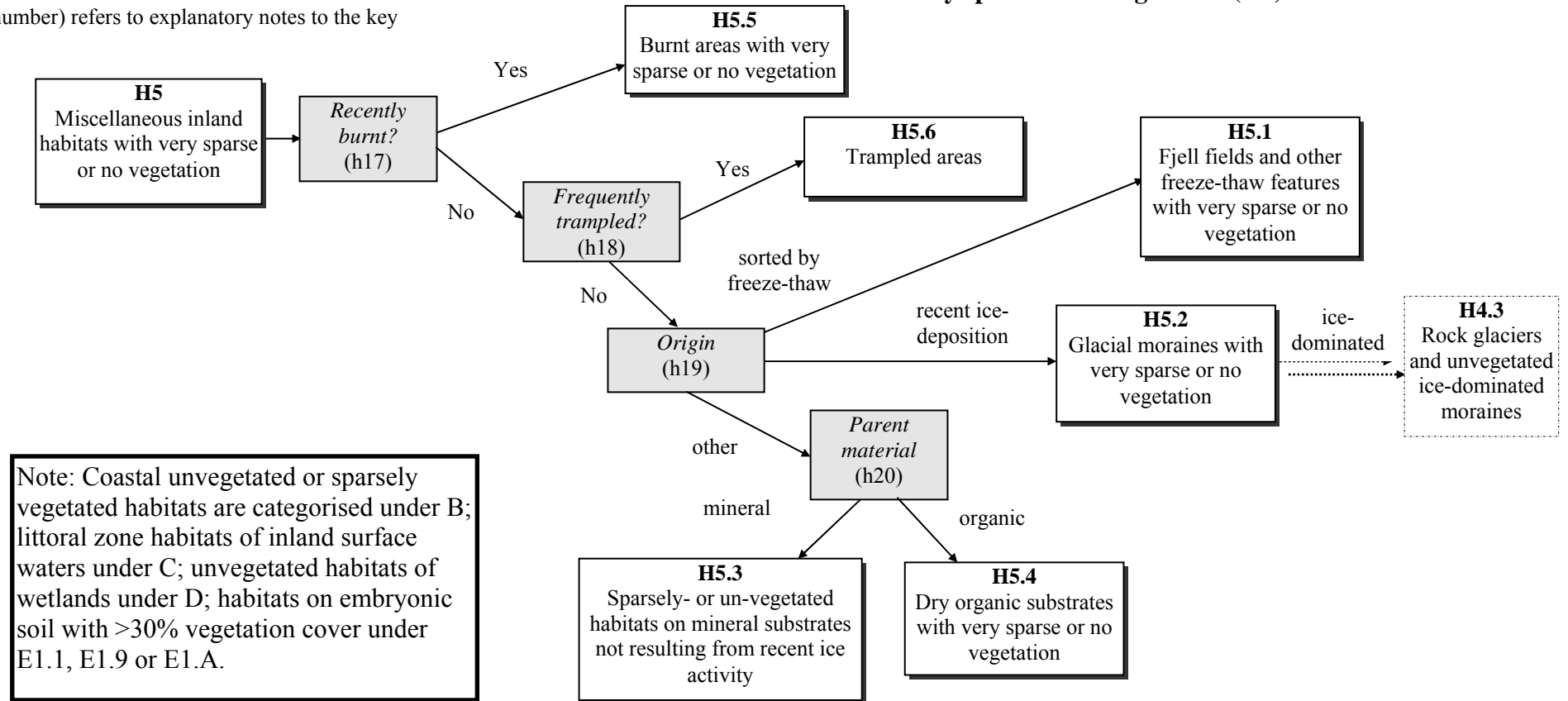
(number) refers to explanatory notes to the key



h16. Habitats dominated by snow and ice are separated according to the substrate type: more or less permanent complete *snow* cover (névé, Firn); moving *ice*; or ice-dominated rock (path = *rock and ice*). Note that unvegetated glacial moraines where ice is no longer dominant are categorised under H5.2.

## H5: EUNIS Habitat Classification: criteria for miscellaneous inland habitats with very sparse or no vegetation (H5) to Level 3

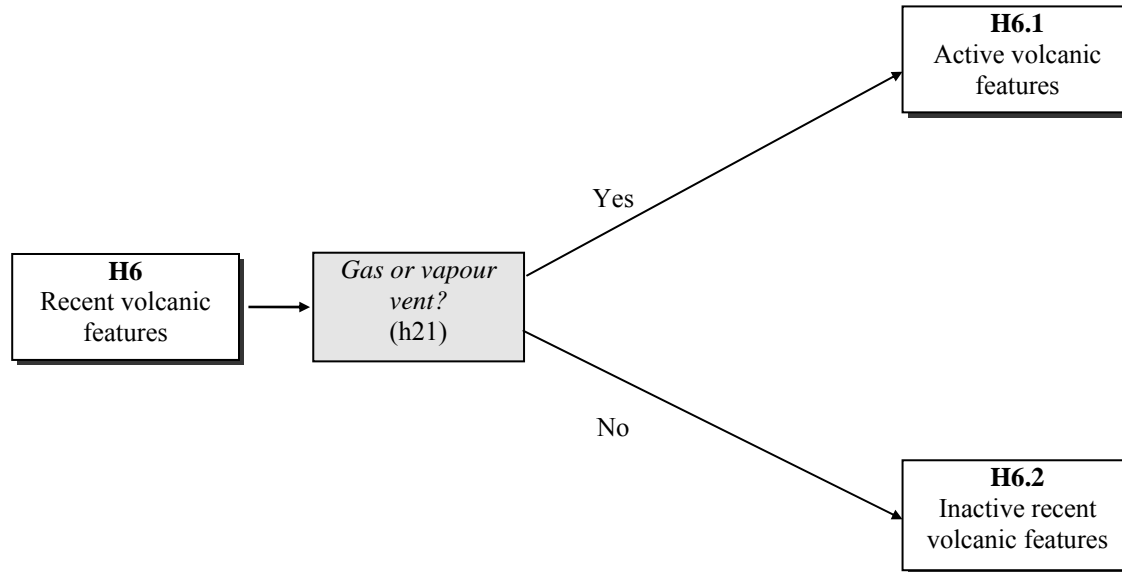
(number) refers to explanatory notes to the key



- h17. Habitats created by fire which are unvegetated or sparsely vegetated are distinguished (path = *Yes*) from those created by other means.
- h18. Habitats which are unvegetated or sparsely vegetated because of frequent trampling or compaction by occasional vehicles are distinguished (path = *Yes*).
- h19. Substrates *sorted by* current or recent *freeze-thaw*; or arising from current or recent glacial activity comprising ice-deposited debris (but where ice is no longer dominant) (*recent ice-deposition*) are separated from those of *other* origin. Note that glacial moraines where ice is still dominant are categorised under H4.3.
- h20. Other inland unvegetated habitats are distinguished according to the nature of their substrate: *mineral*; and *organic* (peat).

**H6: EUNIS Habitat Classification: criteria for recent volcanic features (H6) to Level 3**

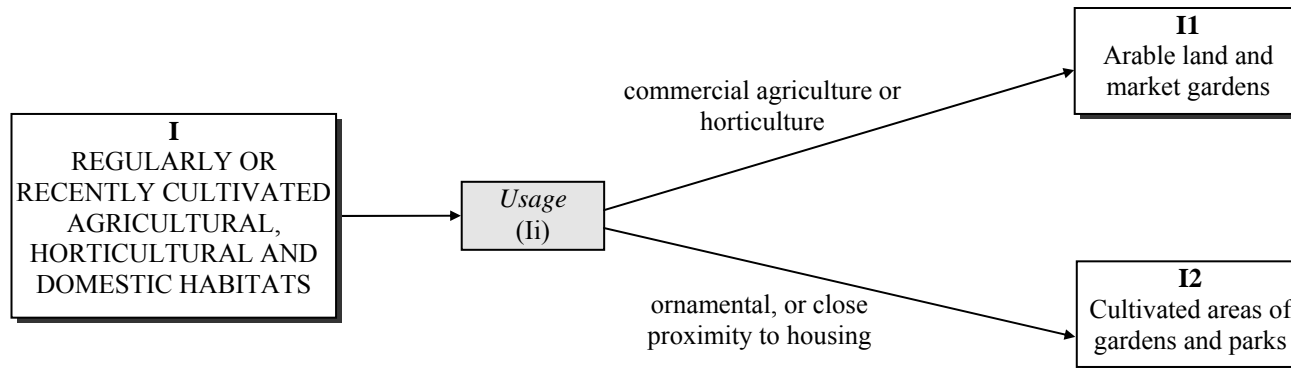
(number) refers to explanatory notes to the key



h21. Hot or cold gas or vapour vents are distinguished (path = *Yes*).

**I: EUNIS Habitat Classification: criteria for regularly or recently cultivated agricultural, horticultural and domestic habitats (I) to Level 2**

(number) refers to explanatory notes to the key

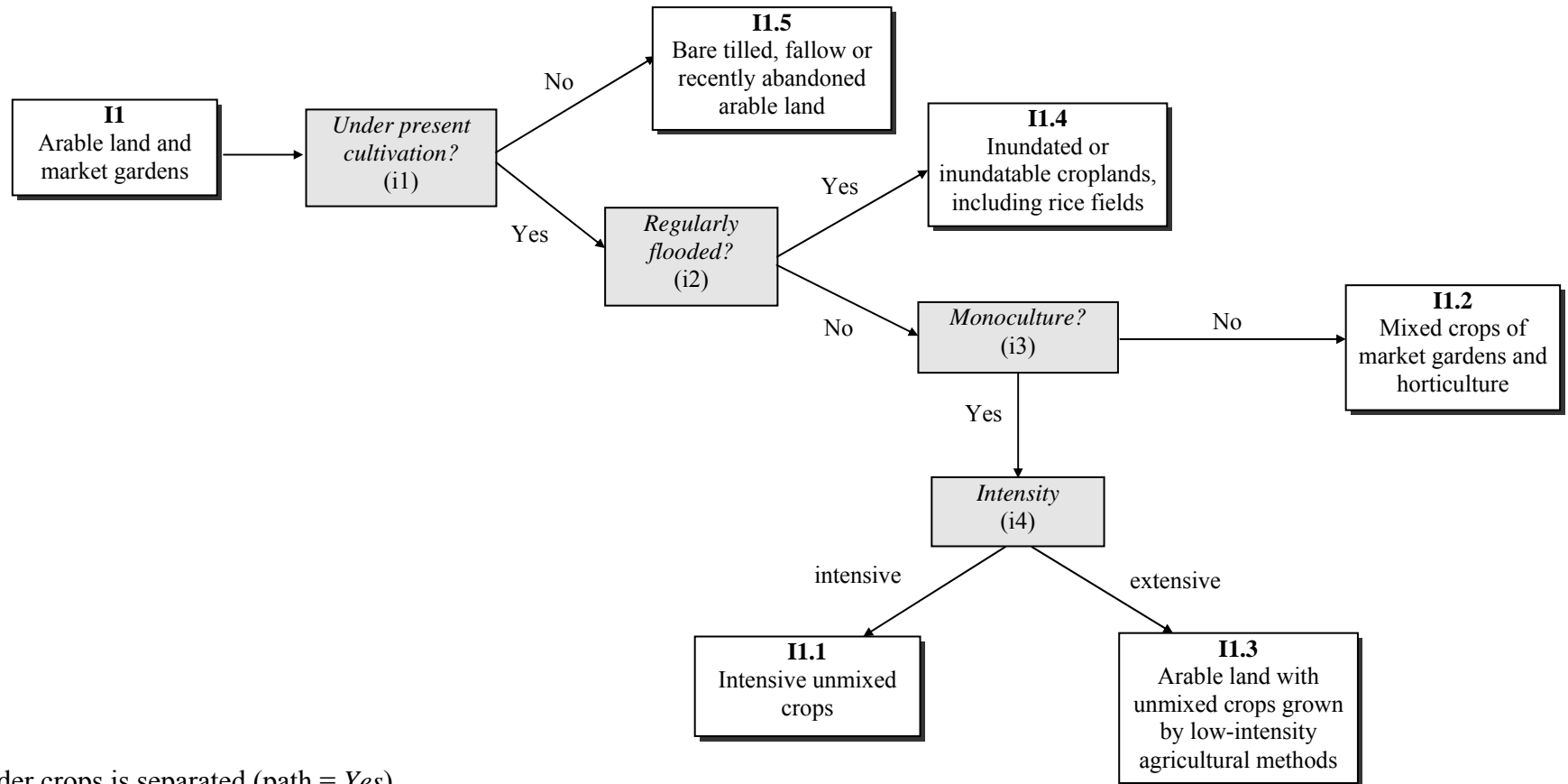


Note: domestic and other gardens, parks and city squares are treated as complexes comprising combinations of units from any other level 1 unit.

- Ii. Land used for purposes of *commercial agriculture or horticulture*, usually large plots with few or no buildings, is distinguished from other regularly or recently cultivated habitats which are usually of smaller size, often in close proximity to buildings or which are highly ornamental (path = *ornamental, or close proximity to housing*). Note that allotments follow path = *commercial agriculture or horticulture*.

## I1: EUNIS Habitat Classification: criteria for arable land and market gardens (I1) to Level 3

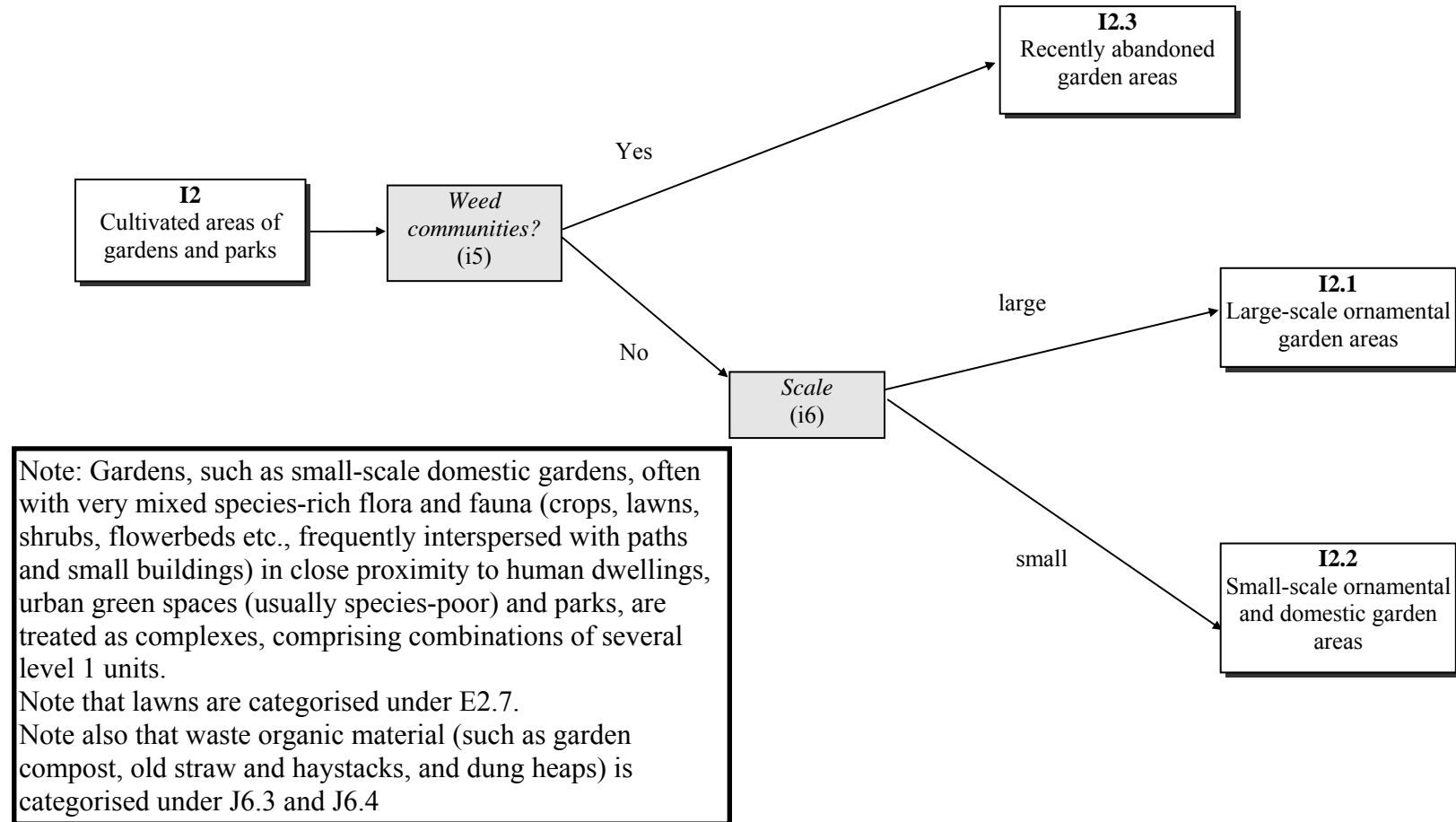
(number) refers to explanatory notes to the key



- i1. Land under crops is separated (path = *Yes*).
- i2. Habitats comprising land regularly flooded as part of crop cultivation are distinguished (path = *Yes*). (Note that water cress beds are categorised under C3.5)
- i3. Crops (agricultural, horticultural and industrial) grown in monoculture on large, unbroken surfaces in open field landscapes are distinguished (path = *Yes*) from cultivation of alternating strips of different crops (including vegetables, flowers, small fruits, path = *No*).
- i4. *Intensive* cultivation with high use of pesticides and/or high use of fertilisers is distinguished from *extensively* cultivated unmixed crops with or without low inputs of natural organic fertiliser.

## I2: EUNIS Habitat Classification: criteria for cultivated areas of gardens and parks (I2) to Level 3

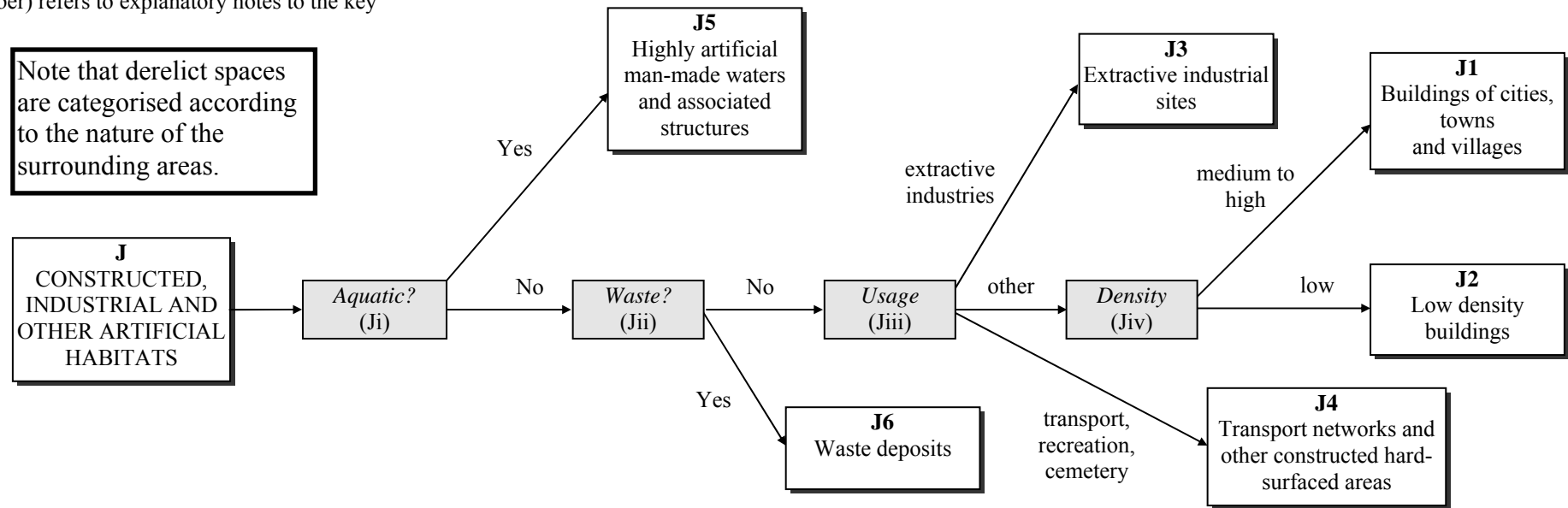
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- i5. Previously cultivated but recently abandoned gardens colonised by weedy communities are distinguished (path = *Yes*).
- i6. *Large* scale ornamental gardens, including botanic gardens with a high proportion of non-native and/or non-food species are separated from *small*-scale cultivated domestic or public garden areas often in close proximity to buildings.

## J: EUNIS Habitat Classification: criteria for constructed, industrial and other artificial habitats (J) to Level 2

(number) refers to explanatory notes to the key

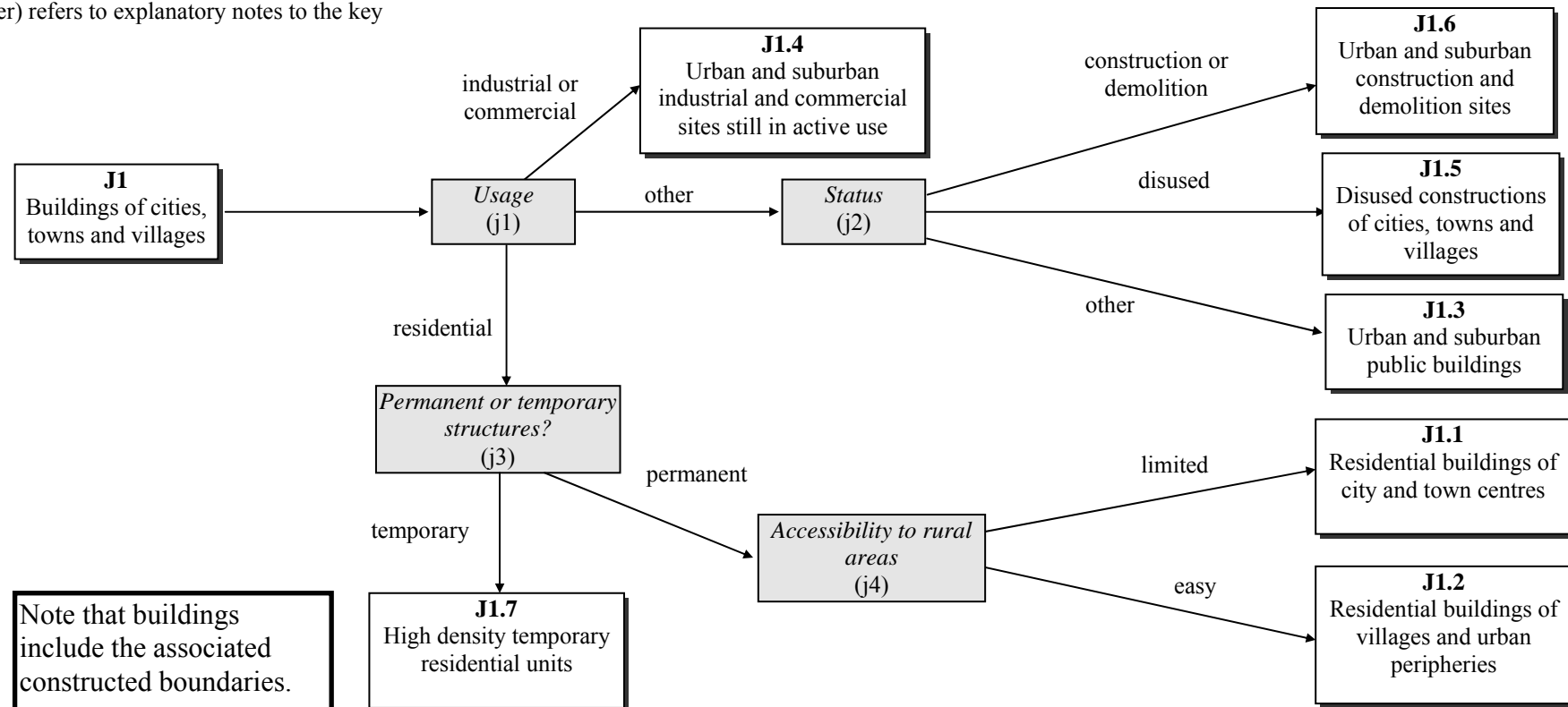


- Ji. Highly artificial waterbodies, with wholly-constructed beds or heavily contaminated water, and associated conduits and containers (path = *Yes*) are separated from non-aquatic artificial habitats.
- Jii. Artificially constructed habitats comprising waste matter (such as slag heaps, landfill, agricultural waste) are separated (path = *Yes*). Note that ruderal or pioneer communities invading these habitats are included with E5.1 Anthropogenic herb stands.
- Jiii. Habitats are distinguished according to current or recent usage: *extractive industries* (quarries, mines etc); transport networks, including paved footpaths, recreation areas (hard surfaces constructed for recreational purposes) and the constructed parts of cemeteries (all including the immediately associated land but excluding the buildings thereon) (path = *transport, recreation, cemetery*); all *other* buildings. Note also that ruderal or pioneer communities invading these habitats are included with E5.1 Anthropogenic herb stands, but habitats which originated through man's activities, but which have reverted to occupation by natural or semi-natural plant and animal communities are categorised with their counterparts elsewhere.
- Jiv. Habitats comprising buildings are differentiated according to their density; *medium to high* density building as in cities, towns and villages is distinguished from *low* density (isolated) housing, agricultural, commercial and non-extractive industrial buildings and sites in a rural setting (surrounded by more natural habitats).



## J1: EUNIS Habitat Classification: criteria for buildings of cities, towns and villages (J1) to Level 3

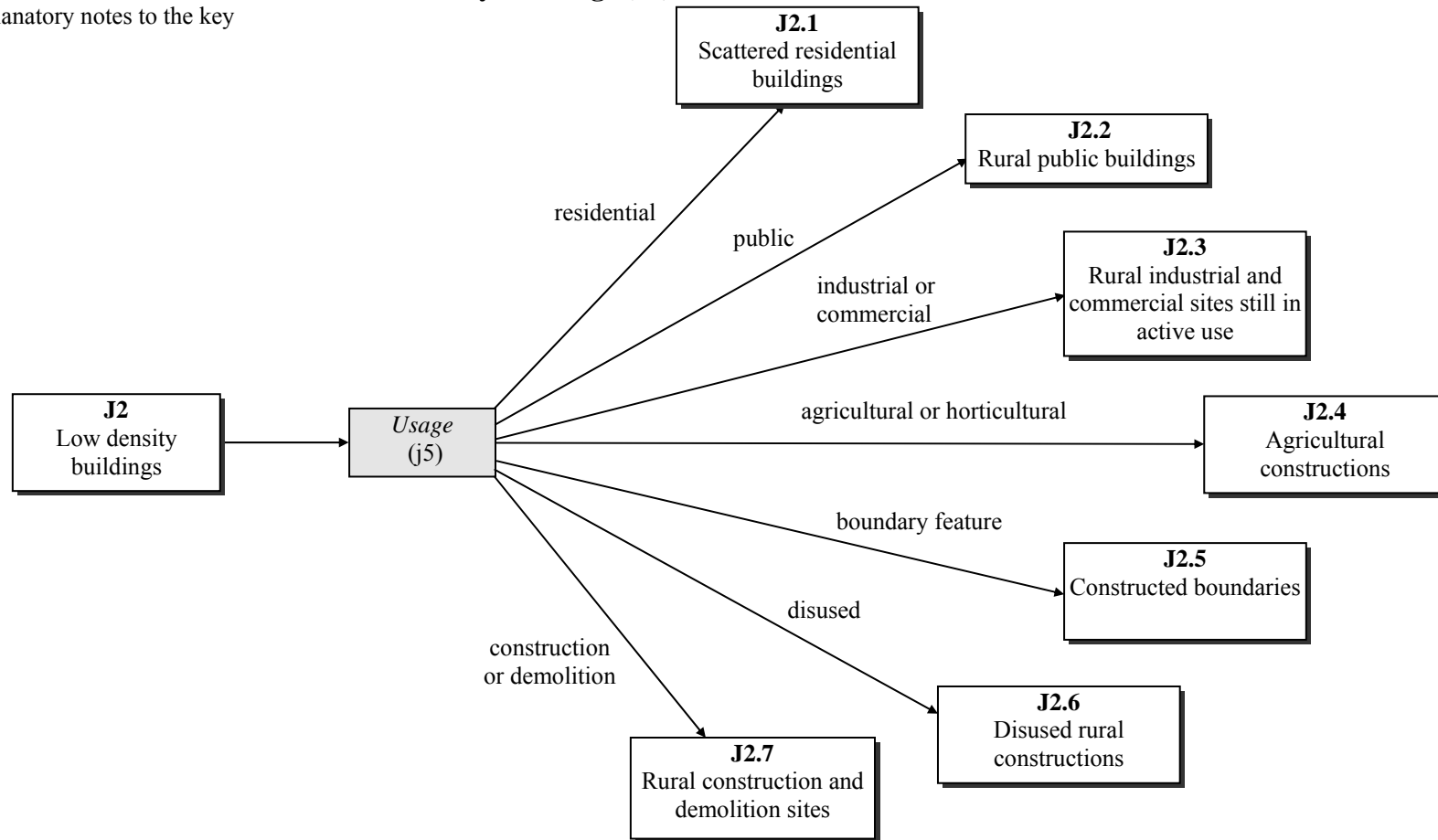
(number) refers to explanatory notes to the key



- j1. Buildings are distinguished according to the amount and type of use: *residential*; *industrial or commercial*; or *other*.
- j2. *Other* non-residential and non-industrial buildings, often with public access (including churches, public halls, libraries etc) are separated from *disused* buildings (including disused paved areas between buildings) and those in the process of *construction or demolition*.
- j3. *Permanent* residential units are distinguished from high density *temporary* residential units. Note that isolated caravans are categorised under J2.1.
- j4. Residential buildings of high density (densely populated urban areas within a medium to large size built-up ensemble, heavily interspersed with roads and footways, with *limited* access to surrounding rural areas) are distinguished from areas with moderate density housing (smaller groups of houses in rural areas and the periphery of more densely populated areas, with strong interconnections between the fauna of the built-up and countryside habitats, i.e. *easy* access to surrounding rural areas).

**J2: EUNIS Habitat Classification: criteria for low density buildings (J2) to Level 3**

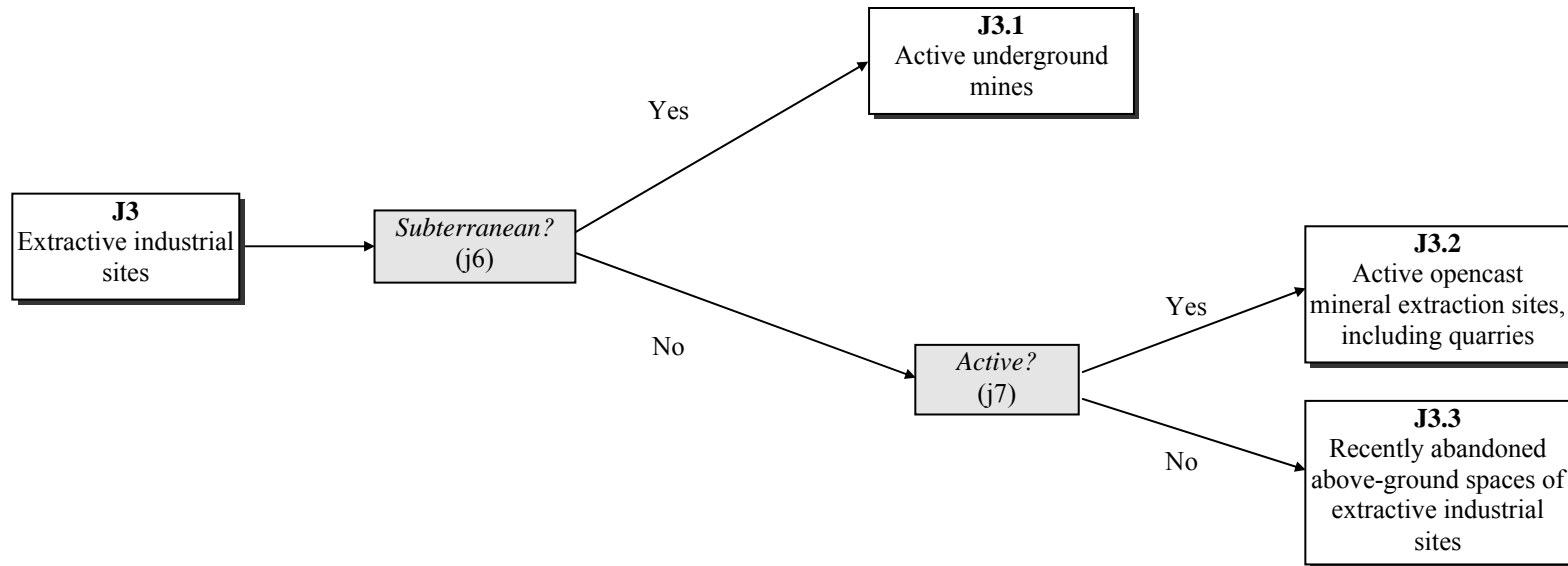
(number) refers to explanatory notes to the key



- j5. Buildings in rural areas are distinguished according to the amount and type of use: *residential*; *public* access (including churches, public halls, libraries etc); *industrial or commercial*; structures connected with *agriculture or horticulture* (including greenhouses); constructed *boundaries*; *disused* (including disused paved areas); structures in the process of *construction or demolition*. Note that constructed boundaries include constructed boundaries of other vegetated areas such as woodland but that constructed boundaries closely associated with buildings are classified together with the buildings. Note that farm buildings used solely for human habitation follow path = *residential*, but farm buildings of mixed residential and agricultural use follow path = *agriculture or horticulture*.

### J3: EUNIS Habitat Classification: criteria for extractive industrial sites (J3) to Level 3

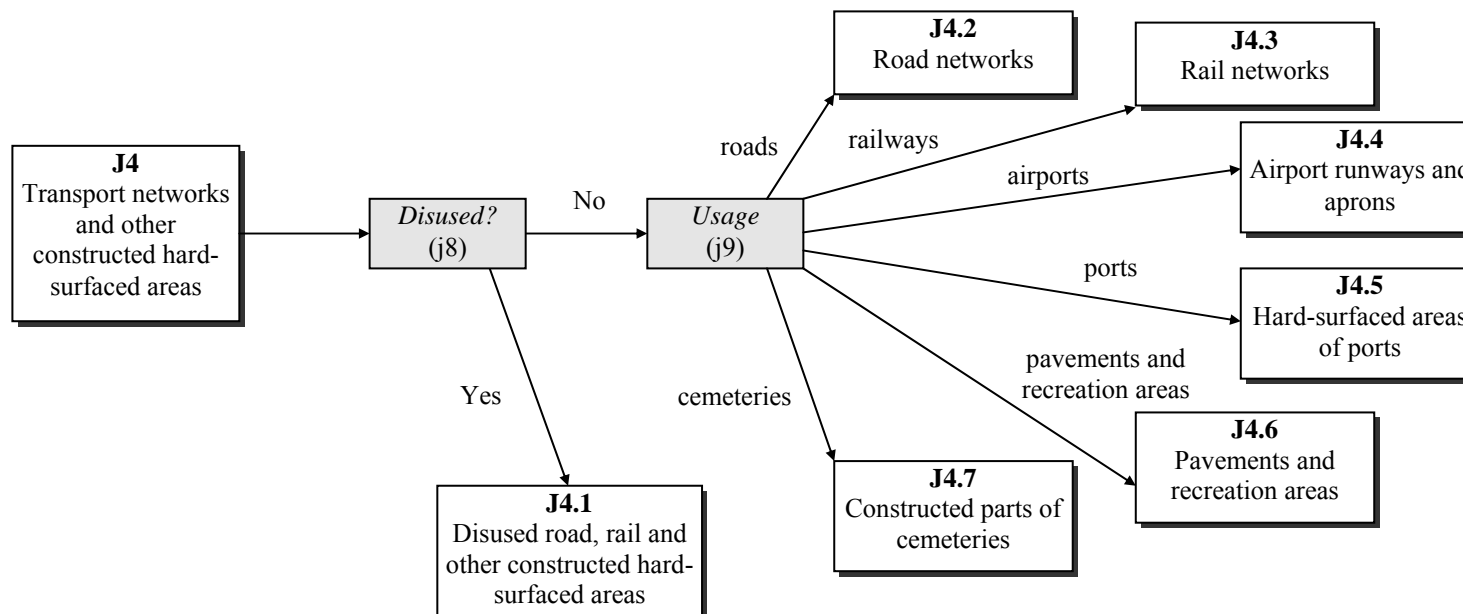
(number) refers to explanatory notes to the key



- j6. Subterranean extractive industrial sites are distinguished (path = *Yes*) from open-cast mining and quarrying carried out at the ground surface. Note that detritus heaps and dump sites associated with extractive industries are categorised under J6 and disused subterranean sites are classified under H1.
- j7. Above-ground mineral extraction sites in active use are distinguished (path = *Yes*) from recently abandoned sites. Note that disused quarries and other above-ground extractive sites with natural or semi-natural communities are characterised elsewhere. Note also that ruderal or pioneer communities invading these habitats are included with E5.1 Anthropogenic herb stands.

#### J4: EUNIS Habitat Classification: criteria for transport networks and other constructed hard-surfaced areas (J4) to Level 3

(number) refers to explanatory notes to the key

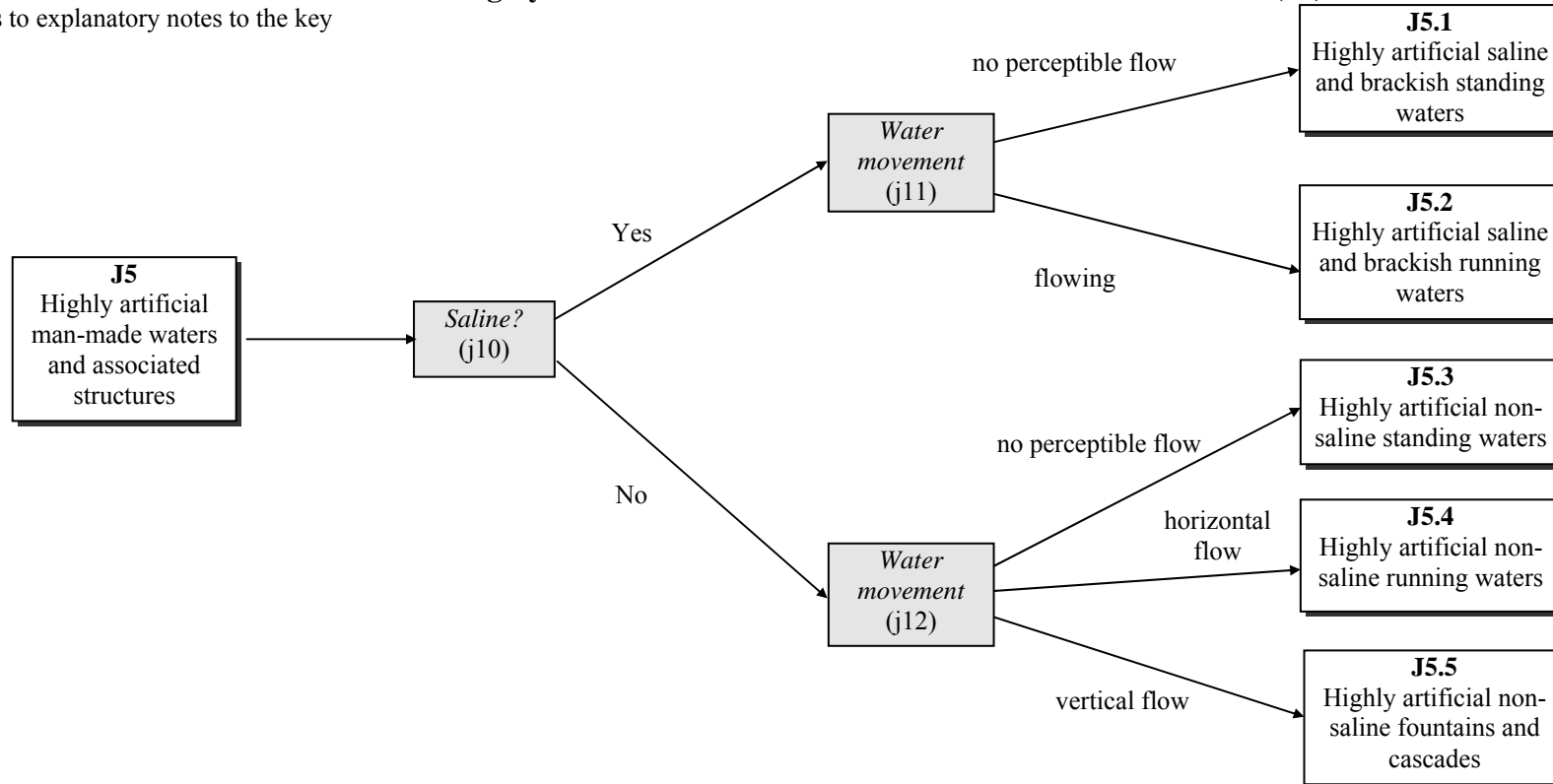


j8. Transport networks and other constructed hard-surfaced areas which have fallen into disuse are separated (path = *Yes*). These may have <30% cover by ruderal or pioneer vegetation. Note that hard-surfaced habitats with ruderal or pioneer vegetation having >30% cover are included with E5.1 Anthropogenic herb stands.

j9. Six types of usage are distinguished: *roads* (including car parks and the immediate environment adjacent to roadways which is highly disturbed); *railways* (including the immediate environment which is highly disturbed); *airports* (constructed runways and aprons only); *ports* (terrestrial parts only); *pavements and recreation areas*; and the constructed parts of *cemeteries*. Note that associated buildings are categorised under J1 or J2 as appropriate.

**J5: EUNIS Habitat Classification: criteria for highly artificial man-made waters and associated structures (J5) to Level 3**

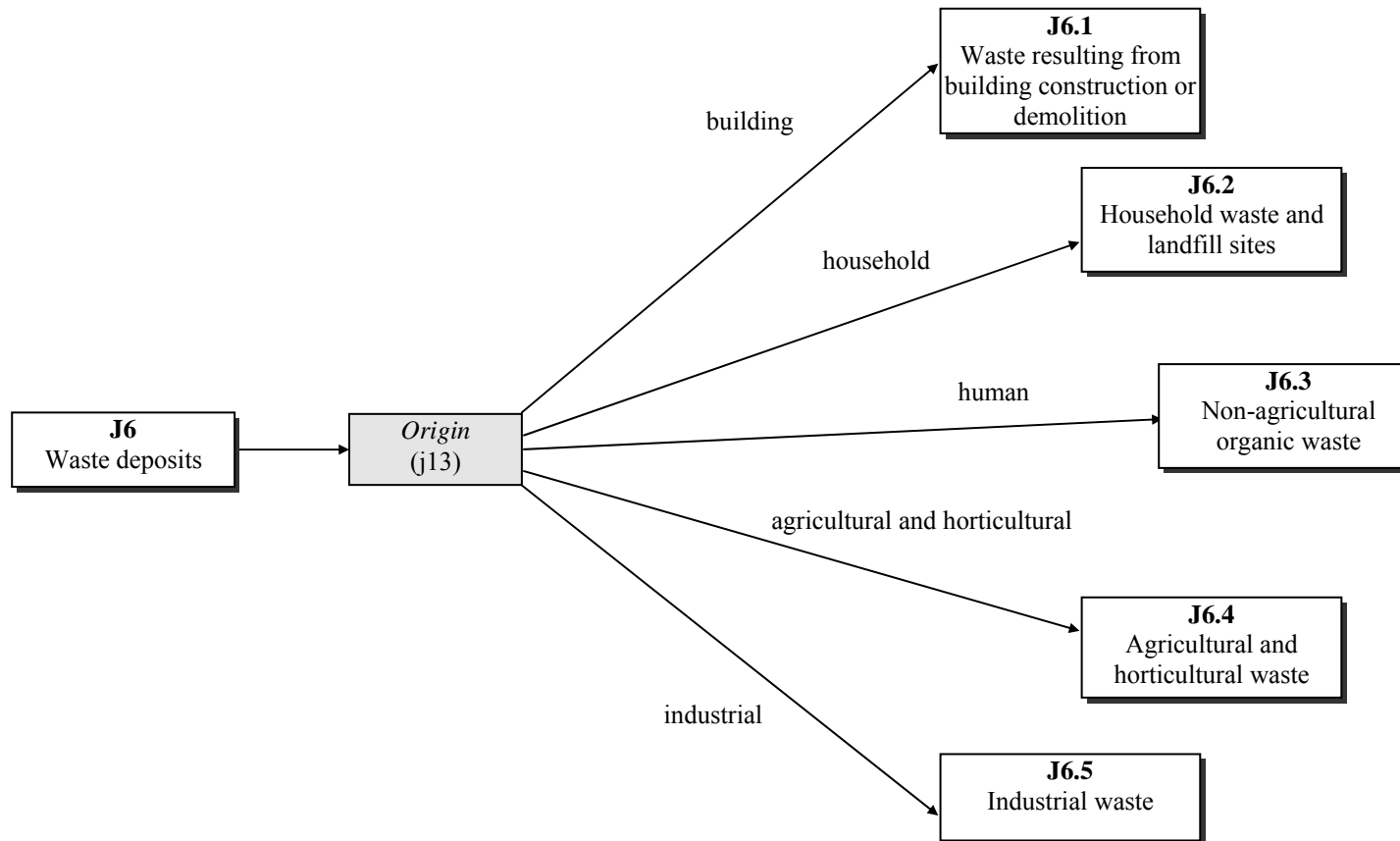
(number) refers to explanatory notes to the key



- j10. Highly artificial saline or brackish waterbodies and their associated conduits or containers (path = *Yes*) are distinguished from non-saline waters. Note that ‘highly artificial’ is defined as very artificial waters with wholly constructed beds or heavily contaminated water. Man-made but semi-natural water-bodies are categorised under C, and constructed habitats which support a semi-natural aquatic fauna and flora under A or C as appropriate (see level 1, note 13).
- j11. Highly artificial saline or brackish waterbodies with *no perceptible flow*, together with their associated containers, are distinguished from those with perceptible flow, together with their associated conduits (path = *flowing*).
- j12. Highly artificial non-saline waters with *no perceptible flow*, together with their associated containers, are distinguished from those with perceptible *horizontal flow*, together with their associated conduits and from those with *vertical flow* such as fountains and artificial cascades with wholly constructed substrates.

### J6: EUNIS Habitat Classification: criteria for waste deposits (J6) to Level 3

(number) refers to explanatory notes to the key



j13. Habitats are distinguished by the origin of the waste material: *household* refuse; *human* waste; *agricultural and horticultural*; *industrial* waste; materials used for *building* or arising from their demolition. Note that ruderal or pioneer communities invading these habitats are included with E5.1 Anthropogenic herb stands.

### 3 HABITAT DEFINITIONS AND FACTSHEETS

The EUNIS Habitat Classification database contains definitions of the habitat types and parameters used to define and distinguish them. The following pages contain extracts from that database, for marine habitats to level 4 in the hierarchy, and for terrestrial habitats to level 3.

For each habitat type, the following information is given:

- Scientific name (i.e. using scientific names of species), and English name where different;
- Description of the habitat;
- Source of the description;
- Legal instruments which include the habitat type;
- Descriptive or diagnostic parameters, under several headings;
- Related phytosociological units, from Rodwell et al (2002).

The legal instruments included are Annex I of the EU Habitats Directive (92/43/EEC) as amended in 2003 (European Commission 2003) and Bern Convention Resolution No. 4 (1996) listing endangered natural habitats requiring specific conservation measures (Council of Europe, 1996). When a legal instrument is given, the EUNIS habitat type either includes, is included within, or overlaps the legally designated habitat(s) mentioned.

The parameters given relate to the key to the classification (Chapter 2), and therefore are primarily the parameters which separate the given habitat type from similar habitats. Although other descriptive parameters are included, these are not exhaustive. For example, “Characteristics of wetness or dryness: Dry” is not repeated for all dry terrestrial habitats, only for those which must be distinguished from wet habitats.

More complete information, including all habitat types in the classification, and equivalents in a number of international and national habitat classifications, is available on the EUNIS website, <http://eunis.eea.eu.int/index.jsp>.

## A MARINE HABITATS

### Description

Marine habitats are directly connected to the oceans, i.e. part of the continuous body of water which covers the greater part of the earth's surface and which surrounds its land masses. Marine waters may be fully saline, brackish or almost fresh. Marine habitats include those below spring high tide limit (or below mean water level in non-tidal waters) and enclosed coastal saline or brackish waters, without a permanent surface connection to the sea but either with intermittent surface or sub-surface connections (as in lagoons). Rockpools in the supralittoral zone are considered as enclaves of the marine zone. Includes marine littoral habitats which are subject to wet and dry periods on a tidal cycle including tidal saltmarshes; marine littoral habitats which are normally water-covered but intermittently exposed due to the action of wind or atmospheric pressure changes; freshly deposited marine strandlines characterised by marine invertebrates. Waterlogged littoral saltmarshes and associated saline or brackish pools above the mean water level in non-tidal waters or above the spring high tide limit in tidal waters are included with marine habitats. Includes constructed marine saline habitats below water level as defined above (such as in marinas, harbours, etc) which support a semi-natural community of both plants and animals. The marine water column includes bodies of ice.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004b)

### Descriptive or diagnostic parameters

<b>Parameter</b>	<b>Value(s)</b>
Altitude zones (terrestrial and marine):	Bathyal; Offshore circalittoral; Circalittoral (marine); Infralittoral (marine); Littoral (marine)
Human activities and impacts:	Urbanised areas, human habitation, constructed artificial surfaces; Other industrial / commercial areas; Port areas
Geomorphology or landform:	Beach; Coastal flat; Lagoon; Reef; Submerged flanks of oceanic islands; Open sea; Sea cave; Marine overhang; Surge gully; Submarine channels; Deep ocean trenches; Elongated submarine ridges; Submarine gas, oil or water vents and seeps; Isolated raised seabed features; Rockpools
Characteristics of wetness or dryness:	Aquatic; Frequently submerged

## EUNIS habitat code and names A1 Littoral rock and other hard substrata

### Description

Littoral rock includes habitats of bedrock, boulders and cobbles which occur in the intertidal zone (the area of the shore between high and low tides) and the splash zone. The upper limit is marked by the top of the lichen zone and the lower limit by the top of the laminarian kelp zone. There are many physical variables affecting rocky shore communities - wave exposure, salinity, temperature and the diurnal emersion and immersion of the shore. Wave exposure is most commonly used to characterise littoral rock, from 'extremely exposed' on the open coast to 'extremely sheltered' in enclosed inlets. Exposed shores tend to support faunal-dominated communities of barnacles and mussels and some robust seaweeds. Sheltered shores are most notable for their dense cover of fucoid seaweeds, with distinctive zones occurring down the shore. In between these extremes of wave exposure, on moderately exposed shores, mosaics of seaweeds and barnacles are more typical.

**Source** Connor, D.W., Allen, J.H., Golding, N., Howell, K.L., Lieberknecht, L.M., Northen, K.O. & Reker, J.B. (2004)

### Descriptive or diagnostic parameters

<b>Parameter</b>	<b>Value(s)</b>
Altitude zones (terrestrial and marine):	Littoral (marine)
Depth zones (for marine habitats):	Upper shore; Mid-shore; Lower shore
Human activities and impacts:	Urbanised areas, human habitation, constructed artificial surfaces; Other industrial / commercial areas; Port areas
Exposure characteristics:	Extremely exposed to wind action; Very exposed to wind action; Exposed to wind action; Moderately exposed to wind action; Sheltered from wind action; Very sheltered from wind action; Extremely sheltered from wind action; Extremely exposed to wave action; Very exposed to wave action; Exposed to wave action; Moderately exposed to wave action; Sheltered from wave action; Very sheltered from wave action; Extremely sheltered from wave action
Geomorphology or landform:	Coastal flat; Lagoon; Reef; Sea cave; Marine overhang; Rockpools
Characteristics of wetness or dryness:	Aquatic; Frequently submerged
Substrate types:	Bedrock; Clay; Chalk; Hard; Artificial hard; Boulders (undefined); Very large non-mobile boulders; Large non-mobile boulders; Small non-mobile boulders; Non-mobile cobbles; Mixed
Salinity levels:	Fully saline; Reduced salinity; Variable salinity

## EUNIS habitat code and names A1.1 High energy littoral rock

### Description



Extremely exposed to moderately exposed or tide-swept bedrock and boulder shores. Extremely exposed shores dominated by mussels and barnacles, occasionally with robust fucoids or turfs of red seaweed. Tide-swept shores support communities of fucoids, sponges and ascidians on the mid to lower shore. Three biological subtypes have been described: Communities on very exposed to moderately exposed upper and mid eulittoral bedrock and boulders dominated by the mussel *Mytilus edulis*, barnacles *Chthamalus* spp. and/or *Semibalanus balanoides* and the limpets *Patella* spp. (A1.11); red and brown seaweeds able to tolerate the extreme conditions of exposed rocky shores, primarily the physical stresses caused by wave action (A1.12), and tide-swept shores in more sheltered areas (such as narrow channels in sea loch) with canopy forming fucoids and a rich filter-feeding community (A1.15).

**Source** Connor, D.W., Allen, J.H., Golding, N., Howell, K.L., Lieberknecht, L.M., Northen, K.O. & Reker, J.B. (2004)

#### Legal instruments

Legal instrument	Legally designated habitat	Code
EU Habitats Directive Annex I	Large shallow inlets and bays	1160
	Reefs	1170

#### Descriptive or diagnostic parameters

Parameter	Value(s)
Altitude zones (terrestrial and marine):	Littoral (marine)
Depth zones (for marine habitats):	Upper shore; Mid-shore; Lower shore
Human activities and impacts:	Urbanised areas, human habitation, constructed artificial surfaces; Other industrial / commercial areas; Port areas
Exposure characteristics:	Extremely exposed to wind action; Very exposed to wind action; Exposed to wind action; Tidal action; Very strong tidal stream; Strong tidal stream; Moderately strong tidal stream; Extremely exposed to wave action; Very exposed to wave action; Exposed to wave action
Geomorphology or landform:	Coastal flat; Reef
Characteristics of wetness or dryness:	Aquatic; Frequently submerged
Substrate types:	Bedrock; Hard; Artificial hard; Boulders (undefined); Very large non-mobile boulders; Large non-mobile boulders; Small non-mobile boulders; Non-mobile cobbles
Salinity levels:	Fully saline; Reduced salinity; Low salinity

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**EUNIS habitat code and names** A1.11 English name: Mussel and/or barnacle communities;  
Scientific name: *Mytilus edulis* and/or barnacle communities

#### Description

Communities on very exposed to moderately exposed upper and mid eulittoral bedrock and boulders dominated by the mussel *Mytilus edulis* (A1.111), barnacles *Chthamalus* spp. and/or *Semibalanus balanoides* and limpets *Patella* spp. (A1.112, A1.113). Several variants are identified. Some shores are characterised by dense bands of the barnacle *Semibalanus balanoides* and the limpet *Patella vulgata* (A1.113). The barnacles may be covered by *Porphyra umbilicalis* on the upper shore of exposed sites. Cracks and crevices in the rock provide a refuge for small individuals of the mussel *M. edulis*, winkles *Littorina saxatilis* and the whelk *Nucella lapillus*. Red seaweeds also frequently occupy damp crevices, particularly *Ceramium shuttleworthianum*, *Corallina officinalis*, *Osmundea pinnatifida* and encrusting coralline algae, but the non-vesiculate form of the wrack *Fucus vesiculosus* might be present (A1.1132). Large numbers of the wrack *Littorina littorea* often dominate fields of large boulders or shores with a more mixed substratum (A1.1133). There is much regional variation affecting the zonation of barnacles in the British Isles. In the north-west *C. montagui* and/or *C. stellatus* can form a distinct band above *S. balanoides*. In the south-west *C. montagui* and/or *C. stellatus* can be the dominant barnacles throughout the eulittoral zone (A1.1121). On the east coasts *S. balanoides* is able to extend to the upper shore due to the absence of *Chthamalus* spp. and thereby any competition. The lichen *Lichina pygmaea* may be prominent, especially in the south, where it can form distinct patches or even a separate zone among the *Chthamalus* spp. (A1.1122). In areas of soft rock (e.g. shales), the barnacles may be scarce or absent and the rock dominated by *P. vulgata*. Situation: This habitat type is found in the mid to upper eulittoral on very to moderately exposed shores below the lichen dominated biotopes (B3.11) and is typically characterised by patches of mussels *M. edulis* interspersed with barnacles. Below A1.11 is a community dominated by the wrack *Himanthalia elongata* and red seaweeds such as *C. officinalis*, *Mastocarpus stellatus* and *O. pinnatifida* (A1.12). With decreasing wave exposure *F. vesiculosus* is able to survive, gradually replacing the barnacles and *P. vulgata* biotope (A1.213). On such moderately exposed shores A1.11 may occur on steep and vertical faces, while fucoids dominate the flatter areas (A1.1132, A1.213).

**Source** Connor, D.W., Allen, J.H., Golding, N., Howell, K.L., Lieberknecht, L.M., Northen, K.O. & Reker, J.B. (2004)

#### Legal instruments

Legal instrument	Legally designated habitat	Code
Council of Europe Bern Convention Res. No. 4 1996	Sublittoral organogenic concretions	11.25

#### Descriptive or diagnostic parameters

Parameter	Value(s)
Altitude zones (terrestrial and marine):	Littoral (marine)
Depth zones (for marine habitats):	Upper shore; Mid-shore; Lower shore
Exposure characteristics:	Extremely exposed to wind action; Very exposed to wind action; Exposed to wind action; Moderately exposed to wind action; Extremely exposed to wave action; Very exposed to wave action; Exposed to wave action; Moderately exposed to wave action
Substrate types:	Bedrock; Large non-mobile boulders
Salinity levels:	Fully saline

**EUNIS habitat code and names** A1.12 Robust fucoid and/or red seaweed communities

**Description**

This habitat type encompasses those seaweeds that are able to tolerate the extreme conditions of very exposed to moderately exposed rocky shores. The physical stresses caused by wave action often results in dwarf forms of the individual seaweeds. The strong holdfasts and short tufts structure of the wracks *Fucus distichus* and *Fucus spiralis* f. *nana* allow these fucoids to survive on extremely exposed shores in the north and north-west (A1.121). Another seaweed able to tolerate the wave-wash is the red seaweed *Corallina officinalis*, which can form a dense turf on the mid to lower shore (A1.122). The wrack *Himanthalia elongata* occurs on the lower shore and can extend on to moderately exposed shores (A1.123). The red seaweed *Mastocarpus stellatus* is common on both exposed and moderately exposed shores, where it may form a dense turf (particularly on vertical or overhanging rock faces, A1.125). Very exposed to moderately exposed lower eulittoral rock can support a pure stand of the red seaweed *Palmaria palmata*. It is found either as a dense band or in large patches above the main sublittoral fringe (A1.124). Exposed to moderately exposed lower eulittoral rock characterised by extensive areas or a distinct band of *Osmundea pinnatifida* (A1.126). Outcrops of fossilised peat in the eulittoral are soft enough to allow a variety of piddocks, such as *Barnea candida* and *Petricola pholadiformis*, to bore into them (A1.127). This biotope is rare. Other species such as the anemone *Halichondria panicea*, the barnacle *Semibalanus balanoides*, the limpet *Patella vulgata*, the mussel *Mytilus edulis* and the whelk *Nucella lapillus* can be present as well, but they are never dominant as in A1.11. There is also a higher number of seaweeds present including the red *Palmaria palmata*, *Lomentaria articulata*, *Ceramium* spp. and the brown seaweeds *Laminaria digitata* and *Fucus serratus*. The green seaweeds *Enteromorpha intestinalis*, *Ulva lactuca* and *Cladophora rupestris* are occasionally present.

Situation: This habitat type is present on extremely exposed to moderately exposed upper to lower shores.

**Source** Connor, D.W., Allen, J.H., Golding, N., Howell, K.L., Lieberknecht, L.M., Northen, K.O. & Reker, J.B. (2004)

**Descriptive or diagnostic parameters**

Parameter	Value(s)
Altitude zones (terrestrial and marine):	Littoral (marine)
Depth zones (for marine habitats):	Upper shore; Mid-shore; Lower shore
Exposure characteristics:	Extremely exposed to wind action; Very exposed to wind action; Exposed to wind action; Extremely exposed to wave action; Very exposed to wave action; Exposed to wave action
Substrate types:	Bedrock
Salinity levels:	Fully saline

**EUNIS habitat code and names** A1.13 Mediterranean communities of upper mediolittoral rock

**Description**

No description available.

**Source** Barcelona Convention (1998)

**Descriptive or diagnostic parameters**

Parameter	Value(s)
Altitude zones (terrestrial and marine):	Littoral (marine)
Salinity levels:	Fully saline

**EUNIS habitat code and names** A1.14 Mediterranean communities of lower mediolittoral rock very exposed to wave action

**Description**

No description available.

**Source** Barcelona Convention (1998)

**Descriptive or diagnostic parameters**

Parameter	Value(s)
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Altitude zones (terrestrial and marine): Littoral (marine)  
 Salinity levels: Fully saline

**EUNIS habitat code and names** A1.15 Fucoids in tide-swept conditions

**Description**

Fucoid seaweeds in tide-swept conditions on sheltered to extremely sheltered mid eulittoral to lower eulittoral rocky shores, such as narrow channels in sea lochs. The middle shore can be dominated by the wrack *Ascophyllum nodosum* (A1.151), while *Fucus serratus* is dominating the lower shore (A1.152, A1.153). The high levels of water movement encourages a rich associated fauna including several filter-feeding groups. These include the sponges *Grantia compressa*, *Halichondria panicea* and *Hymeniacion perleve* which frequently occur on steep and overhanging faces of boulders and bedrock. It also includes the sea squirts *Dendrodoa grossularia* and *Asciidiella scabra*, which occur on steep surfaces and beneath boulders. Hydroids such as the pink *Clava multicornis* can form colonies on *A. nodosum* while *Dynamena pumila* is more often found on *Fucus vesiculosus* or *F. serratus*. Underneath the canopy formed by the brown seaweeds is a diverse community of the red seaweeds *Gelidium pusillum*, *Chondrus crispus*, *Lomentaria articulata*, *Membranoptera alata* and coralline crusts, but the green seaweeds *Enteromorpha intestinalis*, *Ulva lactuca* and *Cladophora rupestris* can be present. The filamentous red seaweed *Polysiphonia lanosa* can usually be found growing on *A. nodosum*. On the rock beneath are the limpet *Patella vulgata* and the barnacle *Semibalanus balanoides*, while the crab *Carcinus maenas* and a variety of winkles including *Littorina littorea*, *Littorina mariae* and *Littorina obtusata* can be found on or among the boulders. The whelk *Nucella lapillus* can either be found in cracks and crevices.

Situation: Sheltered tide-swept shores (i.e. estuaries and sea lochs) below the *Fucus spiralis* and *F. vesiculosus* band and above the kelp dominated zone in the sublittoral.

**Source** Connor, D.W., Allen, J.H., Golding, N., Howell, K.L., Lieberknecht, L.M., Northen, K.O. & Reker, J.B. (2004)

**Descriptive or diagnostic parameters**

Parameter	Value(s)
Altitude zones (terrestrial and marine):	Littoral (marine)
Depth zones (for marine habitats):	Mid-shore; Lower shore
Exposure characteristics:	Sheltered from wind action; Very sheltered from wind action; Extremely sheltered from wind action; Very strong tidal stream; Strong tidal stream; Moderately strong tidal stream; Sheltered from wave action; Very sheltered from wave action; Extremely sheltered from wave action; Ultra sheltered from wave action
Substrate types:	Bedrock; Large non-mobile boulders; Cobbles (undefined)
Salinity levels:	Fully saline; Variable salinity

**EUNIS habitat code and names** A1.2 Moderate energy littoral rock

**Description**

Moderately exposed shores (bedrock, boulders and cobbles) characterised by mosaics of barnacles and fucoids on the mid and upper shore; with fucoids and red seaweed mosaics on the lower shore. Where freshwater or sand-scour affects the shore ephemeral red or green seaweeds can dominate. Other shores support communities of mussels and fucoids in the mid to lower shore. Two biological subtypes have been described: barnacles and fucoids (A1.21) and mussels and fucoids (A1.22).

**Source** Connor, D.W., Allen, J.H., Golding, N., Howell, K.L., Lieberknecht, L.M., Northen, K.O. & Reker, J.B. (2004)

**Legal instruments**

Legal instrument	Legally designated habitat	Code
EU Habitats Directive Annex I	Estuaries	1130
	Large shallow inlets and bays	1160
	Reefs	1170

**Descriptive or diagnostic parameters**

Parameter	Value(s)
Altitude zones (terrestrial and marine):	Littoral (marine); Driftline
Depth zones (for marine habitats):	Upper shore; Mid-shore; Lower shore
Human activities and impacts:	Urbanised areas, human habitation, constructed artificial surfaces; Other industrial / commercial areas; Port areas
Exposure characteristics:	Moderately exposed to wind action; Tidal action; Moderately strong tidal stream; Moderately exposed to wave action
Geomorphology or landform:	Coastal flat; Lagoon; Reef
Characteristics of wetness or dryness:	Aquatic; Frequently submerged
Substrate types:	Bedrock; Clay; Hard; Artificial hard; Boulders (undefined); Very large non-mobile boulders; Large non-mobile boulders; Small non-mobile boulders; Non-mobile cobbles
Salinity levels:	Fully saline; Reduced salinity; Low salinity

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**EUNIS habitat code and names** A1.21 Barnacles and fucoids on moderately exposed shores**Description**

Moderately exposed rocky shores characterised by a mosaic of fucoids and barnacles on bedrock and boulders, where the extent of the fucoid cover is typically less than the blanket cover associated with sheltered shores. Other species are normally present as well in this habitat including the winkle *Littorina littorea*, the whelk *Nucella lapillus* and the red seaweed *Mastocarpus stellatus*. Beneath the band of yellow and grey lichens at the top of the shore is a zone dominated by the wrack *Pelvetia canaliculata*, scattered barnacles, while the black lichen *Verrucaria maura* covers the rock surface (A1.211). Below, on the mid shore the wrack *Fucus vesiculosus* generally forms a mosaic with the barnacle *Semibalanus balanoides* and the limpet *Patella vulgata* (A1.213). Finally, the wrack *Fucus serratus*, dominates the lower shore, while a variety of red seaweeds can be found underneath the *F. serratus* canopy (A1.214). A number of variants have been described: lower shore bedrock and boulders characterised by mosaics of *F. serratus* and turf-forming red seaweeds (A1.2141); where the density of *F. serratus* is greater (typically Common - Superabundant) and the abundance of red seaweeds less, A1.3151 should be recorded. The presence of boulders and cobbles on the shore can increase the micro-habitat diversity, which often results in greater species richness. Although the upper surface of the boulders may bear very similar communities to A1.3151 there is often an increase in fauna (crabs, tube-forming polychaetes, sponges and bryozoans) and A1.2142 should be recorded. Sand-influenced exposed to moderately exposed lower shore rock can be characterised by dense mats of *Rhodothamniella floridula* (A1.215).  
Situation: Mid and lower eulittoral moderately exposed bedrock with a lichen zone above and a kelp dominated community below in the sublittoral zone.

**Source** Connor, D.W., Allen, J.H., Golding, N., Howell, K.L., Lieberknecht, L.M., Northen, K.O. & Reker, J.B. (2004)

**Descriptive or diagnostic parameters**

Parameter	Value(s)
Altitude zones (terrestrial and marine):	Littoral (marine)
Depth zones (for marine habitats):	Upper shore; Mid-shore; Lower shore
Exposure characteristics:	Moderately exposed to wind action; Moderately exposed to wave action
Substrate types:	Bedrock; Boulders (undefined)
Salinity levels:	Fully saline

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**EUNIS habitat code and names** A1.22 English name: Mussels and fucoids on moderately exposed shores; Scientific name: *Mytilus edulis* and fucoids on moderately exposed shores**Description**

Mid and lower eulittoral exposed to moderately exposed bedrock, often with nearby sediment, may be densely covered by large individuals of the mussel *Mytilus edulis*. Three biotopes have been described: In the mid eulittoral, the mussels may form a band or large patches with scattered bladder wrack *Fucus vesiculosus* (A1.221). In the lower eulittoral a range of red seaweeds including *Mastocarpus stellatus* and *Palmaria palmata* occur amongst the mussels (in higher abundance than the mid eulittoral) (A1.222). Clay outcrops in the mid to lower eulittoral may be bored by a variety of piddocks including *Pholas dactylus*, *Barnea candida* and *Petricola pholadiformis*, while the surface is characterised by small clumps of the mussel *M. edulis*, the barnacle *Elminius modestus* and the winkle *Littorina littorea* (A1.223). Ephemeral green seaweeds such as *Enteromorpha intestinalis* and *Ulva lactuca* commonly occur on the shells of the mussels. Barnacles are common on both the mussel valves and on patches of bare rock, where the limpet *Patella vulgata* is found as well, often at high abundance. The whelk *Nucella lapillus* and a range of littorinids also occur within the mussel bed. A dense *M. edulis* community may be found on more sheltered coasts on mixed substrata (A2.721).  
Situation: Above this habitat type is a *M. edulis* and *S. balanoides* dominated zone or a *F. vesiculosus* dominated biotope (A1.213). In the lower eulittoral zone below is a zone dominated by the wrack *Fucus serratus*, *M. edulis* and a variety of red seaweeds (A1.21) while kelp dominate the sublittoral fringe.

**Source** Connor, D.W., Allen, J.H., Golding, N., Howell, K.L., Lieberknecht, L.M., Northen, K.O. & Reker, J.B. (2004)

**Legal instruments**

Legal instrument	Legally designated habitat	Code
EU Habitats Directive Annex I	Reefs	1170
Council of Europe Bern Convention Res. No. 4 1996	Sublittoral organogenic concretions	11.25

**Descriptive or diagnostic parameters**

Parameter	Value(s)
Altitude zones (terrestrial and marine):	Littoral (marine)
Depth zones (for marine habitats):	Mid-shore; Lower shore
Exposure characteristics:	Exposed to wind action; Moderately exposed to wind action; Exposed to wave action; Moderately exposed to wave action
Substrate types:	Bedrock; Large non-mobile boulders
Salinity levels:	Fully saline

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**EUNIS habitat code and names** A1.23 Mediterranean communities of lower mediolittoral rock moderately exposed to wave action

**Description**

No description available.

**Source** Barcelona Convention (1998)

**Descriptive or diagnostic parameters**

<b>Parameter</b>	<b>Value(s)</b>
Altitude zones (terrestrial and marine):	Littoral (marine)
Salinity levels:	Fully saline

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**EUNIS habitat code and names** A1.3 Low energy littoral rock

**Description**

Sheltered to extremely sheltered rocky shores with very weak to weak tidal streams are typically characterised by a dense cover of fucoid seaweeds which form distinct zones (the wrack *Pelvetia canaliculata* on the upper shore through to the wrack *Fucus serratus* on the lower shore). Where salinity is reduced (such as at the head of a sea loch or where streams run across the shore) *Fucus ceranoides* may occur. Fucoids also occur on less stable, mixed substrata (cobble and pebbles on sediment) although in lower abundance and with fewer associated epifaunal species; beds of mussels *Mytilus edulis* are also common. In summer months, dense blankets of ephemeral green and red seaweeds can dominate these mixed shores. Two biological subtypes have been described: Dense blankets of fucoid seaweeds dominating sheltered, fully marine littoral rocky shores (A1.31) and fucoids dominating variable salinity rocky shores (A1.32).

**Source** Connor, D.W., Allen, J.H., Golding, N., Howell, K.L., Lieberknecht, L.M., Northen, K.O. & Reker, J.B. (2004)

**Legal instruments**

<u>Legal instrument</u>	<u>Legally designated habitat</u>	<u>Code</u>
EU Habitats Directive Annex I	Estuaries	1130
	Coastal lagoons	1150
	Large shallow inlets and bays	1160
	Reefs	1170

**Descriptive or diagnostic parameters**

<b>Parameter</b>	<b>Value(s)</b>
Altitude zones (terrestrial and marine):	Littoral (marine)
Depth zones (for marine habitats):	Upper shore; Mid-shore; Lower shore
Human activities and impacts:	Urbanised areas, human habitation, constructed artificial surfaces; Other industrial / commercial areas; Port areas
Exposure characteristics:	Sheltered from wind action; Very sheltered from wind action; Extremely sheltered from wind action; Tidal action; Weak tidal stream; Very weak or no tidal stream; Sheltered from wave action; Very sheltered from wave action; Extremely sheltered from wave action; Ultra sheltered from wave action
Geomorphology or landform:	Coastal flat; Lagoon; Reef
Characteristics of wetness or dryness:	Aquatic; Frequently submerged
Substrate types:	Bedrock; Clay; Hard; Artificial hard; Boulders (undefined); Very large non-mobile boulders; Large non-mobile boulders; Small non-mobile boulders; Non-mobile cobbles; Cobbles (undefined); Pebbles; Mixed
Salinity levels:	Fully saline; Reduced salinity; Low salinity; Variable salinity

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**EUNIS habitat code and names** A1.31 Fucoids on sheltered marine shores

**Description**

Dense blankets of fucoid seaweeds dominating sheltered to extremely sheltered rocky shores and/or in locally sheltered patches on exposed to moderately exposed rocky shores. Typically, the wrack *Pelvetia canaliculata* (A1.311) occurs on the upper shore, with the wrack *Fucus spiralis* (A1.312) below. The middle shore is dominated by vast areas of the wrack *Ascophyllum nodosum* or the wrack *Fucus vesiculosus* (A1.313, A1.314) or a mixture of both. The wrack *Fucus serratus* covers lower shore bedrock and boulders (A1.315). Sheltered to very sheltered mixed substrata (pebbles and cobbles overlying muddy sand and gravel) shores can support fucoid communities (A1.3122; A1.3132; A1.3142; A1.3152).

Situation: Sheltered shores (i.e. estuaries and sea lochs) below the lichen dominated zone and above the kelp dominated zone in the sublittoral or sheltered patches on more wave exposed shores.

**Source** Connor, D.W., Allen, J.H., Golding, N., Howell, K.L., Lieberknecht, L.M., Northen, K.O. & Reker, J.B. (2004)

**Descriptive or diagnostic parameters**

<b>Parameter</b>	<b>Value(s)</b>
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Altitude zones (terrestrial and marine):	Littoral (marine)
Depth zones (for marine habitats):	Upper shore; Mid-shore; Lower shore
Exposure characteristics:	Sheltered from wind action; Very sheltered from wind action; Extremely sheltered from wind action; Sheltered from wave action; Very sheltered from wave action; Extremely sheltered from wave action
Substrate types:	Bedrock; Large non-mobile boulders; Cobbles (undefined)
Salinity levels:	Fully saline; Variable salinity

**EUNIS habitat code and names** A1.32 Fucoids in variable salinity

**Description**

Blankets of fucoid seaweeds dominating sheltered to extremely sheltered rocky shores with variable salinity. The wrack *Pelvetia canaliculata* (A1.321) occurs on the upper shore, with the wrack *Fucus spiralis* (A1.322) below. The middle shore is dominated by vast areas of the wrack *Ascophyllum nodosum* or the wrack *Fucus vesiculosus* (A1.323, A1.324) or a mixture of both. The wrack *Fucus serratus* covers lower shore bedrock and boulders (A1.326). *Fucus* ceranoides can be found on extremely sheltered shores with variable or low salinity (A1.327). The variable salinity communities are species impoverished compared to fucoids in full salinity or in tide-swept conditions as red seaweeds and sponges are usually absent. Underneath the canopy are a few green seaweeds including *Enteromorpha intestinalis* and *Cladophora* spp., while the red seaweed *Polysiphonia lanosa* can be found as an epiphyte on *A. nodosum*. On the rock and among the boulders are the winkles *Littorina littorea* and *Littorina saxatilis*, the crab *Carcinus maenas*, the barnacles *Semibalanus balanoides* and *Elminius modestus* and even the occasional mussel *Mytilus edulis*.

*Situation: On sheltered eulittoral rocky shores with variable salinity conditions, such as sea loch or estuaries.*

**Source** Connor, D.W., Allen, J.H., Golding, N., Howell, K.L., Lieberknecht, L.M., Northen, K.O. & Reker, J.B. (2004)

**Descriptive or diagnostic parameters**

Parameter	Value(s)
Altitude zones (terrestrial and marine):	Littoral (marine)
Depth zones (for marine habitats):	Upper shore; Mid-shore; Lower shore
Exposure characteristics:	Sheltered from wind action; Very sheltered from wind action; Extremely sheltered from wind action; Moderately strong tidal stream; Weak tidal stream; Very weak or no tidal stream; Sheltered from wave action; Very sheltered from wave action; Extremely sheltered from wave action
Substrate types:	Bedrock; Boulders (undefined); Cobbles (undefined)
Salinity levels:	Reduced salinity; Low salinity; Variable salinity

**EUNIS habitat code and names** A1.33 Red algal turf in lower eulittoral, sheltered from wave action

**Description**

Proposed new level 4 unit. More information required.

**Source** OSPAR/ICES/EEA (2000)

**Descriptive or diagnostic parameters**

Parameter	Value(s)
Altitude zones (terrestrial and marine):	Littoral (marine)
Depth zones (for marine habitats):	Lower shore

**EUNIS habitat code and names** A1.34 Mediterranean communities of lower mediolittoral rock sheltered from wave action

**Description**

No description available.

**Source** Barcelona Convention (1998)

**Descriptive or diagnostic parameters**

Parameter	Value(s)
Altitude zones (terrestrial and marine):	Littoral (marine)
Depth zones (for marine habitats):	Lower shore
Salinity levels:	Fully saline

**EUNIS habitat code and names** A1.4 Features of littoral rock

**Description**

Littoral rock features include rockpools (A1.41, A1.42), ephemeral algae (A1.45) and caves (A1.44) in the intertidal zone (the area of the shore between high and low tides). These features are present throughout the littoral rock zone from the upper limit at the top of the lichen zone and the lower limit by the top of the laminarian kelp zone. These features can be found on most rocky shores regardless of wave exposure. Lichens can be found in the supralittoral zone on shores with suitable substratum. The lichen band is wider and more distinct on more exposed shores. Rockpools occur where the topography of the shore allows seawater to be retained within depressions in the bedrock producing 'pools' on the retreat of the tide. As these rockpool communities are permanently submerged they are not directly affected by height on the shore and normal rocky shore zonation patterns do not apply allowing species from the sublittoral to survive. Ephemeral seaweeds occur on disturbed littoral rock in the lower to upper shore. The shaded nature of caves and overhangs diminishes the amount of desiccation suffered by biota during periods of low tides which allows certain species to proliferate. In addition, the amount of scour, wave surge, sea spray and penetrating light determines the unique community assemblages found in upper, mid and lower shore caves, and on overhangs on the lower shore. Non-tidal areas irregularly exposed by wind action (hydrolittoral) with hard substrata are also included here. Note that lichens and algae crusts in the supralittoral zone are coastal habitats (B3.11).

**Source** Connor, D.W., Allen, J.H., Golding, N., Howell, K.L., Lieberknecht, L.M., Northen, K.O. & Reker, J.B. (2004)

#### Legal instruments

Legal instrument	Legally designated habitat	Code
EU Habitats Directive Annex I	Estuaries	1130
	Large shallow inlets and bays	1160
	Reefs	1170
	Submerged or partially submerged sea caves	8330

#### Descriptive or diagnostic parameters

Parameter	Value(s)
Altitude zones (terrestrial and marine):	Littoral (marine); Driftline
Depth zones (for marine habitats):	Upper shore; Mid-shore; Lower shore
Exposure characteristics:	Extremely exposed to wind action; Very exposed to wind action; Exposed to wind action; Moderately exposed to wind action; Sheltered from wind action; Very sheltered from wind action; Extremely sheltered from wind action; Tidal action; Extremely exposed to wave action; Very exposed to wave action; Exposed to wave action; Moderately exposed to wave action; Sheltered from wave action; Very sheltered from wave action; Extremely sheltered from wave action
Geomorphology or landform:	Coastal flat; Sea cave; Marine overhang; Rockpools
Substrate types:	Bedrock; Clay; Boulders (undefined); Very large non-mobile boulders; Large non-mobile boulders; Small non-mobile boulders; Non-mobile cobbles
Salinity levels:	Fully saline; Reduced salinity; Low salinity; Variable salinity

### EUNIS habitat code and names A1.41 Communities of littoral rockpools

#### Description

Rockpools occur where the topography of the shore allows seawater to be retained within depressions in the bedrock producing 'pools' on the retreat of the tide. As these rockpool communities are permanently submerged they are not directly affected by height on the shore and normal rocky shore zonation patterns do not apply. For this reason rockpools have been dealt with as a separate habitat type, apart from the scheme of wave exposure and shore height. Four main rockpool biotopes have been described, and although it is accepted that an enormous variety of rockpool communities exist, it is hoped that these biotope descriptions are broad enough to adequately encompass most types. It would be meaningless to include the characterising species in a description at the habitat type level. Rockpools on the upper shore which are subject to rainwater influence and wide fluctuations in temperature are included in A1.42. Shallow rockpools in the mid to upper shore characterised by encrusting coralline algae and *Corallina officinalis* (A1.411); several variants of these coralline pools occur in south-west Britain and Ireland (A1.4112, A1.4113 and A1.4114). Deeper rockpools on the mid to lower shore can support fucoids and some sublittoral species such as kelp (A1.412). Those rockpools influenced by the presence of sand are characterised by sand-tolerant seaweed such as *Furcellaria lumbricalis* and *Polyides rotundus* (A1.413). Where more stable sand occurs in the base of the rockpool sea-grass beds can occur. Shallow rockpools on mixed cobbles, pebbles, gravel and sand may be characterised by hydroids (A1.414). A very rough guideline to the terms "shallow" and "deep" rockpools: "shallow" rockpools do not support kelp, whereas "deep" rockpools do. A1.41 does not include shallow standing water on compacted sediment or mixed substrata. Situation: Rockpools occur in the littoral zone where the topography of the shore allows seawater to be retained within depressions in the bedrock producing 'pools' on the retreat of the tide.

**Source** Connor, D.W., Allen, J.H., Golding, N., Howell, K.L., Lieberknecht, L.M., Northen, K.O. & Reker, J.B. (2004)

#### Descriptive or diagnostic parameters

Parameter	Value(s)
Altitude zones (terrestrial and marine):	Littoral (marine)
Depth zones (for marine habitats):	Upper shore; Mid-shore; Lower shore
Exposure characteristics:	Very exposed to wind action; Exposed to wind action; Moderately exposed to

Geomorphology or landform:	wind action; Sheltered from wind action; Very exposed to wave action; Exposed to wave action; Moderately exposed to wave action; Sheltered from wave action
Substrate types:	Rockpools
Salinity levels:	Bedrock
	Fully saline; Variable salinity

**EUNIS habitat code and names** A1.42 Communities of rockpools in the supralittoral zone

**Description**

Rockpools in the littoral fringe or upper eulittoral zone subject to widely fluctuating temperatures and salinity due to rainwater influence are characterised by ephemeral green alga of the genus *Enteromorpha*, along with *Cladophora* spp. and *Ulva lactuca*.

**Source** Connor, D.W., Allen, J.H., Golding, N., Howell, K.L., Lieberknecht, L.M., Northen, K.O. & Reker, J.B. (2004)

**Descriptive or diagnostic parameters**

Parameter	Value(s)
Altitude zones (terrestrial and marine):	Littoral (marine)
Depth zones (for marine habitats):	Upper shore
Exposure characteristics:	Very exposed to wind action; Exposed to wind action; Moderately exposed to wind action; Sheltered from wind action; Very exposed to wave action; Exposed to wave action; Moderately exposed to wave action; Sheltered from wave action
Salinity levels:	Fully saline; Variable salinity

**EUNIS habitat code and names** A1.43 Brackish permanent pools in the geolittoral zone

**Description**

No description available.

**Source** Helsinki Commission (1998)

**Descriptive or diagnostic parameters**

Parameter	Value(s)
Altitude zones (terrestrial and marine):	Littoral (marine)
Characteristics of wetness or dryness:	Infrequently submerged
Salinity levels:	High salinity in a brackish water body; Medium salinity in a brackish water body; Low salinity in a brackish water body; Very low salinity in a brackish water body

**EUNIS habitat code and names** A1.44 Communities of littoral caves and overhangs

**Description**

Where caves and overhangs occur on rocky shores, the shaded nature of the habitat diminishes the amount of desiccation suffered by biota during periods of low tides which allows certain species to proliferate. In addition, the amount of scour, wave surge, sea spray and penetrating light determines the unique community assemblages found in upper, mid and lower shore caves and overhangs on the lower shore. Biotopes from the surrounding shore such as A1.111, A1.113 or any of the furoid communities occasionally extend into cave entrances. A1.113 often extends some way into the cave. Other open shore biotopes may also be found within caves, such as the green seaweed *Prasiola stipitata* on cave roofs where birds roost (B3.112), and localised patches of green algae where freshwater seepage influences the rock (A1.451). Rockpools containing encrusting coralline algae (A1.411), furoids and kelp (A1.412) and hydroids and littorinid molluscs may occur also on the floor of cave entrances. The cave biotope descriptions are largely based on data obtained from surveys of Berwickshire caves (ERT,2000), chalk caves from the Thanet coast (Tittley *et al*, 1998; Tittley & Spurrier 2001) and data from Wales (CCW Phase 1 data). In general, the biomass and diversity of algal species found in upper and mid-shore littoral caves decreases with increasing depth into the cave as the light levels diminish. Furoids are usually only found at the entrances to caves, but red algae, and filamentous and encrusting green algae are able to penetrate to lower light intensities towards the back of the cave, and mats of the turf forming red seaweed *Audouinella purpurea* and/or patches of the green seaweed *Cladophora rupestris* may occur on the upper walls (A1.444). Brownish velvety growths of the brown algae *Pilinia maritima* occurring in mats with the red alga *A. purpurea* on cave walls and upper littoral levels of cliffs (A1.443) should not be confused with the green (A1.442) or golden brown algal stains often found above this zone on the ceilings of the caves (A1.443; A1.441). Below is a zone of *Verrucaria mucosa* and/or *Hildenbrandia rubra* on the inner and outer reaches (A1.445). Fauna usually only occur on the lower and mid walls of the caves and generally comprise barnacles, anemones and tube-forming polychaetes (A1.448; A1.449) depending on the level of boulder scour or wave surge. Where the floors of caves consist of mobile cobbles and small boulders, little algae and fauna occur due to the effects of scouring (A1.44A). Vertical or steeply sloping cave walls and overhangs on the mid and lower shore, subject to wave-



surge but without scour, support a rich biota of sponges, hydroids, ascidians and shade-tolerant red algae (A1.447, A1.446 or A1.4461).

Situation: Caves and overhangs in the littoral zone in hard rock and limestone (including chalk).

**Source** Connor, D.W., Allen, J.H., Golding, N., Howell, K.L., Lieberknecht, L.M., Northen, K.O. & Reker, J.B. (2004)

#### Legal instruments

<u>Legal instrument</u>	<u>Legally designated habitat</u>	<u>Code</u>
EU Habitats Directive Annex I	Submerged or partially submerged sea caves	8330

#### Descriptive or diagnostic parameters

<b>Parameter</b>	<b>Value(s)</b>
Altitude zones (terrestrial and marine):	Littoral (marine); Supralittoral
Depth zones (for marine habitats):	Upper shore; Mid-shore; Lower shore
Exposure characteristics:	Very exposed to wind action; Exposed to wind action; Moderately exposed to wind action; Sheltered from wind action; Very sheltered from wind action; Very exposed to wave action; Exposed to wave action; Moderately exposed to wave action; Sheltered from wave action; Very sheltered from wave action
Substrate types:	Bedrock
Salinity levels:	Fully saline; Variable salinity

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### EUNIS habitat code and names A1.45 Ephemeral green or red seaweeds (freshwater or sand-influenced) on non-mobile substrata

#### Description

Ephemeral seaweeds on disturbed littoral rock in the lower to upper shore. Dominant green seaweeds include *Enteromorpha intestinalis*, *Ulva lactuca* and the red seaweeds *Rhodothamniella floridula* and *Porphyra purpurea*. Winkles such as *Littorina littorea* and *Littorina saxatilis*, the limpet *Patella vulgata* and the barnacles *Semibalanus balanoides* can occur, though usually in low abundance. The crab *Carcinus maenas* can be found where boulders are present, while the barnacle *Elminius modestus* is usually present on sites subject to variable salinity. On moderately exposed shores, the biotope is *Enteromorpha* spp. on freshwater-influenced or unstable upper shore rock (A1.451) or *P. purpurea* and/or *Enteromorpha* spp. on sand-scoured mid to lower eulittoral rock (A1.452). These are biotopes with a low species diversity and the relatively high number of species in the characterising species list are due to a variation in the species composition from site to site, not to high species richness on individual sites.

Situation: This habitat type occurs the splash zone, sometimes on cliff faces, and throughout the main intertidal zone.

Note: Connor et al (2004) classify this habitat type together with A2.43 and A2.82 as LR.ELR.Eph.

**Source** Connor, D.W., Allen, J.H., Golding, N., Howell, K.L., Lieberknecht, L.M., Northen, K.O. & Reker, J.B. (2004)

#### Descriptive or diagnostic parameters

<b>Parameter</b>	<b>Value(s)</b>
Altitude zones (terrestrial and marine):	Littoral (marine)
Depth zones (for marine habitats):	Upper shore; Mid-shore
Exposure characteristics:	Very exposed to wind action; Exposed to wind action; Moderately exposed to wind action; Sheltered from wind action; Very sheltered from wind action; Extremely sheltered from wind action; Very exposed to wave action; Exposed to wave action; Moderately exposed to wave action; Sheltered from wave action; Very sheltered from wave action; Extremely sheltered from wave action
Substrate types:	Bedrock; Boulders (undefined)
Salinity levels:	Fully saline; Variable salinity

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### EUNIS habitat code and names A1.46 Hydrolittoral soft rock

#### Description

No description available.

**Source** Helsinki Commission (1998)

#### Descriptive or diagnostic parameters

<b>Parameter</b>	<b>Value(s)</b>
Altitude zones (terrestrial and marine):	Littoral (marine)
Salinity levels:	Low salinity

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### EUNIS habitat code and names A1.47 Hydrolittoral solid rock (bedrock)

#### Description

No description available.

**Source** Helsinki Commission (1998)

**Descriptive or diagnostic parameters**

Parameter	Value(s)
Altitude zones (terrestrial and marine):	Littoral (marine)
Salinity levels:	Low salinity

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**EUNIS habitat code and names** A1.48 Hydrolittoral hard clay

**Description**

No description available.

**Source** Helsinki Commission (1998)

**Descriptive or diagnostic parameters**

Parameter	Value(s)
Altitude zones (terrestrial and marine):	Littoral (marine)
Salinity levels:	Low salinity

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**EUNIS habitat code and names** A1.49 Hydrolittoral mussel beds

**Description**

No description available.

**Source** Helsinki Commission (1998)

**Descriptive or diagnostic parameters**

Parameter	Value(s)
Altitude zones (terrestrial and marine):	Littoral (marine)
Salinity levels:	Low salinity

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**EUNIS habitat code and names** A1.4A Hydrolittoral peat

**Description**

No description available.

**Source** Helsinki Commission (1998)

**Descriptive or diagnostic parameters**

Parameter	Value(s)
Altitude zones (terrestrial and marine):	Littoral (marine)
Salinity levels:	Low salinity

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**EUNIS habitat code and names** A2 Littoral sediment

**Description**

Littoral sediment includes habitats of shingle (mobile cobbles and pebbles), gravel, sand and mud or any combination of these which occur in the intertidal zone. Littoral sediment is defined further using descriptions of particle sizes - mainly gravel (16-4 mm), coarse sand (4-1 mm), medium sand (1-0.25 mm), fine sand (0.25-0.063 mm) and mud (less than 0.063 mm) and various admixtures of these (and coarser) grades - muddy sand, sandy mud and mixed sediment (cobbles, gravel, sand and mud together). Littoral sediments support communities tolerant to some degree of drainage at low tide and often subject to variation in air temperature and reduced salinity in estuarine situations. Very coarse sediments tend to support few macrofaunal species because these sediments tend to be mobile and subject to a high degree of drying when exposed at low tide. Finer sediments tend to be more stable and retain some water between high tides, and therefore support a greater diversity of species. Medium and fine sand shores usually support a range of oligochaetes, polychaetes, and burrowing crustaceans, and even more stable muddy sand shores also support a range of bivalves. Very fine and cohesive sediment (mud) tends to have a lower species diversity, because oxygen cannot penetrate far below the sediment surface. A black, anoxic layer of sediment develops under these circumstances, which may extend to the sediment surface and in which few species can survive. Some intertidal sediments are dominated by angiosperms, e.g. eelgrass (*Zostera noltii*) beds on the mid and upper shore of muddy sand flats, or saltmarshes which develop on the extreme upper shore of sheltered fine sediment flats.

Situation: Littoral sediments are found across the entire intertidal zone, including the strandline. Sediment biotopes can extend further landwards (dune systems, marshes) and further seawards (sublittoral sediments). Sediment shores are generally found along relatively more sheltered stretches of coast compared to rocky shores. Muddy shores or muddy sand shores occur mainly in very sheltered inlets and along estuaries, where wave exposure is low enough to allow fine sediments to settle. Sandy shores and coarser sediment (gravel, pebbles, cobbles) shores are found in areas subject to higher wave exposures.

Temporal variation: Littoral sediment environments can change markedly over seasonal cycles, with sediment

being eroded during winter storms and accreted during calmer summer months. The particle size structure of the sediment may change from finer to coarser during winter months, as finer sediment gets resuspended in seasonal exposed conditions. This may affect the sediment infauna, with some species only present in summer when sediments are more stable. These changes are most likely to affect sandy shores on relatively open shores. Sheltered muddy shores are likely to be more stable throughout the year, but may have a seasonal cover of green seaweeds during the summer period, particularly in nutrient enriched areas or where there is freshwater input.

**Source** Connor, D.W., Allen, J.H., Golding, N., Howell, K.L., Lieberknecht, L.M., Northen, K.O. & Reker, J.B. (2004)

**Descriptive or diagnostic parameters**

<b>Parameter</b>	<b>Value(s)</b>
Altitude zones (terrestrial and marine):	Littoral (marine)
Depth zones (for marine habitats):	Upper shore; Mid-shore; Lower shore
Exposure characteristics:	Very exposed to wind action; Exposed to wind action; Moderately exposed to wind action; Sheltered from wind action; Very sheltered from wind action; Extremely sheltered from wind action; Very exposed to wave action; Exposed to wave action; Moderately exposed to wave action; Sheltered from wave action; Very sheltered from wave action; Extremely sheltered from wave action
Geomorphology or landform:	Beach; Coastal flat; Lagoon
Characteristics of wetness or dryness:	Aquatic; Frequently submerged
Substrate types:	Mobile; Mobile cobbles; Pebbles; Gravel; Mobile shingle; Sand; Muddy sand; Mud, Silt; Biogenic; Peat; Shells; Mixed; Rock, Sand, Gravel; Pebbles, Cobbles; Sand, Gravel; Mud, Sand, Gravel; Mud, Gravel; Mud, Sand; Sand, Organic
Salinity levels:	Fully saline; Reduced salinity; Low salinity; Variable salinity

**EUNIS habitat code and names** A2.1 Littoral coarse sediment

**Description**

Littoral coarse sediments include shores of mobile pebbles, cobbles and gravel, sometimes with varying amounts of coarse sand. The sediment is highly mobile and subject to high degrees of drying between tides. As a result, few species are able to survive in this environment. Beaches of mobile cobbles and pebbles tend to be devoid of macroinfauna, while gravelly shores may support limited numbers of crustaceans, such as *Pectenogammarus planicrurus*.

**Situation:** Littoral coarse sediments are found along relatively exposed open shores, where wave action prevents finer sediments from settling. Coarse sediments may also be present on the upper parts of shores where there are more stable, sandy biotopes on the lower and mid shore.

**Temporal variation:** The sediment particle size structure may vary seasonally, with relatively finer sediments able to settle during calmer conditions in summer. Where the sediment grain size is very large (at the interface between sediment and boulder shores), cobbles may be mobile during exposed winter conditions, but stable enough during summer months to support limited juvenile rocky shore epifauna (e.g. juvenile barnacles).

**Source** Connor, D.W., Allen, J.H., Golding, N., Howell, K.L., Lieberknecht, L.M., Northen, K.O. & Reker, J.B. (2004)

**Legal instruments**

<u>Legal instrument</u>	<u>Legally designated habitat</u>	<u>Code</u>
EU Habitats Directive Annex I	Estuaries	1130
	Mudflats and sandflats not covered by seawater at low tide	1140
	Large shallow inlets and bays	1160

**Descriptive or diagnostic parameters**

<b>Parameter</b>	<b>Value(s)</b>
Altitude zones (terrestrial and marine):	Littoral (marine)
Depth zones (for marine habitats):	Upper shore; Mid-shore; Lower shore
Exposure characteristics:	Exposed to wind action; Moderately exposed to wind action; Tidal action; Exposed to wave action; Moderately exposed to wave action
Geomorphology or landform:	Beach; Coastal flat; Lagoon
Characteristics of wetness or dryness:	Aquatic; Frequently submerged
Substrate types:	Mobile; Mobile cobbles; Pebbles; Gravel; Mobile shingle; Sand
Salinity levels:	Fully saline; Reduced salinity; Low salinity; Variable salinity

**EUNIS habitat code and names** A2.11 Shingle (pebble) and gravel shores

**Description**

Shores of shingle (mobile cobbles and pebbles) or coarse gravel, typically deposited as a result of onshore wave action and long-shore drift. The particle size tends to increase along the shore in the direction of the long-shore drift. As the sediment is very coarse and often quite mobile, it typically supports little marine life, other than opportunist amphipods and oligochaete worms. Summer growths of ephemeral green algae (*Enteromorpha* spp.) may develop.

**Source** Connor, D.W., Brazier, D.P., Hill, T.O., & Northen, K.O. (1997)

**Descriptive or diagnostic parameters**

<b>Parameter</b>	<b>Value(s)</b>
Altitude zones (terrestrial and marine):	Littoral (marine)
Depth zones (for marine habitats):	Upper shore; Mid-shore; Lower shore
Exposure characteristics:	Exposed to wind action; Moderately exposed to wind action; Exposed to wave action; Moderately exposed to wave action
Substrate types:	Gravel; Mobile shingle
Salinity levels:	Fully saline

**EUNIS habitat code and names** A2.12 Estuarine coarse sediment shores**Description**

Shores of coarse sediments (shingle, gravels and coarse sand) in the upper reaches of estuaries and other inlets (e.g. sealochs) which are subject to variable and reduced salinity conditions. The outflow of riverine freshwater at the heads of the inlets results in the washing out of fine particulate matter, leaving coarse sediments. These are typically species-poor and characterised by oligochaete worms (cf. A2.222).

**Source** Connor, D.W., Brazier, D.P., Hill, T.O., & Northen, K.O. (1997)

**Legal instruments**

<u>Legal instrument</u>	<u>Legally designated habitat</u>	<u>Code</u>
EU Habitats Directive Annex I	Estuaries	1130
Council of Europe Bern Convention Res. No. 4 1996	Estuaries	13.2

**Descriptive or diagnostic parameters**

<b>Parameter</b>	<b>Value(s)</b>
Altitude zones (terrestrial and marine):	Littoral (marine)
Depth zones (for marine habitats):	Upper shore; Mid-shore; Lower shore
Exposure characteristics:	Very sheltered from wind action; Extremely sheltered from wind action; Very strong tidal stream; Strong tidal stream; Moderately strong tidal stream; Very sheltered from wave action; Extremely sheltered from wave action
Substrate types:	Gravel; Mobile shingle
Salinity levels:	Reduced salinity; Variable salinity

**EUNIS habitat code and names** A2.13 Mediterranean communities of mediolittoral coarse detritic

bottoms

**Description**

No description available.

**Source** Barcelona Convention (1998)

**Descriptive or diagnostic parameters**

<b>Parameter</b>	<b>Value(s)</b>
Altitude zones (terrestrial and marine):	Littoral (marine)
Salinity levels:	Fully saline

**EUNIS habitat code and names** A2.2 Littoral sand and muddy sand**Description**

Shores comprising clean sands (coarse, medium or fine-grained) and muddy sands with up to 25% silt and clay fraction. Shells and stones may occasionally be present on the surface. The sand may be duned or rippled as a result of wave action or tidal currents. Littoral sands exhibit varying degrees of drying at low tide depending on the steepness of the shore, the sediment grade and the height on the shore. The more mobile sand shores are relatively impoverished (A2.22), with more species-rich communities of amphipods, polychaetes and, on the lower shore, bivalves developing with increasing stability in finer sand habitats (A2.23). Muddy sands (A2.24), the most stable within this habitat complex, contain the highest proportion of bivalves.

**Situation:** A strandline of talitrid amphipods (A2.211) typically develops at the top of the shore where decaying seaweed accumulates. Fully marine sandy shores occur along stretches of open coast, whilst muddy sands are often present in more sheltered lower estuarine conditions and may be subject to some freshwater influence.

**Temporal variation:** Littoral sandy shore environments can change markedly over seasonal cycles, with sediment being eroded during winter storms and accreted during calmer summer months. The particle size structure of the sediment may change from finer to coarser during winter months, as finer sediment gets resuspended in seasonal exposed conditions. This may affect the sediment infauna, with some species only present in summer when sediments are more stable. More sheltered muddy sand shores are likely to be more stable throughout the year, but may have a seasonal cover of green seaweeds during the summer period, particularly in nutrient

enriched areas or where there is freshwater input.

**Source** Connor, D.W., Allen, J.H., Golding, N., Howell, K.L., Lieberknecht, L.M., Northen, K.O. & Reker, J.B. (2004)

**Legal instruments**

<u>Legal instrument</u>	<u>Legally designated habitat</u>	<u>Code</u>
EU Habitats Directive Annex I	Estuaries	1130
	Mudflats and sandflats not covered by seawater at low tide	1140
	Coastal lagoons	1150
	Large shallow inlets and bays	1160
Council of Europe Bern Convention Res. No. 4 1996	Soft sediment littoral communities	11.27
	MUD FLATS AND SAND FLATS	14

**Descriptive or diagnostic parameters**

<b>Parameter</b>	<b>Value(s)</b>
Altitude zones (terrestrial and marine):	Littoral (marine); Driftline
Depth zones (for marine habitats):	Upper shore; Mid-shore; Lower shore
Exposure characteristics:	Exposed to wind action; Moderately exposed to wind action; Sheltered from wind action; Very sheltered from wind action; Tidal action; Exposed to wave action; Moderately exposed to wave action; Sheltered from wave action; Very sheltered from wave action
Geomorphology or landform:	Beach; Coastal flat; Lagoon
Characteristics of wetness or dryness:	Aquatic; Frequently submerged
Substrate types:	Mobile; Mobile shingle; Sand; Muddy sand
Salinity levels:	Fully saline; Variable salinity

**EUNIS habitat code and names A2.21 Strandline**

**Description**

The strandline is the shifting line of decomposing seaweed and debris which is typically left behind on sediment (and some rocky shores) at the upper extreme of the intertidal at each high tide. These ephemeral bands of seaweed often shelter communities of sandhoppers. A fauna of dense juvenile mussels may be found in sheltered firths, attached to algae on shores of pebbles, gravel, sand, mud and shell debris with a strandline of fucoid algae.

Situation: Strandlines may occur in bands along the upper extreme of any sediment shore and some rocky shores.

Temporal variation: Strandlines tend to be mobile, as they consist of driftlines of decomposing seaweed and other debris, which will decompose, and be shifted by the tide. The amount of debris washed up on strandlines, and hence the extent of the strandline, may vary significantly depending on factors such as recent storms or high tides.

**Source** Connor, D.W., Allen, J.H., Golding, N., Howell, K.L., Lieberknecht, L.M., Northen, K.O. & Reker, J.B. (2004)

**Legal instruments**

<u>Legal instrument</u>	<u>Legally designated habitat</u>	<u>Code</u>
Council of Europe Bern Convention Res. No. 4 1996	Soft sediment littoral communities	11.27
	MUD FLATS AND SAND FLATS	14

**Descriptive or diagnostic parameters**

<b>Parameter</b>	<b>Value(s)</b>
Altitude zones (terrestrial and marine):	Littoral (marine); Driftline
Depth zones (for marine habitats):	Upper shore; Mid-shore
Exposure characteristics:	Exposed to wind action; Moderately exposed to wind action; Sheltered from wind action; Very sheltered from wind action; Tidal action; Very strong tidal stream; Strong tidal stream; Moderately strong tidal stream; Exposed to wave action; Moderately exposed to wave action; Sheltered from wave action; Very sheltered from wave action
Substrate types:	Mobile shingle; Sand
Salinity levels:	Fully saline; Variable salinity

**EUNIS habitat code and names A2.22 Barren or amphipod-dominated mobile sand shores**

**Description**

Shores consisting of clean mobile sands (coarse, medium and some fine-grained), with little very fine sand, and no mud present. Shells and stones may occasionally be present on the surface. The sand may be duned or rippled as a result of wave action or tidal currents. The sands are non-cohesive, with low water retention, and thus subject to drying out between tides, especially on the upper shore and where the shore profile is steep. Most of these shores support a limited range of species, ranging from barren, highly mobile sands to more stable clean sands supporting communities of isopods, amphipods and a limited range of polychaetes. Species which can characterise mobile sand communities include *Scolecopsis squamata*, *Pontocrates arenarius*, *Bathyporeia pelagica*, *B. pilosa*, *Haustorius arenarius* and *Eurydice pulchra*. Situation: Mobile sand shores are typically

situated along open stretches of coastline, with a relatively high degree of wave exposure. Bands of gravel and shingle may be present on the upper shore of exposed beaches. Where the wave exposure is less, and the shore profile more shallow, mobile sand communities may also be present on the upper part of the shore, with more stable fine sand communities present lower down. A strandline of talitrid amphipods (A2.211) typically develops at the top of the shore where decaying seaweed accumulates.

Temporal variation: Mobile sand shores may show significant seasonal changes, with sediment accretion during calm summer periods and beach erosion during more stormy winter months. There may be a change in sediment particle size structure, with finer sediment grains washed out during winter months, leaving behind coarser sediments.

**Source** Connor, D.W., Allen, J.H., Golding, N., Howell, K.L., Lieberknecht, L.M., Northen, K.O. & Reker, J.B. (2004)

**Legal instruments**

<u>Legal instrument</u>	<u>Legally designated habitat</u>	<u>Code</u>
Council of Europe Bern Convention	Soft sediment littoral communities	11.27
Res. No. 4 1996	MUD FLATS AND SAND FLATS	14

**Descriptive or diagnostic parameters**

<b>Parameter</b>	<b>Value(s)</b>
Altitude zones (terrestrial and marine):	Littoral (marine)
Depth zones (for marine habitats):	Upper shore; Mid-shore; Lower shore
Exposure characteristics:	Exposed to wind action; Moderately exposed to wind action; Exposed to wave action; Moderately exposed to wave action
Substrate types:	Sand
Salinity levels:	Fully saline; Variable salinity

**EUNIS habitat code and names** A2.23 Polychaete/amphipod-dominated fine sand shores

**Description**

Shores of clean, medium to fine and very fine sand, with no coarse sand, gravel or mud present. Shells and stones may occasionally be present on the surface. The sand may be duned or rippled as a result of wave action or tidal currents. The degree of drying between tides is limited, and the sediment usually remains damp throughout the tidal cycle. Typically, no anoxic layer is present. Fine sand shores support a range of species including amphipods and polychaetes. On the lower shore, and where sediments are stable, bivalves such as *Angulus tenuis* may be present in large numbers. An exceptionally rich fine sand community has been recorded from very sheltered reduced salinity shores in Poole Harbour. Species recorded include *Anaitides maculata*, *Hediste diversicolor*, *Scoloplos armiger*, *Pygospio elegans*, *Tharyx killariensis*, oligochaetes, *Gammarus locusta*, *Hydrobia ulvae*, *Cerastoderma edule* and *Mya truncata*.

Situation: Fine sand communities may be present throughout the intertidal zone on moderately exposed beaches, or they may be present on the lower parts of the shore with mobile sand communities present along the upper shore. A strandline of talitrid amphipods (A2.211) typically develops at the top of the shore where decaying seaweed accumulates.

Temporal variation: Fine sand shores may show seasonal changes, with sediment accretion during calm summer periods and beach erosion during more stormy winter months. There may be a change in sediment particle size structure, with finer sediment grains washed out during winter months, leaving behind coarser sediments.

**Source** Connor, D.W., Allen, J.H., Golding, N., Howell, K.L., Lieberknecht, L.M., Northen, K.O. & Reker, J.B. (2004)

**Legal instruments**

<u>Legal instrument</u>	<u>Legally designated habitat</u>	<u>Code</u>
Council of Europe Bern Convention	Soft sediment littoral communities	11.27
Res. No. 4 1996	MUD FLATS AND SAND FLATS	14

**Descriptive or diagnostic parameters**

<b>Parameter</b>	<b>Value(s)</b>
Altitude zones (terrestrial and marine):	Littoral (marine); Driftline
Depth zones (for marine habitats):	Upper shore; Mid-shore; Lower shore
Exposure characteristics:	Moderately exposed to wind action; Sheltered from wind action; Moderately exposed to wave action; Sheltered from wave action
Substrate types:	Sand
Salinity levels:	Fully saline; Variable salinity

**EUNIS habitat code and names** A2.24 Polychaete/bivalve-dominated muddy sand shores

**Description**

Muddy sand or fine sand, often occurring as extensive intertidal flats on open coasts and in marine inlets. The sediment generally remains water-saturated during low water. The habitat may be subject to variable salinity conditions in marine inlets. An anoxic layer may be present below 5 cm of the sediment surface, sometimes seen in the worm casts on the surface. The infauna consists of a diverse range of amphipods, polychaetes, bivalves and gastropods.

Situation: Muddy sand communities are found predominantly on the mid and lower shore, though they may span the entire intertidal. Fine sand or mobile sand communities may be present on the upper shore with muddy sand communities present lower down. In sheltered mid estuarine conditions, muddy sand communities may be present on the upper part of the shore with mid estuarine muddy shore communities (A2.31) lower down.

**Source** Connor, D.W., Allen, J.H., Golding, N., Howell, K.L., Lieberknecht, L.M., Northen, K.O. & Reker, J.B. (2004)

**Legal instruments**

<u>Legal instrument</u>	<u>Legally designated habitat</u>	<u>Code</u>
EU Habitats Directive Annex I	Mudflats and sandflats not covered by seawater at low tide	1140
Council of Europe Bern Convention Res. No. 4 1996	Soft sediment littoral communities MUD FLATS AND SAND FLATS	11.27 14

**Descriptive or diagnostic parameters**

<b>Parameter</b>	<b>Value(s)</b>
Altitude zones (terrestrial and marine):	Littoral (marine); Driftline
Depth zones (for marine habitats):	Upper shore; Mid-shore; Lower shore
Exposure characteristics:	Moderately exposed to wind action; Sheltered from wind action; Very sheltered from wind action; Extremely sheltered from wind action; Moderately exposed to wave action; Sheltered from wave action; Very sheltered from wave action; Extremely sheltered from wave action
Substrate types:	Sand; Muddy sand
Salinity levels:	Fully saline; Reduced salinity; Variable salinity

**EUNIS habitat code and names** A2.25 Mediterranean communities of mediolittoral sands

**Description**

No description available.

**Source** Barcelona Convention (1998)

**Descriptive or diagnostic parameters**

<b>Parameter</b>	<b>Value(s)</b>
Depth zones (for marine habitats):	Mid-shore
Salinity levels:	Fully saline

**EUNIS habitat code and names** A2.3 Littoral mud

**Description**

Shores of fine particulate sediment, mostly in the silt and clay fraction (particle size less than 0.063 mm in diameter), though sandy mud may contain up to 40% sand (mostly very fine and fine sand). Littoral mud typically forms extensive mudflats, though dry compacted mud can form steep and even vertical structures, particularly at the top of the shore adjacent to saltmarshes. Little oxygen penetrates these cohesive sediments, and an anoxic layer is often present within millimetres of the sediment surface. Littoral mud can support communities characterised by polychaetes, bivalves and oligochaetes. Most muddy shores are subject to some freshwater influence, as most of them occur along the shores of estuaries. Mudflats on sheltered lower estuarine shores can support a rich infauna, whereas muddy shores at the extreme upper end of estuaries and which are subject to very low salinity often support very little infauna.

Situation: Muddy shores are principally found along the shores of estuaries where there is enough shelter from wave action to allow fine sediment to settle. Muddy shores may also be present in sheltered inlets, straits and embayments which are not part of major estuarine systems.

Temporal variation: *Enteromorpha* spp. and *Ulva lactuca* may form mats on the surface of the mud during the summer months, particularly in areas of nutrient enrichment or where there is significant freshwater influence.

**Source** Connor, D.W., Allen, J.H., Golding, N., Howell, K.L., Lieberknecht, L.M., Northen, K.O. & Reker, J.B. (2004)

**Legal instruments**

<u>Legal instrument</u>	<u>Legally designated habitat</u>	<u>Code</u>
EU Habitats Directive Annex I	Estuaries	1130
	Mudflats and sandflats not covered by seawater at low tide	1140
	Coastal lagoons	1150
	Large shallow inlets and bays	1160
Council of Europe Bern Convention Res. No. 4 1996	Soft sediment littoral communities MUD FLATS AND SAND FLATS	11.27 14

**Descriptive or diagnostic parameters**

<b>Parameter</b>	<b>Value(s)</b>
Altitude zones (terrestrial and marine):	Littoral (marine)
Depth zones (for marine habitats):	Upper shore; Mid-shore; Lower shore
Exposure characteristics:	Sheltered from wind action; Very sheltered from wind action; Extremely sheltered from wind action; Tidal action; Sheltered from wave action; Very sheltered from wave action; Extremely sheltered from wave action
Geomorphology or landform:	Coastal flat; Lagoon

Characteristics of wetness or dryness: Aquatic; Frequently submerged  
 Substrate types: Mobile; Muddy sand; Mud, Silt  
 Salinity levels: Fully saline; Reduced salinity; Low salinity; Variable salinity

**EUNIS habitat code and names** A2.31 Polychaete/bivalve-dominated mid estuarine mud shores  
**Description**

Mid estuarine shores of fine sediment, mostly in the silt and clay fraction (particle size less than 0.063 mm in diameter), though sandy mud may contain up to 40% sand (mostly very fine and fine sand). Littoral mud typically forms extensive mudflats, though dry compacted mud can form steep and even vertical structures, particularly at the top of the shore adjacent to saltmarshes. Little oxygen penetrates these cohesive sediments, and an anoxic layer is often present within millimetres of the sediment surface. Most mid estuarine muddy shores are subject to some freshwater influence, though at some locations more or less fully marine conditions may prevail. Mid estuarine muds support rich communities characterised by polychaetes, bivalves and oligochaetes.

Situation: Principally along mid estuarine shores. The mid estuarine communities may also be present in sheltered inlets, straits and embayments which are not part of major estuarine systems, though usually there is some freshwater influence.

Temporal variation: *Enteromorpha* spp. and *Ulva lactuca* may form mats on the surface of the mud during the summer months, particularly in areas of nutrient enrichment or where there is significant freshwater influence.

**Source** Connor, D.W., Allen, J.H., Golding, N., Howell, K.L., Lieberknecht, L.M., Northen, K.O. & Reker, J.B. (2004)

**Legal instruments**

Legal instrument	Legally designated habitat	Code
EU Habitats Directive Annex I	Mudflats and sandflats not covered by seawater at low tide	1140
Council of Europe Bern Convention Res. No. 4 1996	Soft sediment littoral communities MUD FLATS AND SAND FLATS	11.27 14

**Descriptive or diagnostic parameters**

Parameter	Value(s)
Altitude zones (terrestrial and marine):	Littoral (marine)
Depth zones (for marine habitats):	Upper shore; Mid-shore; Lower shore
Exposure characteristics:	Sheltered from wind action; Very sheltered from wind action; Extremely sheltered from wind action; Sheltered from wave action; Very sheltered from wave action; Extremely sheltered from wave action
Substrate types:	Muddy sand; Mud, Silt
Salinity levels:	Fully saline; Reduced salinity; Variable salinity

**EUNIS habitat code and names** A2.32 Polychaete/oligochaete-dominated upper estuarine mud shores

**Description**

Upper estuarine sandy mud and mud shores, in areas with significant freshwater influence. Littoral mud typically forms mudflats, though dry compacted mud can form steep and even vertical structures, particularly at the top of the shore adjacent to saltmarshes. Little oxygen penetrates these cohesive sediments, and an anoxic layer is often present within millimetres of the sediment surface. The upper estuarine mud communities support few infaunal species and are principally characterised by a restricted range of polychaetes and oligochaetes.

Situation: There are three oligochaete dominated upper estuarine mud biotopes. Of these three, A2.321 occurs the furthest towards the mid estuary, and possibly lower on the shore than the other two. A2.323 is the most extreme upper estuarine biotope, occurring at the head of estuaries where there is no strong river flow and hence conditions are very sheltered, and there is a very strong freshwater influence. Further towards the mid estuary, this biotope may occur at the top of the shore, with A2.3223 and A2.321 further down the shore.

Temporal variation: *Enteromorpha* spp. and *Ulva lactuca* may form mats on the surface of the mud during the summer months, particularly in areas of nutrient enrichment.

**Source** Connor, D.W., Allen, J.H., Golding, N., Howell, K.L., Lieberknecht, L.M., Northen, K.O. & Reker, J.B. (2004)

**Legal instruments**

Legal instrument	Legally designated habitat	Code
EU Habitats Directive Annex I	Mudflats and sandflats not covered by seawater at low tide	1140
Council of Europe Bern Convention Res. No. 4 1996	Soft sediment littoral communities MUD FLATS AND SAND FLATS	11.27 14

**Descriptive or diagnostic parameters**

Parameter	Value(s)
Altitude zones (terrestrial and marine):	Littoral (marine)
Depth zones (for marine habitats):	Upper shore; Mid-shore; Lower shore
Exposure characteristics:	Sheltered from wind action; Very sheltered from wind action; Extremely sheltered from wind action; Sheltered from wave action; Very sheltered from wave action; Extremely sheltered from wave action
Substrate types:	Muddy sand; Mud, Silt



Salinity levels: Reduced salinity; Variable salinity

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**EUNIS habitat code and names** A2.33 Marine mud shores

**Description**

Proposed new level 4 habitat to account for fully marine habitats in the Waddensea and elsewhere.

**Source** OSPAR (2004)

**Descriptive or diagnostic parameters**

Parameter	Value(s)
Altitude zones (terrestrial and marine):	Littoral (marine)
Depth zones (for marine habitats):	Mid-shore; Lower shore
Substrate types:	Mud, Silt
Salinity levels:	Fully saline

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**EUNIS habitat code and names** A2.34 English name: Mud shrimps in soft mud shores;  
Scientific

name: *Corophium* spp. in soft mud shores

**Description**

Proposed new unit. No description available.

**Source** OSPAR/ICES/EEA (2000)

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**EUNIS habitat code and names** A2.4 Littoral mixed sediments

**Description**

Shores of mixed sediments ranging from muds with gravel and sand components to mixed sediments with pebbles, gravels, sands and mud in more even proportions. By definition, mixed sediments are poorly sorted. Stable large cobbles or boulders may be present which support epibiota such as fucoids and green seaweeds more commonly found on rocky and boulder shores. Mixed sediments which are predominantly muddy tend to support infaunal communities which are similar to those of mud and sandy mud shores.

Situation: It is probable that there are broad transition areas between areas of mudflat or sandy mudflat, and mixed sediment biotopes where the sediment consists principally of mud but has significant proportions of gravel and sand mixed in. Gravelly mud may occur in patches on mudflats. Similarly, there is unlikely to be an easily defined boundary between areas of mixed sediment with stable cobbles and boulders, and boulder fields which fall into the rocky shore category.

**Source** Connor, D.W., Allen, J.H., Golding, N., Howell, K.L., Lieberknecht, L.M., Northen, K.O. & Reker, J.B. (2004)

**Legal instruments**

Legal instrument	Legally designated habitat	Code
EU Habitats Directive Annex I	Estuaries	1130
	Mudflats and sandflats not covered by seawater at low tide	1140
	Coastal lagoons	1150
	Large shallow inlets and bays	1160
Council of Europe Bern Convention Res. No. 4 1996	Soft sediment littoral communities	11.27
	MUD FLATS AND SAND FLATS	14

**Descriptive or diagnostic parameters**

Parameter	Value(s)
Altitude zones (terrestrial and marine):	Littoral (marine); Driftline
Depth zones (for marine habitats):	Upper shore; Mid-shore; Lower shore
Exposure characteristics:	Moderately exposed to wind action; Sheltered from wind action; Very sheltered from wind action; Extremely sheltered from wind action; Tidal action; Moderately exposed to wave action; Sheltered from wave action; Very sheltered from wave action; Extremely sheltered from wave action
Geomorphology or landform:	Beach; Coastal flat; Lagoon
Characteristics of wetness or dryness:	Aquatic; Frequently submerged
Substrate types:	Mobile; Pebbles; Gravel; Mixed; Rock, Sand, Gravel; Pebbles, Cobbles; Sand, Gravel; Mud, Sand, Gravel; Mud, Gravel; Mud, Sand; Sand, Organic
Salinity levels:	Fully saline; Reduced salinity; Low salinity; Variable salinity

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**EUNIS habitat code and names** A2.41 English name: Ragworm dominated gravelly sandy mud shores; Scientific name: *Hediste diversicolor* dominated gravelly sandy mud shores

### Description

Sheltered gravelly sandy mud, subject to reduced salinity, mainly on the mid and lower shore. The infaunal community is dominated by abundant ragworms *Hediste diversicolor*. Other species of the infauna vary for the sub-biotopes described. They include polychaetes such as *Pygospio elegans*, *Streblospio shrubsolii*, and *Manayunkia aestuarina*, oligochaetes such as *Heterochaeta costata* and *Tubificoides* spp., the mud shrimp *Corophium volutator*, the spire shell *Hydrobia ulvae*, the baltic tellin *Macoma balthica* and the peppery furrow shell *Scrobicularia plana*. Sub-biotopes described in A2.411 have equivalent communities in soft muddy sediments, but the sediment here is much firmer due to the gravel component. There are relatively few records in each sub-type, leading to uncertainty over the precise nature of the habitat, particularly regarding sediment type and salinity regime.

Situation: It is probable that there are broad transition areas between the sub-biotopes of A2.411, and the corresponding muddy sediment biotopes. The boundaries may be very indistinct, with the A2.411 groups present in patches of gravelly mud on areas of mudflat where the main biotopes are their corresponding mud or sandy mud biotopes. Given the small number of records for each of the sub-biotopes, their spatial distribution is still uncertain.

**Source** Connor, D.W., Allen, J.H., Golding, N., Howell, K.L., Lieberknecht, L.M., Northen, K.O. & Reker, J.B. (2004)

### Legal instruments

<u>Legal instrument</u>	<u>Legally designated habitat</u>	<u>Code</u>
Council of Europe Bern Convention Res. No. 4 1996	Soft sediment littoral communities MUD FLATS AND SAND FLATS	11.27 14

### Descriptive or diagnostic parameters

<b>Parameter</b>	<b>Value(s)</b>
Altitude zones (terrestrial and marine):	Littoral (marine); Driftline
Depth zones (for marine habitats):	Upper shore; Mid-shore; Lower shore
Exposure characteristics:	Sheltered from wind action; Very sheltered from wind action; Extremely sheltered from wind action; Sheltered from wave action; Very sheltered from wave action; Extremely sheltered from wave action
Substrate types:	Mixed; Mud, Sand, Gravel
Salinity levels:	Fully saline; Reduced salinity; Variable salinity

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## EUNIS habitat code and names A2.42 Species-rich mixed sediment shores

### Description

Sheltered mixed sediments, usually subject to variable salinity conditions. The infauna is very diverse, dominated by a range of polychaetes including *Exogone naidina*, *Sphaerosyllis taylori*, *Pygospio elegans*, *Chaetozone gibber*, *Cirriiformia tentaculata*, *Aphelochaeta marioni*, *Capitella capitata*, *Mediomastus fragilis*, and *Melinna palmata*. The oligochaete worms *Tubificoides benedii* and *T. pseudogaster* are abundant, as is the cockle *Cerastoderma edule*. A large range of amphipods may occur, including *Melita palmata*, *Microprotopus maculatus*, *Aora gracilis* and *Corophium volutator*. The bivalves *Abra alba* and *A. nitida* may occur. The barnacle *Elminius modestus* may be abundant where the sediment has stones on the surface.

Situation: Mid shore, lower shore, as extension of shallow sublittoral biotope.

**Source** Connor, D.W., Allen, J.H., Golding, N., Howell, K.L., Lieberknecht, L.M., Northen, K.O. & Reker, J.B. (2004)

### Legal instruments

<u>Legal instrument</u>	<u>Legally designated habitat</u>	<u>Code</u>
Council of Europe Bern Convention Res. No. 4 1996	Soft sediment littoral communities MUD FLATS AND SAND FLATS	11.27 14

### Descriptive or diagnostic parameters

<b>Parameter</b>	<b>Value(s)</b>
Altitude zones (terrestrial and marine):	Littoral (marine)
Depth zones (for marine habitats):	Mid-shore; Lower shore
Exposure characteristics:	Very sheltered from wind action; Extremely sheltered from wind action; Very sheltered from wave action; Extremely sheltered from wave action
Substrate types:	Mixed
Salinity levels:	Variable salinity

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## EUNIS habitat code and names A2.43 Species-poor mixed sediment shores

### Description

Eulittoral mixed substrata where the substratum is too mobile or disturbed to support a seaweed community (A2.431). This is a biotope with a low species diversity and the relatively high number of species in the characterising species list are due to a variation in the species composition from site to site, not to high species richness on individual sites.

Note: Connor et al (2004) classify this habitat type together with A1.45 and A2.82 as LR.ELR.Eph.

**Source** Connor, D.W., Allen, J.H., Golding, N., Howell, K.L., Lieberknecht, L.M., Northen, K.O. & Reker, J.B. (2004)

## Descriptive or diagnostic parameters

Parameter	Value(s)
Altitude zones (terrestrial and marine):	Littoral (marine)
Depth zones (for marine habitats):	Upper shore; Mid-shore; Lower shore
Exposure characteristics:	Sheltered from wind action; Very sheltered from wind action; Extremely sheltered from wind action; Sheltered from wave action; Very sheltered from wave action; Extremely sheltered from wave action
Substrate types:	Mixed
Salinity levels:	Fully saline; Variable salinity

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## EUNIS habitat code and names A2.5 Coastal saltmarshes and saline reedbeds

### Description

Angiosperm-dominated stands of vegetation, occurring on the extreme upper shore of sheltered coasts and periodically covered by high tides. The vegetation develops on a variety of sandy and muddy sediment types and may have admixtures of coarser material. The character of the saltmarsh communities is affected by height up the shore, resulting in a zonation pattern related to the degree or frequency of immersion in seawater.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004b)

### Legal instruments

Legal instrument	Legally designated habitat	Code
EU Habitats Directive Annex I	Estuaries	1130
	Coastal lagoons	1150
	Large shallow inlets and bays	1160
	Salicornia and other annuals colonizing mud and sand	1310
	Spartina swards ( <i>Spartinion maritimae</i> )	1320
	Atlantic salt meadows ( <i>Glauco-Puccinellietalia maritimae</i> )	1330
	Mediterranean salt meadows ( <i>Juncetalia maritimi</i> )	1410
	Mediterranean and thermo-Atlantic halophilous scrubs ( <i>Sarcocornetea fruticosi</i> )	1420
	Boreal Baltic coastal meadows	1630

## Descriptive or diagnostic parameters

Parameter	Value(s)
Altitude zones (terrestrial and marine):	Littoral (marine); Driftline
Depth zones (for marine habitats):	Upper shore; Mid-shore; Lower shore
Exposure characteristics:	Sheltered from wind action; Very sheltered from wind action; Extremely sheltered from wind action; Tidal action; Sheltered from wave action; Very sheltered from wave action; Extremely sheltered from wave action
Geomorphology or landform:	Coastal flat; Lagoon
Dominant life forms:	Angiosperms (in aquatic habitats); Terrestrial angiosperms (in aquatic habitats); Halophile species
Characteristics of wetness or dryness:	Aquatic; Frequently submerged
Substrate types:	Muddy sand; Mud, Silt; Mud, Sand, Gravel; Mud, Gravel; Mud, Sand
Salinity levels:	Fully saline; Reduced salinity; Low salinity; Variable salinity
Related phytosociological units:	<i>Aegopodium podagrariae</i> ; <i>Agropyron pungentis</i> ; <i>Agropyro-Artemision coerulescentis</i> ; <i>Armerion maritimae</i> ; <i>Arthrocnemion glauci</i> ; <i>Atriplicion littoralis</i> ; <i>Caricion fuscae</i> ; <i>Crypsidetalia aculeatae</i> ; <i>Cypero-Spergularion salinae</i> ; <i>Eleocharition uniglumis</i> ; <i>Frankenion pulverulentae</i> ; <i>Glauco maritimae-Juncion maritimi</i> ; <i>Glauco-Puccinellietalia</i> ; <i>Honckenyo-Crambion maritimae</i> ; <i>Hordeion marini</i> ; <i>Juncion maritimi</i> ; <i>Limoniastrion monopetali</i> ; <i>Limonion ferulacei</i> ; <i>Plantaginion crassifoliae</i> ; <i>Puccinellion limosae</i> ; <i>Puccinellion maritimae</i> ; <i>Puccinellion phryganodis</i> ; <i>Puccinellio-Spergularion salinae</i> ; <i>Romulion</i> ; <i>Saginetalia maritimae</i> ; <i>Saginetea maritimae</i> ; <i>Saginion maritimae</i> ; <i>Salicornietalia fruticosae</i> ; <i>Salicornion fruticosae</i> ; <i>Salicornion herbaceae</i> ; <i>Salicornion patulae</i> ; <i>Salicornio-Puccinellion</i> ; <i>Spartinion maritimae</i> ; <i>Suaedion braun-blanqueti</i> ; <i>Suaedion verae</i> ; <i>Thero-Atriplicion</i> ; <i>Thero-Salicornietalia</i> ; <i>Thero-Salicornietea</i> ; <i>Thero-Salicornion</i> ; <i>Thero-Suaedion</i> ; <i>Trifolion squamosi</i>

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## EUNIS habitat code and names A2.51 Saltmarsh driftlines

### Description

The top level of saltmarsh, not covered by all tides. Vigorous *Atriplex* spp., *Beta vulgaris*, *Elymus* spp., *Matricaria maritima* may be fertilized by drift decomposition.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004b)

## Descriptive or diagnostic parameters

Parameter	Value(s)
Altitude zones (terrestrial and marine):	Driftline
Geomorphology or landform:	Driftline
Dominant life forms:	Annual nitrophiles

Characteristics of wetness or dryness: Infrequently submerged

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**EUNIS habitat code and names** A2.52 Upper saltmarshes

**Description**

Salt scrubs with *Arthrocnemum*, *Halocnemum*, *Suaeda*. Stands, sometimes rather open of *Juncus acutus*, *Juncus maritimus*. Numerous other salt-tolerant species, some communities being quite species-rich.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004b)

**Descriptive or diagnostic parameters**

Parameter	Value(s)
Altitude zones (terrestrial and marine):	Littoral (marine)
Depth zones (for marine habitats):	Upper shore
Species richness (when used in criteria):	Species rich
Characteristics of wetness or dryness:	Infrequently submerged

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**EUNIS habitat code and names** A2.53 Mid-upper saltmarshes and saline and brackish reed, rush  
and sedge beds

**Description**

Closed saltmarsh meadows, more species-rich than in low-mid saltmarsh, dominated by graminoids *Blysmus rufus*, *Carex extensa*, *Festuca rubra*, *Juncus gerardii*, *Puccinellia* spp.; also *Armeria maritima*, *Artemisia maritima*, *Frankenia laevis*. Saline or brackish beds of *Hippuris tetraphylla*, *Juncus maritimus*, *Phragmites australis*.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004b)

**Descriptive or diagnostic parameters**

Parameter	Value(s)
Altitude zones (terrestrial and marine):	Littoral (marine)
Depth zones (for marine habitats):	Upper shore; Mid-shore
Species richness (when used in criteria):	monospecific; species poor
Characteristics of wetness or dryness:	Infrequently submerged

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**EUNIS habitat code and names** A2.54 Low-mid saltmarshes

**Description**

Saltmarshes with more or less closed angiosperm vegetation. Included are grassy salt meadows dominated by *Puccinellia festuciformis* or *Aeluropus litoralis* in the Mediterranean and by *Puccinellia maritima* in northern Europe. Also characteristic are *Glaux maritima*, *Halimone portulacoides*, *Limonium vulgare*, *Plantago maritima*.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004b)

**Descriptive or diagnostic parameters**

Parameter	Value(s)
Altitude zones (terrestrial and marine):	Littoral (marine)
Depth zones (for marine habitats):	Mid-shore; Lower shore
Cover characteristics (when used as criteria):	Vegetation >30%
Characteristics of wetness or dryness:	Frequently submerged

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**EUNIS habitat code and names** A2.55 Pioneer saltmarshes

**Description**

Saltmarshes at the lowest level of non-aquatic angiosperms; vegetation open and very species-poor, typically with *Salicornia* spp. or *Spartina* spp., less often with *Arthrocnemum* spp., *Aster tripolium*, *Sagina maritima*, *Salsola kali* or *Suaeda* spp.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004b)

**Descriptive or diagnostic parameters**

Parameter	Value(s)
Altitude zones (terrestrial and marine):	Littoral (marine)
Depth zones (for marine habitats):	Upper shore
Cover characteristics (when used as criteria):	Vegetation <30%
Characteristics of wetness or dryness:	Frequently submerged

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**EUNIS habitat code and names** A2.6 Littoral sediments dominated by aquatic angiosperms**Description**

Dominants are *Eleocharis acicularis*, *Eleocharis parvula*, *Zostera* spp.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004b)

**Legal instruments**

<u>Legal instrument</u>	<u>Legally designated habitat</u>	<u>Code</u>
EU Habitats Directive Annex I	Estuaries	1130
	Mudflats and sandflats not covered by seawater at low tide	1140
	Large shallow inlets and bays	1160

**Descriptive or diagnostic parameters**

<b>Parameter</b>	<b>Value(s)</b>
Altitude zones (terrestrial and marine):	Littoral (marine)
Exposure characteristics:	Sheltered from wind action; Very sheltered from wind action; Extremely sheltered from wind action; Tidal action; Sheltered from wave action; Very sheltered from wave action; Extremely sheltered from wave action
Geomorphology or landform:	Coastal flat; Lagoon
Dominant life forms:	Angiosperms (in aquatic habitats); Aquatic angiosperms; Halophile species
Characteristics of wetness or dryness:	Aquatic; Frequently submerged
Substrate types:	Mobile; Mobile cobbles; Pebbles; Gravel; Sand; Muddy sand; Mud; Silt; Biogenic; Peat; Shells; Mixed
Salinity levels:	Fully saline; Reduced salinity; Variable salinity
Related phytosociological units:	<i>Cymodoceion nodosae</i> ; <i>Ruppiaetea maritima</i> ; <i>Ruppion maritima</i> ; <i>Scirpion parvulae</i> ; <i>Zosterion marinae</i>

**EUNIS habitat code and names** A2.61 Seagrass beds on littoral sediments**Description**

Dominants are *Zostera* spp.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004b)

**Legal instruments**

<u>Legal instrument</u>	<u>Legally designated habitat</u>	<u>Code</u>
EU Habitats Directive Annex I	Mudflats and sandflats not covered by seawater at low tide	1140
Council of Europe Bern Convention Res. No. 4 1996	Sea-grass meadows	11.3

**Descriptive or diagnostic parameters**

<b>Parameter</b>	<b>Value(s)</b>
Altitude zones (terrestrial and marine):	Littoral (marine)
Depth zones (for marine habitats):	Mid-shore; Lower shore
Exposure characteristics:	Sheltered from wind action; Very sheltered from wind action; Extremely sheltered from wind action; Sheltered from wave action; Very sheltered from wave action; Extremely sheltered from wave action
Substrate types:	Muddy sand
Salinity levels:	Fully saline; Variable salinity

**EUNIS habitat code and names** A2.62 English name: Marine sedge beds; Scientific name: Marine *Cyperaceae* beds**Description**

Dominants are *Eleocharis acicularis*, *Eleocharis parvula*.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004b)

**EUNIS habitat code and names** A2.7 Littoral biogenic reefs**Description**

The Littoral Biogenic Reefs habitat contains two biological subtypes, littoral *Sabellaria* reefs (A2.71) and mixed sediment shores with mussels (A2.72), encompassing the littoral biotope dominated by the honeycomb worm *Sabellaria alveolata*, and littoral *Mytilus edulis*-dominated communities. *S. alveolata* can form honeycomb reefs on mid to lower shore on exposed coasts, where there is a plentiful supply of sediment. The underlying substratum may consist primarily of rock or stable cobbles and boulders, or of cobbles and boulders on sand. Mixed sediment shores characterised by beds of adult mussels *Mytilus edulis* occur principally on mid and lower eulittoral mixed substrata (mainly cobbles and pebbles on muddy sediments) in a wide range of exposure conditions. In high densities the mussels bind the substratum and provide a habitat for many infaunal and epifaunal species.

Temporal variation: *S. alveolata* reefs may be susceptible to storm damage in the winter, although they can regenerate remarkably quickly in a season as long as some adults are left as they facilitate the larval settlement. *S. alveolata* is tolerant to burial under sand for several weeks. Changes in desiccation over a period of time can cause part of the population to die. One of the mussel-dominated subtypes, A2.7212, could change to A2.7213 over time as pseudofaeces build up forming a layer of mud. This cannot happen where wave action or tidal streams wash away pseudofaeces and prevent a build up. In areas where mussel spat ("mussel crumble") settles on the surface shell layer of cockle beds, the mussel cover may be ephemeral.

**Source** Connor, D.W., Allen, J.H., Golding, N., Howell, K.L., Lieberknecht, L.M., Northen, K.O. & Reker, J.B. (2004)

#### Legal instruments

Legal instrument	Legally designated habitat	Code
EU Habitats Directive Annex I	Estuaries	1130
	Large shallow inlets and bays	1160
	Reefs	1170

#### Descriptive or diagnostic parameters

Parameter	Value(s)
Altitude zones (terrestrial and marine):	Littoral (marine)
Depth zones (for marine habitats):	Mid-shore; Lower shore
Exposure characteristics:	Exposed to wind action; Moderately exposed to wind action; Sheltered from wind action; Very sheltered from wind action; Tidal action; Moderately strong current; Weak current; Exposed to wave action; Moderately exposed to wave action; Sheltered from wave action; Very sheltered from wave action
Geomorphology or landform:	Beach; Coastal flat; Lagoon
Characteristics of wetness or dryness:	Aquatic; Frequently submerged
Substrate types:	Biogenic; Peat; Shells; Mixed
Salinity levels:	Fully saline; Variable salinity

**EUNIS habitat code and names** A2.71 English name: Littoral honeycomb worm reefs; Scientific name: Littoral *Sabellaria* reefs

#### Description

The sedentary polychaete *Sabellaria alveolata* (honeycomb worm) builds tubes from sand and shell. On exposed shores, where there is a plentiful supply of sediment, *S. alveolata* can form honeycomb reefs on boulders and low-lying bedrock on the mid to lower shore. These *S. alveolata* reefs are quite distinct from the mosaic of seaweeds and barnacles or red seaweeds (A1.2) generally associated with moderately exposed rocky shores though many of the same species are present. These include the anemone *Actinia equina*, the barnacles *Semibalanus balanoides* and *Elminius modestus*, the limpet *Patella vulgata*, the top shell *Gibbula cineraria* and the wrinkle *Littorina littorea*. The whelk *Nucella lapillus* and the mussel *Mytilus edulis* is also present on the boulders whereas the polychaete *Lanice conchilega* is restricted to the associated sediment areas. Scour resistant red seaweeds including *Palmaria palmata*, *Corallina officinalis*, *Mastocarpus stellatus*, *Chondrus crispus*, *Ceramium nodulosum*, *Osmundea pinnatifida*, *Polysiphonia* spp. and coralline crusts can also be present where suitable substrata exist. Brown and green seaweeds also present include *Fucus serratus*, *Fucus vesiculosus*, *Cladostephus spongiosus*, *Enteromorpha intestinalis* and *Ulva lactuca*.

Situation: Above A2.71 are biotopes dominated either by ephemeral seaweeds, such as *Enteromorpha* spp. and *Porphyra* spp. or the perennial wrack *Fucus vesiculosus* on mixed substrata (A1.213; A1.3132; A2.821; A1.452). Rockpool biotopes dominated by the red seaweed *Corallina officinalis* (A1.411), by wracks such as *Fucus* spp. or by kelp such as *Laminaria* spp. (A1.412) can usually be found above this biotope. Beneath this biotope is a community consisting of mixed scour-tolerant like the kelp *Laminaria digitata* and opportunistic foliose red seaweeds such as *Polyides rotundus* and *Ahnfeltia plicata* (A3.2111; A3.125; A3.127).

**Source** Connor, D.W., Allen, J.H., Golding, N., Howell, K.L., Lieberknecht, L.M., Northen, K.O. & Reker, J.B. (2004)

#### Descriptive or diagnostic parameters

Parameter	Value(s)
Altitude zones (terrestrial and marine):	Littoral (marine)
Depth zones (for marine habitats):	Mid-shore; Lower shore
Exposure characteristics:	Exposed to wind action; Moderately exposed to wind action; Exposed to wave action; Moderately exposed to wave action
Substrate types:	Bedrock; Boulders (undefined); Cobbles (undefined); Pebbles; Sand
Salinity levels:	Fully saline

**EUNIS habitat code and names** A2.72 English name: Littoral mussel beds on sediment; Scientific name: Littoral *Mytilus edulis* beds on sediment

#### Description

Sediment shores characterised by beds of adult mussels *Mytilus edulis* occur principally on mid and lower

eulittoral mixed substrata (mainly cobbles and pebbles on muddy sediments) in a wide range of exposure conditions. In high densities the mussels bind the substratum and provide a habitat for many infaunal and epifaunal species. This biotope is also found in lower shore tide-swept areas, such as in the tidal narrows of Scottish sealochs. A fauna of dense juvenile mussels may be found in sheltered firths, attached to algae on shores of pebbles, gravel, sand, mud and shell debris with a strandline of furoid algae.

Situation: High densities of juvenile mussels attached to seaweed have been recorded from sheltered shores of the Dornoch Firth and Moray Firth. Adult mussel beds can be found below a band of ephemeral green seaweeds (A2.821) on more exposed, predominantly rocky shores. On sheltered, predominantly rocky shores either a *F. vesiculosus* dominated biotope or a biotope dominated by the wrack *Ascophyllum nodosum* (A1.3132; A1.3142) can be found above or the barnacle dominated biotope (A1.1133).

Temporal variation: The temporal stability of mussel beds can vary a lot. Some beds are permanent, maintained by recruitment of spat in amongst adults. Other beds are ephemeral, an example of which are beds occurring at South America Skear where large amounts of spat settle intermittently on a cobble basement. The mussels rapidly build up mud, and are unable to remain attached to the stable cobbles. They are then liable to be washed away during gales. A second example of ephemeral mussel dominated biotopes occurs when mussel spat ("mussel crumble") settles on the superficial shell of cockle beds, such as is known to occur in the Burry Inlet.

**Source** Connor, D.W., Allen, J.H., Golding, N., Howell, K.L., Lieberknecht, L.M., Northen, K.O. & Reker, J.B. (2004)

**Legal instruments**

<u>Legal instrument</u>	<u>Legally designated habitat</u>	<u>Code</u>
Council of Europe Bern Convention Res. No. 4 1996	Sublittoral organogenic concretions	11.25

**Descriptive or diagnostic parameters**

<b>Parameter</b>	<b>Value(s)</b>
Altitude zones (terrestrial and marine):	Littoral (marine)
Depth zones (for marine habitats):	Mid-shore; Lower shore
Exposure characteristics:	Exposed to wind action; Moderately exposed to wind action; Sheltered from wind action; Very sheltered from wind action; Extremely sheltered from wind action; Exposed to wave action; Moderately exposed to wave action; Sheltered from wave action; Very sheltered from wave action; Extremely sheltered from wave action
Substrate types:	Boulders (undefined); Mud, Silt; Shells; Mixed; Rock, Sand, Gravel; Pebbles, Cobbles
Salinity levels:	Fully saline; Variable salinity

**EUNIS habitat code and names** A2.8 Features of littoral sediment

**Description**

Features of littoral sediment include littoral habitats characterised by the presence of gases or liquids bubbling or seeping through sediments (A2.81); areas which are characterised by pioneer or ephemeral red and green algae because of variations in salinity and/or siltation (A2.82); and sedimentary shores of non-tidal, reduced salinity waters which are below the mean water level and normally water-covered, but which are regularly or occasionally exposed by the action of wind (hydrolittoral zone in the Baltic) (A2.83-A2.87).

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004b)

**Descriptive or diagnostic parameters**

<b>Parameter</b>	<b>Value(s)</b>
Altitude zones (terrestrial and marine):	Littoral (marine)
Depth zones (for marine habitats):	Upper shore; Mid-shore; Lower shore
Exposure characteristics:	Sheltered from wind action; Very sheltered from wind action; Extremely sheltered from wind action; Sheltered from wave action; Very sheltered from wave action; Extremely sheltered from wave action
Salinity levels:	Low salinity; Variable salinity

**EUNIS habitat code and names** A2.81 Methane seeps in littoral sediments

**Description**

Proposed new unit. No description available.

**Source** OSPAR/ICES/EEA (2000)

**EUNIS habitat code and names** A2.82 Ephemeral green or red seaweeds (freshwater or sand-influenced) on mobile substrata

**Description**

Eulittoral mixed substrata subject to variations in salinity and/or siltation characterised by dense blankets of

ephemeral green and red seaweeds (A2.821). This is a biotope with a low species diversity and the relatively high number of species in the characterising species list are due to a variation in the species composition from site to site, not to high species richness on individual sites.

Note: Connor et al (2004) classify this habitat type together with A1.45 and A2.43 as LR.ELR.Eph.

**Source** Connor, D.W., Allen, J.H., Golding, N., Howell, K.L., Lieberknecht, L.M., Northen, K.O. & Reker, J.B. (2004)

**Descriptive or diagnostic parameters**

<b>Parameter</b>	<b>Value(s)</b>
Altitude zones (terrestrial and marine):	Littoral (marine)
Depth zones (for marine habitats):	Mid-shore
Exposure characteristics:	Sheltered from wind action; Very sheltered from wind action; Extremely sheltered from wind action; Sheltered from wave action; Very sheltered from wave action; Extremely sheltered from wave action
Substrate types:	Bedrock; Boulders (undefined)
Salinity levels:	Fully saline; Variable salinity

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**EUNIS habitat code and names** A2.83 Hydrolittoral stony substrata

**Description**

No description available.

**Source** Helsinki Commission (1998)

**Descriptive or diagnostic parameters**

<b>Parameter</b>	<b>Value(s)</b>
Altitude zones (terrestrial and marine):	Littoral (marine)
Salinity levels:	Low salinity

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**EUNIS habitat code and names** A2.84 Hydrolittoral gravel substrata

**Description**

No description available.

**Source** Helsinki Commission (1998)

**Descriptive or diagnostic parameters**

<b>Parameter</b>	<b>Value(s)</b>
Altitude zones (terrestrial and marine):	Littoral (marine)
Salinity levels:	Low salinity

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**EUNIS habitat code and names** A2.85 Hydrolittoral sandy substrata

**Description**

No description available.

**Source** Helsinki Commission (1998)

**Descriptive or diagnostic parameters**

<b>Parameter</b>	<b>Value(s)</b>
Altitude zones (terrestrial and marine):	Littoral (marine)
Salinity levels:	Low salinity

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**EUNIS habitat code and names** A2.86 Hydrolittoral muddy substrata

**Description**

No description available.

**Source** Helsinki Commission (1998)

**Descriptive or diagnostic parameters**

<b>Parameter</b>	<b>Value(s)</b>
Altitude zones (terrestrial and marine):	Littoral (marine)
Salinity levels:	Low salinity

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**EUNIS habitat code and names** A2.87 Hydrolittoral mixed sediment substrata;

**Description**

No description available.



**Source** Helsinki Commission (1998)

**Descriptive or diagnostic parameters**

Parameter	Value(s)
Altitude zones (terrestrial and marine):	Littoral (marine)
Salinity levels:	Low salinity

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**EUNIS habitat code and names** A3      Infralittoral rock and other hard substrata

**Description**

Infralittoral rock includes habitats of bedrock, boulders and cobbles which occur in the shallow subtidal zone and typically support seaweed communities. The upper limit is marked by the top of the kelp zone whilst the lower limit is marked by the lower limit of kelp growth or the lower limit of dense seaweed growth. Infralittoral rock typically has an upper zone of dense kelp (forest) and a lower zone of sparse kelp (park), both with an understorey of erect seaweeds. In exposed conditions the kelp is *Laminaria hyperborea* whilst in more sheltered habitats it is usually *Laminaria saccharina*; other kelp species may dominate under certain conditions. On the extreme lower shore and in the very shallow subtidal (sublittoral fringe) there is usually a narrow band of dabberlocks *Alaria esculenta* (exposed coasts) or the kelps *Laminaria digitata* (moderately exposed) or *L. saccharina* (very sheltered). Areas of mixed ground, lacking stable rock, may lack kelps but support seaweed communities. In estuaries and other turbid-water areas the shallow subtidal may be dominated by animal communities, with only poorly developed seaweed communities.

**Source** Connor, D.W., Allen, J.H., Golding, N., Howell, K.L., Lieberknecht, L.M., Northen, K.O. & Reker, J.B. (2004)

**Legal instruments**

Legal instrument	Legally designated habitat	Code
Council of Europe Bern Convention Res. No. 4 1996	Sublittoral rocky seabeds and kelp forests	11.24

**Descriptive or diagnostic parameters**

Parameter	Value(s)
Altitude zones (terrestrial and marine):	Infralittoral (marine)
Depth zones (for marine habitats):	0 - 5m; 5 - 10m; 10 - 20m; 20 - 30m
Human activities and impacts:	Urbanised areas, human habitation, constructed artificial surfaces; Other industrial / commercial areas; Port areas
Exposure characteristics:	Extremely exposed to wind action; Very exposed to wind action; Exposed to wind action; Moderately exposed to wind action; Sheltered from wind action; Very sheltered from wind action; Extremely sheltered from wind action; Tidal action; Very strong tidal stream; Strong tidal stream; Moderately strong tidal stream; Weak tidal stream; Very weak or no tidal stream; Extremely exposed to wave action; Very exposed to wave action; Exposed to wave action; Moderately exposed to wave action; Sheltered from wave action; Very sheltered from wave action; Extremely sheltered from wave action
Geomorphology or landform:	Coastal flat; Reef; Open sea; Sea cave; Marine overhang; Surge gully; Submarine gas, oil or water vents and seeps
Substrate types:	Bedrock; Clay; Hard; Artificial hard; Boulders (undefined); Very large non-mobile boulders; Large non-mobile boulders; Small non-mobile boulders; Non-mobile cobbles; Cobbles (undefined); Mixed
Salinity levels:	Fully saline; Reduced salinity; Low salinity; Variable salinity

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**EUNIS habitat code and names** A3.1      Atlantic and Mediterranean high energy infralittoral rock

**Description**

Rocky habitats in the infralittoral zone subject to exposed to extremely exposed wave action or strong tidal streams. Typically the rock supports a community of kelp *Laminaria hyperborea* with foliose seaweeds and animals, the latter tending to become more prominent in areas of strongest water movement. The depth to which the kelp extends varies according to water clarity, exceptionally (e.g. St Kilda) reaching 45 m. The sublittoral fringe is characterised by dabberlocks *Alaria esculenta*.

**Source** Connor, D.W., Allen, J.H., Golding, N., Howell, K.L., Lieberknecht, L.M., Northen, K.O. & Reker, J.B. (2004)

**Legal instruments**

Legal instrument	Legally designated habitat	Code
EU Habitats Directive Annex I	Large shallow inlets and bays	1160
	Reefs	1170
Council of Europe Bern Convention Res. No. 4 1996	Sublittoral rocky seabeds and kelp forests	11.24

**Descriptive or diagnostic parameters**

Parameter	Value(s)
Altitude zones (terrestrial and marine):	Infralittoral (marine)
Depth zones (for marine habitats):	0 - 5m; 5 - 10m; 10 - 20m; 20 - 30m

Human activities and impacts:	Urbanised areas, human habitation, constructed artificial surfaces; Other industrial / commercial areas; Port areas
Exposure characteristics:	Extremely exposed to wind action; Very exposed to wind action; Exposed to wind action; Moderately exposed to wind action; Moderately strong tidal stream; Weak tidal stream; Very weak or no tidal stream; Very strong current; Strong current; Extremely exposed to wave action; Very exposed to wave action; Exposed to wave action; Moderately exposed to wave action
Geomorphology or landform:	Reef; Open sea
Dominant life forms:	Foliose algae
Characteristics of wetness or dryness:	Aquatic
Substrate types:	Bedrock; Clay; Hard; Artificial hard; Boulders (undefined); Very large non-mobile boulders; Large non-mobile boulders; Small non-mobile boulders; Non-mobile cobbles
Salinity levels:	Fully saline

**EUNIS habitat code and names** A3.11 Kelp with cushion fauna and/or foliose red seaweeds

**Description**

Rocky habitats in the infralittoral zone subject to exposed to extremely exposed wave action or strong tidal streams. Typically the rock supports a community of kelp *Laminaria hyperborea* with foliose seaweeds and animals, the latter tending to become more prominent in areas of strongest water movement (A3.113, A3.115 and A3.1152). The depth to which the kelp extends varies according to water clarity, exceptionally (e.g. St Kilda) reaching 45 m. In some areas, there may be a band of dense foliose seaweeds (reds or browns) below the main kelp zone (A3.116). The sublittoral fringe is characterised by dabberlocks *Alaria esculenta* (A3.111). In very strong wave action the sublittoral fringe *A. esculenta* zone extends to 5 to 10 m depth, whilst at Rockall *A. esculenta* replaces *L. hyperborea* as the dominant kelp in the infralittoral zone (A3.112).

Situation: Very exposed rocky coasts, from low water to depths up to 45m.

Temporal variation: Winter storms may remove patches of kelp, and fast-growing annuals may form a temporary forest (A3.122).

**Source** Connor, D.W., Allen, J.H., Golding, N., Howell, K.L., Lieberknecht, L.M., Northen, K.O. & Reker, J.B. (2004)

**Legal instruments**

<u>Legal instrument</u>	<u>Legally designated habitat</u>	<u>Code</u>
Council of Europe Bern Convention Res. No. 4 1996	Sublittoral rocky seabeds and kelp forests	11.24

**Descriptive or diagnostic parameters**

<b>Parameter</b>	<b>Value(s)</b>
Altitude zones (terrestrial and marine):	Infralittoral (marine)
Depth zones (for marine habitats):	0 - 5m; 5 - 10m; 10 - 20m; 20 - 30m
Exposure characteristics:	Extremely exposed to wind action; Very exposed to wind action; Exposed to wind action; Moderately exposed to wind action; Moderately strong tidal stream; Weak tidal stream; Very weak or no tidal stream; Extremely exposed to wave action; Very exposed to wave action; Exposed to wave action; Moderately exposed to wave action
Substrate types:	Bedrock; Boulders (undefined); Large non-mobile boulders
Salinity levels:	Fully saline

**EUNIS habitat code and names** A3.12 Sediment-affected or disturbed kelp and seaweed communities

**Description**

Infralittoral rock habitats, subject to disturbance through mobility of the substratum (boulders or cobbles) or abrasion/covering by nearby coarse sediments or suspended particulate matter (sand). The associated communities can be quite variable in character, depending on the particular conditions, which prevail. The typical *Laminaria hyperborea* and red seaweed communities of stable open coast rocky habitats (A3.21) are replaced by those, which include more ephemeral species or those tolerant of sand and gravel abrasion. As such *Laminaria saccharina*, *Saccorhiza polyschides* or *Halidrys siliquosa* may be prominent components of the community.

**Source** Connor, D.W., Allen, J.H., Golding, N., Howell, K.L., Lieberknecht, L.M., Northen, K.O. & Reker, J.B. (2004)

**Legal instruments**

<u>Legal instrument</u>	<u>Legally designated habitat</u>	<u>Code</u>
Council of Europe Bern Convention Res. No. 4 1996	Sublittoral rocky seabeds and kelp forests	11.24

**Descriptive or diagnostic parameters**

<b>Parameter</b>	<b>Value(s)</b>
Altitude zones (terrestrial and marine):	Infralittoral (marine)
Depth zones (for marine habitats):	0 - 5m; 5 - 10m; 10 - 20m
Exposure characteristics:	Exposed to wind action; Moderately exposed to wind action; Sheltered from

Substrate types: wind action; Moderately strong tidal stream; Weak tidal stream; Very weak or no tidal stream; Exposed to wave action; Moderately exposed to wave action; Sheltered from wave action  
 Salinity levels: Bedrock; Mobile rock  
 Fully saline

**EUNIS habitat code and names** A3.13 Mediterranean communities of infralittoral algae very exposed to wave action

**Description**

No description available.

**Source** Barcelona Convention (1998)

**Legal instruments**

<u>Legal instrument</u>	<u>Legally designated habitat</u>	<u>Code</u>
Council of Europe Bern Convention Res. No. 4 1996	Sublittoral rocky seabeds and kelp forests	11.24

**Descriptive or diagnostic parameters**

<b>Parameter</b>	<b>Value(s)</b>
Altitude zones (terrestrial and marine):	Infralittoral (marine)
Salinity levels:	Fully saline

**EUNIS habitat code and names** A3.14 Encrusting algal communities

**Description**

Proposed new unit. No description available.

**Source** OSPAR/ICES/EEA (2000)

**Descriptive or diagnostic parameters**

<b>Parameter</b>	<b>Value(s)</b>
Altitude zones (terrestrial and marine):	Infralittoral (marine)

**EUNIS habitat code and names** A3.15 Frondose algal communities (other than kelp)

**Description**

Proposed new unit. No description available.

**Source** OSPAR/ICES/EEA (2000)

**Descriptive or diagnostic parameters**

<b>Parameter</b>	<b>Value(s)</b>
Altitude zones (terrestrial and marine):	Infralittoral (marine)

**EUNIS habitat code and names** A3.2 Atlantic and Mediterranean moderate energy infralittoral rock

**Description**

Predominantly moderately wave-exposed bedrock and boulders, subject to moderately strong to weak tidal streams. On the bedrock and stable boulders there is typically a narrow band of kelp *Laminaria digitata* in the sublittoral fringe which lies above a *Laminaria hyperborea* forest and park. Associated with the kelp are communities of seaweeds, predominantly reds and including a greater variety of more delicate filamentous types than found on more exposed coasts (cf. A3.11).

**Source** Connor, D.W., Allen, J.H., Golding, N., Howell, K.L., Lieberknecht, L.M., Northen, K.O. & Reker, J.B. (2004)

**Legal instruments**

<u>Legal instrument</u>	<u>Legally designated habitat</u>	<u>Code</u>
EU Habitats Directive Annex I	Estuaries	1130
	Large shallow inlets and bays	1160
	Reefs	1170
Council of Europe Bern Convention Res. No. 4 1996	Sublittoral rocky seabeds and kelp forests	11.24

**Descriptive or diagnostic parameters**

<b>Parameter</b>	<b>Value(s)</b>
Altitude zones (terrestrial and marine):	Infralittoral (marine)
Depth zones (for marine habitats):	0 - 5m; 5 - 10m; 10 - 20m
Human activities and impacts:	Urbanised areas, human habitation, constructed artificial surfaces; Other

Exposure characteristics:	industrial / commercial areas; Port areas Exposed to wind action; Moderately exposed to wind action; Sheltered from wind action; Moderately strong tidal stream; Weak tidal stream; Very weak or no tidal stream; Moderately strong current; Exposed to wave action; Moderately exposed to wave action; Sheltered from wave action
Geomorphology or landform:	Reef; Open sea
Dominant life forms:	Foliose algae
Characteristics of wetness or dryness:	Aquatic
Substrate types:	Bedrock; Clay; Hard; Artificial hard; Boulders (undefined); Very large non-mobile boulders; Large non-mobile boulders; Small non-mobile boulders; Non-mobile cobbles
Salinity levels:	Fully saline; Variable salinity

**EUNIS habitat code and names**    A3.21    Kelp and red seaweeds (moderate energy infralittoral rock)

**Description**

Infralittoral rock subject to moderate wave exposure, or moderately strong tidal streams on more sheltered coasts. On bedrock and stable boulders there is typically a narrow band of kelp *Laminaria digitata* in the sublittoral fringe which lies above a *Laminaria hyperborea* forest and park. Associated with the kelp are communities of seaweeds, predominantly reds and including a greater variety of more delicate filamentous types than found on more exposed coasts (A3.11). The faunal component of the understorey is also less prominent than in A3.11.

**Source**    Connor, D.W., Allen, J.H., Golding, N., Howell, K.L., Lieberknecht, L.M., Northen, K.O. & Reker, J.B. (2004)

**Legal instruments**

<u>Legal instrument</u>	<u>Legally designated habitat</u>	<u>Code</u>
Council of Europe Bern Convention Res. No. 4 1996	Sublittoral rocky seabeds and kelp forests	11.24

**Descriptive or diagnostic parameters**

<b>Parameter</b>	<b>Value(s)</b>
Altitude zones (terrestrial and marine):	Infralittoral (marine)
Depth zones (for marine habitats):	0 - 5m; 5 - 10m; 10 - 20m
Exposure characteristics:	Exposed to wind action; Moderately exposed to wind action; Sheltered from wind action; Moderately strong tidal stream; Weak tidal stream; Very weak or no tidal stream; Exposed to wave action; Moderately exposed to wave action; Sheltered from wave action
Substrate types:	Bedrock; Boulders (undefined)
Salinity levels:	Fully saline

**EUNIS habitat code and names**    A3.22    Kelp and seaweed communities in tide-swept sheltered conditions

**Description**

Sheltered infralittoral rock exposed to strong tidal streams. In the sublittoral fringe dense *Laminaria digitata* is found together with erect seaweeds, sponges, ascidians and bryozoans (A3.221). Below this, on bedrock and stable boulders a canopy of mixed kelp (primarily *Laminaria hyperborea* and *Laminaria saccharina*) occurs with foliose red seaweeds, sponges and ascidians (A3.222). This biotope is typically found in the sheltered narrows and sills of Scottish sealochs. Mixed substrata of boulders, cobbles, pebbles and gravel, that also occurs in the tidal rapids of Scottish sealochs, supports a reduced kelp canopy (*L. hyperborea* and *L. saccharina*; typically Frequent), with a rich red seaweed component and maerl at some sites (A3.223). In south-west Britain, sheltered, tide-swept rock is restricted to estuarine conditions where variable salinity and increased turbidity of the water have a significant effect on the biota, limiting the infralittoral zone to very shallow depths. Unlike the tide-swept channels in sealochs, the rock in these estuaries is characterised by a relatively low abundance of *L. saccharina* (< Common) with foliose red seaweeds, sponges and ascidians (A3.224). *L. hyperborea* is rarely present.

**Source**    Connor, D.W., Allen, J.H., Golding, N., Howell, K.L., Lieberknecht, L.M., Northen, K.O. & Reker, J.B. (2004)

**Descriptive or diagnostic parameters**

<b>Parameter</b>	<b>Value(s)</b>
Altitude zones (terrestrial and marine):	Infralittoral (marine)
Depth zones (for marine habitats):	0 - 5m; 5 - 10m; 10 - 20m
Exposure characteristics:	Sheltered from wind action; Very sheltered from wind action; Extremely sheltered from wind action; Strong tidal stream; Moderately strong tidal stream; Weak tidal stream; Sheltered from wave action; Very sheltered from wave action; Extremely sheltered from wave action
Substrate types:	Bedrock; Boulders (undefined); Cobbles (undefined)

Salinity levels: Fully saline; Variable salinity

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**EUNIS habitat code and names** A3.23 Mediterranean communities of infralittoral algae moderately exposed to wave action

**Description**

No description available.

**Source** Barcelona Convention (1998)

**Legal instruments**

<u>Legal instrument</u>	<u>Legally designated habitat</u>	<u>Code</u>
EU Habitats Directive Annex I	Reefs	1170
Council of Europe Bern Convention Res. No. 4 1996	Sublittoral rocky seabeds and kelp forests	11.24

**Descriptive or diagnostic parameters**

<b>Parameter</b>	<b>Value(s)</b>
Altitude zones (terrestrial and marine):	Infralittoral (marine)
Salinity levels:	Fully saline

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**EUNIS habitat code and names** A3.24 Faunal communities on moderate energy infralittoral rock

**Description**

Added by CEH to accommodate level 5 units proposed at Southampton workshop

**Source** Davies, C.E. & Moss, D. (2002)

**Descriptive or diagnostic parameters**

<b>Parameter</b>	<b>Value(s)</b>
Altitude zones (terrestrial and marine):	Infralittoral (marine)

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**EUNIS habitat code and names** A3.3 Atlantic and Mediterranean low energy infralittoral rock

**Description**

Infralittoral rock in wave and tide-sheltered conditions, supporting silty communities with *Laminaria hyperborea* and/or *Laminaria saccharina* (A3.31). Associated seaweeds are typically silt-tolerant and include a high proportion of delicate filamentous types. In turbid-water estuarine areas, the kelp and seaweeds (A3.32) may be replaced by animal-dominated communities (A3.36) whilst stable hard substrata in lagoons support distinctive communities (A3.34).

**Source** Connor, D.W., Allen, J.H., Golding, N., Howell, K.L., Lieberknecht, L.M., Northen, K.O. & Reker, J.B. (2004)

**Legal instruments**

<u>Legal instrument</u>	<u>Legally designated habitat</u>	<u>Code</u>
EU Habitats Directive Annex I	Estuaries	1130
	Coastal lagoons	1150
	Large shallow inlets and bays	1160
	Reefs	1170
Council of Europe Bern Convention Res. No. 4 1996	Sublittoral rocky seabeds and kelp forests	11.24

**Descriptive or diagnostic parameters**

<b>Parameter</b>	<b>Value(s)</b>
Altitude zones (terrestrial and marine):	Infralittoral (marine)
Depth zones (for marine habitats):	0 - 5m; 5 - 10m; 10 - 20m
Human activities and impacts:	Urbanised areas, human habitation, constructed artificial surfaces; Other industrial / commercial areas; Port areas
Exposure characteristics:	Sheltered from wind action; Very sheltered from wind action; Extremely sheltered from wind action; Ultra sheltered from wind action; Moderately strong tidal stream; Weak tidal stream; Very weak or no tidal stream; Weak current; Very weak or no current; Sheltered from wave action; Very sheltered from wave action; Extremely sheltered from wave action; Ultra sheltered from wave action
Geomorphology or landform:	Reef; Open sea
Dominant life forms:	Foliose algae
Characteristics of wetness or dryness:	Aquatic
Substrate types:	Bedrock; Clay; Hard; Artificial hard; Boulders (undefined); Non-mobile cobbles
Salinity levels:	Fully saline; Variable salinity

EUNIS habitat **code and names** A3.31 Silted kelp on low energy infralittoral rock with full salinity

**Description**

Infralittoral rock in wave and tide-sheltered conditions, supporting silty communities with *Laminaria hyperborea* and/or *Laminaria saccharina*. Associated seaweeds are typically silt-tolerant and include a high proportion of delicate filamentous types. Some areas, particularly in the lower infralittoral zone, are subject to intense grazing by urchins and chitons and may have poorly developed seaweed communities.

**Source** Connor, D.W., Allen, J.H., Golding, N., Howell, K.L., Lieberknecht, L.M., Northen, K.O. & Reker, J.B. (2004)

**Legal instruments**

<u>Legal instrument</u>	<u>Legally designated habitat</u>	<u>Code</u>
Council of Europe Bern Convention Res. No. 4 1996	Sublittoral rocky seabeds and kelp forests	11.24

**Descriptive or diagnostic parameters**

<b>Parameter</b>	<b>Value(s)</b>
Altitude zones (terrestrial and marine):	Infralittoral (marine)
Depth zones (for marine habitats):	0 - 5m; 5 - 10m; 10 - 20m
Exposure characteristics:	Sheltered from wind action; Very sheltered from wind action; Extremely sheltered from wind action; Moderately strong tidal stream; Weak tidal stream; Very weak or no tidal stream; Sheltered from wave action; Very sheltered from wave action; Extremely sheltered from wave action
Substrate types:	Bedrock; Boulders (undefined); Cobbles (undefined); Mixed
Salinity levels:	Fully saline; Variable salinity

EUNIS habitat **code and names** A3.32 Kelp in variable salinity on low energy infralittoral rock

**Description**

Very wave-sheltered bedrock, boulders and cobbles subject to only weak tidal streams in the sublittoral fringe and infralittoral zone, in areas of variable/reduced salinity. This habitat type is characterised by the kelp *Laminaria saccharina* and coralline crusts such as *Lithothamnion glaciale*. Grazers such as the urchins *Psammechinus miliaris* and *Echinus esculentus*, and the gastropods *Gibbula cineraria* and *Buccinum undatum* may be present. The tube-dwelling polychaete *Pomatoceros triqueter*, the ascidians *Ciona intestinalis*, *Corella parallelogramma* and *Asciidiella scabra*, the barnacle *Balanus crenatus*, the starfish *Asterias rubens* and the brittlestar *Ophiothrix fragilis* may also be present. Red algal communities are composed primarily of *Phycodrys rubens*. The crabs *Carcinus maenas* and *Pagurus bernhardus*, and the bivalve *Modiolus modiolus* may also be observed.

**Source** Connor, D.W., Allen, J.H., Golding, N., Howell, K.L., Lieberknecht, L.M., Northen, K.O. & Reker, J.B. (2004)

**Legal instruments**

<u>Legal instrument</u>	<u>Legally designated habitat</u>	<u>Code</u>
Council of Europe Bern Convention Res. No. 4 1996	Sublittoral rocky seabeds and kelp forests	11.24

**Descriptive or diagnostic parameters**

<b>Parameter</b>	<b>Value(s)</b>
Altitude zones (terrestrial and marine):	Infralittoral (marine)
Depth zones (for marine habitats):	0 - 5m; 5 - 10m
Exposure characteristics:	Sheltered from wind action; Very sheltered from wind action; Extremely sheltered from wind action; Ultra sheltered from wind action; Weak tidal stream; Very weak or no tidal stream; Sheltered from wave action; Very sheltered from wave action; Extremely sheltered from wave action; Ultra sheltered from wave action
Substrate types:	Bedrock; Boulders (undefined); Cobbles (undefined)
Salinity levels:	Fully saline; Reduced salinity; Low salinity; Variable salinity

EUNIS habitat **code and names** A3.33 Mediterranean submerged fucoids, green or red seaweeds  
on full salinity infralittoral rock

**Description**

No description available.

**Source** Barcelona Convention (1998)

**Legal instruments**

<u>Legal instrument</u>	<u>Legally designated habitat</u>	<u>Code</u>
Council of Europe Bern Convention Res. No. 4 1996	Sublittoral rocky seabeds and kelp forests	11.24

**Descriptive or diagnostic parameters**

Parameter	Value(s)
Altitude zones (terrestrial and marine):	Infralittoral (marine)
Salinity levels:	Fully saline

**EUNIS habitat code and names** A3.34 Submerged fucoids, green or red seaweeds (low salinity infralittoral rock)

**Description**

Very shallow submerged rocky habitats in lagoons, subject to reduced or permanently low salinity conditions. These particular conditions lead to a variety of seaweed-dominated communities, which include fucoids and green filamentous species. The fucoids, more typical of intertidal habitats, penetrate into the subtidal under the reduced salinity conditions which are not tolerated by kelps.

**Source** Connor, D.W., Allen, J.H., Golding, N., Howell, K.L., Lieberknecht, L.M., Northen, K.O. & Reker, J.B. (2004)

**Legal instruments**

Legal instrument	Legally designated habitat	Code
EU Habitats Directive Annex I	Coastal lagoons	1150
Council of Europe Bern Convention Res. No. 4 1996	Sublittoral rocky seabeds and kelp forests	11.24

**Descriptive or diagnostic parameters**

Parameter	Value(s)
Altitude zones (terrestrial and marine):	Infralittoral (marine)
Depth zones (for marine habitats):	0 - 5m
Exposure characteristics:	Extremely sheltered from wind action; Weak tidal stream; Very weak or no tidal stream; Extremely sheltered from wave action
Geomorphology or landform:	Lagoon
Substrate types:	Bedrock; Hard; Boulders (undefined); Cobbles (undefined); Pebbles
Salinity levels:	Reduced salinity; Low salinity; Variable salinity

**EUNIS habitat code and names** A3.35 Faunal communities on low energy infralittoral rock

**Description**

Added by CEH to accommodate level 5 units proposed at Southampton workshop

**Source** Davies, C.E. & Moss, D. (2002)

**Descriptive or diagnostic parameters**

Parameter	Value(s)
Altitude zones (terrestrial and marine):	Infralittoral (marine)

**EUNIS habitat code and names** A3.36 Faunal communities on variable or reduced salinity infralittoral rock

**Description**

Shallow subtidal rocky habitats which support faunal-dominated communities, with seaweed communities only poorly developed or absent. In some sealochs dense mussel *Mytilus edulis* beds (A3.361) develop in tide-swept channels, whilst upper estuarine rocky habitats in the south-west coast rias may support particular brackish-water tolerant faunas (A3.362; A3.363).

**Source** Connor, D.W., Allen, J.H., Golding, N., Howell, K.L., Lieberknecht, L.M., Northen, K.O. & Reker, J.B. (2004)

**Legal instruments**

Legal instrument	Legally designated habitat	Code
EU Habitats Directive Annex I	Estuaries	1130
Council of Europe Bern Convention Res. No. 4 1996	Sublittoral rocky seabeds and kelp forests	11.24
	Estuaries	13.2

**Descriptive or diagnostic parameters**

Parameter	Value(s)
Altitude zones (terrestrial and marine):	Infralittoral (marine)
Depth zones (for marine habitats):	0 - 5m
Exposure characteristics:	Very sheltered from wind action; Extremely sheltered from wind action; Ultra sheltered from wind action; Strong tidal stream; Moderately strong tidal stream; Weak tidal stream; Very weak or no tidal stream; Very sheltered from wave action; Extremely sheltered from wave action; Ultra sheltered from wave action
Substrate types:	Bedrock; Artificial hard; Boulders (undefined); Mud; Silt; Shells
Salinity levels:	Reduced salinity; Low salinity; Variable salinity

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**EUNIS habitat code and names** A3.4 Baltic exposed infralittoral rock**Description**

Rock habitats in the Baltic infralittoral zone which are exposed to wave action, currents or ice scouring. The exposure status is that impacting on the area concerned at the relevant scale. Thus there may be enclaves of different exposure status caused by localised variation in relief (e.g. steeper rock in more moderately exposed or even sheltered areas). Note that it has been proposed that 'exposed' has an effective fetch of greater than 25 km: this requires verification across the Baltic.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004b)

**Legal instruments**

<u>Legal instrument</u>	<u>Legally designated habitat</u>	<u>Code</u>
EU Habitats Directive Annex I	Reefs	1170

**Descriptive or diagnostic parameters**

<b>Parameter</b>	<b>Value(s)</b>
Altitude zones (terrestrial and marine):	Infralittoral (marine)
Depth zones (for marine habitats):	0 - 5m; 5 - 10m; 10 - 20m
Exposure characteristics:	Exposed to wind action; Moderately exposed to wind action; Exposed to wave action; Moderately exposed to wave action
Geomorphology or landform:	Reef; Open sea
Characteristics of wetness or dryness:	Aquatic
Substrate types:	Bedrock; Clay; Hard; Artificial hard; Boulders (undefined); Very large non-mobile boulders; Large non-mobile boulders; Small non-mobile boulders; Non-mobile cobbles
Salinity levels:	Reduced salinity; Low salinity

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**EUNIS habitat code and names** A3.5 Baltic moderately exposed infralittoral rock**Description**

Rock habitats in the Baltic infralittoral zone which are moderately exposed to wave action, currents or ice scouring. The exposure status is that impacting on the area concerned at the relevant scale. Thus there may be enclaves of different exposure status caused by localised variation in relief (e.g. steeper rock in sheltered areas). Note that it has been proposed that 'exposed' has an effective fetch of 5 – 25 km: this requires verification across the Baltic.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004b)

**Legal instruments**

<u>Legal instrument</u>	<u>Legally designated habitat</u>	<u>Code</u>
EU Habitats Directive Annex I	Reefs	1170

**Descriptive or diagnostic parameters**

<b>Parameter</b>	<b>Value(s)</b>
Altitude zones (terrestrial and marine):	Infralittoral (marine)
Depth zones (for marine habitats):	0 - 5m; 5 - 10m; 10 - 20m
Exposure characteristics:	Moderately exposed to wind action; Sheltered from wind action; Moderately exposed to wave action; Sheltered from wave action
Geomorphology or landform:	Reef; Open sea
Characteristics of wetness or dryness:	Aquatic
Substrate types:	Bedrock; Clay; Hard; Artificial hard; Boulders (undefined); Very large non-mobile boulders; Large non-mobile boulders; Small non-mobile boulders; Non-mobile cobbles
Salinity levels:	Reduced salinity; Low salinity

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**EUNIS habitat code and names** A3.6 Baltic sheltered infralittoral rock**Description**

Rock habitats in the Baltic infralittoral zone which are sheltered from wave action, currents or ice scouring. The exposure status is that impacting on the area concerned at the relevant scale. Thus there may be enclaves of different exposure status caused by localised variation in relief (e.g. sheltered areas within exposed or moderately exposed areas). Note that it has been proposed that 'exposed' has an effective fetch less than 5 km: this requires verification across the Baltic.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004b)

**Legal instruments**

<u>Legal instrument</u>	<u>Legally designated habitat</u>	<u>Code</u>
EU Habitats Directive Annex I	Reefs	1170



### Descriptive or diagnostic parameters

Parameter	Value(s)
Altitude zones (terrestrial and marine):	Infralittoral (marine)
Depth zones (for marine habitats):	0 - 5m; 5 - 10m; 10 - 20m
Exposure characteristics:	Very sheltered from wind action; Extremely sheltered from wind action; Ultra sheltered from wind action; Very sheltered from wave action; Extremely sheltered from wave action; Ultra sheltered from wave action
Geomorphology or landform:	Reef; Open sea
Characteristics of wetness or dryness:	Aquatic
Substrate types:	Bedrock; Clay; Hard; Artificial hard; Boulders (undefined); Non-mobile cobbles
Salinity levels:	Reduced salinity; Low salinity

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### EUNIS habitat code and names A3.7 Features of infralittoral rock

#### Description

Includes surge gulleys (A3.71), which are found throughout the infralittoral rock zone, and usually consist of vertical bedrock walls, occasionally with overhanging faces, and support communities, which reflect the degree of wave surge they are subject to and any scour from mobile substrata on the cave/gully floors. The larger cave and gully systems, such as found in Shetland, Orkney, the Western Isles and St Kilda, typically show a marked zonation from the entrance to the rear of the gully/cave as wave surge increases and light reduces. Also includes habitats in hard substrata in the infralittoral zone characterised by the presence of seeping or bubbling gases, oils or water (A3.73) and recently colonised artificial hard substrata in the infralittoral zone (A3.72). **Source**

Connor, D.W., Allen, J.H., Golding, N., Howell, K.L., Lieberknecht, L.M., Northen, K.O. & Reker, J.B. (2004)

#### Legal instruments

Legal instrument	Legally designated habitat	Code
EU Habitats Directive Annex I	Estuaries	1130
	Large shallow inlets and bays	1160
	Reefs	1170
	Submerged or partially submerged sea caves	8330
Council of Europe Bern Convention Res. No. 4 1996	Sea-caves	12.7

### Descriptive or diagnostic parameters

Parameter	Value(s)
Altitude zones (terrestrial and marine):	Infralittoral (marine)
Depth zones (for marine habitats):	0 - 5m; 5 - 10m; 10 - 20m
Exposure characteristics:	Extremely exposed to wind action; Very exposed to wind action; Exposed to wind action; Moderately exposed to wind action; Moderately strong tidal stream; Weak tidal stream; Very weak or no tidal stream; Extremely exposed to wave action; Very exposed to wave action; Exposed to wave action; Moderately exposed to wave action
Geomorphology or landform:	Reef; Sea cave; Marine overhang; Surge gully
Light intensity (when used in criteria):	beyond limit of light
Substrate types:	Bedrock; Clay; Hard; Boulders (undefined); Non-mobile cobbles
Salinity levels:	Fully saline

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### EUNIS habitat code and names A3.71 Robust faunal cushions and crusts in surge gullies and caves

#### Description

Infralittoral rocky habitats subject to strong wave surge conditions, as found in surge gullies and shallow caves, and typically colonised by faunal communities of encrusting or cushion sponges, colonial ascidians, short turf-forming bryozoans, anthozoans, barnacles and, where there is sufficient light, red seaweeds. These features usually consist of vertical bedrock walls, occasionally with overhanging faces, and support communities which reflect the degree of wave surge they are subject to, and any scour from mobile substrata on the cave/gully floors. The larger cave and gully systems, such as found in Shetland, Orkney, the Western Isles and St Kilda, typically show a marked zonation from the entrance to the rear of the gully/cave as wave surge increases and light reduces. This is reflected in communities of anthozoans, ascidians, bryozoans and red seaweeds near the entrance, leading to sponge crust-dominated communities and finally barnacle and spirorbid worm communities in the most severe surge conditions. Gully/cave floors usually have mobile boulders, cobbles, pebbles or coarse sediment. The mobile nature of the gully/cave floors leads to communities of encrusting species, tolerant of scour and abrasion or fast summer-growing ephemeral species. The lower zone of the gully side walls are also often scoured, and typically colonised by coralline crusts and barnacles.

Situation: On open rocky coasts with moderate or greater wave action.

Temporal variation: Unknown, although winter storms likely to yield scouring on gully/cave walls; some ephemeral growth likely in calmer summer months.

**Source** Connor, D.W., Allen, J.H., Golding, N., Howell, K.L., Lieberknecht, L.M., Northen, K.O. & Reker, J.B. (2004)

**Legal instruments**

<u>Legal instrument</u>	<u>Legally designated habitat</u>	<u>Code</u>
EU Habitats Directive Annex I	Submerged or partially submerged sea caves	8330
Council of Europe Bern Convention Res. No. 4 1996	Sublittoral cave communities	11.26

**Descriptive or diagnostic parameters**

<b>Parameter</b>	<b>Value(s)</b>
Altitude zones (terrestrial and marine):	Infralittoral (marine)
Depth zones (for marine habitats):	0 - 5m; 5 - 10m; 10 - 20m
Exposure characteristics:	Extremely exposed to wind action; Very exposed to wind action; Exposed to wind action; Moderately exposed to wind action; Moderately strong tidal stream; Weak tidal stream; Very weak or no tidal stream; Extremely exposed to wave action; Very exposed to wave action; Exposed to wave action; Moderately exposed to wave action
Substrate types:	Bedrock; Boulders (undefined); Cobbles (undefined); Pebbles
Salinity levels:	Fully saline

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**EUNIS habitat code and names** A3.72 Infralittoral fouling seaweed communities

**Description**

Moderately exposed to wave-sheltered artificial substrata (such as steel wrecks/concrete pilings/cable debris etc.) subject to moderately strong to weak tidal streams in the infralittoral zone. This habitat type is characterised by a dense covering of filamentous and foliose algae on vertical as well as the upper faces of the substrata. Although there are no biotopes currently defined under this biotope, due to the low number of records, it is suspected that this has been highly 'under-recorded', and that additional records will be added in the near future, leading to the definition of biotopes.

**Source** Connor, D.W., Allen, J.H., Golding, N., Howell, K.L., Lieberknecht, L.M., Northen, K.O. & Reker, J.B. (2004)

**Descriptive or diagnostic parameters**

<b>Parameter</b>	<b>Value(s)</b>
Altitude zones (terrestrial and marine):	Infralittoral (marine)
Depth zones (for marine habitats):	0 - 5m; 5 - 10m; 10 - 20m
Exposure characteristics:	Moderately exposed to wind action; Sheltered from wind action; Very sheltered from wind action; Extremely sheltered from wind action; Ultra sheltered from wind action; Moderately strong tidal stream; Weak tidal stream; Very weak or no tidal stream; Moderately exposed to wave action; Sheltered from wave action; Very sheltered from wave action; Extremely sheltered from wave action; Ultra sheltered from wave action
Substrate types:	Artificial hard
Salinity levels:	Fully saline; Variable salinity

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**EUNIS habitat code and names** A3.73 Vents and seeps in infralittoral rock

**Description**

No description available.

**Source** OSPAR/ICES/EEA (2000)

**Legal instruments**

<u>Legal instrument</u>	<u>Legally designated habitat</u>	<u>Code</u>
EU Habitats Directive Annex I	Submarine structures made by leaking gases	1180

**Descriptive or diagnostic parameters**

<b>Parameter</b>	<b>Value(s)</b>
Altitude zones (terrestrial and marine):	Infralittoral (marine)
Depth zones (for marine habitats):	0 - 5m; 5 - 10m; 10 - 20m
Geomorphology or landform:	Reef; Open sea; Submarine gas, oil or water vents and seeps
Substrate types:	Bedrock; Hard; Boulders (undefined); Non-mobile cobbles

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**EUNIS habitat code and names** A4 Circalittoral rock and other hard substrata

**Description**

Circalittoral rock is characterised by animal dominated communities (a departure from the algae dominated communities in the infralittoral zone). The circalittoral zone can itself be split into two sub-zones; upper circalittoral (foliose red algae present but not dominant) and lower circalittoral (foliose red algae absent). The depth at which the circalittoral zone begins is directly dependent on the intensity of light reaching the seabed; in highly turbid conditions, the circalittoral zone may begin just below water level at mean low water springs

(MLWS). The biotopes identified in the field can be broadly assigned to one of three energy level categories: high, moderate and low energy circalittoral rock (used to define the habitat complex level). The character of the fauna varies enormously and is affected mainly by wave action, tidal stream strength, salinity, turbidity, the degree of scouring and rock topography. It is typical for the community not to be dominated by single species, as is common in shore and infralittoral habitats, but rather comprise a mosaic of species. This, coupled with the range of influencing factors, makes circalittoral rock a difficult area to satisfactorily classify; particular care should therefore be taken in matching species and habitat data to the classification.

**Source** Connor, D.W., Allen, J.H., Golding, N., Howell, K.L., Lieberknecht, L.M., Northen, K.O. & Reker, J.B. (2004)

#### Legal instruments

<u>Legal instrument</u>	<u>Legally designated habitat</u>	<u>Code</u>
Council of Europe Bern Convention Res. No. 4 1996	Sublittoral rocky seabeds and kelp forests	11.24

#### Descriptive or diagnostic parameters

<b>Parameter</b>	<b>Value(s)</b>
Altitude zones (terrestrial and marine):	Circalittoral (marine)
Depth zones (for marine habitats):	5 - 10m; 10 - 20m; 20 - 30m; 30 - 50m
Human activities and impacts:	Urbanised areas, human habitation, constructed artificial surfaces; Other industrial / commercial areas; Port areas
Exposure characteristics:	Extremely exposed to wind action; Very exposed to wind action; Exposed to wind action; Moderately exposed to wind action; Sheltered from wind action; Very sheltered from wind action; Extremely sheltered from wind action; Very strong tidal stream; Strong tidal stream; Moderately strong tidal stream; Weak tidal stream; Very weak or no tidal stream; Extremely exposed to wave action; Very exposed to wave action; Exposed to wave action; Moderately exposed to wave action; Sheltered from wave action; Very sheltered from wave action; Extremely sheltered from wave action
Substrate types:	Bedrock; Clay; Hard; Artificial hard; Boulders (undefined); Very large non-mobile boulders; Large non-mobile boulders; Small non-mobile boulders; Non-mobile cobbles; Cobbles (undefined); Mixed
Salinity levels:	Fully saline; Reduced salinity; Low salinity; Variable salinity

#### **EUNIS habitat code and names** A4.1 Atlantic and Mediterranean high energy circalittoral rock **Description**

Occurs on extremely wave-exposed to exposed circalittoral bedrock and boulders subject to tidal streams ranging from strong to very strong. Typically found in tidal straits and narrows. The high energy levels found within this habitat complex are reflected in the fauna recorded. Sponges such as *Pachymatisma johnstonia*, *Halichondria panicea*, *Esperiopsis fucorum* and *Myxilla incrustans* may all be recorded. Characteristic of this habitat complex is the dense 'carpet' of the hydroid *Tubularia indivisa*. The barnacle *Balanus crenatus* is recorded in high abundance on the rocky substrata. On rocky outcrops, *Alcyonium digitatum* is often present.

**Source** Connor, D.W., Allen, J.H., Golding, N., Howell, K.L., Lieberknecht, L.M., Northen, K.O. & Reker, J.B. (2004)

#### Legal instruments

<u>Legal instrument</u>	<u>Legally designated habitat</u>	<u>Code</u>
EU Habitats Directive Annex I	Large shallow inlets and bays Reefs	1160 1170
Council of Europe Bern Convention Res. No. 4 1996	Sublittoral rocky seabeds and kelp forests	11.24

#### Descriptive or diagnostic parameters

<b>Parameter</b>	<b>Value(s)</b>
Altitude zones (terrestrial and marine):	Offshore circalittoral; Circalittoral (marine)
Depth zones (for marine habitats):	5 - 10m; 10 - 20m; 20 - 30m; 30 - 50m
Exposure characteristics:	Extremely exposed to wind action; Very exposed to wind action; Exposed to wind action; Very strong tidal stream; Strong tidal stream; Very strong current; Strong current; Extremely exposed to wave action; Very exposed to wave action; Exposed to wave action
Geomorphology or landform:	Reef; Open sea
Characteristics of wetness or dryness:	Aquatic
Substrate types:	Bedrock; Clay; Hard; Boulders (undefined); Non-mobile cobbles
Salinity levels:	Fully saline

#### **EUNIS habitat code and names** A4.11 Very tide-swept faunal communities on circalittoral rock **Description**

This habitat type occurs in wave-exposed, tide-swept narrows and straits on circalittoral bedrock and boulders. The biotopes within this complex are characterised by a high abundance of the robust hydroid *Tubularia indivisa*. The barnacle *Balanus crenatus* is characteristic of A4.111, the cushion sponges *Halichondria panicea* and

*Myxilla incrustans* are characteristic of A4.1121 and *Alcyonium digitatum* is characteristic of A4.1122. The anemones *Sagartia elegans*, *Actinothoe sphyrodeta*, *Urticina felina*, *Corynactis viridis* and *Metridium senile* are all found within this complex. Other species present in this high-energy complex are the sponges *Esperiopsis fucorum* and *Pachymatisma johnstonia*, the bryozoans *Alcyonidium diaphanum* and *Flustra foliacea*, *Cancer pagurus*, *Sertularia argentea* and *Asterias rubens*.

**Source** Connor, D.W., Allen, J.H., Golding, N., Howell, K.L., Lieberknecht, L.M., Northen, K.O. & Reker, J.B. (2004)

#### Legal instruments

<u>Legal instrument</u>	<u>Legally designated habitat</u>	<u>Code</u>
Council of Europe Bern Convention Res. No. 4 1996	Sublittoral rocky seabeds and kelp forests	11.24

#### Descriptive or diagnostic parameters

<u>Parameter</u>	<u>Value(s)</u>
Altitude zones (terrestrial and marine):	Circalittoral (marine)
Depth zones (for marine habitats):	10 - 20m; 20 - 30m
Exposure characteristics:	Extremely exposed to wind action; Very exposed to wind action; Exposed to wind action; Very strong tidal stream; Strong tidal stream; Very strong current; Strong current; Extremely exposed to wave action; Very exposed to wave action; Exposed to wave action
Substrate types:	Bedrock; Boulders (undefined)
Salinity levels:	Fully saline

### EUNIS habitat code and names A4.12 Sponge communities on deep circalittoral rock

#### Description

This habitat type typically occurs on deep (commonly below 30m depth), wave-exposed circalittoral rock subject to negligible tidal streams. The sponge component of this biotope is the most striking feature, with similar species to the bryozoan and erect sponge habitat type (A4.131) although in this case, the sponges *Phakellia ventilabrum*, *Axinella infundibuliformis*, *Axinella dissimilis* and *Stelligera stuposa* dominate. Other sponge species frequently found on exposed rocky coasts are also present in low to moderate abundance. These include *Cliona celata*, *Polymastia boletiformis*, *Haliclona viscosa*, *Pachymatisma johnstonia*, *Dysidea fragilis*, *Suberites carnosus*, *Stelligera rigida*, *Hemimycale columella* and *Tethya aurantium*. The cup coral *Caryophyllia smithii* and the anemone *Corynactis viridis* may be locally abundant in some areas, along with the holothurian *Holothuria forskali*. The soft corals *Alcyonium digitatum* and *Alcyonium glomeratum* are frequently observed. The bryozoans *Pentapora foliacea* and *Porella compressa* are also more frequently found in this deep-water habitat type. Bryozoan crusts such as *Parasmittina trispinosa* are also occasionally recorded. Isolated clumps of large hydroids such as *Nemertesia antennina*, *Nemertesia ramosa* and *Sertularella gayi* may be seen on the tops of boulders and rocky outcrops. Large echinoderms such as *Echinus esculentus*, *Luidia ciliaris*, *Marthasterias glacialis*, *Strichastrella rosea*, *Henricia oculata* and *Aslia lefevrei* may also be present. The sea fan *Eunicella verucosa* may be locally common but to a lesser extent than in A4.1311. The top shell *Calliostoma zizyphinum* is often recorded as present.

**Source** Connor, D.W., Allen, J.H., Golding, N., Howell, K.L., Lieberknecht, L.M., Northen, K.O. & Reker, J.B. (2004)

#### Legal instruments

<u>Legal instrument</u>	<u>Legally designated habitat</u>	<u>Code</u>
Council of Europe Bern Convention Res. No. 4 1996	Sublittoral rocky seabeds and kelp forests	11.24

#### Descriptive or diagnostic parameters

<u>Parameter</u>	<u>Value(s)</u>
Altitude zones (terrestrial and marine):	Offshore circalittoral; Circalittoral (marine)
Depth zones (for marine habitats):	20 - 30m; 30 - 50m
Exposure characteristics:	Extremely exposed to wind action; Very exposed to wind action; Exposed to wind action; Moderately strong tidal stream; Weak tidal stream; Very weak or no tidal stream; Very strong current; Strong current; Extremely exposed to wave action; Very exposed to wave action; Exposed to wave action
Geomorphology or landform:	Open sea
Substrate types:	Bedrock
Salinity levels:	Fully saline

### EUNIS habitat code and names A4.13 Mixed faunal turf communities on circalittoral rock

#### Description

This habitat type occurs on wave-exposed circalittoral bedrock and boulders, subject to tidal streams ranging from strong to moderately strong. This complex is characterised by its diverse range of hydroids (*Halecium halecinum*, *Nemertesia antennina* and *Nemertesia ramosa*), bryozoans (*Alcyonidium diaphanum*, *Flustra foliacea*, *Bugula flabellata* and *Bugula plumosa*) and sponges (*Scypha ciliata*, *Pachymatisma johnstonia*, *Cliona*

*celeta*, *Raspailia ramosa*, *Esperiopsis fucorum*, *Hemimyscale columella* and *Dysidea fragilis*) forming an often dense, mixed faunal turf. Other species found within this complex are *Alcyonium digitatum*, *Urticina felina*, *Sagartia elegans*, *Actinothoe sphyrodeta*, *Caryophyllia smithii*, *Pomatoceros triqueter*, *Balanus crenatus*, *Cancer pagurus*, *Necora puber*, *Asterias rubens*, *Echinus esculentus* and *Clavelina lepadiformis*.

**Source** Connor, D.W., Allen, J.H., Golding, N., Howell, K.L., Lieberknecht, L.M., Northen, K.O. & Reker, J.B. (2004)

#### Legal instruments

<u>Legal instrument</u>	<u>Legally designated habitat</u>	<u>Code</u>
Council of Europe Bern Convention Res. No. 4 1996	Sublittoral rocky seabeds and kelp forests	11.24

#### Descriptive or diagnostic parameters

<u>Parameter</u>	<u>Value(s)</u>
Altitude zones (terrestrial and marine):	Circalittoral (marine)
Depth zones (for marine habitats):	5 - 10m; 10 - 20m; 20 - 30m
Exposure characteristics:	Extremely exposed to wind action; Very exposed to wind action; Exposed to wind action; Moderately exposed to wind action; Strong tidal stream; Moderately strong tidal stream; Extremely exposed to wave action; Very exposed to wave action; Exposed to wave action; Moderately exposed to wave action
Substrate types:	Bedrock; Boulders (undefined)
Salinity levels:	Fully saline

**EUNIS habitat code and names** A4.2 Atlantic and Mediterranean moderate energy circalittoral rock

#### Description

Mainly occurs on exposed to moderately wave-exposed circalittoral bedrock and boulders, subject to moderately strong and weak tidal streams. This habitat type contains a broad range of biological subtypes, from echinoderms and crustose communities (A4.21) to Sabellaria reefs (A4.22) and circalittoral mussel beds

**Source** Connor, D.W., Allen, J.H., Golding, N., Howell, K.L., Lieberknecht, L.M., Northen, K.O. & Reker, J.B. (2004)

#### Legal instruments

<u>Legal instrument</u>	<u>Legally designated habitat</u>	<u>Code</u>
EU Habitats Directive Annex I	Estuaries	1130
	Large shallow inlets and bays	1160
	Reefs	1170
Council of Europe Bern Convention Res. No. 4 1996	Sublittoral rocky seabeds and kelp forests	11.24

#### Descriptive or diagnostic parameters

<u>Parameter</u>	<u>Value(s)</u>
Altitude zones (terrestrial and marine):	Offshore circalittoral; Circalittoral (marine)
Depth zones (for marine habitats):	10 - 20m; 20 - 30m; 30 - 50m
Exposure characteristics:	Exposed to wind action; Moderately exposed to wind action; Moderately strong tidal stream; Weak tidal stream; Moderately strong current; Exposed to wave action; Moderately exposed to wave action
Geomorphology or landform:	Reef; Open sea
Characteristics of wetness or dryness:	Aquatic
Substrate types:	Bedrock; Clay; Hard; Boulders (undefined); Non-mobile cobbles; Mixed
Salinity levels:	Fully saline; Variable salinity

**EUNIS habitat code and names** A4.21 Echinoderms and crustose communities on circalittoral rock

#### Description

This habitat type occurs on wave-exposed, moderately strong to weakly tide-swept, circalittoral bedrock and boulders. Echinoderms, faunal (*Parasmittina trispinosa*) and algal crusts (red encrusting algae) dominate this biotope, giving a sparse appearance. Typical echinoderms present are the starfish *Asterias rubens*, the brittlestar *Ophiothrix fragilis* and the sea urchin *Echinus esculentus*. There may be isolated clumps of the hydroids *Nemertesia antennina* and *Abietinaria abietina*, *Alcyonium digitatum*, the anemone *Urticina felina* and the cup coral *Caryophyllia smithii*. Other species present may include the polychaete *Pomatoceros triqueter* and the top shell *Calliostoma zizphinum*.

**Source** Connor, D.W., Allen, J.H., Golding, N., Howell, K.L., Lieberknecht, L.M., Northen, K.O. & Reker, J.B. (2004)

#### Legal instruments

<u>Legal instrument</u>	<u>Legally designated habitat</u>	<u>Code</u>
Council of Europe Bern Convention Res. No. 4 1996	Sublittoral rocky seabeds and kelp forests	11.24

### Descriptive or diagnostic parameters

Parameter	Value(s)
Altitude zones (terrestrial and marine):	Circalittoral (marine)
Depth zones (for marine habitats):	10 - 20m; 20 - 30m; 30 - 50m
Exposure characteristics:	Extremely exposed to wind action; Very exposed to wind action; Exposed to wind action; Moderately exposed to wind action; Moderately strong tidal stream; Weak tidal stream; Extremely exposed to wave action; Very exposed to wave action; Exposed to wave action; Moderately exposed to wave action
Substrate types:	Bedrock; Boulders (undefined)
Salinity levels:	Fully saline

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**EUNIS habitat code and names** A4.22 English name: Ross worm reefs on circalittoral rock;  
Scientific name: *Sabellaria* reefs on circalittoral rock

#### Description

This habitat type occurs on moderately wave-exposed, circalittoral bedrock, boulders and cobbles subject to moderately strong tidal streams. It is characterised by dense crusts of the polychaete *Sabellaria spinulosa* covering the substratum. Other fauna present in many cases reflects the biotopes found on nearby rock, so to a certain extent, is quite variable. Species typically present include the bryozoans *Flustra foliacea*, *Alcyonidium diaphanum* and *Pentapora foliacea*, the hydroid *Nemertesia antennina*, the sponges *Tethya aurantium* and *Phorbast fictitius*, the anemones *Urticina felina* and *Sagartia elegans*, and the ascidians *Distomus variolosus*, *Polycarpa pomaria* and *Polycarpa scuba*. The barnacle *Balanus crenatus*, the polychetes *Pomatoceros triqueter* and *Salmacina dysteri*, the starfish *Crossaster papposus*, and *Alcyonium digitatum* may also be recorded.

**Source** Connor, D.W., Allen, J.H., Golding, N., Howell, K.L., Lieberknecht, L.M., Northen, K.O. & Reker, J.B. (2004)

#### Legal instruments

Legal instrument	Legally designated habitat	Code
Council of Europe Bern Convention Res. No. 4 1996	Sublittoral rocky seabeds and kelp forests	11.24

### Descriptive or diagnostic parameters

Parameter	Value(s)
Altitude zones (terrestrial and marine):	Circalittoral (marine)
Depth zones (for marine habitats):	10 - 20m; 20 - 30m
Exposure characteristics:	Exposed to wind action; Moderately exposed to wind action; Moderately strong tidal stream; Exposed to wave action; Moderately exposed to wave action
Substrate types:	Bedrock; Boulders (undefined); Cobbles (undefined); Pebbles
Salinity levels:	Fully saline

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**EUNIS habitat code and names** A4.23 Communities on soft circalittoral rock

#### Description

This habitat type occurs on moderately wave-exposed, circalittoral soft bedrock subject to moderately strong tidal streams. As this complex is found in highly turbid water conditions, the circalittoral zone may begin at the low water mark, due to poor light penetration. This complex is dominated by the piddock *Pholas dactylus*. Other species typical of this complex include the polychaete *Polydora* and *Bispira volutacornis*, the sponges *Cliona celata* and *Suberites ficus*, the bryozoan *Flustra foliacea*, *Alcyonium digitatum*, the starfish *Asterias rubens*, the mussel *Mytilus edulis* and the crab *Necora puber* and *Cancer pagurus*. Foliose red algae may also be present. Please note: in areas subject to very high turbidity, biotopes within this habitat type may occur in the infralittoral and even the littoral zone.

**Source** Connor, D.W., Allen, J.H., Golding, N., Howell, K.L., Lieberknecht, L.M., Northen, K.O. & Reker, J.B. (2004)

#### Legal instruments

Legal instrument	Legally designated habitat	Code
Council of Europe Bern Convention Res. No. 4 1996	Sublittoral rocky seabeds and kelp forests	11.24

### Descriptive or diagnostic parameters

Parameter	Value(s)
Altitude zones (terrestrial and marine):	Circalittoral (marine)
Depth zones (for marine habitats):	0 - 5m; 5 - 10m; 10 - 20m
Exposure characteristics:	Moderately exposed to wind action; Moderately strong tidal stream; Moderately exposed to wave action
Substrate types:	Bedrock
Salinity levels:	Fully saline

**EUNIS habitat code and names** A4.24 Mussel beds on circalittoral rock**Description**

This habitat type occurs on moderately wave-exposed upper circalittoral bedrock subject to strong or moderately strong tidal streams. This complex is characterised by dense aggregations of the mussels *Mytilus edulis* or *Musculus discors* carpeting the underlying substrata. Sponges that may be recorded in this complex are *Scypha ciliata*, *Tethya aurantium*, *Pachymatisma johnstonia*, *Dysidea fragilis* and *Cliona celata*. A sparse hydroid/bryozoan turf composed primarily of *Nemertesia antennina*, *Alcyonidium diaphanum* and *Flustra foliacea* is often recorded. Anemones present are *Urticina felina* and *Sagartia elegans*. Other species recorded are the crabs *Cancer pagurus*, *Carcinus maenas* and *Necora puber*, the starfish *Crossaster papposus* and *Asterias rubens*, and *Alcyonium digitatum* and in this upper circalittoral complex, algae species such as *Dictyota dichotoma*, *Cryptopleura ramosa* and *Plocamium cartilagineum*.

**Source** Connor, D.W., Allen, J.H., Golding, N., Howell, K.L., Lieberknecht, L.M., Northen, K.O. & Reker, J.B. (2004)

**Legal instruments**

<u>Legal instrument</u>	<u>Legally designated habitat</u>	<u>Code</u>
EU Habitats Directive Annex I	Reefs	1170
Council of Europe Bern Convention Res. No. 4 1996	Sublittoral organogenic concretions	11.25

**Descriptive or diagnostic parameters**

<b>Parameter</b>	<b>Value(s)</b>
Altitude zones (terrestrial and marine):	Circalittoral (marine)
Depth zones (for marine habitats):	5 - 10m; 10 - 20m
Exposure characteristics:	Moderately exposed to wind action; Strong tidal stream; Moderately strong tidal stream; Moderately exposed to wave action
Substrate types:	Bedrock
Salinity levels:	Fully saline

**EUNIS habitat code and names** A4.25 Circalittoral faunal communities in variable salinity**Description**

This habitat type occurs on wave-sheltered, variable salinity bedrock and cobbles, subject to moderately strong to weak tidal streams. This complex contains a suite of sponges able to tolerate the variable salinity conditions like *Hymeniacidon perleve*, *Suberites ficus*, *Halichondria panicea*, *Halichondria bowerbanki*, *Cliona celata* and *Leucosolenia botryoides*. The barnacle *Balanus crenatus* is frequently recorded in this complex. A sparse hydroid/bryozoan turf composed primarily of *Nemertesia antennina*, *Nemerteis ramosa*, *Plumularia setacea*, *Alcyonidium diaphanum* and *Bugula plumosa* is often recorded. Other species recorded are the ascidians *Clavelina lepadiformis*, *Morchellium argus* and *Dendrodoa grossularia*, the anemones *Metridium senile* and *Sagartia troglodytes*, the starfish *Asterias rubens* and the crab *Carcinus maenas*.

**Source** Connor, D.W., Allen, J.H., Golding, N., Howell, K.L., Lieberknecht, L.M., Northen, K.O. & Reker, J.B. (2004)

**Legal instruments**

<u>Legal instrument</u>	<u>Legally designated habitat</u>	<u>Code</u>
Council of Europe Bern Convention Res. No. 4 1996	Sublittoral rocky seabeds and kelp forests	11.24

**Descriptive or diagnostic parameters**

<b>Parameter</b>	<b>Value(s)</b>
Altitude zones (terrestrial and marine):	Circalittoral (marine)
Depth zones (for marine habitats):	0 - 5m; 5 - 10m; 10 - 20m
Exposure characteristics:	Sheltered from wind action; Very sheltered from wind action; Extremely sheltered from wind action; Ultra sheltered from wind action; Moderately strong tidal stream; Weak tidal stream; Sheltered from wave action; Very sheltered from wave action; Extremely sheltered from wave action; Ultra sheltered from wave action
Substrate types:	Bedrock; Cobbles (undefined)
Salinity levels:	Fully saline; Variable salinity

**EUNIS habitat code and names** A4.26 Mediterranean coralligenous communities moderately exposed to hydrodynamic action**Description**

Communities forming and colonizing corallogenic concretions of calcified red algae in the circalittoral zone of the Mediterranean.

**Source** Devillers, P., Devillers-Terschuren, J. and Vander Linden, C. (2001)

**Legal instruments**

<u>Legal instrument</u>	<u>Legally designated habitat</u>	<u>Code</u>
Council of Europe Bern Convention	Sublittoral organogenic concretions	11.25

Res. No. 4 1996

**Descriptive or diagnostic parameters**

Parameter	Value(s)
Altitude zones (terrestrial and marine):	Circalittoral (marine)
Salinity levels:	Fully saline

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**EUNIS habitat code and names** A4.27 Faunal communities on deep moderate energy circalittoral rock

**Description**

No description available.

**Source** Davies, C.E. & Moss, D. (2002)

**Legal instruments**

Legal instrument	Legally designated habitat	Code
Council of Europe Bern Convention Res. No. 4 1996	Sublittoral rocky seabeds and kelp forests	11.24

**Descriptive or diagnostic parameters**

Parameter	Value(s)
Depth zones (for marine habitats):	20 - 30m; 30 - 50m

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**EUNIS habitat code and names** A4.3 Atlantic and Mediterranean low energy circalittoral rock

**Description**

Occurs on wave-sheltered circalittoral bedrock and boulders subject to mainly weak/very weak tidal streams. The biotopes identified within this habitat type are often dominated by encrusting red algae, brachiopods (*Neocrania anomala*) and ascidians (*Ciona intestinalis* and *Ascidia mentula*).

**Source** Connor, D.W., Allen, J.H., Golding, N., Howell, K.L., Lieberknecht, L.M., Northen, K.O. & Reker, J.B. (2004)

**Legal instruments**

Legal instrument	Legally designated habitat	Code
EU Habitats Directive Annex I	Estuaries	1130
	Large shallow inlets and bays	1160
	Reefs	1170
Council of Europe Bern Convention Res. No. 4 1996	Sublittoral rocky seabeds and kelp forests	11.24

**Descriptive or diagnostic parameters**

Parameter	Value(s)
Altitude zones (terrestrial and marine):	Offshore circalittoral; Circalittoral (marine)
Depth zones (for marine habitats):	5 - 10m; 10 - 20m; 20 - 30m
Exposure characteristics:	Sheltered from wind action; Very sheltered from wind action; Weak tidal stream; Very weak or no tidal stream; Weak current; Very weak or no current; Sheltered from wave action; Very sheltered from wave action
Geomorphology or landform:	Reef; Open sea
Characteristics of wetness or dryness:	Aquatic
Substrate types:	Bedrock; Clay; Hard; Boulders (undefined); Non-mobile cobbles
Salinity levels:	Fully saline; Reduced salinity

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**EUNIS habitat code and names** A4.31 Brachiopod and ascidian communities on circalittoral rock

**Description**

This habitat type occurs on the wave-sheltered, circalittoral bedrock and boulders subject to weak tidal streams. The biotopes within this complex are typically found in the Scottish sealochs (with the exception of A4.312, recorded off Ireland) and are characterised by brachiopod and ascidian communities. Ascidians often recorded in this complex are *Ciona intestinalis*, *Ascidia mentula*, *Ascidia virginea* and *Clavelina lepadiformis*. The brachiopod *Neocrania anomala* is also characteristic of the biotopes within this complex recorded in Scottish sealochs. The polychaete *Pomatoceros triqueter*, the saddle oyster *Pododesmus patelliformis*, the cup coral *Caryophyllia smithii* and encrusting red algae are frequently recorded on the rocky substrata. Echinoderms such as the brittlestars *Ophiothrix fragilis*, *Ophiocoma nigra* and *Ophiura albida*, the starfish *Asterias rubens*, *Crossaster papposus* and *Henricia oculata*, the crinoid *Antedon bifida* and the urchin *Echinus esculentus* are all found in this complex. Other species present include the squat lobster *Munida rugosa*, the hermit crab *Pagurus bernhardus*, *Alcyonium digitatum*, the anemone *Protanthea simplex* and the hydroid *Kirchenpaueria pinnata*.



**Source** Connor, D.W., Allen, J.H., Golding, N., Howell, K.L., Lieberknecht, L.M., Northen, K.O. & Reker, J.B. (2004)

**Legal instruments**

<u>Legal instrument</u>	<u>Legally designated habitat</u>	<u>Code</u>
Council of Europe Bern Convention Res. No. 4 1996	Sublittoral rocky seabeds and kelp forests	11.24

**Descriptive or diagnostic parameters**

<b>Parameter</b>	<b>Value(s)</b>
Altitude zones (terrestrial and marine):	Circalittoral (marine)
Depth zones (for marine habitats):	5 - 10m; 10 - 20m; 20 - 30m
Exposure characteristics:	Sheltered from wind action; Very sheltered from wind action; Weak tidal stream; Very weak or no tidal stream; Sheltered from wave action; Very sheltered from wave action
Substrate types:	Bedrock; Boulders (undefined)
Salinity levels:	Fully saline; Reduced salinity

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**EUNIS habitat code and names** A4.32 Mediterranean coralligenous communities sheltered from hydrodynamic action

**Description**

Communities forming and colonizing corallogenic concretions of calcified red algae in the circalittoral zone of the Mediterranean.

**Source** Devillers, P., Devillers-Terschuren, J. and Vander Linden, C. (2001)

**Legal instruments**

<u>Legal instrument</u>	<u>Legally designated habitat</u>	<u>Code</u>
Council of Europe Bern Convention Res. No. 4 1996	Sublittoral organogenic concretions	11.25

**Descriptive or diagnostic parameters**

<b>Parameter</b>	<b>Value(s)</b>
Altitude zones (terrestrial and marine):	Circalittoral (marine)
Salinity levels:	Fully saline

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**EUNIS habitat code and names** A4.33 Faunal communities on deep low energy circalittoral rock

**Description**

Added by CEH to accommodate level 5 units proposed at Southampton workshop

**Source** Davies, C.E. & Moss, D. (2002)

**Descriptive or diagnostic parameters**

<b>Parameter</b>	<b>Value(s)</b>
Depth zones (for marine habitats):	20 - 30m; 30 - 50m

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**EUNIS habitat code and names** A4.4 Baltic exposed circalittoral rock

**Description**

Rock habitats in the Baltic infralittoral zone which are exposed to wave action, currents or ice scouring. The exposure status is that impacting on the area concerned at the relevant scale. Thus there may be enclaves of different exposure status caused by localised variation in relief (e.g. steeper rock in more moderately exposed or even sheltered areas). Note that it has been proposed that 'exposed' has an effective fetch of greater than 25 km: this requires verification across the Baltic.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004b)

**Legal instruments**

<u>Legal instrument</u>	<u>Legally designated habitat</u>	<u>Code</u>
EU Habitats Directive Annex I	Reefs	1170
Council of Europe Bern Convention Res. No. 4 1996	Sublittoral rocky seabeds and kelp forests	11.24

**Descriptive or diagnostic parameters**

<b>Parameter</b>	<b>Value(s)</b>
Altitude zones (terrestrial and marine):	Offshore circalittoral; Circalittoral (marine)
Depth zones (for marine habitats):	5 - 10m; 10 - 20m; 20 - 30m; 30 - 50m
Exposure characteristics:	Exposed to wind action; Moderately exposed to wind action; Exposed to wave action; Moderately exposed to wave action
Geomorphology or landform:	Reef; Open sea
Characteristics of wetness or dryness:	Aquatic

Substrate types: Bedrock; Clay; Hard; Boulders (undefined); Non-mobile cobbles  
Salinity levels: Reduced salinity; Low salinity

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**EUNIS habitat code and names** A4.5 Baltic moderately exposed circalittoral rock

**Description**

Rock habitats in the Baltic infralittoral zone which are moderately exposed to wave action, currents or ice scouring. The exposure status is that impacting on the area concerned at the relevant scale. Thus there may be enclaves of different exposure status caused by localised variation in relief (e.g. steeper rock in sheltered areas). Note that it has been proposed that 'exposed' has an effective fetch of 5 – 25 km: this requires verification across the Baltic.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004b)

**Legal instruments**

<u>Legal instrument</u>	<u>Legally designated habitat</u>	<u>Code</u>
EU Habitats Directive Annex I	Reefs	1170
Council of Europe Bern Convention Res. No. 4 1996	Sublittoral rocky seabeds and kelp forests	11.24

**Descriptive or diagnostic parameters**

<b>Parameter</b>	<b>Value(s)</b>
Altitude zones (terrestrial and marine):	Offshore circalittoral; Circalittoral (marine)
Depth zones (for marine habitats):	10 - 20m; 20 - 30m; 30 - 50m
Exposure characteristics:	Moderately exposed to wind action; Sheltered from wind action; Moderately exposed to wave action; Sheltered from wave action
Geomorphology or landform:	Reef; Open sea
Characteristics of wetness or dryness:	Aquatic
Substrate types:	Bedrock; Clay; Hard; Boulders (undefined); Non-mobile cobbles; Mixed
Salinity levels:	Reduced salinity; Low salinity

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**EUNIS habitat code and names** A4.6 Baltic sheltered circalittoral rock

**Description**

Rock habitats in the Baltic infralittoral zone which are sheltered from wave action, currents or ice scouring. The exposure status is that impacting on the area concerned at the relevant scale. Thus there may be enclaves of different exposure status caused by localised variation in relief (e.g. sheltered areas within exposed or moderately exposed areas). Note that it has been proposed that 'exposed' has an effective fetch less than 5 km: this requires verification across the Baltic.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004b)

**Legal instruments**

<u>Legal instrument</u>	<u>Legally designated habitat</u>	<u>Code</u>
EU Habitats Directive Annex I	Reefs	1170
Council of Europe Bern Convention Res. No. 4 1996	Sublittoral rocky seabeds and kelp forests	11.24

**Descriptive or diagnostic parameters**

<b>Parameter</b>	<b>Value(s)</b>
Altitude zones (terrestrial and marine):	Offshore circalittoral; Circalittoral (marine)
Depth zones (for marine habitats):	5 - 10m; 10 - 20m; 20 - 30m
Exposure characteristics:	Very sheltered from wind action; Extremely sheltered from wind action; Ultra sheltered from wind action; Very sheltered from wave action; Extremely sheltered from wave action; Ultra sheltered from wave action
Geomorphology or landform:	Reef; Open sea
Characteristics of wetness or dryness:	Aquatic
Substrate types:	Bedrock; Clay; Hard; Boulders (undefined); Non-mobile cobbles
Salinity levels:	Reduced salinity; Low salinity

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**EUNIS habitat code and names** A4.7 Features of circalittoral rock

**Description**

Circalittoral rock features include circalittoral fouling communities (A4.72) and circalittoral caves and overhangs (A4.71). These features are present throughout the circalittoral zone in a variety of wave exposures and tidal streams. Two fouling subtypes have also been identified: A4.722 has been recorded from disused fishing nets and other artificial substrata, and is characterised by aggregations of *Ascidella aspersa* whilst A4.721 has been recorded from steel wrecks, and is characterised by dense aggregations of *Alcyonium digitatum* and *Metridium senile*. Habitats in hard substrata in the circalittoral zone characterised by the presence of seeping or bubbling gases, oils or water are also included (A4.73).

**Source** Connor, D.W., Allen, J.H., Golding, N., Howell, K.L., Lieberknecht, L.M., Northen, K.O. & Reker, J.B. (2004)

**Legal instruments**

<u>Legal instrument</u>	<u>Legally designated habitat</u>	<u>Code</u>
EU Habitats Directive Annex I	Large shallow inlets and bays	1160
	Reefs	1170
	Submerged or partially submerged sea caves	8330

**Descriptive or diagnostic parameters**

<b>Parameter</b>	<b>Value(s)</b>
Altitude zones (terrestrial and marine):	Offshore circalittoral; Circalittoral (marine)
Depth zones (for marine habitats):	10 - 20m; 20 - 30m; 30 - 50m
Exposure characteristics:	Extremely exposed to wind action; Very exposed to wind action; Exposed to wind action; Moderately exposed to wind action; Sheltered from wind action; Moderately strong tidal stream; Weak tidal stream; Very weak or no tidal stream; Extremely exposed to wave action; Very exposed to wave action; Exposed to wave action; Moderately exposed to wave action; Sheltered from wave action
Geomorphology or landform:	Sea cave; Marine overhang
Light intensity (when used in criteria):	Beyond limit of light
Characteristics of wetness or dryness:	Aquatic
Substrate types:	Bedrock; Clay; Hard; Artificial hard; Boulders (undefined); Non-mobile cobbles
Salinity levels:	Fully saline

**EUNIS habitat code and names** A4.71 Communities of circalittoral caves and overhangs

**Description**

Caves and overhanging rock in the circalittoral zone, away from significant influence of strong wave action (compare A3.71). This habitat may be colonised by a wide variety of species, with sponges such as *Dercitus bucklandi*, anemones *Parazoanthus* spp. and the cup corals *Caryophyllia inornatus*, *Hoplangia durotrix* and others particularly characteristic.

**Source** Connor, D.W., Allen, J.H., Golding, N., Howell, K.L., Lieberknecht, L.M., Northen, K.O. & Reker, J.B. (2004)

**Legal instruments**

<u>Legal instrument</u>	<u>Legally designated habitat</u>	<u>Code</u>
EU Habitats Directive Annex I	Large shallow inlets and bays	1160
	Reefs	1170
	Submerged or partially submerged sea caves	8330
Council of Europe Bern Convention Res. No. 4 1996	Sea-caves	12.7

**Descriptive or diagnostic parameters**

<b>Parameter</b>	<b>Value(s)</b>
Altitude zones (terrestrial and marine):	Circalittoral (marine)
Depth zones (for marine habitats):	10 - 20m; 20 - 30m; 30 - 50m
Exposure characteristics:	Very exposed to wind action; Exposed to wind action; Moderately exposed to wind action; Sheltered from wind action; Weak tidal stream; Very weak or no tidal stream; Very exposed to wave action; Exposed to wave action; Moderately exposed to wave action; Sheltered from wave action
Substrate types:	Bedrock
Salinity levels:	Fully saline

**EUNIS habitat code and names** A4.72 Circalittoral fouling faunal communities

**Description**

This habitat type contains two biotopes which, although have different physical habitat characteristics, share the fact that they colonise new areas of artificial substrata relatively quickly. The *Ascidella aspersa* fouling biotope (A4.722) is found on wave-sheltered artificial substrata such as discarded fishing nets/mooring lines. A separate fouling biotope (A4.721) is described for open coast wrecks. This biotope has a characteristic faunal community of *Alcyonium digitatum* and the anemone *Metridium senile*. Other species recorded in this complex (primarily under the AdigMsen biotope) include the hydroid *Nemertesia antennina*, the anemones *Actinothoe sphyrodeta* and *Sagartia elegans*, the cup coral *Caryophyllia smithii*, the bryozoans *Flustra foliacea* and *Bugula plumosa*, the crabs *Necora puber*, *Cancer pagurus* and *Maja squinado* and the lobster *Homarus gammarus*.

**Source** Connor, D.W., Allen, J.H., Golding, N., Howell, K.L., Lieberknecht, L.M., Northen, K.O. & Reker, J.B. (2004)

**Descriptive or diagnostic parameters**

<b>Parameter</b>	<b>Value(s)</b>
Altitude zones (terrestrial and marine):	Circalittoral (marine)
Depth zones (for marine habitats):	5 - 10m; 10 - 20m; 20 - 30m
Exposure characteristics:	Moderately exposed to wind action; Extremely sheltered from wind action; Ultra sheltered from wind action; Moderately strong tidal stream; Moderately

Substrate types: exposed to wave action; Extremely sheltered from wave action; Ultra sheltered from wave action  
 Salinity levels: Artificial hard  
 Fully saline; Variable salinity

**EUNIS habitat code and names** A4.73 Vents and seeps in circalittoral rock

**Description**

No description available.

**Source** OSPAR/ICES/EEA (2000)

**Legal instruments**

<u>Legal instrument</u>	<u>Legally designated habitat</u>	<u>Code</u>
EU Habitats Directive Annex I	Submarine structures made by leaking gases	1180

**Descriptive or diagnostic parameters**

<b>Parameter</b>	<b>Value(s)</b>
Depth zones (for marine habitats):	10 - 20m; 20 - 30m; 30 - 50m

**EUNIS habitat code and names** A5 Sublittoral sediment

**Description**

Sediment habitats in the sublittoral near shore zone (i.e. covering the infralittoral and circalittoral zones), typically extending from the extreme lower shore down to the edge of the bathyal zone (200 m). Sediment ranges from boulders and cobbles, through pebbles and shingle, coarse sands, sands, fine sands, muds, and mixed sediments. Those communities found in or on sediment are described within this broad habitat type.

**Source** Connor, D.W., Allen, J.H., Golding, N., Howell, K.L., Lieberknecht, L.M., Northen, K.O. & Reker, J.B. (2004)

**Legal instruments**

<u>Legal instrument</u>	<u>Legally designated habitat</u>	<u>Code</u>
Council of Europe Bern Convention Res. No. 4 1996	Sublittoral soft seabeds	11.22

**Descriptive or diagnostic parameters**

<b>Parameter</b>	<b>Value(s)</b>
Altitude zones (terrestrial and marine):	Offshore circalittoral; Circalittoral (marine); Infralittoral (marine)
Depth zones (for marine habitats):	0 - 5m; 5 - 10m; 10 - 20m; 20 - 30m; 30 - 50m; 50 - 100m
Exposure characteristics:	Very exposed to wind action; Exposed to wind action; Moderately exposed to wind action; Sheltered from wind action; Very sheltered from wind action; Extremely sheltered from wind action; Strong tidal stream; Moderately strong tidal stream; Weak tidal stream; Very weak or no tidal stream; Very exposed to wave action; Exposed to wave action; Moderately exposed to wave action; Sheltered from wave action; Very sheltered from wave action; Extremely sheltered from wave action
Geomorphology or landform:	Reef; Open sea
Characteristics of wetness or dryness:	Aquatic
Substrate types:	Mobile; Mobile rock; Cobbles (undefined); Mobile cobbles; Pebbles; Gravel; Sand; Muddy sand; Mud, Silt; Biogenic; Peat; Shells; Mixed; Rock, Sand, Gravel; Pebbles, Cobbles; Sand, Gravel; Mud, Sand, Gravel; Mud, Gravel; Mud, Sand; Sand, Organic
Salinity levels:	Fully saline; Reduced salinity; Low salinity; Variable salinity

**EUNIS habitat code and names** A5.1 Sublittoral coarse sediment

**Description**

Coarse sediments including coarse sand, gravel, pebbles, shingle and cobbles which are often unstable due to tidal currents and/or wave action. These habitats are generally found on the open coast or in tide-swept channels of marine inlets. They typically have a low silt content and a lack of a significant seaweed component. They are characterised by a robust fauna including venerid bivalves.

**Source** Connor, D.W., Allen, J.H., Golding, N., Howell, K.L., Lieberknecht, L.M., Northen, K.O. & Reker, J.B. (2004)

**Legal instruments**

<u>Legal instrument</u>	<u>Legally designated habitat</u>	<u>Code</u>
EU Habitats Directive Annex I	Sandbanks which are slightly covered by sea water all the time	1110
	Estuaries	1130
	Coastal lagoons	1150
	Large shallow inlets and bays	1160
Council of Europe Bern Convention Res. No. 4 1996	Sublittoral soft seabeds	11.22

### Descriptive or diagnostic parameters

Parameter	Value(s)
Altitude zones (terrestrial and marine):	Offshore circalittoral; Circalittoral (marine); Infralittoral (marine)
Depth zones (for marine habitats):	0 - 5m; 5 - 10m; 10 - 20m; 20 - 30m
Exposure characteristics:	Exposed to wind action; Moderately exposed to wind action; Sheltered from wind action; Strong tidal stream; Moderately strong tidal stream; Weak tidal stream; Very weak or no tidal stream; Exposed to wave action; Moderately exposed to wave action; Sheltered from wave action
Geomorphology or landform:	Open sea
Characteristics of wetness or dryness:	Aquatic
Substrate types:	Mobile; Mobile rock; Cobbles (undefined); Mobile cobbles; Pebbles; Gravel; Mobile shingle; Sand; Shells
Salinity levels:	Fully saline; Variable salinity

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### EUNIS habitat code and names A5.11 Infralittoral coarse sediment in reduced salinity

#### Description

Clean gravels that occur in the upper reaches of marine inlets, especially estuaries, where water movement is sufficiently strong to remove the silt content of the sediment. The habitat typically lacks a significant seaweed component and is characterised by a sparse but very robust brackish-water tolerant fauna.

**Source** Connor, D.W., Allen, J.H., Golding, N., Howell, K.L., Lieberknecht, L.M., Northen, K.O. & Reker, J.B. (2004)

#### Legal instruments

Legal instrument	Legally designated habitat	Code
Council of Europe Bern Convention Res. No. 4 1996	Sublittoral soft seabeds	11.22

### Descriptive or diagnostic parameters

Parameter	Value(s)
Altitude zones (terrestrial and marine):	Circalittoral (marine); Infralittoral (marine)
Depth zones (for marine habitats):	0 - 5m; 5 - 10m; 10 - 20m
Exposure characteristics:	Moderately exposed to wind action; Sheltered from wind action; Very sheltered from wind action; Strong tidal stream; Moderately strong tidal stream; Weak tidal stream; Very weak or no tidal stream; Moderately exposed to wave action; Sheltered from wave action; Very sheltered from wave action
Substrate types:	Pebbles; Gravel
Salinity levels:	Reduced salinity; Variable salinity

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### EUNIS habitat code and names A5.12 Infralittoral coarse sediment

#### Description

Moderately exposed habitats with coarse sand, gravelly sand, shingle and gravel in the infralittoral, are subject to disturbance by tidal streams and wave action. Such habitats found on the open coast or in tide-swept marine inlets are characterised by a robust fauna of infaunal polychaetes such as *Chaetozone setosa* and *Lanice conchilega*, cumacean crustacea such as *Iphinoe trispinosa* and *Diastylis bradyi*, and venerid bivalves.

**Source** Connor, D.W., Allen, J.H., Golding, N., Howell, K.L., Lieberknecht, L.M., Northen, K.O. & Reker, J.B. (2004)

#### Legal instruments

Legal instrument	Legally designated habitat	Code
Council of Europe Bern Convention Res. No. 4 1996	Sublittoral soft seabeds	11.22

### Descriptive or diagnostic parameters

Parameter	Value(s)
Altitude zones (terrestrial and marine):	Infralittoral (marine)
Depth zones (for marine habitats):	0 - 5m; 5 - 10m; 10 - 20m
Exposure characteristics:	Exposed to wind action; Moderately exposed to wind action; Sheltered from wind action; Strong tidal stream; Moderately strong tidal stream; Weak tidal stream; Very weak or no tidal stream; Exposed to wave action; Moderately exposed to wave action; Sheltered from wave action
Substrate types:	Sand; Sand, Gravel; Mud, Sand, Gravel
Salinity levels:	Fully saline

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### EUNIS habitat code and names A5.13 Circalittoral coarse sediment

#### Description

Tide-swept circalittoral coarse sands, gravel and shingle generally in depths of over 15-20m. This habitat may be found in tidal channels of marine inlets, along exposed coasts and offshore. This habitat, as with shallower coarse sediments, may be characterised by robust infaunal polychaetes, mobile crustacea and bivalves. Certain

species of sea cucumber (e.g. *Neopentadactyla*) may also be prevalent in these areas along with the lancelet *Branchiostoma lanceolatum*.

**Source** Connor, D.W., Allen, J.H., Golding, N., Howell, K.L., Lieberknecht, L.M., Northen, K.O. & Reker, J.B. (2004)

**Legal instruments**

<u>Legal instrument</u>	<u>Legally designated habitat</u>	<u>Code</u>
Council of Europe Bern Convention Res. No. 4 1996	Sublittoral soft seabeds	11.22

**Descriptive or diagnostic parameters**

<b>Parameter</b>	<b>Value(s)</b>
Altitude zones (terrestrial and marine):	Circalittoral (marine)
Depth zones (for marine habitats):	5 - 10m; 10 - 20m; 20 - 30m
Exposure characteristics:	Exposed to wind action; Moderately exposed to wind action; Moderately strong tidal stream; Weak tidal stream; Very weak or no tidal stream; Exposed to wave action; Moderately exposed to wave action
Substrate types:	Gravel; Sand
Salinity levels:	Fully saline

**EUNIS habitat code and names** A5.14 Deep circalittoral coarse sediment

**Description**

Offshore (deep) circalittoral habitats with coarse sands and gravel or shell. This habitat may cover large areas of the offshore continental shelf although there is relatively little quantitative data available. Such habitats are quite diverse compared to shallower versions of this habitat and generally characterised by robust infaunal polychaete and bivalve species. Animal communities in this habitat are closely related to offshore mixed sediments and in some areas settlement of *Modiolus modiolus* larvae may occur and consequently these habitats may occasionally have large numbers of juvenile *M. Modiolus*. In areas where the mussels reach maturity their byssus threads bind the sediment together, increasing stability and allowing an increased deposition of silt leading to the development of the biotope A5.622.

**Source** Connor, D.W., Allen, J.H., Golding, N., Howell, K.L., Lieberknecht, L.M., Northen, K.O. & Reker, J.B. (2004)

**Legal instruments**

<u>Legal instrument</u>	<u>Legally designated habitat</u>	<u>Code</u>
Council of Europe Bern Convention Res. No. 4 1996	Sublittoral soft seabeds	11.22

**Descriptive or diagnostic parameters**

<b>Parameter</b>	<b>Value(s)</b>
Altitude zones (terrestrial and marine):	Offshore circalittoral
Depth zones (for marine habitats):	20 - 30m; 30 - 50m; 50 - 100m
Exposure characteristics:	Moderately exposed to wind action; Sheltered from wind action; Very sheltered from wind action; Moderately strong tidal stream; Weak tidal stream; Very weak or no tidal stream; Moderately exposed to wave action; Sheltered from wave action; Very sheltered from wave action
Substrate types:	Gravel; Sand
Salinity levels:	Fully saline

**EUNIS habitat code and names** A5.2 Sublittoral sand

**Description**

Clean medium to fine sands or non-cohesive slightly muddy sands on open coasts, offshore or in estuaries and marine inlets. Such habitats are often subject to a degree of wave action or tidal currents which restrict the silt and clay content to less than 15%. This habitat is characterised by a range of taxa including polychaetes, bivalve molluscs and amphipod crustacea.

**Source** Connor, D.W., Allen, J.H., Golding, N., Howell, K.L., Lieberknecht, L.M., Northen, K.O. & Reker, J.B. (2004)

**Legal instruments**

<u>Legal instrument</u>	<u>Legally designated habitat</u>	<u>Code</u>
EU Habitats Directive Annex I	Sandbanks which are slightly covered by sea water all the time	1110
	Estuaries	1130
	Coastal lagoons	1150
	Large shallow inlets and bays	1160
	Sublittoral soft seabeds	11.22
Council of Europe Bern Convention Res. No. 4 1996		

**Descriptive or diagnostic parameters**

<b>Parameter</b>	<b>Value(s)</b>
Altitude zones (terrestrial and marine):	Offshore circalittoral; Circalittoral (marine); Infralittoral (marine)
Depth zones (for marine habitats):	0 - 5m; 5 - 10m; 10 - 20m; 20 - 30m; 30 - 50m
Exposure characteristics:	Moderately exposed to wind action; Sheltered from wind action; Very sheltered

Geomorphology or landform: from wind action; Moderately strong tidal stream; Weak tidal stream; Very weak or no tidal stream; Moderately exposed to wave action; Sheltered from wave action; Very sheltered from wave action  
 Characteristics of wetness or dryness: Open sea  
 Substrate types: Aquatic  
 Salinity levels: Mobile; Sand; Muddy sand; Mixed  
 Fully saline; Reduced salinity; Low salinity; Variable salinity

**EUNIS habitat code and names** A5.21 Sublittoral sand in low or reduced salinity

**Description**

Shallow sand and muddy sand in areas of low or reduced, although relatively stable salinity (may vary annually), with largely ephemeral faunal communities. The species are often similar to that found in A5.31 and are characterised by *Arenicola marina* with other species, including mysids, tubificoid and enchytraeid oligochaetes, *Corophium volutator*, *Hediste diversicolor*, *Pygospio elegans*, *Hydrobia ulvae* and *Cerastoderma glaucum*, which commonly occur in lagoons. Filamentous green algae such as *Chaetomorpha linum* may also be present. In some examples of this biotope the polychaete *Fabricia sabella* may be super-abundant and the isopod *Sphaeroma hookeri* common.

**Source** Connor, D.W., Allen, J.H., Golding, N., Howell, K.L., Lieberknecht, L.M., Northen, K.O. & Reker, J.B. (2004)

**Legal instruments**

<u>Legal instrument</u>	<u>Legally designated habitat</u>	<u>Code</u>
Council of Europe Bern Convention Res. No. 4 1996	Sublittoral soft seabeds	11.22

**Descriptive or diagnostic parameters**

<b>Parameter</b>	<b>Value(s)</b>
Altitude zones (terrestrial and marine):	Circalittoral (marine); Infralittoral (marine)
Depth zones (for marine habitats):	0 - 5m; 5 - 10m; 10 - 20m
Exposure characteristics:	Ultra sheltered from wind action; Very weak or no tidal stream; Ultra sheltered from wave action
Substrate types:	Sand
Salinity levels:	Reduced salinity; Low salinity

**EUNIS habitat code and names** A5.22 Sublittoral sand in variable salinity (estuaries)

**Description**

Clean sands that occur in the upper reaches of marine inlets, especially estuaries, where water movement is moderately strong, allowing the sedimentation of sand but not the finer silt fraction. The habitat typically lacks a significant seaweed component and is characterised by brackish-water tolerant fauna, particularly amphipods, polychaetes and mysid shrimps.

**Source** Connor, D.W., Allen, J.H., Golding, N., Howell, K.L., Lieberknecht, L.M., Northen, K.O. & Reker, J.B. (2004)

**Legal instruments**

<u>Legal instrument</u>	<u>Legally designated habitat</u>	<u>Code</u>
EU Habitats Directive Annex I	Estuaries	1130
Council of Europe Bern Convention Res. No. 4 1996	Sublittoral soft seabeds	11.22

**Descriptive or diagnostic parameters**

<b>Parameter</b>	<b>Value(s)</b>
Altitude zones (terrestrial and marine):	Circalittoral (marine)
Depth zones (for marine habitats):	0 - 5m; 5 - 10m; 10 - 20m
Exposure characteristics:	Moderately exposed to wind action; Sheltered from wind action; Very sheltered from wind action; Strong tidal stream; Moderately strong tidal stream; Weak tidal stream; Moderately exposed to wave action; Sheltered from wave action; Very sheltered from wave action
Substrate types:	Sand
Salinity levels:	Variable salinity

**EUNIS habitat code and names** A5.23 Infralittoral fine sand

**Description**

Clean sands which occur in shallow water, either on the open coast or in tide-swept channels of marine inlets. The habitat typically lacks a significant seaweed component and is characterised by robust fauna, particularly amphipods (*Bathyporeia*) and robust polychaetes including *Nephtys cirrosa* and *Lanice conchilega*.

**Source** Connor, D.W., Allen, J.H., Golding, N., Howell, K.L., Lieberknecht, L.M., Northen, K.O. & Reker, J.B. (2004)

**Legal instruments**

<u>Legal instrument</u>	<u>Legally designated habitat</u>	<u>Code</u>
Council of Europe Bern Convention Res. No. 4 1996	Sublittoral soft seabeds	11.22

#### Descriptive or diagnostic parameters

Parameter	Value(s)
Altitude zones (terrestrial and marine):	Infralittoral (marine)
Depth zones (for marine habitats):	0 - 5m; 5 - 10m; 10 - 20m
Exposure characteristics:	Exposed to wind action; Moderately exposed to wind action; Sheltered from wind action; Strong tidal stream; Moderately strong tidal stream; Weak tidal stream; Very weak or no tidal stream; Exposed to wave action; Moderately exposed to wave action; Sheltered from wave action
Substrate types:	Sand
Salinity levels:	Fully saline

### EUNIS habitat code and names A5.24 Infralittoral muddy sand

#### Description

Non-cohesive muddy sand (with 5% to 20% silt/clay) in the infralittoral zone, extending from the extreme lower shore down to more stable circalittoral zone at about 15-20 m. The habitat supports a variety of animal-dominated communities, particularly polychaetes (*Magelona mirabilis*, *Spiophanes bombyx* and *Chaetozone setosa*), bivalves (*Fabulina fibula* and *Chamelea gallina*) and the urchin *Echinocardium cordatum*.

**Source** Connor, D.W., Allen, J.H., Golding, N., Howell, K.L., Lieberknecht, L.M., Northen, K.O. & Reker, J.B. (2004)

#### Legal instruments

<u>Legal instrument</u>	<u>Legally designated habitat</u>	<u>Code</u>
Council of Europe Bern Convention Res. No. 4 1996	Sublittoral soft seabeds	11.22

#### Descriptive or diagnostic parameters

Parameter	Value(s)
Altitude zones (terrestrial and marine):	Infralittoral (marine)
Depth zones (for marine habitats):	0 - 5m; 5 - 10m; 10 - 20m
Exposure characteristics:	Moderately exposed to wind action; Sheltered from wind action; Moderately strong tidal stream; Weak tidal stream; Very weak or no tidal stream; Moderately exposed to wave action; Sheltered from wave action
Substrate types:	Sand; Muddy sand
Salinity levels:	Fully saline; Variable salinity

### EUNIS habitat code and names A5.25 Circalittoral fine sand

#### Description

Clean fine sands with less than 5% silt/clay in deeper water, either on the open coast or in tide-swept channels of marine inlets in depths of over 15-20 m. The habitat may also extend offshore and is characterised by a wide range of echinoderms (in some areas including the pea urchin *Echinocyamus pusillus*), polychaetes and bivalves. This habitat is generally more stable than shallower, infralittoral sands and consequently supports a more diverse community.

**Source** Connor, D.W., Allen, J.H., Golding, N., Howell, K.L., Lieberknecht, L.M., Northen, K.O. & Reker, J.B. (2004)

#### Descriptive or diagnostic parameters

Parameter	Value(s)
Altitude zones (terrestrial and marine):	Circalittoral (marine)
Depth zones (for marine habitats):	10 - 20m; 20 - 30m; 30 - 50m
Exposure characteristics:	Moderately exposed to wind action; Sheltered from wind action; Very sheltered from wind action; Weak tidal stream; Very weak or no tidal stream; Moderately exposed to wave action; Sheltered from wave action; Very sheltered from wave action
Substrate types:	Sand
Salinity levels:	Fully saline; Variable salinity

### EUNIS habitat code and names A5.26 Circalittoral muddy sand

#### Description

Circalittoral non-cohesive muddy sands with the silt content of the substratum typically ranging from 5% to 20%. This habitat is generally found in water depths of over 15-20 m and supports animal-dominated communities characterised by a wide variety of polychaetes, bivalves such as *Abra alba* and *Nucula nitidosa*, and echinoderms such as *Amphiura* spp and *Ophiura* spp., and *Astropecten irregularis*. These circalittoral habitats tend to be more stable than their infralittoral counterparts and as such support a richer infaunal community.



**Source** Connor, D.W., Allen, J.H., Golding, N., Howell, K.L., Lieberknecht, L.M., Northen, K.O. & Reker, J.B. (2004)

**Legal instruments**

<u>Legal instrument</u>	<u>Legally designated habitat</u>	<u>Code</u>
Council of Europe Bern Convention Res. No. 4 1996	Sublittoral soft seabeds	11.22

**Descriptive or diagnostic parameters**

<b>Parameter</b>	<b>Value(s)</b>
Altitude zones (terrestrial and marine):	Circalittoral (marine)
Depth zones (for marine habitats):	10 - 20m; 20 - 30m; 30 - 50m
Exposure characteristics:	Exposed to wind action; Moderately exposed to wind action; Moderately strong tidal stream; Weak tidal stream; Very weak or no tidal stream; Exposed to wave action; Moderately exposed to wave action
Substrate types:	Sand
Salinity levels:	Fully saline

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**EUNIS habitat code and names** A5.27 Deep circalittoral sand

**Description**

Offshore (deep) circalittoral habitats with fine sands or non-cohesive muddy sands. Very little data is available on these habitats however they are likely to be more stable than their shallower counterparts and characterised by a diverse range of polychaetes, amphipods, bivalves and echinoderms.

**Source** Connor, D.W., Allen, J.H., Golding, N., Howell, K.L., Lieberknecht, L.M., Northen, K.O. & Reker, J.B. (2004)

**Legal instruments**

<u>Legal instrument</u>	<u>Legally designated habitat</u>	<u>Code</u>
Council of Europe Bern Convention Res. No. 4 1996	Sublittoral soft seabeds	11.22

**Descriptive or diagnostic parameters**

<b>Parameter</b>	<b>Value(s)</b>
Altitude zones (terrestrial and marine):	Offshore circalittoral
Substrate types:	Sand; Muddy sand
Salinity levels:	Fully saline

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**EUNIS habitat code and names** A5.28 Mediterranean communities of superficial muddy sands in sheltered waters

**Description**

No description available.

**Source** Barcelona Convention (1998)

**Legal instruments**

<u>Legal instrument</u>	<u>Legally designated habitat</u>	<u>Code</u>
Council of Europe Bern Convention Res. No. 4 1996	Sublittoral soft seabeds	11.22

**Descriptive or diagnostic parameters**

<b>Parameter</b>	<b>Value(s)</b>
Altitude zones (terrestrial and marine):	Circalittoral (marine); Infralittoral (marine)
Salinity levels:	Fully saline

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**EUNIS habitat code and names** A5.3 Sublittoral mud

**Description**

Sublittoral mud and cohesive sandy mud extending from the extreme lower shore to offshore, circalittoral habitats. This biotope is predominantly found in sheltered harbours, sealochs, bays, marine inlets and estuaries and stable deeper/offshore areas where the reduced influence of wave action and/or tidal streams allow fine sediments to settle. Such habitats are often by dominated by polychaetes and echinoderms, in particular brittlestars such as *Amphiura* spp. Seapens such as *Virgularia mirabilis* and burrowing megafauna including *Nephtys norvegicus* are common in deeper muds. Estuarine muds tend to be characterised by infaunal polychaetes and oligochaetes.

**Source** Connor, D.W., Allen, J.H., Golding, N., Howell, K.L., Lieberknecht, L.M., Northen, K.O. & Reker, J.B. (2004)

**Legal instruments**

<u>Legal instrument</u>	<u>Legally designated habitat</u>	<u>Code</u>
EU Habitats Directive Annex I	Estuaries	1130

	Coastal lagoons	1150
	Large shallow inlets and bays	1160
	Boreal Baltic narrow inlets	1650
Council of Europe Bern Convention Res. No. 4 1996	Sublittoral soft seabeds	11.22

#### Descriptive or diagnostic parameters

Parameter	Value(s)
Altitude zones (terrestrial and marine):	Offshore circalittoral; Circalittoral (marine); Infralittoral (marine)
Depth zones (for marine habitats):	0 - 5m; 5 - 10m; 10 - 20m; 20 - 30m
Exposure characteristics:	Moderately exposed to wind action; Sheltered from wind action; Very sheltered from wind action; Extremely sheltered from wind action; Ultra sheltered from wind action; Moderately strong tidal stream; Weak tidal stream; Very weak or no tidal stream; Moderately exposed to wave action; Sheltered from wave action; Very sheltered from wave action; Extremely sheltered from wave action; Ultra sheltered from wave action
Geomorphology or landform:	Open sea
Characteristics of wetness or dryness:	Aquatic
Substrate types:	Muddy sand; Mud, Silt
Salinity levels:	Fully saline; Reduced salinity; Low salinity; Variable salinity

#### EUNIS habitat code and names A5.31 Sublittoral mud in low or reduced salinity (lagoons)

##### Description

Shallow, typically anoxic, muddy and sandy mud sediments in areas of low or reduced, although stable, salinity (may vary annually) with largely ephemeral faunal communities. Characterised by *Arenicola marina* and blue-green algae with other species, including mysids, *Carcinus maenas* and *Corophium volutator* which commonly occur in lagoons. Important infaunal species may include *Hediste diversicolor*, *Heterochaeta costata* and chironomids; however infaunal records for this biotope are limited.

**Source** Connor, D.W., Allen, J.H., Golding, N., Howell, K.L., Lieberknecht, L.M., Northen, K.O. & Reker, J.B. (2004)

##### Legal instruments

Legal instrument	Legally designated habitat	Code
EU Habitats Directive Annex I	Coastal lagoons	1150
Council of Europe Bern Convention Res. No. 4 1996	Sublittoral soft seabeds	11.22

#### Descriptive or diagnostic parameters

Parameter	Value(s)
Altitude zones (terrestrial and marine):	Infralittoral (marine)
Depth zones (for marine habitats):	0 - 5m
Exposure characteristics:	Extremely sheltered from wind action; Ultra sheltered from wind action; Weak tidal stream; Very weak or no tidal stream; Extremely sheltered from wave action; Ultra sheltered from wave action
Substrate types:	Muddy sand
Salinity levels:	Reduced salinity; Low salinity

#### EUNIS habitat code and names A5.32 Sublittoral mud in variable salinity (estuaries)

##### Description

Shallow sublittoral muds, extending from the extreme lower shore into the subtidal in variable salinity (estuarine) conditions. Such habitats typically support communities characterised by oligochaetes, and polychaetes such as *Aphelocheata marioni*. In lowered salinity conditions the sediments may include a proportion of coarser material, where the silt content is sufficient to yield a similar community to that found in purer muds.

**Source** Connor, D.W., Allen, J.H., Golding, N., Howell, K.L., Lieberknecht, L.M., Northen, K.O. & Reker, J.B. (2004)

##### Legal instruments

Legal instrument	Legally designated habitat	Code
EU Habitats Directive Annex I	Estuaries	1130
Council of Europe Bern Convention Res. No. 4 1996	Sublittoral soft seabeds	11.22

#### Descriptive or diagnostic parameters

Parameter	Value(s)
Altitude zones (terrestrial and marine):	Infralittoral (marine)
Depth zones (for marine habitats):	0 - 5m; 5 - 10m
Exposure characteristics:	Moderately exposed to wind action; Sheltered from wind action; Very sheltered from wind action; Extremely sheltered from wind action; Strong tidal stream; Moderately strong tidal stream; Weak tidal stream; Very weak or no tidal stream; Moderately exposed to wave action; Sheltered from wave action; Very sheltered from wave action; Extremely sheltered from wave action

Substrate types: Muddy sand; Mud, Silt  
Salinity levels: Variable salinity

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**EUNIS habitat code and names** A5.33 Infralittoral sandy mud

**Description**

Infralittoral, cohesive sandy mud, typically with over 20% silt/clay, in depths of less than 15-20 m. This habitat is generally found in sheltered bays or marine inlets and along sheltered areas of open coast. Typical species include a rich variety of polychaetes including *Melinna palmate*, tube building amphipods (*Ampelisca* spp.) and deposit feeding bivalves such as *Macoma balthica* and *Mysella bidentata*. Sea pens such as *Virgularia mirabilis* and brittlestars such as *Amphiura* spp. may be present but not in the same abundances as found in deeper circalittoral waters.

**Source** Connor, D.W., Allen, J.H., Golding, N., Howell, K.L., Lieberknecht, L.M., Northen, K.O. & Reker, J.B. (2004)

**Legal instruments**

<u>Legal instrument</u>	<u>Legally designated habitat</u>	<u>Code</u>
Council of Europe Bern Convention Res. No. 4 1996	Sublittoral soft seabeds	11.22

**Descriptive or diagnostic parameters**

<b>Parameter</b>	<b>Value(s)</b>
Altitude zones (terrestrial and marine):	Infralittoral (marine)
Depth zones (for marine habitats):	0 - 5m; 5 - 10m; 10 - 20m
Exposure characteristics:	Sheltered from wind action; Very sheltered from wind action; Extremely sheltered from wind action; Moderately strong tidal stream; Weak tidal stream; Very weak or no tidal stream; Sheltered from wave action; Very sheltered from wave action; Extremely sheltered from wave action
Substrate types:	Muddy sand; Mud, Silt
Salinity levels:	Fully saline; Variable salinity

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**EUNIS habitat code and names** A5.34 Infralittoral fine mud

**Description**

Shallow sublittoral muds, extending from the extreme lower shore to about 15-20 m depth in fully marine or near marine conditions, predominantly in extremely sheltered areas with very weak tidal currents. Such habitats are found in sealochs and some rias and harbours. Populations of the lugworm *Arenicola marina* may be dense, with anemones, the opisthobranch *Philine aperta* and synaptid holothurians also characteristic in some areas. The extent of the oxidised layer may be shallow with some areas being periodically or permanently anoxic. In these areas bacterial mats may develop on the sediment surface. Infaunal records for this habitat type are limited encompassing only one biotope. They are therefore not representative of the full suite of infaunal species found in this biotope.

**Source** Connor, D.W., Allen, J.H., Golding, N., Howell, K.L., Lieberknecht, L.M., Northen, K.O. & Reker, J.B. (2004)

**Legal instruments**

<u>Legal instrument</u>	<u>Legally designated habitat</u>	<u>Code</u>
Council of Europe Bern Convention Res. No. 4 1996	Sublittoral soft seabeds	11.22

**Descriptive or diagnostic parameters**

<b>Parameter</b>	<b>Value(s)</b>
Altitude zones (terrestrial and marine):	Infralittoral (marine)
Depth zones (for marine habitats):	0 - 5m; 5 - 10m; 10 - 20m
Exposure characteristics:	Sheltered from wind action; Very sheltered from wind action; Extremely sheltered from wind action; Weak tidal stream; Very weak or no tidal stream; Sheltered from wave action; Very sheltered from wave action; Extremely sheltered from wave action
Substrate types:	Mud, Gravel
Salinity levels:	Fully saline; Variable salinity

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**EUNIS habitat code and names** A5.35 Circalittoral sandy mud

**Description**

Circalittoral, cohesive sandy mud, typically with over 20% silt/clay, generally in water depths of over 10 m, with weak or very weak tidal streams. This habitat is generally found in deeper areas of bays and marine inlets or offshore from less wave exposed coasts. Sea pens such as *Virgularia mirabilis* and brittlestars such as *Amphiura* spp. are particularly characteristic of this habitat whilst infaunal species include the tube building polychaetes *Lagis koreni* and *Owenia fusiformis*, and deposit feeding bivalves such as *Mysella bidentata* and *Abra* spp.

**Source** Connor, D.W., Allen, J.H., Golding, N., Howell, K.L., Lieberknecht, L.M., Northen, K.O. & Reker, J.B. (2004)

**Legal instruments**

<u>Legal instrument</u>	<u>Legally designated habitat</u>	<u>Code</u>
Council of Europe Bern Convention Res. No. 4 1996	Sublittoral soft seabeds	11.22

**Descriptive or diagnostic parameters**

<b>Parameter</b>	<b>Value(s)</b>
Altitude zones (terrestrial and marine):	Circalittoral (marine)
Depth zones (for marine habitats):	10 - 20m; 20 - 30m; 30 - 50m; 50 - 100m
Exposure characteristics:	Exposed to wind action; Moderately exposed to wind action; Sheltered from wind action; Very sheltered from wind action; Moderately strong tidal stream; Weak tidal stream; Very weak or no tidal stream; Exposed to wave action; Moderately exposed to wave action; Sheltered from wave action; Very sheltered from wave action
Substrate types:	Mud, Silt
Salinity levels:	Fully saline

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**EUNIS habitat code and names** A5.36 Circalittoral fine mud

**Description**

Sublittoral muds, occurring below moderate depths of 15-20 m, either on the open coast or in marine inlets such as sealochs. The seapens *Virgularia mirabilis* and *Pennatulula phosphorea* are characteristic of this habitat type together with the burrowing anemone *Cerianthus lloydii* and the ophiuroid *Amphiura* spp. The relatively stable conditions often lead to the establishment of communities of burrowing megafaunal species, such as *Nephrops norvegicus*.

**Source** Connor, D.W., Allen, J.H., Golding, N., Howell, K.L., Lieberknecht, L.M., Northen, K.O. & Reker, J.B. (2004)

**Legal instruments**

<u>Legal instrument</u>	<u>Legally designated habitat</u>	<u>Code</u>
Council of Europe Bern Convention Res. No. 4 1996	Sublittoral soft seabeds	11.22

**Descriptive or diagnostic parameters**

<b>Parameter</b>	<b>Value(s)</b>
Altitude zones (terrestrial and marine):	Circalittoral (marine)
Depth zones (for marine habitats):	10 - 20m; 20 - 30m; 30 - 50m
Exposure characteristics:	Moderately exposed to wind action; Sheltered from wind action; Very sheltered from wind action; Extremely sheltered from wind action; Weak tidal stream; Very weak or no tidal stream; Moderately exposed to wave action; Sheltered from wave action; Very sheltered from wave action; Extremely sheltered from wave action
Substrate types:	Mud, Silt
Salinity levels:	Fully saline; Variable salinity

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**EUNIS habitat code and names** A5.37 Deep circalittoral mud

**Description**

In mud and cohesive sandy mud in the offshore circalittoral zone, typically below 50-70 m, a variety of faunal communities may develop, depending upon the level of silt/clay and organic matter in the sediment. Communities are typically dominated by polychaetes but often with high numbers of bivalves such as *Thyasira* spp., echinoderms and foraminifera.

**Source** Connor, D.W., Allen, J.H., Golding, N., Howell, K.L., Lieberknecht, L.M., Northen, K.O. & Reker, J.B. (2004)

**Legal instruments**

<u>Legal instrument</u>	<u>Legally designated habitat</u>	<u>Code</u>
Council of Europe Bern Convention Res. No. 4 1996	Sublittoral soft seabeds	11.22

**Descriptive or diagnostic parameters**

<b>Parameter</b>	<b>Value(s)</b>
Altitude zones (terrestrial and marine):	Offshore circalittoral
Depth zones (for marine habitats):	50 - 100m
Exposure characteristics:	Weak tidal stream; Very weak or no tidal stream
Substrate types:	Muddy sand
Salinity levels:	Fully saline

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**EUNIS habitat code and names** A5.38 Mediterranean communities of muddy detritic bottoms

**Description**

No description available.

**Source** Barcelona Convention (1998)

**Legal instruments**

<u>Legal instrument</u>	<u>Legally designated habitat</u>	<u>Code</u>
Council of Europe Bern Convention Res. No. 4 1996	Sublittoral soft seabeds	11.22

**Descriptive or diagnostic parameters**

<b>Parameter</b>	<b>Value(s)</b>
Altitude zones (terrestrial and marine):	Circalittoral (marine); Infralittoral (marine)
Salinity levels:	Fully saline

**EUNIS habitat code and names** A5.39 Mediterranean communities of coastal terrigenous muds**Description**

No description available.

**Source** Barcelona Convention (1998)

**Legal instruments**

<u>Legal instrument</u>	<u>Legally designated habitat</u>	<u>Code</u>
Council of Europe Bern Convention Res. No. 4 1996	Sublittoral soft seabeds	11.22

**Descriptive or diagnostic parameters**

<b>Parameter</b>	<b>Value(s)</b>
Altitude zones (terrestrial and marine):	Circalittoral (marine); Infralittoral (marine)
Salinity levels:	Fully saline

**EUNIS habitat code and names** A5.4 Sublittoral mixed sediments**Description**

Sublittoral mixed (heterogeneous) sediments found from the extreme low water mark to deep offshore circalittoral habitats. These habitats incorporate a range of sediments including heterogeneous muddy gravelly sands and also mosaics of cobbles and pebbles embedded in or lying upon sand, gravel or mud. There is a degree of confusion with regard nomenclature within this complex as many habitats could be defined as containing mixed sediments, in part depending on the scale of the survey and the sampling method employed. The BGS trigon can be used to define truly mixed or heterogeneous sites with surficial sediments which are a mixture of mud, gravel and sand. However, another 'form' of mixed sediment includes mosaic habitats such as superficial waves or ribbons of sand on a gravel bed or areas of lag deposits with cobbles/pebbles embedded in sand or mud and these are less well defined and may overlap into other habitat or biological subtypes. These habitats may support a wide range of infauna and epibiota including polychaetes, bivalves, echinoderms, anemones, hydroids and Bryozoa. Mixed sediments with biogenic reefs or macrophyte dominated communities are classified separately in A5.6 and A5.5 respectively.

**Source** Connor, D.W., Allen, J.H., Golding, N., Howell, K.L., Lieberknecht, L.M., Northen, K.O. & Reker, J.B. (2004)

**Legal instruments**

<u>Legal instrument</u>	<u>Legally designated habitat</u>	<u>Code</u>
EU Habitats Directive Annex I	Sandbanks which are slightly covered by sea water all the time	1110
	Estuaries	1130
	Coastal lagoons	1150
	Large shallow inlets and bays	1160
Council of Europe Bern Convention Res. No. 4 1996	Sublittoral soft seabeds	11.22

**Descriptive or diagnostic parameters**

<b>Parameter</b>	<b>Value(s)</b>
Altitude zones (terrestrial and marine):	Offshore circalittoral; Circalittoral (marine); Infralittoral (marine)
Depth zones (for marine habitats):	0 - 5m; 5 - 10m; 10 - 20m; 20 - 30m; 30 - 50m
Exposure characteristics:	Moderately exposed to wind action; Sheltered from wind action; Very sheltered from wind action; Extremely sheltered from wind action; Ultra sheltered from wind action; Moderately strong tidal stream; Weak tidal stream; Very weak or no tidal stream; Moderately exposed to wave action; Sheltered from wave action; Very sheltered from wave action; Extremely sheltered from wave action; Ultra sheltered from wave action
Geomorphology or landform:	Open sea
Characteristics of wetness or dryness:	Aquatic
Substrate types:	Mobile; Shells; Mixed; Rock, Sand, Gravel; Pebbles, Cobbles; Sand, Gravel; Mud, Sand, Gravel; Mud, Gravel; Mud, Sand; Sand, Organic
Salinity levels:	Fully saline; Reduced salinity; Low salinity; Variable salinity

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**EUNIS habitat code and names** A5.41 Sublittoral mixed sediment in low or reduced salinity (lagoons)

**Description**

Shallow, muddy mixed sediments in areas of low or reduced, although stable, salinity (may vary annually) with largely ephemeral faunal communities. Characterised infaunally by oligochaetes, including *Heterochaeta costata* and members of the Enchytraeidae, polychaetes such as *Hediste diversicolor*, *Polydora ciliata* and *Pygospio elegans*, and bivalves such as *Mya arenaria* and the lagoon cockle *Cerastoderma glaucum*. These bivalve species may also form conspicuous members of the epifauna together with more ubiquitous species like the common goby *Pomatoschistus microps*.

**Source** Connor, D.W., Allen, J.H., Golding, N., Howell, K.L., Lieberknecht, L.M., Northen, K.O. & Reker, J.B. (2004)

**Legal instruments**

<u>Legal instrument</u>	<u>Legally designated habitat</u>	<u>Code</u>
EU Habitats Directive Annex I	Coastal lagoons	1150
Council of Europe Bern Convention Res. No. 4 1996	Sublittoral soft seabeds	11.22

**Descriptive or diagnostic parameters**

<u>Parameter</u>	<u>Value(s)</u>
Altitude zones (terrestrial and marine):	Infralittoral (marine)
Depth zones (for marine habitats):	0 - 5m; 5 - 10m
Exposure characteristics:	Ultra sheltered from wind action; Weak tidal stream; Ultra sheltered from wave action
Substrate types:	Mixed
Salinity levels:	Low salinity

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**EUNIS habitat code and names** A5.42 Sublittoral mixed sediment in variable salinity (estuaries)

**Description**

Shallow sublittoral mixed sediments in estuarine conditions, often with surface shells or stones, enabling the development of diverse epifaunal communities, e.g. *Crepidula fornicata* (A5.422), as well as infaunal communities. This habitat type is therefore often quite species rich, compared with purer sediments.

**Source** Connor, D.W., Allen, J.H., Golding, N., Howell, K.L., Lieberknecht, L.M., Northen, K.O. & Reker, J.B. (2004)

**Legal instruments**

<u>Legal instrument</u>	<u>Legally designated habitat</u>	<u>Code</u>
EU Habitats Directive Annex I	Estuaries	1130
Council of Europe Bern Convention Res. No. 4 1996	Sublittoral soft seabeds	11.22

**Descriptive or diagnostic parameters**

<u>Parameter</u>	<u>Value(s)</u>
Altitude zones (terrestrial and marine):	Infralittoral (marine)
Depth zones (for marine habitats):	0 - 5m; 5 - 10m
Exposure characteristics:	Sheltered from wind action; Very sheltered from wind action; Extremely sheltered from wind action; Moderately strong tidal stream; Weak tidal stream; Very weak or no tidal stream; Sheltered from wave action; Very sheltered from wave action; Extremely sheltered from wave action
Substrate types:	Mud, Sand, Gravel
Salinity levels:	Reduced salinity; Low salinity; Variable salinity

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**EUNIS habitat code and names** A5.43 Infralittoral mixed sediments

**Description**

Shallow mixed (heterogeneous) sediments in fully marine or near fully marine conditions, supporting various animal-dominated communities, with relatively low proportions of seaweeds. This habitat may include well mixed muddy gravelly sands or very poorly sorted mosaics of shell, cobbles and pebbles embedded in mud, sand or gravel. Due to the quite variable nature of the sediment type, a widely variable array of communities may be found, including those characterised by bivalves (A5.433, A5.431, and A5.435), polychaetes (A5.432) and file shells (A5.434). This has resulted in many species being described as characteristic of this habitat type all contributing only a small percentage to the overall similarity (see below). This habitat type may also include a newly proposed *Chaetopterus* biotope (Rees pers com.) recently found in the eastern English Channel. This biotope is characterised by an undescribed *Chaetopterus* sp. and small *Lanice conchilega*. Further sampling is need in order to assess and fully characterise this potential biotope. As a result, the *Chaetopterus* biotope has not been included in this revision. Infaunal data for this habitat type are limited to that described in the biotope

A5.433 and so are not representative of the infaunal component of the whole habitat type.

**Source** Connor, D.W., Allen, J.H., Golding, N., Howell, K.L., Lieberknecht, L.M., Northen, K.O. & Reker, J.B. (2004)

#### Legal instruments

<u>Legal instrument</u>	<u>Legally designated habitat</u>	<u>Code</u>
Council of Europe Bern Convention Res. No. 4 1996	Sublittoral soft seabeds	11.22

#### Descriptive or diagnostic parameters

<b>Parameter</b>	<b>Value(s)</b>
Altitude zones (terrestrial and marine):	Infralittoral (marine)
Depth zones (for marine habitats):	0 - 5m; 5 - 10m; 10 - 20m; 20 - 30m
Exposure characteristics:	Moderately exposed to wind action; Sheltered from wind action; Very sheltered from wind action; Strong tidal stream; Moderately strong tidal stream; Weak tidal stream; Moderately exposed to wave action; Sheltered from wave action; Very sheltered from wave action
Substrate types:	Mixed
Salinity levels:	Fully saline; Variable salinity

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### EUNIS habitat code and names A5.44 Circalittoral mixed sediments

#### Description

Mixed (heterogeneous) sediment habitats in the circalittoral zone (generally below 15-20 m) including well mixed muddy gravelly sands or very poorly sorted mosaics of shell, cobbles and pebbles embedded in or lying upon mud, sand or gravel. Due to the variable nature of the seabed a variety of communities can develop which are often very diverse. A wide range of infaunal polychaetes, bivalves, echinoderms and burrowing anemones such as *Cerianthus lloydii* are often present in such habitat and the presence of hard substrata (shells and stones) on the surface enables epifaunal species to become established, particularly hydroids such as *Nemertesia* spp and *Hydrallmania falcata*. The combination of epifauna and infauna can lead to species rich communities. Coarser mixed sediment communities may show a strong resemblance, in terms of infauna, to biotopes within the A5.1. However, infaunal data for this habitat type is limited to that described under the biotope A5.443, and so are not representative of the infaunal component of this habitat type.

**Source** Connor, D.W., Allen, J.H., Golding, N., Howell, K.L., Lieberknecht, L.M., Northen, K.O. & Reker, J.B. (2004)

#### Legal instruments

<u>Legal instrument</u>	<u>Legally designated habitat</u>	<u>Code</u>
Council of Europe Bern Convention Res. No. 4 1996	Sublittoral soft seabeds	11.22

#### Descriptive or diagnostic parameters

<b>Parameter</b>	<b>Value(s)</b>
Altitude zones (terrestrial and marine):	Circalittoral (marine)
Depth zones (for marine habitats):	5 - 10m; 10 - 20m; 20 - 30m; 30 - 50m
Exposure characteristics:	Moderately exposed to wind action; Sheltered from wind action; Very sheltered from wind action; Moderately strong tidal stream; Weak tidal stream; Very weak or no tidal stream; Moderately exposed to wave action; Sheltered from wave action; Very sheltered from wave action
Substrate types:	Mixed
Salinity levels:	Fully saline

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### EUNIS habitat code and names A5.45 Deep mixed sediments

#### Description

Offshore (deep) circalittoral habitats with slightly muddy mixed gravelly sand and stones or shell. This habitat may cover large areas of the offshore continental shelf although there is relatively little data available. Such habitats are often highly diverse with a high number of infaunal polychaete and bivalve species. Animal communities in this habitat are closely related to offshore gravels and coarse sands and in some areas populations of the horse mussel *Modiolus modiolus* may develop in these habitats (see A5.622).

**Source** Connor, D.W., Allen, J.H., Golding, N., Howell, K.L., Lieberknecht, L.M., Northen, K.O. & Reker, J.B. (2004)

#### Legal instruments

<u>Legal instrument</u>	<u>Legally designated habitat</u>	<u>Code</u>
Council of Europe Bern Convention Res. No. 4 1996	Sublittoral soft seabeds	11.22

#### Descriptive or diagnostic parameters

<b>Parameter</b>	<b>Value(s)</b>
Altitude zones (terrestrial and marine):	Offshore circalittoral
Depth zones (for marine habitats):	20 - 30m; 30 - 50m; 50 - 100m
Exposure characteristics:	Moderately exposed to wind action; Sheltered from wind action; Moderately exposed to wave action; Sheltered from wave action

Substrate types: Muddy sand  
Salinity levels: Fully saline

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**EUNIS habitat code and names** A5.46 Mediterranean communities of coastal detritic bottoms

**Description**

No description available.

**Source** Barcelona Convention (1998)

**Legal instruments**

<u>Legal instrument</u>	<u>Legally designated habitat</u>	<u>Code</u>
Council of Europe Bern Convention Res. No. 4 1996	Sublittoral soft seabeds	11.22

**Descriptive or diagnostic parameters**

<b>Parameter</b>	<b>Value(s)</b>
Altitude zones (terrestrial and marine):	Circalittoral (marine); Infralittoral (marine)
Salinity levels:	Fully saline

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**EUNIS habitat code and names** A5.47 Mediterranean communities of shelf-edge detritic bottoms

**Description**

No description available.

**Source** Barcelona Convention (1998)

**Legal instruments**

<u>Legal instrument</u>	<u>Legally designated habitat</u>	<u>Code</u>
Council of Europe Bern Convention Res. No. 4 1996	Sublittoral soft seabeds	11.22

**Descriptive or diagnostic parameters**

<b>Parameter</b>	<b>Value(s)</b>
Salinity levels:	Fully saline

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**EUNIS habitat code and names** A5.5 Sublittoral macrophyte-dominated sediment

**Description**

This habitat type includes maerl beds, seaweed dominated mixed sediments (including kelps such as *Laminaria saccharina* and filamentous/foliose red and green algae), seagrass beds, and lagoonal angiosperm communities. These communities develop in a range of habitats from exposed open coasts to lagoons and are found in a variety of sediment types and salinity regimes.

**Source** Connor, D.W., Allen, J.H., Golding, N., Howell, K.L., Lieberknecht, L.M., Northen, K.O. & Reker, J.B. (2004)

**Legal instruments**

<u>Legal instrument</u>	<u>Legally designated habitat</u>	<u>Code</u>
EU Habitats Directive Annex I	Sandbanks which are slightly covered by sea water all the time	1110
	Posidonia beds ( <i>Posidonia oceanica</i> )	1120
	Estuaries	1130
	Coastal lagoons	1150
	Large shallow inlets and bays	1160

**Descriptive or diagnostic parameters**

<b>Parameter</b>	<b>Value(s)</b>
Altitude zones (terrestrial and marine):	Infralittoral (marine)
Depth zones (for marine habitats):	0 - 5m; 5 - 10m; 10 - 20m
Exposure characteristics:	Moderately exposed to wind action; Sheltered from wind action; Very sheltered from wind action; Extremely sheltered from wind action; Moderately strong tidal stream; Weak tidal stream; Very weak or no tidal stream; Moderately exposed to wave action; Sheltered from wave action; Very sheltered from wave action; Extremely sheltered from wave action
Geomorphology or landform:	Open sea
Dominant life forms:	Aquatic angiosperms
Characteristics of wetness or dryness:	Aquatic
Substrate types:	Mobile; Cobbles (undefined); Gravel; Sand; Muddy sand; Mud; Silt; Biogenic; Peat; Shells; Mixed
Salinity levels:	Fully saline; Reduced salinity; Variable salinity
Related phytosociological units:	<i>Charion canescentis</i> ; <i>Cymodoceion nodosae</i> ; <i>Posidonium oceanicae</i> ;



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**EUNIS habitat code and names** A5.51 Maerl beds

**Description**

Beds of maerl in coarse clean sediments of gravels and clean sands, which occur either on the open coast or in tide-swept channels of marine inlets (the latter often stony). In fully marine conditions the dominant maerl is typically *Phymatolithon calcareum* (A5.511), whilst under variable salinity conditions in some sealochs beds of *Lithothamnion glaciale* (A5.512) may develop.

**Source** Connor, D.W., Allen, J.H., Golding, N., Howell, K.L., Lieberknecht, L.M., Northen, K.O. & Reker, J.B. (2004)

**Legal instruments**

<u>Legal instrument</u>	<u>Legally designated habitat</u>	<u>Code</u>
Council of Europe Bern Convention Res. No. 4 1996	Sublittoral soft seabeds	11.22

**Descriptive or diagnostic parameters**

<b>Parameter</b>	<b>Value(s)</b>
Altitude zones (terrestrial and marine):	Circalittoral (marine); Infralittoral (marine)
Depth zones (for marine habitats):	0 - 5m; 5 - 10m; 10 - 20m
Exposure characteristics:	Moderately exposed to wind action; Sheltered from wind action; Very sheltered from wind action; Extremely sheltered from wind action; Moderately strong tidal stream; Weak tidal stream; Very weak or no tidal stream; Moderately exposed to wave action; Sheltered from wave action; Very sheltered from wave action; Extremely sheltered from wave action
Substrate types:	Gravel; Sand; Biogenic; Mud, Gravel
Salinity levels:	Fully saline; Variable salinity

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**EUNIS habitat code and names** A5.52 Kelp and seaweed communities on sublittoral sediment

**Description**

Shallow sublittoral sediments which support seaweed communities, typically including the kelp *Laminaria saccharina*, the bootlace weed *Chorda filum* and various red and brown seaweeds, particularly filamentous types. The generally sheltered nature of these habitats enables the seaweeds to grow on shells and small stones which lie on the sediment surface; some communities develop as loose-lying mats on the sediment surface.

**Source** Connor, D.W., Allen, J.H., Golding, N., Howell, K.L., Lieberknecht, L.M., Northen, K.O. & Reker, J.B. (2004)

**Legal instruments**

<u>Legal instrument</u>	<u>Legally designated habitat</u>	<u>Code</u>
Council of Europe Bern Convention Res. No. 4 1996	Sublittoral soft seabeds	11.22

**Descriptive or diagnostic parameters**

<b>Parameter</b>	<b>Value(s)</b>
Altitude zones (terrestrial and marine):	Infralittoral (marine)
Depth zones (for marine habitats):	0 - 5m; 5 - 10m; 10 - 20m
Exposure characteristics:	Moderately exposed to wind action; Sheltered from wind action; Very sheltered from wind action; Extremely sheltered from wind action; Moderately strong tidal stream; Weak tidal stream; Very weak or no tidal stream; Moderately exposed to wave action; Sheltered from wave action; Very sheltered from wave action; Extremely sheltered from wave action
Substrate types:	Shells; Mixed
Salinity levels:	Fully saline; Reduced salinity; Variable salinity

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**EUNIS habitat code and names** A5.53 Sublittoral seagrass beds

**Description**

Beds of submerged marine angiosperms in the genera *Cymodocea*, *Halophila*, *Posidonia*, *Ruppia*, *Thalassia*, *Zostera*.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004b)

**Legal instruments**

<u>Legal instrument</u>	<u>Legally designated habitat</u>	<u>Code</u>
EU Habitats Directive Annex I	Sandbanks which are slightly covered by sea water all the time	1110
	Posidonia beds ( <i>Posidonia oceanica</i> )	1120
Council of Europe Bern Convention Res. No. 4 1996	Sea-grass meadows	11.3

**Descriptive or diagnostic parameters**

<b>Parameter</b>	<b>Value(s)</b>
Altitude zones (terrestrial and marine):	Infralittoral (marine)
Depth zones (for marine habitats):	0 - 5m; 5 - 10m
Exposure characteristics:	Sheltered from wind action; Very sheltered from wind action; Extremely sheltered from wind action; Moderately strong tidal stream; Weak tidal stream; Very weak or no tidal stream; Sheltered from wave action; Very sheltered from wave action; Extremely sheltered from wave action
Substrate types:	Muddy sand
Salinity levels:	Fully saline; Reduced salinity; Variable salinity

**EUNIS habitat code and names** A5.54 Angiosperm communities in reduced salinity

**Description**

Beds of submerged or slightly emergent vascular vegetation of brackish seas, sea inlets, estuaries, permanent pools of mud or sand flats, and coastal lagoons.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004b)

**Legal instruments**

<u>Legal instrument</u>	<u>Legally designated habitat</u>	<u>Code</u>
EU Habitats Directive Annex I	Sandbanks which are slightly covered by sea water all the time	1110

**Descriptive or diagnostic parameters**

<b>Parameter</b>	<b>Value(s)</b>
Altitude zones (terrestrial and marine):	Infralittoral (marine)
Depth zones (for marine habitats):	0 - 5m
Exposure characteristics:	Extremely sheltered from wind action; Very weak or no tidal stream; Extremely sheltered from wave action
Substrate types:	Muddy sand
Salinity levels:	Reduced salinity; Low salinity; Variable salinity

**EUNIS habitat code and names** A5.6 Sublittoral biogenic reefs

**Description**

This habitat type includes polychaete reefs, bivalve reefs (e.g. mussel beds) and cold water coral reefs. These communities develop in a range of habitats from exposed open coasts to estuaries, marine inlets and deeper offshore habitats and may be found in a variety of sediment types and salinity regimes.

**Source** Connor, D.W., Allen, J.H., Golding, N., Howell, K.L., Lieberknecht, L.M., Northen, K.O. & Reker, J.B. (2004)

**Legal instruments**

<u>Legal instrument</u>	<u>Legally designated habitat</u>	<u>Code</u>
EU Habitats Directive Annex I	Estuaries	1130
	Coastal lagoons	1150
	Large shallow inlets and bays	1160
	Reefs	1170
	Sublittoral soft seabeds	11.22
Council of Europe Bern Convention Res. No. 4 1996	Sublittoral rocky seabeds and kelp forests	11.24

**Descriptive or diagnostic parameters**

<b>Parameter</b>	<b>Value(s)</b>
Altitude zones (terrestrial and marine):	Circalittoral (marine); Infralittoral (marine)
Depth zones (for marine habitats):	0 - 5m; 5 - 10m; 10 - 20m; 20 - 30m; 30 - 50m; 50 - 100m
Exposure characteristics:	Moderately exposed to wind action; Sheltered from wind action; Very sheltered from wind action; Strong tidal stream; Moderately strong tidal stream; Weak tidal stream; Very weak or no tidal stream; Moderately exposed to wave action; Sheltered from wave action; Very sheltered from wave action
Geomorphology or landform:	Reef; Open sea
Characteristics of wetness or dryness:	Aquatic
Substrate types:	Biogenic; Peat; Shells
Salinity levels:	Fully saline; Variable salinity

**EUNIS habitat code and names** A5.61 Sublittoral polychaete worm reefs on sediment

**Description**

Sublittoral reefs of polychaete worms in mixed sediments found in a variety of hydrographic conditions. Such habitats may range from extensive structures of considerable size to loose agglomerations of tubes. Such communities often play an important role in the structural composition or stability of the seabed and provide a wide range of niches for other species to inhabit. Consequently polychaete worm reefs often support a diverse flora and fauna.

**Source** Connor, D.W., Allen, J.H., Golding, N., Howell, K.L., Lieberknecht, L.M., Northen, K.O. & Reker, J.B. (2004)

**Descriptive or diagnostic parameters**

<b>Parameter</b>	<b>Value(s)</b>
Altitude zones (terrestrial and marine):	Circalittoral (marine); Infralittoral (marine)
Depth zones (for marine habitats):	5 - 10m; 10 - 20m; 20 - 30m
Exposure characteristics:	Exposed to wind action; Moderately exposed to wind action; Sheltered from wind action; Very sheltered from wind action; Strong tidal stream; Moderately strong tidal stream; Weak tidal stream; Exposed to wave action; Moderately exposed to wave action; Sheltered from wave action; Very sheltered from wave action
Substrate types:	Pebbles; Mud, Sand, Gravel
Salinity levels:	Fully saline

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**EUNIS habitat code and names** A5.62 Sublittoral mussel beds on sediment

**Description**

Sublittoral mussel beds comprised of either the horse mussel *Modiolus modiolus* or the common mussel *Mytilus edulis*. These communities may be sublittoral extensions of littoral reefs or exist independently. Found in a variety of habitats ranging from sheltered estuaries and marine inlets to open coasts and offshore areas they may occupy a range of substrata, although due to the stabilising effect such communities have on the substratum muddy mixed sediments are typical. A diverse range of epibiota and infauna often exists in these communities.

**Source** Connor, D.W., Allen, J.H., Golding, N., Howell, K.L., Lieberknecht, L.M., Northen, K.O. & Reker, J.B. (2004)

**Descriptive or diagnostic parameters**

<b>Parameter</b>	<b>Value(s)</b>
Altitude zones (terrestrial and marine):	Circalittoral (marine); Infralittoral (marine)
Depth zones (for marine habitats):	0 - 5m; 5 - 10m; 10 - 20m; 20 - 30m; 50 - 100m
Exposure characteristics:	Exposed to wind action; Moderately exposed to wind action; Sheltered from wind action; Very sheltered from wind action; Extremely sheltered from wind action; Strong tidal stream; Moderately strong tidal stream; Weak tidal stream; Very weak or no tidal stream; Exposed to wave action; Moderately exposed to wave action; Sheltered from wave action; Very sheltered from wave action; Extremely sheltered from wave action
Substrate types:	Biogenic; Shells; Pebbles, Cobbles; Mud, Sand, Gravel
Salinity levels:	Fully saline

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**EUNIS habitat code and names** A5.63 Circalittoral coral reefs

**Description**

The coral reef structures in UK waters are found in cold, largely aphotic waters, generally along the shelf edge and in offshore waters down to 2000 m. In the north east Atlantic, *Lophelia pertusa* is the dominant colonial coral and is the characterising species of the biotope described under this habitat type. *Lophelia* and its deep-water allies lack the symbiotic algae of their tropical relatives, so can live in the permanent darkness of the deep sea. These corals form colonies and can aggregate into patches and banks which may be described as reefs. These deep-sea corals can support and shelter hundreds of other species, including sponges, polychaete worms, echinoderms (starfish, sea urchins, brittle stars) and bryozoans (sea mats). Some 200-300 species can be found in one of these coral habitats, a number comparable to that found in other important deep-water habitats. Unlike tropical coral reef systems, they are dominated by only a few hard-coral species, and there are far fewer fish species.

**Source** Connor, D.W., Allen, J.H., Golding, N., Howell, K.L., Lieberknecht, L.M., Northen, K.O. & Reker, J.B. (2004)

**Descriptive or diagnostic parameters**

<b>Parameter</b>	<b>Value(s)</b>
Altitude zones (terrestrial and marine):	Offshore circalittoral
Depth zones (for marine habitats):	50 - 100m; 100 - 200m
Exposure characteristics:	Ultra sheltered from wind action; Moderately strong tidal stream; Weak tidal stream; Ultra sheltered from wave action
Substrate types:	Mud, Silt
Salinity levels:	Fully saline

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**EUNIS habitat code and names** A5.7 Features of sublittoral sediments

**Description**

Features of sublittoral sediments include sublittoral habitats characterised by the presence of gases or liquids bubbling or seeping through sediments (A5.71) and sublittoral sediments which are organically-enriched or permanently or periodically anoxic (A5.72).

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004b)

**Legal instruments**

<u>Legal instrument</u>	<u>Legally designated habitat</u>	<u>Code</u>
EU Habitats Directive Annex I	Submarine structures made by leaking gases	1180
Council of Europe Bern Convention Res. No. 4 1996	Sublittoral soft seabeds	11.22

**Descriptive or diagnostic parameters**

<b>Parameter</b>	<b>Value(s)</b>
Altitude zones (terrestrial and marine):	Offshore circalittoral; Circalittoral (marine); Infralittoral (marine)
Geomorphology or landform:	Reef; Open sea; Submarine gas, oil or water vents and seeps
Chemical attributes:	Anoxic/Hypoxic
Substrate types:	Mobile; Mobile cobbles; Pebbles; Gravel; Sand; Muddy sand; Mud; Silt; Biogenic; Peat; Shells; Mixed; Rock, Sand, Gravel; Pebbles, Cobbles; Sand, Gravel; Mud, Sand, Gravel; Mud, Gravel; Mud, Sand; Sand, Organic

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**EUNIS habitat code and names** A5.71 Seeps and vents in sublittoral sediments

**Description**

No description available.

**Source** OSPAR/ICES/EEA (2000)

**Legal instruments**

<u>Legal instrument</u>	<u>Legally designated habitat</u>	<u>Code</u>
EU Habitats Directive Annex I	Submarine structures made by leaking gases	1180
Council of Europe Bern Convention Res. No. 4 1996	Sublittoral soft seabeds	11.22

**Descriptive or diagnostic parameters**

<b>Parameter</b>	<b>Value(s)</b>
Characteristics of wetness or dryness:	Aquatic

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**EUNIS habitat code and names** A5.72 Organically-enriched or anoxic sublittoral habitats

**Description**

No description available.

**Source** OSPAR/ICES/EEA (2000)

**Legal instruments**

<u>Legal instrument</u>	<u>Legally designated habitat</u>	<u>Code</u>
Council of Europe Bern Convention Res. No. 4 1996	Sublittoral soft seabeds	11.22

**Descriptive or diagnostic parameters**

<b>Parameter</b>	<b>Value(s)</b>
Altitude zones (terrestrial and marine):	Circalittoral (marine); Infralittoral (marine)

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**EUNIS habitat code and names** A6 Deep-sea bed

**Description**

The sea bed beyond the continental shelf break. The shelf break occurs at variable depth, but is generally over 200 m. The upper limit of the deep-sea zone is marked by the edge of the shelf. Includes areas of the Mediterranean Sea which are deeper than 200 m but not of the Baltic Sea which is a shelf sea. Excludes caves in the deep sea which are classified in A4.71 irrespective of depth.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004b)

**Descriptive or diagnostic parameters**

<b>Parameter</b>	<b>Value(s)</b>
Altitude zones (terrestrial and marine):	Bathyal
Depth zones (for marine habitats):	>200m
Geomorphology or landform:	Open sea; Submarine channels; Deep ocean trenches
Characteristics of wetness or dryness:	Aquatic
Substrate types:	Bedrock; Hard; Mobile; Biogenic; Mixed

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**EUNIS habitat code and names** A6.1 Deep-sea rock and artificial hard substrata

**Description**

Deep-sea benthic habitats with substrates predominantly of bedrock, immobile boulders or artificial hard substrates.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004b)

**Legal instruments**

<u>Legal instrument</u>	<u>Legally designated habitat</u>	<u>Code</u>
EU Habitats Directive Annex I	Reefs	1170

**Descriptive or diagnostic parameters**

<b>Parameter</b>	<b>Value(s)</b>
Altitude zones (terrestrial and marine):	Bathyal
Depth zones (for marine habitats):	>200m
Geomorphology or landform:	Open sea
Characteristics of wetness or dryness:	Aquatic
Substrate types:	Bedrock; Hard; Artificial hard; Boulders (undefined); Non-mobile cobbles; Mobile rock; Cobbles (undefined)

**EUNIS habitat code and names** A6.11 Deep-sea bedrock**Description**

No description available.

**Source** OSPAR/ICES/EEA (2000)

**Descriptive or diagnostic parameters**

<b>Parameter</b>	<b>Value(s)</b>
Depth zones (for marine habitats):	>200m

**EUNIS habitat code and names** A6.12 Deep-sea artificial hard substrata**Description**

No description available.

**Source** OSPAR/ICES/EEA (2000)

**Descriptive or diagnostic parameters**

<b>Parameter</b>	<b>Value(s)</b>
Depth zones (for marine habitats):	>200m

**EUNIS habitat code and names** A6.13 Deep-sea manganese nodules**Description**

No description available.

**Source** OSPAR/ICES/EEA (2000)

**Descriptive or diagnostic parameters**

<b>Parameter</b>	<b>Value(s)</b>
Depth zones (for marine habitats):	>200m

**EUNIS habitat code and names** A6.14 Boulders on the deep-sea bed**Description**

No description available.

**Source** Davies, C.E. & Moss, D. (2002)

**Descriptive or diagnostic parameters**

<b>Parameter</b>	<b>Value(s)</b>
Depth zones (for marine habitats):	>200m

**EUNIS habitat code and names** A6.2 Deep-sea mixed substrata**Description**

Deep-sea benthic habitats with substrates predominantly of mixed particle size or gravel. Includes habitats with mobile substrates of biogenic origin but no longer living, and of allochthonous material such as macrophyte debris. Deep-sea habitats with living biogenic substrates are included in A6.6.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004b)

**Descriptive or diagnostic parameters**

Parameter	Value(s)
Altitude zones (terrestrial and marine):	Bathyal
Depth zones (for marine habitats):	>200m
Geomorphology or landform:	Open sea
Characteristics of wetness or dryness:	Aquatic
Substrate types:	Shells; Mixed

---

**EUNIS habitat code and names** A6.21 Deep-sea lag deposits**Description**

No description available.

**Source** OSPAR/ICES/EEA (2000)**Descriptive or diagnostic parameters**

Parameter	Value(s)
Depth zones (for marine habitats):	>200m

---

**EUNIS habitat code and names** A6.22 Deep-sea biogenic gravels (shells, coral debris)**Description**

No description available.

**Source** OSPAR/ICES/EEA (2000)**Descriptive or diagnostic parameters**

Parameter	Value(s)
Depth zones (for marine habitats):	>200m

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**EUNIS habitat code and names** A6.23 Deep-sea calcareous pavements**Description**

No description available.

**Source** OSPAR/ICES/EEA (2000)**Descriptive or diagnostic parameters**

Parameter	Value(s)
Depth zones (for marine habitats):	>200m

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**EUNIS habitat code and names** A6.24 Communities of allochthonous material**Description**

No description available.

**Source** OSPAR/ICES/EEA (2000)**Descriptive or diagnostic parameters**

Parameter	Value(s)
Depth zones (for marine habitats):	>200m

---

**EUNIS habitat code and names** A6.3 Deep-sea sand**Description**

Deep-sea benthic habitats with substrates predominantly of sand.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004b)**Descriptive or diagnostic parameters**

Parameter	Value(s)
Altitude zones (terrestrial and marine):	Bathyal
Depth zones (for marine habitats):	>200m
Geomorphology or landform:	Open sea
Characteristics of wetness or dryness:	Aquatic
Substrate types:	Sand

---

**EUNIS habitat code and names** A6.31 Communities of bathyal detritic sands with *Grypheus vitreus*

**Description**

No description available.

**Source** Barcelona Convention (1998)

**Descriptive or diagnostic parameters**

Parameter	Value(s)
Depth zones (for marine habitats):	>200m

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**EUNIS habitat code and names** A6.4 Deep-sea muddy sand

**Description**

Deep-sea benthic habitats with substrates predominantly of muddy sand.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004b)

**Descriptive or diagnostic parameters**

Parameter	Value(s)
Altitude zones (terrestrial and marine):	Bathyal
Depth zones (for marine habitats):	>200m
Geomorphology or landform:	Open sea
Characteristics of wetness or dryness:	Aquatic
Substrate types:	Muddy sand

---

**EUNIS habitat code and names** A6.5 Deep-sea mud

**Description**

Bathyal and abyssal benthic habitats with substrates predominantly of mud.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004b)

**Descriptive or diagnostic parameters**

Parameter	Value(s)
Altitude zones (terrestrial and marine):	Bathyal
Depth zones (for marine habitats):	>200m
Geomorphology or landform:	Open sea
Characteristics of wetness or dryness:	Aquatic
Substrate types:	Mud, Silt

---

**EUNIS habitat code and names** A6.51 Mediterranean communities of bathyal muds

**Description**

No description available.

**Source** Barcelona Convention (1998)

**Descriptive or diagnostic parameters**

Parameter	Value(s)
Depth zones (for marine habitats):	>200m

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**EUNIS habitat code and names** A6.52 Communities of abyssal muds

**Description**

No description available.

**Source** Barcelona Convention (1998)

**Descriptive or diagnostic parameters**

Parameter	Value(s)
Depth zones (for marine habitats):	>200m

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**EUNIS habitat code and names** A6.6 Deep-sea bioherms

**Description**

A bioherm is a mound, dome, or reef-like mass of rock that is composed almost exclusively of the remains of sedentary marine organisms and is embedded in rock of different physical character. This habitat type includes deep-sea coral reefs (A6.61) and sponge beds (A6.62).

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004b)

**Legal instruments**

<u>Legal instrument</u>	<u>Legally designated habitat</u>	<u>Code</u>
EU Habitats Directive Annex I	Reefs	1170

**Descriptive or diagnostic parameters**

<b>Parameter</b>	<b>Value(s)</b>
Altitude zones (terrestrial and marine):	Bathyal
Depth zones (for marine habitats):	>200m
Geomorphology or landform:	Open sea
Characteristics of wetness or dryness:	Aquatic
Substrate types:	Biogenic

---

**EUNIS habitat code and names** A6.61 Communities of deep-sea corals

**Description**

The only community described is *Lophelia pertusa*, a cold water, reef-forming coral, which has a wide geographic distribution ranging from 55°S to 70°N, where water temperatures typically remain between 4-8°C. These reefs are generally subject to moderate current velocities (0.5 knots). The majority of records occur in the north-east Atlantic. The extent of *L. pertusa* reefs varies, with examples off Norway several km long and more than 20 m high. These reefs occur within a depth range of 200 - >2000 m on the continental slope, and in shallower waters in Norwegian fjords and Swedish west coast. In Norwegian waters, *L. pertusa* reefs occur on the shelf and shelf break off the western and northern parts on local elevations of the sea floor and on the edges of escarpments. The biological diversity of the reef community is approximately three times as high as the surrounding soft sediment (ICES, 2003), suggesting that these cold-water coral reefs may be biodiversity hotspots. Characteristic species include other hard corals, such as *Madrepora oculata* and *Solenosmilia variabilis*, the redfish *Sebastes viviparous* and the squat lobster *Munida sarsi*. *L. pertusa* reefs occur on hard substrata; this may be *Lophelia* rubble from an old colony or on glacial deposits. For this reason, *L. pertusa* reefs can be associated with iceberg plough-mark zones.

**Source** OSPAR (2004)

**Descriptive or diagnostic parameters**

<b>Parameter</b>	<b>Value(s)</b>
Depth zones (for marine habitats):	>200m

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**EUNIS habitat code and names** A6.62 Deep-sea sponge aggregations

**Description**

Deep sea sponge aggregations are principally composed of sponges from two classes: *Hexactinellida* and *Desmospongia*. They are known to occur between water depths of 250 m to 1300 m (Bett & Rice, 1992), where the water temperature ranges from 4-10°C and there is moderate current velocity (0.5 knots). Deep sea sponge aggregations may be found on soft substrata or hard substrata, such as boulders and cobbles which may lie on sediment. Iceberg plough-mark zones provide an ideal habitat for sponges because stable boulders and cobbles, exposed on the seabed, provide numerous attachment/settlement points (B. Bett, pers comm.). However, with 3.5 kg of pure siliceous spicule material per m<sup>2</sup> reported from some sites (Gubbay, 2002), the occurrence of sponge fields can alter the characteristics of surrounding muddy sediments. Densities of occurrence are hard to quantify, but sponges in the class *Hexactinellida* have been reported at densities of 4-5 per m<sup>2</sup>, whilst 'massive' growth forms of sponges from the class *Desmospongia* have been reported at densities of 0.5 to 1 per m<sup>2</sup> (B. Bett, pers comm.). Deep sea sponges have similar habitat preferences to cold-water corals, and hence are often found at the same location. Research has shown that the dense mats of spicules present around sponge fields may inhibit colonisation by infaunal animals, resulting in a dominance of epifaunal elements (Gubbay, 2002). Sponge fields also support ophiuroids, which use the sponges as elevated perches.

**Source** OSPAR (2004)

**Descriptive or diagnostic parameters**

<b>Parameter</b>	<b>Value(s)</b>
Depth zones (for marine habitats):	>200m

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**EUNIS habitat code and names** A6.7 Raised features of the deep-sea bed

**Description**

Habitats on the deep-sea bed with significant elevation (typically >200m) in relation to their surroundings. Includes permanently submerged flanks of oceanic islands (A6.71), seamounts, knolls and banks (A6.72), oceanic ridges (A6.73), abyssal hills (A6.74) and carbonate mounds (A6.75).



**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004b)

**Descriptive or diagnostic parameters**

<b>Parameter</b>	<b>Value(s)</b>
Geomorphology or landform:	Submerged flanks of oceanic islands; Open sea; Open sea; Open sea; Elongated submarine ridges; Isolated raised seabed features; Isolated raised seabed features

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**EUNIS habitat code and names** A6.71 Permanently submerged flanks of oceanic islands

**Description**

No description available.

**Source** OSPAR/ICES/EEA (2000)

**Descriptive or diagnostic parameters**

<b>Parameter</b>	<b>Value(s)</b>
Characteristics of wetness or dryness:	Aquatic

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**EUNIS habitat code and names** A6.72 Seamounts, knolls and banks

**Description**

Seamounts are defined as undersea mountains, with a crest that rises more than 1,000 m above the surrounding sea floor (Menard, 1964 in Rogers, 1994). Seamounts can be a variety of shapes, but are generally conical with a circular, elliptical or more elongate base. Seamounts are volcanic in origin, and are often associated with seafloor 'hot-spots'; thinner areas of the earth's crust where magma can escape. Seamounts, often with a slope inclination of up to 60°, provide a striking contrast to the surrounding 'flat' abyssal plain. Their relief has profound effects on the surrounding oceanic circulation, with the formation of trapped waves, jets, eddies and closed circulations known as Taylor columns (Taylor, 1917 in Rogers, 1994). Seamounts occur frequently within the OSPAR Maritime Area. Analysis of narrow beam bathymetric data by the US Naval Oceanographic office from 1967-1989 identified more than 810 seamounts within the North Atlantic. The majority occur along the Mid-Atlantic ridge between Iceland and the Hayes fracture zone (Gubbay, 2002). The enhanced currents that occur around seamounts provide ideal conditions for suspension feeders. Gorgonian, scleratinian and antipatharian corals may be particularly abundant, and other suspension feeders such as sponges, hydroids and ascidians are also present. Concentrations of commercially important fish species, such as *Hoplostethus atlanticus* (orange roughy), aggregate around seamounts and live in close association with the benthic communities (Gubbay, 2002).

**Source** OSPAR (2004)

**Descriptive or diagnostic parameters**

<b>Parameter</b>	<b>Value(s)</b>
Characteristics of wetness or dryness:	Aquatic

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**EUNIS habitat code and names** A6.73 Oceanic ridges

**Description**

No description available.

**Source** OSPAR/ICES/EEA (2000)

**Descriptive or diagnostic parameters**

<b>Parameter</b>	<b>Value(s)</b>
Characteristics of wetness or dryness:	Aquatic

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**EUNIS habitat code and names** A6.74 Abyssal hills

**Description**

No description available.

**Source** OSPAR/ICES/EEA (2000)

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**EUNIS habitat code and names** A6.75 Carbonate mounds

**Description**

Carbonate mounds are very steep-sided mounds of variety of shapes, which may be up to 350 m high and 2 km wide at their base (Weering et al, 2003). They occur offshore in water depths of 500 m-1100 m with examples present in the Porcupine Seabight and Rockall Trough (Kenyon et al, 2003). Carbonate mounds may have a

sediment veneer, typically composed of carbonate sands, muds and silts. The cold-water reef-building corals *Lophelia pertusa* and *Madrepora oculata*, as well as echiuran worms are characteristic fauna of carbonate mounds. Where cold-water corals (such as *Lophelia*) are present on the mound summit, coral debris may form a significant component of the overlying substratum. There is currently speculation on the origin of carbonate mounds, with possible associations with fault-controlled methane seepage from deep hydrocarbon reservoirs, or gas-hydrate dissociation (Henriet et al, 1998) through to the debris from 'cold-water' coral colonies such as *Lophelia*.

**Source** OSPAR (2004)

**EUNIS habitat code and names** A6.8 Deep-sea trenches and canyons, channels, slope failures and slumps on the continental slope

**Description**

Habitats on the deep-sea bed significantly below the deep-sea bed, including deep ocean trenches, often greater than 6000 m depth with an active margin reduction zone (A6.82), and downslope or along-slope channels on the deep-sea bed (A6.81).

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004b)

**Descriptive or diagnostic parameters**

<b>Parameter</b>	<b>Value(s)</b>
Altitude zones (terrestrial and marine):	Bathyal
Geomorphology or landform:	Open sea; Open sea; Submarine channels; Deep ocean trenches

**EUNIS habitat code and names** A6.81 Canyons, channels, slope failures and slumps on the continental slope

**Description**

No description available.

**Source** OSPAR/ICES/EEA (2000)

**Descriptive or diagnostic parameters**

<b>Parameter</b>	<b>Value(s)</b>
Characteristics of wetness or dryness:	Aquatic

**EUNIS habitat code and names** A6.82 Deep-sea trenches

**Description**

Benthic communities of the oceanic trenches, deep elongated subduction troughs of the ocean floor.

**Source** Devillers, P., Devillers-Terschuren, J. and Vander Linden, C. (2001)

**Descriptive or diagnostic parameters**

<b>Parameter</b>	<b>Value(s)</b>
Characteristics of wetness or dryness:	Aquatic

**EUNIS habitat code and names** A6.9 Vents, seeps, hypoxic and anoxic habitats of the deep sea

**Description**

Deep-sea habitats characterised by chemical conditions. Includes interface habitats on the deep-sea bed where reducing conditions exist (A6.91), not generally associated with drastically elevated temperatures, including the carcasses of large cetaceans (A6.913). These habitats are often indicated by the presence of seeping or bubbling gases or liquids, hypoxic and/or anoxic conditions in the water column above. Also includes vents in the deep-sea bed (A6.94).

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004b)

**Descriptive or diagnostic parameters**

<b>Parameter</b>	<b>Value(s)</b>
Altitude zones (terrestrial and marine):	Bathyal
Depth zones (for marine habitats):	>200m
Geomorphology or landform:	Open sea; Open sea; Open sea; Submarine gas, oil or water vents and seeps
Chemical attributes:	Anoxic/Hypoxic; Reducing conditions

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**EUNIS habitat code and names** A6.91 Deep-sea reducing habitats

**Description**

No description available.

**Source** OSPAR/ICES/EEA (2000)

**Descriptive or diagnostic parameters**

Parameter	Value(s)
Depth zones (for marine habitats):	>200m
Characteristics of wetness or dryness:	Aquatic

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**EUNIS habitat code and names** A6.92 Deep-sea bed influenced by hypoxic water column

**Description**

No description available.

**Source** OSPAR/ICES/EEA (2000)

**Descriptive or diagnostic parameters**

Parameter	Value(s)
Depth zones (for marine habitats):	>200m
Characteristics of wetness or dryness:	Aquatic

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**EUNIS habitat code and names** A6.93 Isolated 'oceanic' features influenced by hypoxic water column

**Description**

No description available.

**Source** OSPAR/ICES/EEA (2000)

**Descriptive or diagnostic parameters**

Parameter	Value(s)
Depth zones (for marine habitats):	>200m
Characteristics of wetness or dryness:	Aquatic

---

**EUNIS habitat code and names** A6.94 Vents in the deep sea

**Description**

Hydrothermal vents occur along spreading ridges (such as the mid-Atlantic ridge), subduction zones, fracture zones and back-arc basins (Gage & Tyler, 1991), and are caused by seawater penetrating the upper levels of the Earth's crust through channels formed in cooling lava flows, reacting chemically with hot basalt in the Earth's crust and then rising back to the sea-bed to vent as superheated water containing compounds such as sulphides, metals, CO<sub>2</sub> and methane (Tunnicliffe et al, 1998 in Gubbay, 2002). The water may trickle out from cracks and crevices on the seabed as hot springs (5-250°C), or as very concentrated jets of superheated water (270-380°C). As these concentrated jets of water cool, minerals dissolved in the water precipitate out in black clouds, giving them their common name of 'black smokers'. At lower temperatures, sulphides are mostly precipitated within the rocks, making the venting fluids appear cloudier. These are known as 'white smokers' (Gage & Tyler, 1991). Hydrothermal vent fields cover relatively small areas of the seabed in water depths of 850 - 4000 m. The biological communities associated with hydrothermal vents are unusual as they are able to derive energy under conditions where photosynthesis is not possible. These habitats contain a huge diversity of chemoautotrophic bacteria, which form the core of the trophic structure around the vent. Characteristic species include the giant vent clam *Calyptogena magnifica*, the mussel *Bathymodiolus thermophilus*, the tube worm *Riftia pachyptila*, the crabs *Cyanograea praedator* and *Bythograea thermhydrion* and the shrimp *Charocaris fortunate*.

**Source** OSPAR (2004)

**Descriptive or diagnostic parameters**

Parameter	Value(s)
Depth zones (for marine habitats):	>200m
Characteristics of wetness or dryness:	Aquatic

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**EUNIS habitat code and names** A7 Pelagic water column

**Description**

The water column of shallow or deep sea, or enclosed coastal waters. Note that because of the strong temporal

nature of the pelagic environment, the water column at a given location will be classified differently at different times of the year.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004b)

**Descriptive or diagnostic parameters**

<b>Parameter</b>	<b>Value(s)</b>
Geomorphology or landform:	Open sea
Characteristics of wetness or dryness:	Aquatic
Substrate types:	Water

**EUNIS habitat code and names** A7.1 Neuston

**Description**

The interface between air and sea water, inhabited by communities of minute or microscopic organisms.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004b)

**Legal instruments**

<u>Legal instrument</u>	<u>Legally designated habitat</u>	<u>Code</u>
EU Habitats Directive Annex I	Estuaries	1130
	Coastal lagoons	1150
	Large shallow inlets and bays	1160

**Descriptive or diagnostic parameters**

<b>Parameter</b>	<b>Value(s)</b>
Geomorphology or landform:	Open sea
Characteristics of wetness or dryness:	Aquatic
Substrate types:	Water; Water and air interface

**EUNIS habitat code and names** A7.11 Temporary neuston layer

**Description**

No description available.

**Source** OSPAR/ICES/EEA (2000)

**EUNIS habitat code and names** A7.12 Permanent neuston layer

**Description**

No description available.

**Source** OSPAR/ICES/EEA (2000)

**EUNIS habitat code and names** A7.2 Completely mixed water column with reduced salinity

**Description**

A water column which is completely and actively mixed, and influenced by freshwater so that the salinity is reduced relative to the adjacent fully marine seawater. This habitat type is usually found in relatively shallow, coastal situations, and is the result of river inflow or ice melt. Note that some discretion should be used in the interpretation of "adjacent", for example in the Baltic Sea, "adjacent" fully marine seawater is reached only in the Kattegat.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004b)

**Legal instruments**

<u>Legal instrument</u>	<u>Legally designated habitat</u>	<u>Code</u>
EU Habitats Directive Annex I	Estuaries	1130
	Coastal lagoons	1150
	Large shallow inlets and bays	1160

**Descriptive or diagnostic parameters**

<b>Parameter</b>	<b>Value(s)</b>
Geomorphology or landform:	Open sea
Characteristics of wetness or dryness:	Aquatic
Characteristics of water flow, source & quality:	Mixed water column
Substrate types:	Water
Salinity levels:	Reduced salinity relative to adjacent water; Low salinity

**EUNIS habitat code and names** A7.21 Completely mixed water column with reduced salinity and short residence time

**Description**  
No description available.  
**Source** ICES (2001)

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**EUNIS habitat code and names** A7.22 Completely mixed water column with reduced salinity and medium residence time

**Description**  
No description available.  
**Source** ICES (2001)

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**EUNIS habitat code and names** A7.23 Completely mixed water column with reduced salinity and long residence time

**Description**  
No description available.  
**Source** ICES (2001)

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**EUNIS habitat code and names** A7.3 Completely mixed water column with full salinity

**Description**  
A water column which is completely and actively mixed, not influenced by freshwater, so that the salinity is the same as that in adjacent seawater. This habitat type is usually found in relatively shallow, coastal situations, without river inflow or ice melt.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004b)

**Legal instruments**

<u>Legal instrument</u>	<u>Legally designated habitat</u>	<u>Code</u>
EU Habitats Directive Annex I	Estuaries	1130
	Coastal lagoons	1150
	Large shallow inlets and bays	1160

**Descriptive or diagnostic parameters**

<b>Parameter</b>	<b>Value(s)</b>
Geomorphology or landform:	Open sea
Characteristics of wetness or dryness:	Aquatic
Characteristics of water flow, source & quality:	Mixed water column
Substrate types:	Water
Salinity levels:	Fully saline

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**EUNIS habitat code and names** A7.31 Completely mixed water column with full salinity and short residence time

**Description**  
No description available.  
**Source** ICES (2001)

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**EUNIS habitat code and names** A7.32 Completely mixed water column with full salinity and medium residence time

**Description**  
No description available.  
**Source** ICES (2001)

---

**EUNIS habitat code and names** A7.33 Completely mixed water column with full salinity and long residence time

**Description**

No description available.

**Source** ICES (2001)

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**EUNIS habitat code and names** A7.4 Partially mixed water column with reduced salinity and medium or long residence time

**Description**

A water column which is unmixed or only partially mixed because the depth of the water body is greater than the depth of mixing. Salinity is reduced relative to the adjacent fully marine seawater. This habitat type is usually found in deeper coastal water situations and is the result of river inflow or ice melt. Note that some discretion should be used in the interpretation of "adjacent", for example in the Baltic Sea, "adjacent" fully marine seawater is reached only in the Kattegat. Medium residence time is defined as changing over time periods greater than daily and up to about 14 days (based on the time required for the phytoplankton population to double) and long residence time lasting longer than 14 days.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004b)

**Legal instruments**

<u>Legal instrument</u>	<u>Legally designated habitat</u>	<u>Code</u>
EU Habitats Directive Annex I	Estuaries	1130
	Coastal lagoons	1150

**Descriptive or diagnostic parameters**

<b>Parameter</b>	<b>Value(s)</b>
Geomorphology or landform:	Open sea
Temporal characteristics (when used in criteria):	Medium residence time; Long residence time
Characteristics of wetness or dryness:	Aquatic
Substrate types:	Water
Salinity levels:	Reduced salinity; Reduced salinity relative to adjacent water; Low salinity; High salinity in a brackish water body; Medium salinity in a brackish water body; Low salinity in a brackish water body; Very low salinity in a brackish water body

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**EUNIS habitat code and names** A7.41 Partially mixed water column with reduced salinity and medium residence time

**Description**

No description available.

**Source** ICES (2001)

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**EUNIS habitat code and names** A7.42 Partially mixed water column with reduced salinity and long residence time

**Description**

No description available.

**Source** ICES (2001)

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**EUNIS habitat code and names** A7.5 Unstratified water column with reduced salinity

**Description**

A water column which is unmixed or only partially mixed because the depth of the water body is greater than the depth of mixing, and with short residence time, defined as changing diurnally. Salinity is reduced relative to the adjacent fully marine seawater. This habitat type is usually found in deeper coastal water situations and is the result of river inflow or ice melt. Note that some discretion should be used in the interpretation of "adjacent", for example in the Baltic Sea, "adjacent" fully marine seawater is reached only in the Kattegat. Unstratified water columns have very weak or no horizontal or vertical gradients.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004b)

**Legal instruments**

<u>Legal instrument</u>	<u>Legally designated habitat</u>	<u>Code</u>
EU Habitats Directive Annex I	Estuaries	1130
	Coastal lagoons	1150

**Descriptive or diagnostic parameters**

Parameter	Value(s)
Geomorphology or landform:	Open sea
Temporal characteristics (when used in criteria):	Short residence time
Characteristics of wetness or dryness:	Aquatic
Temperature attributes (when used in criteria):	Thermally unstratified
Substrate types:	Water
Salinity levels:	Reduced salinity; Reduced salinity relative to adjacent water; Low salinity; High salinity in a brackish water body; Medium salinity in a brackish water body; Low salinity in a brackish water body; Very low salinity in a brackish water body

**EUNIS habitat code and names** A7.51 Euphotic (epipelagic) zone in unstratified reduced salinity water

**Description**

No description available.

**Source** ICES (2001)

**EUNIS habitat code and names** A7.52 Mesopelagic zone in unstratified reduced salinity water

**Description**

No description available.

**Source** ICES (2001)

**EUNIS habitat code and names** A7.53 Bathypelagic zone in unstratified reduced salinity water

**Description**

No description available.

**Source** ICES (2001)

**EUNIS habitat code and names** A7.54 Abyssopelagic zone in unstratified reduced salinity water

**Description**

No description available.

**Source** ICES (2001)

**EUNIS habitat code and names** A7.6 Vertically stratified water column with reduced salinity

**Description**

A water column which is unmixed or only partially mixed because the depth of the water body is greater than the depth of mixing, and with short residence time, defined as changing diurnally. Salinity is reduced relative to the adjacent fully marine seawater. This habitat type is usually found in deeper coastal water situations and is the result of river inflow or ice melt. Note that some discretion should be used in the interpretation of "adjacent", for example in the Baltic Sea, "adjacent" fully marine seawater is reached only in the Kattegat. This habitat type shows pronounced vertical stratification (e.g. caused by seasonal temperature changes, river discharge influence or ice-melt). The subtypes are separated at level 4 by the cause and degree of persistence of the gradient – e.g. seasonal temperature gradients or persistent salinity gradients.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004b)

**Descriptive or diagnostic parameters**

Parameter	Value(s)
Geomorphology or landform:	Open sea
Temporal characteristics (when used in criteria):	Short residence time
Characteristics of wetness or dryness:	Aquatic
Temperature attributes (when used in criteria):	Thermally stratified vertically
Substrate types:	Water
Salinity levels:	Reduced salinity; Reduced salinity relative to adjacent water; Low salinity; High salinity in a brackish water body; Medium salinity in a brackish water body; Low salinity in a brackish water body; Very low salinity in a brackish water body; Vertically stratified salinity

**EUNIS habitat code and names** A7.61 Water column with ephemeral thermal stratification and reduced salinity

**Description**  
No description available.  
**Source** ICES (2001)

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**EUNIS habitat code and names** A7.62 Water column with seasonal thermal stratification and reduced salinity

**Description**  
No description available.  
**Source** ICES (2001)

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**EUNIS habitat code and names** A7.63 Water column with permanent thermal stratification and reduced salinity

**Description**  
No description available.  
**Source** ICES (2001)

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**EUNIS habitat code and names** A7.64 Water column with ephemeral halocline and reduced salinity

**Description**  
No description available.  
**Source** ICES (2001)

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**EUNIS habitat code and names** A7.65 Water column with seasonal halocline and reduced salinity

**Description**  
No description available.  
**Source** ICES (2001)

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**EUNIS habitat code and names** A7.66 Water column with permanent halocline and reduced salinity

**Description**  
No description available.  
**Source** ICES (2001)

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**EUNIS habitat code and names** A7.67 Water column with ephemeral oxygen stratification and reduced salinity

**Description**  
No description available.  
**Source** ICES (2001)

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**EUNIS habitat code and names** A7.68 Water column with seasonal oxygen stratification and reduced salinity

**Description**  
No description available.  
**Source** ICES (2001)



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**EUNIS habitat code and names** A7.69 Water column with permanent oxygen stratification and reduced salinity

**Description**

No description available.

**Source** ICES (2001)

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**EUNIS habitat code and names** A7.7 Fronts in reduced salinity water column

**Description**

A water column which is unmixed or only partially mixed because the depth of the water body is greater than the depth of mixing, and with short residence time, defined as changing diurnally. Salinity is reduced relative to the adjacent fully marine seawater. This habitat type is usually found in deeper coastal water situations and is the result of river inflow or ice melt. Note that some discretion should be used in the interpretation of "adjacent", for example in the Baltic Sea, "adjacent" fully marine seawater is reached only in the Kattegat. Horizontal gradients give rise to fronts, which are separated at level 4 by the degree of persistence of the stratification.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004b)

**Descriptive or diagnostic parameters**

<b>Parameter</b>	<b>Value(s)</b>
Geomorphology or landform:	Open sea
Temporal characteristics (when used in criteria):	Short residence time
Characteristics of wetness or dryness:	Aquatic
Temperature attributes (when used in criteria):	thermally stratified horizontally
Substrate types:	Water
Salinity levels:	Reduced salinity; Reduced salinity relative to adjacent water; Low salinity; High salinity in a brackish water body; Medium salinity in a brackish water body; Low salinity in a brackish water body; Very low salinity in a brackish water body; Horizontally stratified salinity

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**EUNIS habitat code and names** A7.71 Ephemeral fronts in reduced salinity water column

**Description**

No description available.

**Source** ICES (2001)

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**EUNIS habitat code and names** A7.72 Seasonal fronts in reduced salinity water column

**Description**

No description available.

**Source** ICES (2001)

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**EUNIS habitat code and names** A7.73 Persistent fronts in reduced salinity water column

**Description**

No description available.

**Source** ICES (2001)

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**EUNIS habitat code and names** A7.8 Unstratified water column with full salinity

**Description**

A water column which is unmixed or only partially mixed because the depth of the water body is greater than the depth of mixing. Salinity is the same as that in adjacent seawater. Unstratified water columns have very weak or no horizontal or vertical gradients.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004b)

**Legal instruments**

<u>Legal instrument</u>	<u>Legally designated habitat</u>	<u>Code</u>
EU Habitats Directive Annex I	Estuaries	1130
	Coastal lagoons	1150
	Large shallow inlets and bays	1160

**Descriptive or diagnostic parameters**

Parameter	Value(s)
Geomorphology or landform:	Open sea
Characteristics of wetness or dryness:	Aquatic
Temperature attributes (when used in criteria):	thermally unstratified
Substrate types:	Water
Salinity levels:	Fully saline; Fully saline in a brackish water body

**EUNIS habitat code and names** A7.81 Euphotic (epipelagic) zone in unstratified full salinity water

**Description**

No description available.

**Source** ICES (2001)

**EUNIS habitat code and names** A7.82 Mesopelagic zone in unstratified full salinity water

**Description**

Waters situated over the continental slope, the steep descent from the continental shelf to the ocean bottom, an area where upwellings, water mixing or shearing and other anomalies often develop.

**Source** Devillers, P., Devillers-Terschuren, J. and Vander Linden, C. (2001)

**EUNIS habitat code and names** A7.83 Bathypelagic zone in unstratified full salinity water

**Description**

No description available.

**Source** ICES (2001)

**Descriptive or diagnostic parameters**

Parameter	Value(s)
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**EUNIS habitat code and names** A7.84 Abyssopelagic zone in unstratified full salinity water

**Description**

Waters beyond the continental shelf. They occupy the greatest part of the Arctic and Atlantic oceans, the Mediterranean Sea, the Ligurian Sea, the Tyrrhenian Sea, the Ionian Sea, as well as the central part of the Aegean Sea, the Black Sea, the southern Adriatic Sea, the eastern part of the northern North Sea. They are absent from the Baltic Sea.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004a)

**EUNIS habitat code and names** A7.9 Vertically stratified water column with full salinity

**Description**

A water column which is unmixed or only partially mixed because the depth of the water body is greater than the depth of mixing. Salinity is the same as that in adjacent seawater. This habitat type shows pronounced vertical stratification (e.g. caused by atmospheric temperature). The subtypes are separated at level 4 by the cause and degree of persistence of the gradient – e.g. seasonal temperature gradients or persistent salinity gradients.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004b)

**Legal instruments**

<u>Legal instrument</u>	<u>Legally designated habitat</u>	<u>Code</u>
EU Habitats Directive Annex I	Large shallow inlets and bays	1160

**Descriptive or diagnostic parameters**

Parameter	Value(s)
Geomorphology or landform:	Open sea
Characteristics of wetness or dryness:	Aquatic
Temperature attributes (when used in criteria):	thermally stratified vertically
Substrate types:	Water
Salinity levels:	Fully saline; Fully saline in a brackish water body; Vertically stratified salinity

**EUNIS habitat code and names** A7.91 Water column with ephemeral thermal stratification and full salinity

**Description**  
No description available.  
**Source** ICES (2001)

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**EUNIS habitat code and names** A7.92 Water column with seasonal thermal stratification and full salinity

**Description**  
No description available.  
**Source** ICES (2001)

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**EUNIS habitat code and names** A7.93 Water column with permanent thermal stratification and full salinity

**Description**  
No description available.  
**Source** ICES (2001)

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**EUNIS habitat code and names** A7.94 Water column with ephemeral halocline and full salinity

**Description**  
No description available.  
**Source** ICES (2001)

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**EUNIS habitat code and names** A7.95 Water column with seasonal halocline and full salinity

**Description**  
No description available.  
**Source** ICES (2001)

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**EUNIS habitat code and names** A7.96 Water column with permanent halocline and full salinity

**Description**  
No description available.  
**Source** ICES (2001)

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**EUNIS habitat code and names** A7.97 Water column with ephemeral oxygen stratification and full salinity

**Description**  
No description available.  
**Source** ICES (2001)

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**EUNIS habitat code and names** A7.98 Water column with seasonal oxygen stratification and full salinity

**Description**  
No description available.  
**Source** ICES (2001)

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**EUNIS habitat code and names** A7.99 Water column with permanent oxygen stratification and full salinity

**Description**

No description available.

**Source** ICES (2001)

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**EUNIS habitat code and names** A7.A Fronts in full salinity water column

**Description**

A water column which is unmixed or only partially mixed because the depth of the water body is greater than the depth of mixing. Salinity is the same as that in adjacent seawater. Horizontal gradients give rise to fronts, which are separated at level 4 by the degree of persistence of the stratification – ephemeral such as eddies, gyres and upwellings; seasonal upwellings; or persistent water mass interfaces.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004b)

**Descriptive or diagnostic parameters**

Parameter	Value(s)
Characteristics of wetness or dryness:	Aquatic
Temperature attributes (when used in criteria):	thermally stratified horizontally
Substrate types:	Water
Salinity levels:	Fully saline; Fully saline in a brackish water body; Horizontally stratified salinity

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**EUNIS habitat code and names** A7.A1 Ephemeral fronts in full salinity water column

**Description**

No description available.

**Source** ICES (2001)

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**EUNIS habitat code and names** A7.A2 Seasonal fronts in full salinity water column

**Description**

No description available.

**Source** ICES (2001)

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**EUNIS habitat code and names** A7.A3 Persistent fronts in full salinity water column

**Description**

No description available.

**Source** ICES (2001)

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**EUNIS habitat code and names** A8 Ice-associated marine habitats

**Description**

Sea ice, icebergs and other ice-associated marine habitats.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004b)

**Descriptive or diagnostic parameters**

Parameter	Value(s)
Geomorphology or landform:	Open sea
Characteristics of wetness or dryness:	Aquatic
Substrate types:	Ice; Water and ice interface

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**EUNIS habitat code and names** A8.1 Sea ice

**Description**

Ice formations floating on sea water, usually constituting an incomplete cover, variable in form and structure, unstable and dynamic under the influence of surface air and water currents.

**Source** Devillers, P., Devillers-Terschuren, J. and Vander Linden, C. (2001)

**Descriptive or diagnostic parameters**

Parameter	Value(s)
Geomorphology or landform:	Open sea
Substrate types:	Ice
Salinity levels:	Fully saline; Reduced salinity; Low salinity

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**EUNIS habitat code and names** A8.11 Seasonal pack-ice**Description**

Semi-continuous ice sheets forming on the sea for part of the year, characteristic of the Arctic Ocean, the Norwegian Sea, Bothnia Bay, the Bothnia Sea, and coastal areas of the Åland Sea, the Gulf of Finland and the Gulf of Riga, exceptional in other areas.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004a)

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**EUNIS habitat code and names** A8.12 Permanent pack-ice**Description**

Semicontinuous ice sheets covering the sea throughout the year, limited to the Arctic Ocean.

**Source** Devillers, P., Devillers-Terschuren, J. and Vander Linden, C. (2001)

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**EUNIS habitat code and names** A8.13 Ice floes**Description**

Discontinuous formations of floating ice blocks, rafts and hummocks detached from the sea pack, remaining after the break-up of seasonal ice packs or drifting to more southern regions.

**Source** Devillers, P., Devillers-Terschuren, J. and Vander Linden, C. (2001)

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**EUNIS habitat code and names** A8.2 Freshwater ice**Description**

Floating and drifting blocks of ice detached from coastal glaciers (H4.2). These are separated by size at level 4.

**Source** Devillers, P., Devillers-Terschuren, J. and Vander Linden, C. (2001)

**Descriptive or diagnostic parameters**

Parameter	Value(s)
Geomorphology or landform:	Open sea
Substrate types:	Ice
Salinity levels:	Freshwater

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**EUNIS habitat code and names** A8.21 Large tabular iceberg**Description**

Proposed new habitat type (CEH, May 2001), qualifying previous unspecified 'icebergs'.

**Source** Davies, C.E. & Moss, D. (2002)

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**EUNIS habitat code and names** A8.22 Medium iceberg**Description**

Proposed new habitat type (CEH, May 2001), qualifying previous unspecified 'icebergs'.

**Source** Davies, C.E. & Moss, D. (2002)

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**EUNIS habitat code and names** A8.23 Small iceberg**Description**

Proposed new habitat type (CEH, May 2001), qualifying previous unspecified 'icebergs'.

**Source** Davies, C.E. & Moss, D. (2002)

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**EUNIS habitat code and names** A8.24 Bergy bit**Description**

Proposed new habitat type (CEH, May 2001), qualifying previous unspecified 'icebergs'.

**Source** Davies, C.E. & Moss, D. (2002)

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**EUNIS habitat code and names** A8.25 Growler**Description**

Proposed new habitat type (CEH, May 2001), qualifying previous unspecified 'icebergs'.

**Source** Davies, C.E. & Moss, D. (2002)

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**EUNIS habitat code and names** A8.3 Brine channels**Description**

During freezing of seawater, salt is rejected from the ice crystals. The remaining brine solution forms a three-dimensional network of tubes and channels with typical diameters of 200 µm within the ice matrix. Despite the harsh environmental conditions (low light intensities, low temperature, high salinity), a specialised community has developed and adapted to live within the brine channel system. Minute unicellular algae like diatoms are the dominant primary producers.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004b)

**Descriptive or diagnostic parameters**

Parameter	Value(s)
Geomorphology or landform:	Open sea
Light intensity (when used in criteria):	Low intensity light
Characteristics of wetness or dryness:	Aquatic
Temperature attributes (when used in criteria):	Super-cooled
Substrate types:	Ice
Salinity levels:	Fully saline; Hypersaline

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**EUNIS habitat code and names** A8.31 Brine channels in first year ice**Description**

No description available.

**Source** OSPAR/ICES/EEA (2000)

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**EUNIS habitat code and names** A8.32 Brine channels in multi-year ice**Description**

No description available.

**Source** OSPAR/ICES/EEA (2000)

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**EUNIS habitat code and names** A8.4 Under-ice habitat**Description**

The boundary layer between sea ice and the water column with special abiotic (e.g. temperature, salinity) and biotic (e.g. food resources) factors, which also vary with season and region. This habitat is colonized by autochthonous under-ice amphipods (*Apherusa glacialis*, *Onisimus* spp., *Gammarus wilkitzkii*), which live directly at the ice underside and complete their entire life-cycle here, and allochthonous sub-ice fauna, organisms originating either from the ice interior or the pelagic realm, which are found in this boundary layer temporarily, e.g. for feeding or during certain life stages. There is some evidence that the first metres below the ice are strongly stratified, particularly during the melt period in summer. Source: <http://www.awi-bremerhaven.de/Climat/WorkingGroups/ofis/ARK-19-1/sea-ice-biology.htm>.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004b)

**Descriptive or diagnostic parameters**

Parameter	Value(s)
Geomorphology or landform:	Open sea
Characteristics of wetness or dryness:	Aquatic
Substrate types:	Ice; Water and ice interface

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**EUNIS habitat code and names** A8.41 Under-ice habitat in first-year ice  
**Description**  
No description available.  
**Source** OSPAR/ICES/EEA (2000)

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**EUNIS habitat code and names** A8.42 Under-ice habitat in multi-year ice  
**Description**  
No description available.  
**Source** OSPAR/ICES/EEA (2000)

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## B COASTAL HABITATS

### Description

Coastal habitats are those above spring high tide limit (or above mean water level in non-tidal waters) occupying coastal features and characterised by their proximity to the sea, including coastal dunes and wooded coastal dunes, beaches and cliffs. Includes free-draining supralittoral habitats adjacent to marine habitats which are normally only affected by spray or splash, strandlines characterised by terrestrial invertebrates and moist and wet coastal dune slacks and dune-slack pools. Excludes supralittoral rock pools and habitats adjacent to the sea which are not characterised by salt spray, wave or sea-ice erosion.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004b)

### Descriptive or diagnostic parameters

Parameter	Value(s)
Altitude zones (terrestrial and marine):	Driftline; Supralittoral; Coastal

### EUNIS habitat code and names B1 Coastal dunes and sandy shores

#### Description

Sand-covered shorelines of the oceans, their connected seas and associated coastal lagoons, fashioned by the action of wind or waves. They include gently sloping beaches and beach-ridges, formed by sands brought by waves, longshore drift and storm waves, as well as dunes, formed by aeolian deposits, though sometimes re-fashioned by waves.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004a)

### Descriptive or diagnostic parameters

Parameter	Value(s)
Altitude zones (terrestrial and marine):	Driftline; Supralittoral; Coastal
Geomorphology or landform:	Embryonic dune; Mobile dune; Fixed dune; Beach (upper); Driftline
Substrate types:	Sand

### EUNIS habitat code and names B1.1 Sand beach driftlines

#### Description

The lowest level of the supralittoral, just above the normal tide limit, where drift material accumulates and the sand may be rich in nitrogenous organic matter. Vegetation, if present at all, is very open and composed of annuals, e.g. *Atriplex* spp., *Cakile* spp., *Salsola kali*, *Polygonum* spp.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004a)

### Legal instruments

Legal instrument	Legally designated habitat	Code
EU Habitats Directive Annex I	Annual vegetation of drift lines	1210
	Boreal Baltic sandy beaches with perennial vegetation	1640

### Descriptive or diagnostic parameters

Parameter	Value(s)
Altitude zones (terrestrial and marine):	Driftline; Coastal
Geomorphology or landform:	Driftline
Dominant life forms:	Angiosperms (in aquatic habitats); Terrestrial angiosperms (in aquatic habitats); Halophile species
Substrate types:	Sand
Related phytosociological units:	<i>Atriplici laciniatae-Salsolion kali</i> ; <i>Atriplicion littoralis</i> ; <i>Cakiletea maritima</i> ; <i>Cakilion edentulae</i> ; <i>Cakilion euxinae</i> ; <i>Elymion gigantei</i> ; <i>Euphorbion peplis</i> ; <i>Honckenyo-Crambion maritima</i> ; <i>Thero-Salicornion</i> ; <i>Thero-Suaedion</i>

### EUNIS habitat code and names B1.2 Sand beaches above the driftline

#### Description

Gently sloping sand-covered shorelines fashioned by wind action along coasts and beside associated coastal lagoons.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004a)

### Legal instruments

Legal instrument	Legally designated habitat	Code
EU Habitats Directive Annex I	Baltic esker islands with sandy, rocky and shingle beach vegetation and sublittoral vegetation	1610
	Boreal Baltic sandy beaches with perennial vegetation	1640



**Descriptive or diagnostic parameters**

Parameter	Value(s)
Altitude zones (terrestrial and marine):	Supralittoral; Coastal
Geomorphology or landform:	Beach (upper)
Characteristics of wetness or dryness:	Dry
Substrate types:	Sand
Related phytosociological units:	<i>Ammophiletalia</i> ; <i>Ammophilion arundinaceae</i> ; <i>Atriplicion littoralis</i> ; <i>Cakilion edentulae</i> ; <i>Honckenyo-Elymion arenarii</i>

**EUNIS habitat code and names B1.3 Shifting coastal dunes****Description**

Mobile sands of the coasts of the boreal, nemoral, steppe, Mediterranean and warm-temperate humid zones, unvegetated or occupied by open grasslands; they may form tall dune ridges or, particularly along the Mediterranean and the Black Sea, be limited to a fairly flat upper beach, still subject in part to inundation.

**Source** Devillers, P., Devillers-Terschuren, J. and Vander Linden, C. (2001)

**Legal instruments**

Legal instrument	Legally designated habitat	Code
EU Habitats Directive Annex I	Boreal Baltic sandy beaches with perennial vegetation	1640
	Embryonic shifting dunes	2110
	Shifting dunes along the shoreline with <i>Ammophila arenaria</i> ('white dunes')	2120
Council of Europe Bern Convention Res. No. 4 1996	Dunes	16.2

**Descriptive or diagnostic parameters**

Parameter	Value(s)
Altitude zones (terrestrial and marine):	Coastal
Geomorphology or landform:	Embryonic dune; Mobile dune
Characteristics of wetness or dryness:	Dry
Substrate types:	Sand
Related phytosociological units:	<i>Agropyron juncei</i> ; <i>Agropyro-Minuartion peploidis</i> ; <i>Ammophiletalia</i> ; <i>Ammophilion arundinaceae</i> ; <i>Elymion gigantei</i> ; <i>Honckenyo-Elymion arenarii</i> ; <i>Ononido ramosissimae-Polycarpion niveae</i> ; <i>Traganion moquini</i> ; <i>Verbascion pinnatifidii</i>

**EUNIS habitat code and names B1.4 Coastal stable dune grassland (grey dunes)****Description**

Fixed or semifixed dunes of the coasts of the boreal, nemoral, steppe, mediterranean and warm-temperate humid zones, with the perennial grasslands, chamaephyte-dotted grasslands, forblands, subshrub or succulent communities that stabilise them and the therophyte communities that may occupy the grassland

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004a)

**Legal instruments**

Legal instrument	Legally designated habitat	Code
EU Habitats Directive Annex I	Fixed coastal dunes with herbaceous vegetation ('grey dunes')	2130
	Crucianellion maritimae fixed beach dunes	2210
	Dunes with <i>Euphorbia terracina</i>	2220
	Malcolmietalia dune grasslands	2230
	Brachypodietalia dune grasslands with annuals	2240
Council of Europe Bern Convention Res. No. 4 1996	Dunes	16.2

**Descriptive or diagnostic parameters**

Parameter	Value(s)
Altitude zones (terrestrial and marine):	Coastal
Geomorphology or landform:	Fixed dune
Dominant life forms:	Herbs
Characteristics of wetness or dryness:	Dry
Substrate types:	Sand
Related phytosociological units:	<i>Ammophiletalia</i> ; <i>Anthyllido hamosae-Malcolmion lacerae</i> ; <i>Artemisio-Koelerietalia</i> ; <i>Bromion erecti</i> ; <i>Corynephorion canescentis</i> ; <i>Crucianelletalia maritimae</i> ; <i>Crucianellion maritimae</i> ; <i>Euphorbio portlandicae-Helichrysion stoechadis</i> ; <i>Festucion beckeri</i> ; <i>Galio littoralis-Geranion sanguinei</i> ; <i>Geranion sanguinei</i> ; <i>Helianthemion guttati</i> ; <i>Helichrysion picardii</i> ; <i>Hyperico perforati-Scleranthion perennis</i> ; <i>Juncion squarrosi</i> ; <i>Koelerion arenariae</i> ; <i>Linaron pedunculatae</i> ; <i>Plantagini-Festucion ovinae</i> ; <i>Potentillion anserinae</i> ; <i>Scabiosion ucranicae</i> ; <i>Thero-Airion</i> ; <i>Traganion moquini</i> ; <i>Violion caninae</i>

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**EUNIS habitat code and names** B1.5 Coastal dune heaths**Description**

Stable dunes with a leached surface and vegetation dominated by *Calluna vulgaris*, *Empetrum nigrum* or *Erica* spp.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004b)

**Legal instruments**

<u>Legal instrument</u>	<u>Legally designated habitat</u>	<u>Code</u>
EU Habitats Directive Annex I	Decalcified fixed dunes with <i>Empetrum nigrum</i>	2140
	Atlantic decalcified fixed dunes ( <i>Calluno-Ulicetea</i> )	2150
Council of Europe Bern Convention Res. No. 4 1996	Dunes	16.2

**Descriptive or diagnostic parameters**

<b>Parameter</b>	<b>Value(s)</b>
Altitude zones (terrestrial and marine):	Coastal
Geomorphology or landform:	Fixed dune
Dominant life forms:	Dwarf shrubs
Characteristics of wetness or dryness:	Dry
Substrate types:	Sand
Related phytosociological units:	<i>Empetrium nigri</i> ; <i>Ericion cinereae</i> ; <i>Ericion umbellatae</i> ; <i>Genistion pilosae</i> ; <i>Genisto-Vaccinion</i> ; <i>Ulicion minoris</i>

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**EUNIS habitat code and names** B1.6 Coastal dune scrub**Description**

Stable dunes with scrub, e.g. *Hippophae rhamnoides*, *Salix repens* in the north, or *Juniperus* spp. or sclerophyllous shrubs in the south.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004b)

**Legal instruments**

<u>Legal instrument</u>	<u>Legally designated habitat</u>	<u>Code</u>
EU Habitats Directive Annex I	Dunes with <i>Hippophae rhamnoides</i>	2160
	Dunes with <i>Salix repens</i> ssp <i>argentea</i> ( <i>Salicion arenariae</i> )	2170
	Coastal dunes with <i>Juniperus</i> spp	2250
	<i>Cisto-Lavanduletalia</i> dune sclerophyllous scrubs	2260
Council of Europe Bern Convention Res. No. 4 1996	Dunes	16.2

**Descriptive or diagnostic parameters**

<b>Parameter</b>	<b>Value(s)</b>
Altitude zones (terrestrial and marine):	Coastal
Geomorphology or landform:	Fixed dune
Dominant life forms:	Arborescent shrubs; Tall shrubs
Characteristics of wetness or dryness:	Dry
Substrate types:	Sand
Related phytosociological units:	<i>Berberidion vulgaris</i> ; <i>Cisto-Lavanduletea</i> ; <i>Juniperion turbinatae</i> ; <i>Ligustro-Hippophaeion</i> ; <i>Oleo-Ceratonion siliquae</i> ; <i>Pruno-Rubion radulae</i> ; <i>Pruno-Rubion ulmifolii</i> ; <i>Quercetea ilicis</i> ; <i>Rosmarinetea officinalis</i> ; <i>Salicion arenariae</i>

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**EUNIS habitat code and names** B1.7 Coastal dune woods**Description**

Coastal dunes colonised by woodland or riparian thickets.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004a)

**Legal instruments**

<u>Legal instrument</u>	<u>Legally designated habitat</u>	<u>Code</u>
EU Habitats Directive Annex I	Wooded dunes of the Atlantic, Continental and Boreal region	2180
	Wooded dunes with <i>Pinus pinea</i> and/or <i>Pinus pinaster</i>	2270
Council of Europe Bern Convention Res. No. 4 1996	Dunes	16.2

**Descriptive or diagnostic parameters**

<b>Parameter</b>	<b>Value(s)</b>
Altitude zones (terrestrial and marine):	Coastal
Geomorphology or landform:	Fixed dune
Dominant life forms:	Trees
Characteristics of wetness or dryness:	Dry
Substrate types:	Sand

**EUNIS habitat code and names B1.8 Moist and wet dune slacks****Description**

Moist or wet depressions in coastal dune systems, sometimes with permanent water but more often only seasonally moist or flooded by fresh water. Dune-slacks are extremely rich and specialised habitats, very threatened by the lowering of water tables.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004a)

**Legal instruments**

<u>Legal instrument</u>	<u>Legally designated habitat</u>	<u>Code</u>
EU Habitats Directive Annex I	Humid dune slacks	2190
Council of Europe Bern Convention Res. No. 4 1996	Humid dune-slacks	16.3

**Descriptive or diagnostic parameters**

<b>Parameter</b>	<b>Value(s)</b>
Altitude zones (terrestrial and marine):	Coastal
Geomorphology or landform:	Fixed dune
Characteristics of wetness or dryness:	Waterlogged; Moist / mesic
Substrate types:	Sand
Related phytosociological units:	<i>Caricion davallianae</i> ; <i>Caricion fuscae</i> ; <i>Hyperico elodis-Sparganion</i> ; <i>Nanocyperetalia</i> ; <i>Phragmito-Magnocaricetea</i> ; <i>Potentillion anserinae</i> ; <i>Preslion cervinae</i> ; <i>Saginion maritimae</i>

**EUNIS habitat code and names B1.9 Machair****Description**

Short-turf grasslands formed on dry and seasonally waterlogged, relatively flat and low-lying sand plains, where windblown calcareous sand overlies peat or impermeable bedrock. Machair grasslands are machair in the strict sense, and form part of the machair complex (X27), characteristic of the Outer Hebrides and western Ireland, with dunes (B1.3, B1.4), shallow lochs (C1) and land cultivated on a strip rotation (I1). They support a flower-rich, and correspondingly insect-rich, dune grassland studded with shallow lochs and cultivated on a strip rotation. The grassland is dominated by *Poa pratensis* and *Festuca rubra*, accompanied by *Thalictrum minus* ssp. *arenarium*, *Thymus praecox* ssp. *arcticus* (*Thymus drucei*), *Bellis perennis*, *Prunella vulgaris*, *Erodium cicutarium*, *Trifolium* spp., *Euphrasia* spp. and many orchids, among which *Dactylorhiza fuchsii* ssp. *hebridensis*, *Dactylorhiza purpurella*, *Gymnadenia conopsea*, *Coeloglossum viride*, *Platanthera chlorantha* and *Orchis mascula* are the most prominent. This grassland harbours a plant community of very restricted distribution comprising vulnerable species; *Cochlearia scotica*, *Euphrasia marshallii* and *Dactylorhiza fuchsii* ssp. *hebridensis* are endemic. As a whole, machair is an essential habitat for breeding waders such as *Haematopus ostralegus*, *Vanellus vanellus*, *Charadrius hiaticula*, *Calidris alpina*, *Tringa totanus* and *Gallinago gallinago*; it supports the healthiest western European population of the threatened corncrake *Crex crex*.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004b)

**Legal instruments**

<u>Legal instrument</u>	<u>Legally designated habitat</u>	<u>Code</u>
EU Habitats Directive Annex I	Machairs (* in Ireland)	21A0
Council of Europe Bern Convention Res. No. 4 1996	Machair	1A.1

**Descriptive or diagnostic parameters**

<b>Parameter</b>	<b>Value(s)</b>
Altitude zones (terrestrial and marine):	Coastal
Human activities and impacts:	Agricultural use
Exposure characteristics:	Wind action
Chemical attributes:	Base-rich; Calcareous
Substrate types:	Sand, Organic
Related phytosociological units:	<i>Plantagini-Festucion ovinae</i>

**EUNIS habitat code and names B2 Coastal shingle****Description**

Beaches of the oceans, of their connected seas and of their associated coastal lagoons, covered by pebbles, or sometimes boulders, usually formed by wave action.

**Source** Devillers, P., Devillers-Terschuren, J. and Vander Linden, C. (2001)

**Descriptive or diagnostic parameters**

<b>Parameter</b>	<b>Value(s)</b>
Altitude zones (terrestrial and marine):	Driftline; Coastal
Geomorphology or landform:	Shingle bank; Beach (upper); Driftline
Substrate types:	Mobile rock; Cobbles (undefined); Mobile cobbles; Pebbles; Gravel; Mobile shingle

**EUNIS habitat code and names** B2.1 Shingle beach driftlines

**Description**

The lowest level of the supralittoral, just above the normal tide limit, where drift material accumulates and the shingle may be rich in nitrogenous organic matter. Vegetation, if present at all, is very open and composed of annuals or, particularly by the Mediterranean, especially the east Mediterranean, of annuals and perennials, occupying accumulations of drift material and gravels rich in nitrogenous organic matter; characteristic are *Cakile maritima*, *Salsola kali*, *Atriplex* spp., *Polygonum* spp., *Euphorbia peplis*, *Mertensia maritima*, and, particularly in Mediterranean formations, *Glaucium flavum*, *Matthiola sinuata*, *Matthiola tricuspidata*, *Euphorbia paralias*, *Eryngium maritimum*.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004a)

**Legal instruments**

<u>Legal instrument</u>	<u>Legally designated habitat</u>	<u>Code</u>
EU Habitats Directive Annex I	Annual vegetation of drift lines	1210
	Baltic esker islands with sandy, rocky and shingle beach vegetation and sublittoral vegetation	1610

**Descriptive or diagnostic parameters**

<b>Parameter</b>	<b>Value(s)</b>
Altitude zones (terrestrial and marine):	Driftline; Coastal
Geomorphology or landform:	Driftline
Substrate types:	Mobile rock; Cobbles (undefined); Mobile cobbles; Pebbles; Gravel; Mobile shingle
Related phytosociological units:	<i>Atriplicetalia littoralis</i> ; <i>Atriplici laciniatae-Salsolion kali</i> ; <i>Cakilion edentulae</i> ; <i>Euphorbietalia peplis</i>

**EUNIS habitat code and names** B2.2 Unvegetated mobile shingle beaches above the driftline

**Description**

Shingle beaches lacking vegetation.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004b)

**Descriptive or diagnostic parameters**

<b>Parameter</b>	<b>Value(s)</b>
Altitude zones (terrestrial and marine):	Coastal
Geomorphology or landform:	Shingle bank; Beach (upper)
Cover characteristics (when used as criteria):	Vegetation <10%
Characteristics of wetness or dryness:	Dry
Substrate types:	Mobile rock; Cobbles (undefined); Mobile cobbles; Pebbles; Gravel; Mobile shingle

**EUNIS habitat code and names** B2.3 Upper shingle beaches with open vegetation

**Description**

The upper beach of large shingle bars, with open perennial vegetation mostly formed by *Crambe maritima*, *Honkenya peploides*, *Lathyrus japonica* and a few other specialised species. Mainly in northwest Europe, from the Atlantic to the Baltic.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004a)

**Legal instruments**

<u>Legal instrument</u>	<u>Legally designated habitat</u>	<u>Code</u>
EU Habitats Directive Annex I	Perennial vegetation of stony banks	1220
	Baltic esker islands with sandy, rocky and shingle beach vegetation and sublittoral vegetation	1610
Council of Europe Bern Convention Res. No. 4 1996	Sea kale communities	17.3

**Descriptive or diagnostic parameters**

<b>Parameter</b>	<b>Value(s)</b>
Altitude zones (terrestrial and marine):	Coastal
Geomorphology or landform:	Shingle bank; Beach (upper)
Cover characteristics (when used as criteria):	Vegetation >10%; Vegetation <30%

Characteristics of wetness or dryness: Dry  
Substrate types: Mobile rock; Mobile cobbles; Pebbles; Gravel; Mobile shingle; Pebbles, Cobbles  
Related phytosociological units: *Honckenyo-Crambion maritimae*

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**EUNIS habitat code and names** B2.4 Fixed shingle beaches, with herbaceous vegetation

**Description**

Vegetated landward expanses of large coastal shingle banks, dominated by grasses or with other herbaceous vegetation.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004a)

**Descriptive or diagnostic parameters**

<b>Parameter</b>	<b>Value(s)</b>
Altitude zones (terrestrial and marine):	Coastal
Geomorphology or landform:	Shingle bank
Dominant life forms:	Herbs
Cover characteristics (when used as criteria):	Vegetation >30%
Characteristics of wetness or dryness:	Dry
Substrate types:	Cobbles (undefined); Pebbles; Gravel

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**EUNIS habitat code and names** B2.5 Shingle and gravel beaches with scrub

**Description**

Coastal gravel banks with scrub. Included are dense thermo-mediterranean brushes on gravel banks beside the Mediterranean and heaths on shingle in the nemoral zone.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004a)

**Descriptive or diagnostic parameters**

<b>Parameter</b>	<b>Value(s)</b>
Altitude zones (terrestrial and marine):	Coastal
Geomorphology or landform:	Shingle bank
Dominant life forms:	Shrubs
Cover characteristics (when used as criteria):	Vegetation >30%
Characteristics of wetness or dryness:	Dry
Substrate types:	Cobbles (undefined); Pebbles; Gravel

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**EUNIS habitat code and names** B2.6 Shingle and gravel beach woodland

**Description**

Coastal gravel banks, colonised by woodland or riparian thickets, in particular, Mediterranean gravel banks colonized by *Quercus ilex* low woods, by *Tamarix africana* or *Vitex agnus-castus*.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004a)

**Descriptive or diagnostic parameters**

<b>Parameter</b>	<b>Value(s)</b>
Altitude zones (terrestrial and marine):	Coastal
Geomorphology or landform:	Shingle bank
Dominant life forms:	Trees
Cover characteristics (when used as criteria):	Vegetation >30%
Characteristics of wetness or dryness:	Dry
Substrate types:	Cobbles (undefined); Pebbles; Gravel

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**EUNIS habitat code and names** B3 Rock cliffs, ledges and shores, including the supralittoral

**Description**

Rock exposures adjacent to the oceans, their connected seas and associated coastal lagoons, or separated from them by a narrow shoreline. The faces, ledges and caves of sea-cliffs and the expanses of rocky shore are important as reproduction, resting and feeding sites for seabirds, sea-mammals and a few groups of terrestrial birds. Sea-cliffs may also harbour highly distinctive, specialised salt-tolerant vegetation with associated terrestrial fauna.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004a)

**Descriptive or diagnostic parameters**

<b>Parameter</b>	<b>Value(s)</b>
Altitude zones (terrestrial and marine):	Supralittoral; Coastal
Geomorphology or landform:	Rocky coast; Coastal cliff; Rock stack

Substrate types: Bedrock; Hard; Hard rock; Artificial hard; Boulders (undefined); Very large non-mobile boulders; Large non-mobile boulders; Small non-mobile boulders; Non-mobile cobbles

Related phytosociological units: *Agropyro-Artemision coerulescentis*; *Crithmo-Staticion*

**EUNIS habitat code and names** B3.1 Supralittoral rock (lichen or splash zone)

**Description**

Cliffs and rocks of the supralittoral spray zone, mostly occupied by lichens such as *Caloplaca* spp. and *Verrucaria* spp.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004a)

**Descriptive or diagnostic parameters**

<b>Parameter</b>	<b>Value(s)</b>
Altitude zones (terrestrial and marine):	Supralittoral; Coastal
Geomorphology or landform:	Rocky coast; Coastal cliff; Rock stack
Substrate types:	Bedrock; Hard; Hard rock; Artificial hard; Boulders (undefined); Very large non-mobile boulders; Large non-mobile boulders; Small non-mobile boulders; Non-mobile cobbles

Related phytosociological units: *Crithmo-Staticetea*

**EUNIS habitat code and names** B3.2 Unvegetated rock cliffs, ledges, shores and islets

**Description**

Hard-rock sea-cliffs, their faces, ledges and associated caves, rocky shores and isolated seaside rocks, their associated seabird, sea mammal, wader and, in a few cases, terrestrial passerine, communities. Vascular plant cover is by definition very low or absent, but lichens are normally present.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004a)

**Legal instruments**

<u>Legal instrument</u>	<u>Legally designated habitat</u>	<u>Code</u>
EU Habitats Directive Annex I	Boreal Baltic islets and small islands	1620

**Descriptive or diagnostic parameters**

<b>Parameter</b>	<b>Value(s)</b>
Altitude zones (terrestrial and marine):	Coastal
Geomorphology or landform:	Rocky coast; Coastal cliff; Rock stack
Cover characteristics (when used as criteria):	Vegetation <10%
Substrate types:	Bedrock; Hard; Hard rock; Artificial hard; Boulders (undefined); Non-mobile cobbles

**EUNIS habitat code and names** B3.3 Rock cliffs, ledges and shores, with angiosperms

**Description**

Sea-cliffs, or parts of sea-cliffs, and rocky shores colonized by disjunct assemblages of salt-tolerant crevice plants (chasmophytes) or by more or less closed salt-tolerant grasslands with associated terrestrial invertebrate and vertebrate faunal communities.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004a)

**Legal instruments**

<u>Legal instrument</u>	<u>Legally designated habitat</u>	<u>Code</u>
EU Habitats Directive Annex I	Vegetated sea cliffs of the Atlantic and Baltic Coasts	1230
	Vegetated sea cliffs of the Mediterranean coasts with endemic <i>Limonium</i> spp	1240
	Vegetated sea cliffs with endemic flora of the Macaronesian coasts	1250

**Descriptive or diagnostic parameters**

<b>Parameter</b>	<b>Value(s)</b>
Altitude zones (terrestrial and marine):	Coastal
Geomorphology or landform:	Rocky coast; Coastal cliff; Rock stack
Cover characteristics (when used as criteria):	Vegetation >10%
Substrate types:	Bedrock; Hard; Hard rock; Artificial hard; Boulders (undefined); Non-mobile cobbles

Related phytosociological units: *Cochleario officinalis-Armerion maritimae*; *Crithmo-Armerion maritimae*; *Crithmo-Staticetalia*; *Crithmo-Staticion*; *Festucion petraeae*; *Frankenio-Astydamietalia*; *Frankenio-Astydamion latifoliae*; *Kochio prostratae-Limonion meyeri*; *Silenion maritimae*

EUNIS habitat **code and names** B3.4 Soft sea-cliffs, often vegetated

**Description**

Sea-cliffs composed of relatively soft, unconsolidated or uncompacted mineral particle deposits, carved by wind and wave action. They may support scrub similar to that on dunes (B1.6), with *Hippophae rhamnoides*, *Salix repens*, *Sorbus aucuparia*.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004a)

**Descriptive or diagnostic parameters**

<b>Parameter</b>	<b>Value(s)</b>
Altitude zones (terrestrial and marine):	Coastal
Geomorphology or landform:	Coastal cliff
Substrate types:	Bedrock; Chalk; Boulders (undefined); Non-mobile cobbles
Related phytosociological units:	<i>Juncetea maritime</i>

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## C INLAND SURFACE WATERS

### Description

Inland surface waters are non-coastal above-ground open fresh or brackish waterbodies (e.g. rivers, streams, lakes and pools, springs), including their littoral zones. Includes constructed inland freshwater, brackish or saline waterbodies (such as canals, ponds, etc) which support a semi-natural community of both plants and animals; seasonal waterbodies which may dry out for part of the year (temporary or intermittent rivers and lakes and their littoral zones). Freshwater littoral zones include those parts of banks or shores that are sufficiently frequently inundated to prevent the formation of closed terrestrial vegetation. Excludes permanent snow and ice. Note that habitats that intimately combine waterlogged mires and vegetation rafts with pools of open water are considered as complexes.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004b)

### Descriptive or diagnostic parameters

Parameter	Value(s)
Altitude zones (terrestrial and marine):	Littoral (non-marine); Sublittoral (non-marine)
Human activities may include:	Urbanised areas, human habitation, constructed artificial surfaces; Other industrial / commercial areas; Port areas
Characteristics of wetness or dryness:	Aquatic; Frequently submerged

## EUNIS habitat code and names C1 Surface standing waters

### Description

Lakes, ponds and pools of natural origin containing fresh (*i.e.* nonsaline), brackish or salt water. Manmade freshwater bodies, including artificially created lakes, reservoirs and canals, provided that they contain seminatural aquatic communities.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004a)

### Descriptive or diagnostic parameters

Parameter	Value(s)
Altitude zones (terrestrial and marine):	Sublittoral (non-marine)
Human activities may include:	Urbanised areas, human habitation, constructed artificial surfaces; Other industrial / commercial areas; Port areas
Characteristics of wetness or dryness:	Aquatic
Characteristics of water flow, source & quality:	Still

## EUNIS habitat code and names C1.1 Permanent oligotrophic lakes, ponds and pools

### Description

Waterbodies with a low nutrient (nitrogen and phosphorus) content, mostly acid (pH 4-6). Includes oligotrophic waters of medium or high pH, e.g. calcareous and basic unpolluted nutrient-poor lakes and pools, which are rare in much of Europe and noted as a habitat of charophytes (C1.14). Excludes peaty, dystrophic waters (C1.4). Because of the low nutrient status, beds of vascular plants, including *Callitriche* spp., *Potamogeton* spp. and isoetids are often sparse and open.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004b)

### Legal instruments

Legal instrument	Legally designated habitat	Code
EU Habitats Directive Annex I	Humid dune slacks	2190
	Oligotrophic waters containing very few minerals of sandy plains (Littorelletalia uniflorae)	3110
	Oligotrophic waters containing very few minerals generally on sandy soils of the West Mediterranean, with <i>Isoetes</i> spp	3120
	Hard oligo-mesotrophic waters with benthic vegetation of <i>Chara</i> spp	3140
Council of Europe Bern Convention Res. No. 4 1996	Lime-deficient oligotrophic waterbodies	22.11

### Descriptive or diagnostic parameters

Parameter	Value(s)
Altitude zones (terrestrial and marine):	Sublittoral (non-marine)
Human activities may include:	Urbanised areas, human habitation, constructed artificial surfaces; Other industrial / commercial areas; Port areas
Temporal characteristics (when used in criteria):	1 year; 2 - 5 years; 5 - 10 years; 10 - 20 years; 20 - 100 years; >100 years; Permanent
Characteristics of wetness or dryness:	Aquatic
Characteristics of water flow, source & quality:	Still
Chemical attributes:	Oligotrophic



Related phytosociological units:

*Charetalia hispidae*; *Charion fragilis*; *Charion vulgaris*; *Hyperico elodis-Sparganion*; *Nelumboion nuciferae*; *Nitelletalia flexilis*; *Nitellion flexilis*; *Nitellion syncarpae-tenuissimae*; *Nymphaeion albae*; *Oenanthion aquaticae*; *Parvopotamion*; *Potametalia*; *Potametea*; *Potamion*; *Potamion graminei*; *Ranunculion aquatilis*; *Ranunculion fluitantis*; *Scorpidio-Utricularion minoris*; *Sphagno-Utricularion*; *Utricularietalia intermedio-minoris*; *Zannichellion pedicellatae*

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## EUNIS habitat code and names C1.2 Permanent mesotrophic lakes, ponds and pools

### Description

Lakes and pools with waters fairly rich in nutrients (nitrogen and phosphorus) and dissolved bases (pH often 6-7). Many unpolluted lowland lakes and ponds are naturally mesotrophic, and support dense beds of macrophytes, which are absent in polluted waters. Beds of charophytes can occur in mesotrophic (C1.25) as well as in oligotrophic (C1.14) waters.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004a)

### Legal instruments

<u>Legal instrument</u>	<u>Legally designated habitat</u>	<u>Code</u>
EU Habitats Directive Annex I	Oligotrophic to mesotrophic standing waters with vegetation of the Littorelletea uniflorae and/or of the Isoeto-Nanojuncetea	3130
	Hard oligo-mesotrophic waters with benthic vegetation of Chara spp	3140
	Lakes of gypsum karst	3190

### Descriptive or diagnostic parameters

<u>Parameter</u>	<u>Value(s)</u>
Altitude zones (terrestrial and marine):	Sublittoral (non-marine)
Human activities may include:	Urbanised areas, human habitation, constructed artificial surfaces; Other industrial / commercial areas; Port areas
Temporal characteristics (when used in criteria):	1 year; 2 - 5 years; 5 - 10 years; 10 - 20 years; 20 - 100 years; >100 years; Permanent
Characteristics of wetness or dryness:	Aquatic
Characteristics of water flow, source & quality:	Still
Chemical attributes:	Mesotrophic
Related phytosociological units:	<i>Charetalia hispidae</i> ; <i>Charion fragilis</i> ; <i>Charion vulgaris</i> ; <i>Hyperico elodis-Sparganion</i> ; <i>Lemnion minoris</i> ; <i>Lemnion trisulcae</i> ; <i>Lemno minoris-Hydrocharition morsus-ranae</i> ; <i>Nelumboion nuciferae</i> ; <i>Nitelletalia flexilis</i> ; <i>Nitellion flexilis</i> ; <i>Nitellion syncarpae-tenuissimae</i> ; <i>Nymphaeion albae</i> ; <i>Parvopotamion</i> ; <i>Potametalia</i> ; <i>Potametea</i> ; <i>Potamion</i> ; <i>Potamion graminei</i> ; <i>Ranunculion aquatilis</i> ; <i>Ranunculion fluitantis</i> ; <i>Scorpidio-Utricularion minoris</i> ; <i>Sphagno-Utricularion</i> ; <i>Utricularietalia intermedio-minoris</i> ; <i>Zannichellion pedicellatae</i>

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## EUNIS habitat code and names C1.3 Permanent eutrophic lakes, ponds and pools

### Description

Lakes and pools with mostly dirty grey to blue-green, more or less turbid, waters, particularly rich in nutrients (nitrogen and phosphorus) and dissolved bases (pH usually > 7). Moderately eutrophic waters can support dense beds of macrophytes, but these disappear when pollution causes nutrient levels to rise further.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004a)

### Legal instruments

<u>Legal instrument</u>	<u>Legally designated habitat</u>	<u>Code</u>
EU Habitats Directive Annex I	Natural eutrophic lakes with Magnopotamion or Hydrocharition -type vegetation	3150

### Descriptive or diagnostic parameters

<u>Parameter</u>	<u>Value(s)</u>
Altitude zones (terrestrial and marine):	Sublittoral (non-marine)
Human activities may include:	Urbanised areas, human habitation, constructed artificial surfaces; Other industrial / commercial areas; Port areas
Temporal characteristics (when used in criteria):	1 year; 2 - 5 years; 5 - 10 years; 10 - 20 years; 20 - 100 years; >100 years; Permanent
Characteristics of wetness or dryness:	Aquatic
Characteristics of water flow, source & quality:	Still
Chemical attributes:	Eutrophic
Related phytosociological units:	<i>Hyperico elodis-Sparganion</i> ; <i>Lemnetea</i> ; <i>Lemnion minoris</i> ; <i>Lemnion trisulcae</i> ; <i>Lemno minoris-Hydrocharition morsus-ranae</i> ; <i>Nelumboion nuciferae</i> ; <i>Nymphaeion albae</i> ; <i>Parvopotamion</i> ; <i>Potametalia</i> ; <i>Potametea</i> ; <i>Potamion</i> ; <i>Potamion graminei</i> ; <i>Ranunculion aquatilis</i> ; <i>Ranunculion fluitantis</i> ; <i>Zannichellion pedicellatae</i>

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**EUNIS habitat code and names** C1.4 Permanent dystrophic lakes, ponds and pools**Description**

Lakes and pools with acidic waters of high humus content and often brown tinted (pH often 3-5).

**Source** Devillers, P., Devillers-Terschuren, J. and Vander Linden, C. (2001)

**Legal instruments**

<u>Legal instrument</u>	<u>Legally designated habitat</u>	<u>Code</u>
EU Habitats Directive Annex I	Natural dystrophic lakes and ponds Active raised bogs	3160 7110

**Descriptive or diagnostic parameters**

<b>Parameter</b>	<b>Value(s)</b>
Altitude zones (terrestrial and marine):	Sublittoral (non-marine)
Human activities may include:	Urbanised areas, human habitation, constructed artificial surfaces; Other industrial / commercial areas; Port areas
Temporal characteristics (when used in criteria):	1 year; 2 - 5 years; 5 - 10 years; 10 - 20 years; 20 - 100 years; >100 years; Permanent
Characteristics of wetness or dryness:	Aquatic
Characteristics of water flow, source & quality:	Still
Chemical attributes:	Dystrophic
Related phytosociological units:	<i>Caricion fuscae</i> ; <i>Caricion lasiocarpae</i> ; <i>Charetalia hispidae</i> ; <i>Charion fragilis</i> ; <i>Charion vulgaris</i> ; <i>Hyperico elodis-Sparganion</i> ; <i>Nelumboion nuciferae</i> ; <i>Nitelletalia flexilis</i> ; <i>Nitellion flexilis</i> ; <i>Nitellion syncarpae-tenuissimae</i> ; <i>Nymphaeion albae</i> ; <i>Parvopotamion</i> ; <i>Potametalia</i> ; <i>Potametea</i> ; <i>Potamion</i> ; <i>Potamion graminei</i> ; <i>Ranunculion aquatilis</i> ; <i>Ranunculion fluitantis</i> ; <i>Rhynchosporion albae</i> ; <i>Scorpidio-Utricularion minoris</i> ; <i>Sphagno-Utricularion</i> ; <i>Utricularietalia intermedio-minoris</i> ; <i>Zannichellion pedicellatae</i>

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**EUNIS habitat code and names** C1.5 Permanent inland saline and brackish lakes, ponds and pools**Description**

Non-coastal brackish, saline or hypersaline lakes, ponds or pools and their pelagic vertebrates and plankton.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004a)

**Legal instruments**

<u>Legal instrument</u>	<u>Legally designated habitat</u>	<u>Code</u>
EU Habitats Directive Annex I	Coastal lagoons	1150
Council of Europe Bern Convention Res. No. 4 1996	Athalassal saline lakes	23.1

**Descriptive or diagnostic parameters**

<b>Parameter</b>	<b>Value(s)</b>
Altitude zones (terrestrial and marine):	Sublittoral (non-marine)
Human activities may include:	Urbanised areas, human habitation, constructed artificial surfaces; Other industrial / commercial areas; Port areas
Temporal characteristics (when used in criteria):	1 year; 2 - 5 years; 5 - 10 years; 10 - 20 years; 20 - 100 years; >100 years; Permanent
Characteristics of wetness or dryness:	Aquatic
Characteristics of water flow, source & quality:	Still
Chemical attributes:	Saline; Brackish
Related phytosociological units:	<i>Charion canescentis</i> ; <i>Ranunculion aquatilis</i> ; <i>Ruppion maritimae</i> ; <i>Zannichellion pedicellatae</i>

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**EUNIS habitat code and names** C1.6 Temporary lakes, ponds and pools**Description**

Freshwater lakes, ponds, pools, or parts of such freshwater bodies that become periodically dry, with their associated animal and algal pelagic and benthic communities. Habitats of the dry phase are listed under C3.5, C3.6 and 3.7.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004a)

**Legal instruments**

<u>Legal instrument</u>	<u>Legally designated habitat</u>	<u>Code</u>
EU Habitats Directive Annex I	Turloughs	3180

**Descriptive or diagnostic parameters**

<b>Parameter</b>	<b>Value(s)</b>
Altitude zones (terrestrial and marine):	Sublittoral (non-marine)
Human activities may include:	Urbanised areas, human habitation, constructed artificial surfaces; Other

Temporal characteristics (when used in criteria): industrial / commercial areas; Port areas  
 Characteristics of wetness or dryness: 1 season; 2-4 seasons; Temporary; Seasonal  
 Characteristics of water flow, source & quality: Aquatic  
 Still  
 Related phytosociological units: *Charion fragilis*; *Hyperico elodis-Sparganion*; *Isoëtion lacustris*; *Littorellion uniflorae*; *Nelumboion nuciferae*; *Nymphaeion albae*; *Parvopotamion*; *Potamion graminei*; *Potentillion anserinae*; *Ranunculion aquatilis*; *Ranunculion fluitantis*; *Zannichellion pedicellatae*

## EUNIS habitat code and names C1.7 Permanent lake ice

### Description

Permanent or almost permanent ice formations of lakes, constituting continuous ice sheets that may cover the entire surface for all of the year or recede to part of the lake during summer and be accompanied or replaced by floating ice blocks, rafts and hummocks. They may, locally, seasonally or permanently, extend to the whole depth of the lake. They are characteristic of high latitude and high altitude lakes.

**Source** Devillers, P., Devillers-Terschuren, J. and Vander Linden, C. (2001)

### Descriptive or diagnostic parameters

Parameter	Value(s)
Characteristics of water flow, source & quality:	Still
Substrate types:	Ice

## EUNIS habitat code and names C2 Surface running waters

### Description

Running waters, including springs, streams and temporary water courses.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004b)

### Descriptive or diagnostic parameters

Parameter	Value(s)
Altitude zones (terrestrial and marine):	Sublittoral (non-marine)
Human activities may include:	Urbanised areas, human habitation, constructed artificial surfaces; Other industrial / commercial areas; Port areas
Characteristics of wetness or dryness:	Aquatic
Characteristics of water flow, source & quality:	Running; Slow or laminar flow; Fast and turbulent flow; Variable flow; Intermittent flow; Vertical flow; Vertical flow downwards; Vertical flow upwards

## EUNIS habitat code and names C2.1 Springs, spring brooks and geysers

### Description

Springs and resurgences, together with animal and plant communities dependent on the peculiar microclimatic and hydrological situation created by them. Excludes vegetated spring mires (D2.2, D4.1), where springs emerge through a (usually small) expanse of vegetation with little or no open water.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004a)

### Legal instruments

Legal instrument	Legally designated habitat	Code
EU Habitats Directive Annex I	Water courses of plain to montane levels with the <i>Ranunculion fluitantis</i> and <i>Callitriche-Batrachion</i> vegetation	3260
	Fennoscandian mineral-rich springs and springfens	7160
	Petrifying springs with tufa formation ( <i>Cratoneurion</i> )	7220

### Descriptive or diagnostic parameters

Parameter	Value(s)
Altitude zones (terrestrial and marine):	Sublittoral (non-marine)
Geomorphology or landform:	Geyser, spring, flush
Temporal characteristics (when used in criteria):	1 year; 2 - 5 years; 5 - 10 years; 10 - 20 years; 20 - 100 years; >100 years; Permanent
Characteristics of wetness or dryness:	Aquatic
Characteristics of water flow, source & quality:	Running; Fast and turbulent flow; Variable flow; Intermittent flow; Vertical flow; Vertical flow upwards
Related phytosociological units:	<i>Adiantion</i> ; <i>Cardamino nymannii-Saxifragion foliolosae</i> ; <i>Cardamino-Montion</i> ; <i>Caricion atrofusco-saxatilis</i> ; <i>Caricion remotae</i> ; <i>Cratoneurion commutati</i> ; <i>Dermatocarpion</i> ; <i>Doronicion corsici</i> ; <i>Epilobio nutantis-Montion</i> ; <i>Lycopodo-Cratoneurion commutati</i> ; <i>Montio-Cardaminetia</i> ; <i>Myosotidion stoloniferae</i> ; <i>Nanocyperion</i> ; <i>Nymphaeion albae</i> ; <i>Philonotidion seriatae</i> ; <i>Ranunculion aquatilis</i> ; <i>Ranunculion fluitantis</i>

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**EUNIS habitat code and names** C2.2 Permanent non-tidal, fast, turbulent watercourses**Description**

Permanent water courses with fast-flowing turbulent water and their associated animal and microscopic algal pelagic and benthic communities. Rivers, streams, brooks, rivulets, rills, torrents, waterfalls, cascades and rapids are included. The bed is typically composed of rocks, stones or gravel with only occasional sandy and silty patches. Features of the river bed, uncovered by low water or permanently emerging, such as gravel or rock islands and bars are treated as the littoral zone (C3). Includes high, mid and low-altitude, usually small to medium-sized streams as defined by the Water Framework Directive.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004a)

**Legal instruments**

<u>Legal instrument</u>	<u>Legally designated habitat</u>	<u>Code</u>
EU Habitats Directive Annex I	Fennoscandian natural rivers	3210
	Water courses of plain to montane levels with the <i>Ranuncion fluitantis</i> and <i>Callitricho-Batrachion</i> vegetation	3260

**Descriptive or diagnostic parameters**

<b>Parameter</b>	<b>Value(s)</b>
Altitude zones (terrestrial and marine):	Sublittoral (non-marine)
Human activities may include:	Urbanised areas, human habitation, constructed artificial surfaces; Other industrial / commercial areas
Temporal characteristics (when used in criteria):	1 year; 2 - 5 years; 5 - 10 years; 10 - 20 years; 20 - 100 years; >100 years; Permanent
Characteristics of wetness or dryness:	Aquatic
Characteristics of water flow, source & quality:	Running; Fast and turbulent flow
Related phytosociological units:	<i>Nymphaeion albae</i> ; <i>Ranuncion aquatilis</i> ; <i>Ranuncion fluitantis</i>

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**EUNIS habitat code and names** C2.3 Permanent non-tidal, smooth-flowing watercourses**Description**

Permanent water courses with non-turbulent water and their associated animal and microscopic algal pelagic and benthic communities. Slow-flowing rivers, streams, brooks, rivulets and rills; also fast-flowing rivers with laminar flow. The bed is typically composed of sand or mud. Features of the river bed, uncovered by low water or permanently emerging, such as sand or mud islands and bars are treated as the littoral zone (C3). Includes mid and low-altitude streams as defined by the Water Framework Directive.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004a)

**Legal instruments**

<u>Legal instrument</u>	<u>Legally designated habitat</u>	<u>Code</u>
EU Habitats Directive Annex I	Water courses of plain to montane levels with the <i>Ranuncion fluitantis</i> and <i>Callitricho-Batrachion</i> vegetation	3260

**Descriptive or diagnostic parameters**

<b>Parameter</b>	<b>Value(s)</b>
Altitude zones (terrestrial and marine):	Sublittoral (non-marine)
Human activities may include:	Urbanised areas, human habitation, constructed artificial surfaces; Other industrial / commercial areas; Port areas
Temporal characteristics (when used in criteria):	1 year; 2 - 5 years; 5 - 10 years; 10 - 20 years; 20 - 100 years; >100 years; Permanent
Characteristics of wetness or dryness:	Aquatic
Characteristics of water flow, source & quality:	Running; Slow or laminar flow
Related phytosociological units:	<i>Nymphaeion albae</i> ; <i>Ranuncion fluitantis</i>

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**EUNIS habitat code and names** C2.4 Tidal rivers, upstream from the estuary**Description**

Portions of rivers subject to the tide, upstream from the estuary.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004a)

**Descriptive or diagnostic parameters**

<b>Parameter</b>	<b>Value(s)</b>
Altitude zones (terrestrial and marine):	Sublittoral (non-marine)
Human activities may include:	Urbanised areas, human habitation, constructed artificial surfaces; Other industrial / commercial areas; Port areas
Geomorphology or landform:	Tidal river
Temporal characteristics (when used in criteria):	1 year; 2 - 5 years; 5 - 10 years; 10 - 20 years; 20 - 100 years; >100 years; Permanent
Characteristics of wetness or dryness:	Aquatic

Characteristics of water flow, source & quality: Running; Slow or laminar flow

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**EUNIS habitat code and names** C2.5 Temporary running waters

**Description**

Watercourses that cease to flow for part of the year, leaving a dry bed or pools. Habitats of the dry phase are treated under C3.5, C3.6 and C3.7.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004a)

**Legal instruments**

<u>Legal instrument</u>	<u>Legally designated habitat</u>	<u>Code</u>
EU Habitats Directive Annex I	Intermittently flowing Mediterranean rivers of the Paspalo-Agrostidion	3290

**Descriptive or diagnostic parameters**

<b>Parameter</b>	<b>Value(s)</b>
Altitude zones (terrestrial and marine):	Sublittoral (non-marine)
Temporal characteristics (when used in criteria):	1 season; 2-4 seasons; Temporary; Seasonal
Characteristics of wetness or dryness:	Aquatic
Characteristics of water flow, source & quality:	Intermittent flow

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**EUNIS habitat code and names** C2.6 Films of water flowing over rocky watercourse margins

**Description**

Flowing water that is not contained within a channel but oozes over rocks.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004b)

**Descriptive or diagnostic parameters**

<b>Parameter</b>	<b>Value(s)</b>
Geomorphology or landform:	Thin film of water over rock
Temporal characteristics (when used in criteria):	1 year; 2 - 5 years; 5 - 10 years; 10 - 20 years; 20 - 100 years; >100 years; Permanent
Characteristics of wetness or dryness:	Aquatic
Characteristics of water flow, source & quality:	Running

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**EUNIS habitat code and names** C3 Littoral zone of inland surface waterbodies

**Description**

Reedbeds and other water-fringing vegetation by lakes, rivers and streams; exposed bottoms of dried up rivers and lakes; rocks, gravel, sand and mud beside or in the bed of rivers and lakes.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004b)

**Descriptive or diagnostic parameters**

<b>Parameter</b>	<b>Value(s)</b>
Altitude zones (terrestrial and marine):	Littoral (non-marine)
Human activities may include:	Urbanised areas, human habitation, constructed artificial surfaces; Other industrial / commercial areas; Port areas
Characteristics of wetness or dryness:	Aquatic; Frequently submerged; Waterlogged

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**EUNIS habitat code and names** C3.1 Species-rich helophyte beds

**Description**

Water-fringing stands of vegetation by lakes, rivers and streams, with mixed species composition.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004b)

**Descriptive or diagnostic parameters**

<b>Parameter</b>	<b>Value(s)</b>
Altitude zones (terrestrial and marine):	Littoral (non-marine)
Dominant life forms:	Low-growing emergent vegetation
Cover characteristics (when used as criteria):	Vegetation >10%
Species richness (when used in criteria):	Species rich
Temporal characteristics (when used in criteria):	2 - 5 years; 5 - 10 years; 10 - 20 years; 20 - 100 years; >100 years; Permanent
Characteristics of wetness or dryness:	Aquatic; Frequently submerged; Waterlogged
Related phytosociological units:	<i>Glycerio-Sparganion</i> ; <i>Phragmito-Magnocaricetea</i>

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**EUNIS habitat code and names** C3.2 Water-fringing reedbeds and tall helophytes other than

## canes

### Description

Water-fringing stands of tall vegetation by lakes (including brackish lakes), rivers and brooks, usually species-poor and often dominated by one species. Includes stands of *Carex* spp., *Cladium mariscus*, *Equisetum fluviatile*, *Glyceria maxima*, *Hippuris vulgaris*, *Phragmites australis*, *Sagittaria sagittifolia*, *Schoenoplectus* spp., *Sparganium* spp. and *Typha* spp. Excludes terrestrialized reed and sedge beds which are not at the water's edge (D5.1, D5.2).

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004a)

### Descriptive or diagnostic parameters

Parameter	Value(s)
Altitude zones (terrestrial and marine):	Littoral (non-marine)
Dominant life forms:	Tall graminoids/grasses; Tall emergent vegetation / helophytes
Cover characteristics (when used as criteria):	Vegetation >10%
Species richness (when used in criteria):	Monospecific; Species poor
Temporal characteristics (when used in criteria):	2 - 5 years; 5 - 10 years; 10 - 20 years; 20 - 100 years; >100 years; Permanent
Characteristics of wetness or dryness:	Aquatic; Frequently submerged; Waterlogged
Related phytosociological units:	<i>Cirsio brachycephali-Bolboschoenion</i> ; <i>Magnocaricion elatae</i> ; <i>Nasturtio-Glycerietalia</i> ; <i>Oenanthion aquaticae</i> ; <i>Phalaridion arundinaceae</i> ; <i>Phragmitetalia</i> ; <i>Phragmiton communis</i> ; <i>Scirpetalia maritimi</i> ; <i>Scirpion maritime</i>

## EUNIS habitat code and names C3.3 Water-fringing beds of tall canes

### Description

Mediterranean beds of tall canes lining permanent or temporary water courses and water bodies. Included are beds of *Arundo donax* (C3.32) and *Saccharum ravennae* (C3.31).

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004a)

### Descriptive or diagnostic parameters

Parameter	Value(s)
Altitude zones (terrestrial and marine):	Littoral (non-marine)
Dominant life forms:	Tall emergent vegetation / helophytes
Cover characteristics (when used as criteria):	Vegetation >10%
Species richness (when used in criteria):	Monospecific; Species poor
Temporal characteristics (when used in criteria):	2 - 5 years; 5 - 10 years; 10 - 20 years; 20 - 100 years; >100 years; Permanent
Characteristics of wetness or dryness:	Aquatic; Frequently submerged; Waterlogged
Related phytosociological units:	<i>Imperato-Erianthion ravennae</i> ; <i>Molinio-Holoschoenion</i> ; <i>Pruno-Rubion ulmifolii</i>

## EUNIS habitat code and names C3.4 Species-poor beds of low-growing water-fringing or amphibious vegetation

### Description

Includes isoetids of the shores of oligotrophic lakes, *Nasturtium aquaticum* by streams, mediterranean dwarf *Scirpus* swards, and other species-poor but dissimilar types of vegetation.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004b)

### Legal instruments

Legal instrument	Legally designated habitat	Code
EU Habitats Directive Annex I	Coastal lagoons	1150
	Oligotrophic waters containing very few minerals of sandy plains (Littorelletalia uniflorae)	3110
	Oligotrophic waters containing very few minerals generally on sandy soils of the West Mediterranean, with Isoetes spp	3120
	Oligotrophic to mesotrophic standing waters with vegetation of the Littorelletea uniflorae and/or of the Isoeto-Nanojuncetea	3130
	Mediterranean temporary ponds	3170

### Descriptive or diagnostic parameters

Parameter	Value(s)
Altitude zones (terrestrial and marine):	Littoral (non-marine)
Dominant life forms:	Amphibious vegetation; Low-growing emergent vegetation
Cover characteristics (when used as criteria):	Vegetation >10%
Species richness (when used in criteria):	Monospecific; Species poor
Temporal characteristics (when used in criteria):	2 - 5 years; 5 - 10 years; 10 - 20 years; 20 - 100 years; >100 years; Permanent
Characteristics of wetness or dryness:	Aquatic; Frequently submerged; Waterlogged
Related phytosociological units:	<i>Deschampsion litoralis</i> ; <i>Eleocharition acicularis</i> ; <i>Eleocharition soloniensis</i> ; <i>Hyperico elodis-Sparganion</i> ; <i>Isoëtion</i> ; <i>Isoëtion lacustris</i> ; <i>Isoëto-Littorelletea</i> ; <i>Isoëto-Nanojuncetea</i> ; <i>Littorelletalia</i> ; <i>Littorellion uniflorae</i> ; <i>Molinio-Holoschoenion</i> ; <i>Nanocyperion</i> ; <i>Nasturtio-Glycerietalia</i> ; <i>Preslion cervinae</i> ; <i>Scirpion parvulae</i> ; <i>Verbenion supinae</i>

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EUNIS habitat **code and names** C3.5 Periodically inundated shores with pioneer and ephemeral vegetation

**Description**

Muddy, sandy and gravelly shores and dried-up bottoms of lakes and rivers, with moderate cover of vascular plants. These include annuals (e.g. *Bidens* spp., *Cyperus* spp., *Persicaria* spp.), developing during the exposure phase as well as perennials tolerant of temporary total immersion.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004a)

**Legal instruments**

<u>Legal instrument</u>	<u>Legally designated habitat</u>	<u>Code</u>
EU Habitats Directive Annex I	Oligotrophic to mesotrophic standing waters with vegetation of the Littorelletea uniflorae and/or of the Isoeto-Nanojuncetea	3130
	Alpine rivers and the herbaceous vegetation along their banks	3220
	Constantly flowing Mediterranean rivers with <i>Glaucium flavum</i>	3250
	Rivers with muddy banks with <i>Chenopodium rubri</i> pp and <i>Bidention</i> pp vegetation	3270

**Descriptive or diagnostic parameters**

<b>Parameter</b>	<b>Value(s)</b>
Altitude zones (terrestrial and marine):	Littoral (non-marine)
Dominant life forms:	Pioneer vegetation; Ephemeral annual vegetation
Temporal characteristics (when used in criteria):	Ephemeral; 1 season; Temporary; Seasonal
Characteristics of wetness or dryness:	Aquatic; Frequently submerged; Waterlogged
Related phytosociological units:	<i>Agrostion salmanticae</i> ; <i>Bidentetea tripartiti</i> ; <i>Bidention tripartitae</i> ; <i>Calamagrostion pseudophragmitis</i> ; <i>Caricion davallianae</i> ; <i>Chenopodion rubri</i> ; <i>Eleocharition soloniensis</i> ; <i>Epilobietalia fleischeri</i> ; <i>Glaucion flavi</i> ; <i>Isoëto-Nanojuncetea</i> ; <i>Nanocyperion</i> ; <i>Phalaridion arundinaceae</i> ; <i>Preslion cervinae</i> ; <i>Saginion maritimae</i> ; <i>Salicion incanae</i>

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EUNIS habitat **code and names** C3.6 Unvegetated or sparsely vegetated shores with soft or mobile sediments

**Description**

Banks of sand, gravel and mud in or by rivers. Gravel by mountain streams. Mud bottoms of dried-up rivers and lakes, including saline lakes. Exposed sand, gravel and mud at the edge of lakes.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004b)

**Descriptive or diagnostic parameters**

<b>Parameter</b>	<b>Value(s)</b>
Altitude zones (terrestrial and marine):	Littoral (non-marine)
Temporal characteristics (when used in criteria):	1 season; 2-4 seasons; Temporary; Seasonal
Characteristics of wetness or dryness:	Aquatic; Frequently submerged; Waterlogged
Substrate types:	Mobile; Mobile cobbles; Pebbles; Gravel; Mobile shingle; Sand; Muddy sand; Mud, Silt

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EUNIS habitat **code and names** C3.7 Unvegetated or sparsely vegetated shores with non-mobile substrates

**Description**

Periodically exposed rocks, pavements and blocks beside rivers and lakes, and in the draw-down zone of reservoirs.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004b)

**Descriptive or diagnostic parameters**

<b>Parameter</b>	<b>Value(s)</b>
Altitude zones (terrestrial and marine):	Littoral (non-marine)
Human activities may include:	Urbanised areas, human habitation, constructed artificial surfaces; Other industrial / commercial areas; Port areas
Temporal characteristics (when used in criteria):	1 season; 2-4 seasons; Temporary; Seasonal
Characteristics of wetness or dryness:	Aquatic; Frequently submerged; Waterlogged
Substrate types:	Bedrock; Clay; Hard; Hard rock; Artificial hard; Boulders (undefined); Non-mobile cobbles; Peat
Related phytosociological units:	<i>Epilobietalia fleischeri</i> ; <i>Koelerio-Coryneporetea</i>

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EUNIS habitat **code and names** C3.8 Inland spray- and steam-dependent habitats

**Description**

Spray-washed margins of pools below waterfalls. Steamy margins of geysers and hot springs.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004b)

**Descriptive or diagnostic parameters**

**Parameter**

Altitude zones (terrestrial and marine):

Characteristics of wetness or dryness:

**Value(s)**

Littoral (non-marine)

Spray or steam; Aquatic

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## D MIRES, BOGS AND FENS

### Description

Wetlands, with the water table at or above ground level for at least half of the year, dominated by herbaceous or ericoid vegetation. Includes inland saltmarshes and waterlogged habitats where the groundwater is frozen.

Excludes the water body and rock structure of springs (C2.1) and waterlogged habitats dominated by trees or large shrubs (F9.2, G1.4, G1.5, G3.D, G3.E). Note that habitats that intimately combine waterlogged mires and vegetation rafts with pools of open water are considered as complexes.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004b)

### Descriptive or diagnostic parameters

Parameter	Value(s)
Dominant life forms:	Tall emergent vegetation / helophytes; Bryophytes
Characteristics of wetness or dryness:	Waterlogged

EUNIS habitat **code and names** D1 Raised and blanket bogs

### Description

Peatlands formed by ombrotrophic acid peat, which is (or was while actively growing) capable of growth fed by rainfall rather than by the inflow of water from higher ground in the vicinity.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004b)

### Descriptive or diagnostic parameters

Parameter	Value(s)
Geomorphology or landform:	Raised bog; Blanket bog
Dominant life forms:	Bryophytes
Characteristics of wetness or dryness:	Waterlogged
Characteristics of water flow, source & quality:	Rainwater
Substrate types:	Peat; Waterlogged peat

EUNIS habitat **code and names** D1.1 Raised bogs

### Description

The mire surface and underlying peat of highly oligotrophic, strongly acidic peatlands with a raised centre from which water drains towards the edges. The peat is composed mainly of sphagnum remains. Raised bogs form on nearly flat ground and derive moisture and nutrients only from rainfall (ombrotrophic). Raised bog complexes (X04) include larger bog pools (C1.46) and a marginal lagg (C1.47), as well as the main mire surface (D1.1), which in actively-growing raised bogs typically comprises a complex of low hummocks, small pools and their associated vegetation. Raised bogs form only in cool climates with high rainfall. They are most widespread in the boreal zone and in the mountains and hills of the nemoral zone; they occur locally in the lowlands of the nemoral zone. They are characteristic of lowlands and hills of northwestern and northern Europe, the adjacent Hercynian ranges, the Jura, the Alps and the Carpathians. Bogs harbour, in addition to sphagna, which are often abundant, a small number of vascular plants such as *Eriophorum vaginatum*, *Scirpus cespitosus* (*Trichophorum cespitosum*), *Carex pauciflora*, *Carex paupercula*, *Ledum palustre*, *Vaccinium oxycoccos*, *Andromeda polifolia* and *Drosera rotundifolia*, and lichens. Animal species are not numerous but those that are adapted to bogs are highly specialised. Among typical invertebrates figure dragonflies (*Leucorrhinia dubia*, *Aeshna subarctica*, *Aeshna caerulea*, *Aeshna juncea*, *Somatochlora arctica*, *Somatochlora alpestris*), lepidopterans (*Colias palaeno*, *Boloria aquilonaris*, *Coenonympha tullia*, *Vacciniina optilete*, *Hypenodes turfosalis*, *Eugraphe subrosea*), beetles, ants (*Formica exsecta*), bugs and spiders (*Pardosa sphagnicola*, *Glyphesis cottonae*). Most of the species that bogs harbour are rare and their populations fragmented into isolated relictual elements; several are threatened. The remaining intact or nearly intact communities are exceptional.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004a)

### Legal instruments

Legal instrument	Legally designated habitat	Code
EU Habitats Directive Annex I	Active raised bogs	7110
	Degraded raised bogs still capable of natural regeneration	7120
Council of Europe Bern Convention Res. No. 4 1996	Near-natural raised bogs	51.1

### Descriptive or diagnostic parameters

Parameter	Value(s)
Geomorphology or landform:	Raised bog
Dominant life forms:	Bryophytes
Characteristics of wetness or dryness:	Waterlogged
Characteristics of water flow, source & quality:	Rainwater

Substrate types: Peat; Waterlogged peat  
 Related phytosociological units: *Betulion pubescentis*; *Caricion lasiocarpae*; *Ericion tetralicis*; *Eriophorion vaginati*; *Oxycocco-Ericion tetralicis*; *Rhynchosporion albae*; *Salicion cinereae*; *Sphagnion medii*

## EUNIS habitat code and names D1.2 Blanket bogs

### Description

The mire surface and underlying peat of ombrotrophic peatlands, formed on flat or gently sloping ground with poor surface drainage, in oceanic climates with high rainfall. The mire surface may on flatter ground be very similar to that of a raised bog, with a complex of small pools and terrestrial hummocks. In the strictest sense, blanket bogs are a habitat endemic to northwestern Europe, characteristic of the western and northern British Isles, the Faeroe Islands and the western seaboard of Scandinavia. They often cover extensive areas with local topographic features supporting distinct communities. *Sphagna* (*Sphagnum papillosum*, *Sphagnum tenellum*, *Sphagnum compactum*, *Sphagnum magellanicum*, *Sphagnum rubellum*, *Sphagnum fuscum*) play an important role in all of them, accompanied by *Narthecium ossifragum*, *Molinia caerulea*, *Scirpus cespitosus*, *Schoenus nigricans*, *Eriophorum angustifolium*, *Eriophorum vaginatum* and *Calluna vulgaris*. Blanket bog complexes (X28) include dystrophic pools (C1.4) and acidic flushes (D2.2) as well as the mire surface (D1.2).

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004a)

### Legal instruments

Legal instrument	Legally designated habitat	Code
EU Habitats Directive Annex I	Blanket bogs (if active bog)	7130
Council of Europe Bern Convention Res. No. 4 1996	BLANKET BOGS	52

### Descriptive or diagnostic parameters

Parameter	Value(s)
Geomorphology or landform:	Blanket bog
Dominant life forms:	Bryophytes
Characteristics of wetness or dryness:	Waterlogged
Characteristics of water flow, source & quality:	Rainwater
Substrate types:	Peat; Waterlogged peat
Related phytosociological units:	<i>Ericion tetralicis</i> ; <i>Oxycocco-Ericion tetralicis</i> ; <i>Rhynchosporion albae</i>

## EUNIS habitat code and names D2 Valley mires, poor fens and transition mires

### Description

Weakly to strongly acid peatlands, flushes and vegetated rafts formed in situations where they receive water from the surrounding landscape or are intermediate between land and water. Included are quaking bogs and vegetated non-calcareous springs. Excluded are calcareous fens (D4), and reedbeds (C3, D5).

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004a)

### Descriptive or diagnostic parameters

Parameter	Value(s)
Dominant life forms:	Bryophytes
Characteristics of wetness or dryness:	Waterlogged
Characteristics of water flow, source & quality:	Ground or river water
Chemical attributes:	Acid
Substrate types:	Floating peat

## EUNIS habitat code and names D2.1 Valley mires

### Description

Topogenous wetlands in which the peat-forming vegetation depends on water draining from the surrounding landscape. Most valley mires are habitat complexes including poor fens, transition mires and pools. Acid valley mires (D2.11) often have vegetation resembling that of bogs (D1), especially in those parts relatively distant from flowing water. Basic and neutral valley mires (D2.12) support mainly poor-fen vegetation (D2.2), but in large mire systems, this is accompanied by acid wet grassland (E3.5), large sedges (D5.2) and reeds (D5.1). *Sphagnum* hummocks form locally and transition mires (D2.3) or littoral (C3.2) and spring (D2.2C) communities colonize small depressions. Excluded are rich-fen valley mires (D4.1).

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004b)

### Descriptive or diagnostic parameters

Parameter	Value(s)
Dominant life forms:	Bryophytes
Characteristics of wetness or dryness:	Waterlogged; Wet and very wet

Characteristics of water flow, source & quality: Ground or river water  
 Chemical attributes: Acid  
 Related phytosociological units: *Oxycocco-Ericion tetralicis*

**EUNIS habitat code and names** D2.2 Poor fens and soft-water spring mires

**Description**

Peatlands, flushes and vegetated springs with moderately acid ground water, within valley mires or on hillsides. As in the rich fens, the water level is at or near the surface of the substratum and peat formation depends on a permanently high watertable. Poor-fen vegetation is typically dominated by small sedges (*Carex canescens*, *Carex echinata*, *Carex nigra*, *Eriophorum angustifolium*, *Eriophorum scheuchzeri*, *Trichophorum cespitosum*), with pleurocarpous mosses (*Calliergonella cuspidata*, *Calliergon sarmentosum*, *Calliergon stramineum*, *Drepanocladus exannulatus*, *Drepanocladus fluitans*) or sphagna (*Sphagnum cuspidatum*, *Sphagnum papillosum*, *Sphagnum recurvum* agg., *Sphagnum russowii*, *Sphagnum subsecundum* agg.). Other characteristic vascular plants are *Agrostis canina*, *Cardamine pratensis*, *Juncus filiformis*, *Ranunculus flammula* and *Viola palustris*. Soft-water spring mires (D2.2C) are often dominated by *Montia fontana* or bryophytes (*Bryum* spp., *Philonotis* spp., *Pohlia* spp.). Excluded are the water body of soft-water springs (C2.1), and incompletely terrestrialized fringing vegetation (C3.2) or vegetation rafts (D2.3).

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004a)

**Descriptive or diagnostic parameters**

Parameter	Value(s)
Dominant life forms:	Bryophytes
Characteristics of wetness or dryness:	Waterlogged; Wet and very wet
Characteristics of water flow, source & quality:	Vertical flow; Vertical flow upwards
Chemical attributes:	Acid
Related phytosociological units:	<i>Bellidio-Bellion nivali</i> ; <i>Caricion atrofusco-saxatilis</i> ; <i>Caricion davallianae</i> ; <i>Caricion fuscae</i> ; <i>Ericion tetralicis</i> ; <i>Magnocaricion elatae</i> ; <i>Nartheccion scardici</i> ; <i>Oxycocco-Ericion tetralicis</i> ; <i>Saginetea piliferae</i> ; <i>Salicion cinereae</i> ; <i>Sphagno warnstorffiani-Tomenthyrnion</i>

**EUNIS habitat code and names** D2.3 Transition mires and quaking bogs

**Description**

Incompletely terrestrialized wetlands occupied by peat-forming vegetation with acid groundwater or (for vegetation rafts) acid underlying pool or lake water. Characteristic species are *Calla palustris*, *Carex chordorrhiza*, *Carex diandra*, *Carex heleonastes*, *Carex lasiocarpa*, *Carex limosa*, *Carex rostrata*, *Menyanthes trifoliata*, *Potentilla palustris*, *Rhynchospora alba*, *Scheuchzeria palustris*. Included are rafts of *Sphagnum* and *Eriophorum* (D2.38) and quaking rafts of *Molinia caerulea* (D2.3D). Excluded are stands of vegetation fringing water bodies (C3.2) unless the vegetation raft is sufficiently extensive to count as a habitat in its own right.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004b)

**Legal instruments**

Legal instrument	Legally designated habitat	Code
EU Habitats Directive Annex I	Transition mires and quaking bogs	7140
	Depressions on peat substrates of the Rhynchosporion	7150
Council of Europe Bern Convention Res. No. 4 1996	Transition mires	54.5

**Descriptive or diagnostic parameters**

Parameter	Value(s)
Dominant life forms:	Bryophytes
Characteristics of wetness or dryness:	Waterlogged
Characteristics of water flow, source & quality:	Water in mires, bogs and fens
Chemical attributes:	Acid
Substrate types:	Floating peat
Related phytosociological units:	<i>Caricion davallianae</i> ; <i>Caricion fuscae</i> ; <i>Caricion lasiocarpae</i> ; <i>Carici-Rumicion hydrolopathi</i> ; <i>Erico mackaiana-Sphagnion papilloso</i> ; <i>Magnocaricion elatae</i> ; <i>Rhynchosporion albae</i> ; <i>Scheuchzerio-Caricetea fuscae</i>

**EUNIS habitat code and names** D3 Aapa, palsa and polygon mires

**Description**

Patterned mire complexes of the arctic, subarctic and northern boreal zones.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004a)

**Descriptive or diagnostic parameters**

Parameter	Value(s)
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Exposure characteristics:	Frost; Ice
Geomorphology or landform:	Mire ridges and hummocks; Mire polygons
Dominant life forms:	Bryophytes
Characteristics of wetness or dryness:	Waterlogged
Substrate types:	Frozen subsoil

### EUNIS habitat code and names D3.1 Palsa mires

#### Description

Mires of the subarctic and northern boreal regions formed by elevated frozen mounds or ridges (palsas), 0.5 to 8 m high and up to 50 m in diameter, interspersed wet hollows of similar area. Palsa mires are distributed in the discontinuous permafrost zone of Iceland, northern Fennoscandia and arctic Russia, in areas experiencing subzero temperatures for at least 200 days per year.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004a)

#### Legal instruments

<u>Legal instrument</u>	<u>Legally designated habitat</u>	<u>Code</u>
EU Habitats Directive Annex I	Palsa mires	7320
Council of Europe Bern Convention Res. No. 4 1996	Palsa mires	54.9

#### Descriptive or diagnostic parameters

<b>Parameter</b>	<b>Value(s)</b>
Exposure characteristics:	Frost; Ice
Dominant life forms:	Bryophytes
Substrate types:	Frozen subsoil

### EUNIS habitat code and names D3.2 Aapa mires

#### Description

Mire complexes of the central and northern boreal zones, often extensive, with a concave or flat, gently to very slightly sloping surface patterned by an alternation of slightly to substantially raised ridges and hummocks (strings), with minerotrophic or ombrotrophic characteristics, and of minerotrophic pools and hollows (flarks), arranged perpendicularly to the slope direction. In Europe, the main area of distribution is subatlantic and subcontinental Fennoscandia and subarctic and arctic Russia.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004a)

#### Legal instruments

<u>Legal instrument</u>	<u>Legally designated habitat</u>	<u>Code</u>
EU Habitats Directive Annex I	Aapa mires	7310
Council of Europe Bern Convention Res. No. 4 1996	Aapa mires	54.8

#### Descriptive or diagnostic parameters

<b>Parameter</b>	<b>Value(s)</b>
Geomorphology or landform:	Mire ridges and hummocks
Dominant life forms:	Bryophytes

### EUNIS habitat code and names D3.3 Polygon mires

#### Description

Complex mires of the arctic and subarctic patterned by surface microrelief of large, 10 to 30 m in diameter, low-centre or high-centre polygons formed by the juxtaposition of dry, 0.3 to 0.5 m high, ridges covered by shrubs, hypnoid mosses and sphagna, and of wet hollows occupied by grasses, sedges, mosses and sphagna. Polygon mires occur mainly outside Europe, in tundra where the mean annual temperature is below -1°C.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004a)

#### Legal instruments

<u>Legal instrument</u>	<u>Legally designated habitat</u>	<u>Code</u>
Council of Europe Bern Convention Res. No. 4 1996	Polygon mires	54.A

#### Descriptive or diagnostic parameters

<b>Parameter</b>	<b>Value(s)</b>
Geomorphology or landform:	Mire polygons
Dominant life forms:	Bryophytes

**EUNIS habitat code and names** D4 Base-rich fens and calcareous spring mires**Description**

Peatlands, flushes and vegetated springs with calcareous or eutrophic ground water, within river valleys, alluvial plains, or on hillsides. As in poor fens, the water level is at or near the surface of the substratum and peat formation depends on a permanently high watertable. Excluded are reedbeds (C3, D5).

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004a)

**Descriptive or diagnostic parameters**

Parameter	Value(s)
Dominant life forms:	Low-growing herbs; Bryophytes
Species richness (when used in criteria):	Species rich
Characteristics of wetness or dryness:	Waterlogged
Characteristics of water flow, source & quality:	Ground or river water
Chemical attributes:	Base-rich; Calcareous
Substrate types:	Peat; Waterlogged peat

**EUNIS habitat code and names** D4.1 Rich fens, including eutrophic tall-herb fens and calcareous flushes and soaks**Description**

Wetlands and spring-mires, seasonally or permanently waterlogged, with a soligenous or topogenous base-rich, often calcareous water supply. Peat formation, when it occurs, depends on a permanently high watertable. Rich fens may be dominated by small or larger graminoids (*Carex* spp., *Eleocharis* spp., *Juncus* spp., *Molinia caerulea*, *Phragmites australis*, *Schoenus* spp., *Sesleria* spp.) or tall herbs (e.g. *Eupatorium cannabinum*). Where the water is base-rich but nutrient-poor, small sedges usually dominate the mire vegetation, together with a "brown moss" carpet. Hard-water spring mires (D4.1N) often contain tufa cones and other tufa deposits. Excluded is the water body of hard-water springs (C2.1); calcareous flushes of the alpine zone are a separate category (D4.2). Rich fens are exceptionally endowed with spectacular, specialised, strictly restricted species. They are among the habitats that have undergone the most serious decline. They are essentially extinct in several regions and gravely endangered in much of central and western Europe.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004a)

**Legal instruments**

Legal instrument	Legally designated habitat	Code
EU Habitats Directive Annex I	Alkaline fens	7230
Council of Europe Bern Convention Res. No. 4 1996	Rich fens	54.2

**Descriptive or diagnostic parameters**

Parameter	Value(s)
Species richness (when used in criteria):	Species rich
Characteristics of wetness or dryness:	Waterlogged
Characteristics of water flow, source & quality:	Ground or river water
Chemical attributes:	Base-rich; Calcareous
Substrate types:	Peat; Waterlogged peat
Related phytosociological units:	<i>Caricetalia davallianae</i> ; <i>Caricion atrofusco-saxatilis</i> ; <i>Caricion davallianae</i> ; <i>Caricion fuscae</i> ; <i>Caricion lasiocarpae</i> ; <i>Phragmitetalia</i> ; <i>Salicion cinereae</i> ; <i>Sphagno warnstorffiani-Tomenthyption</i>

**EUNIS habitat code and names** D4.2 Basic mountain flushes and streamsides, with a rich arctic-montane flora**Description**

Rare Alpine, peri-Alpine, northern British and periarctic pioneer communities colonizing gravelly, sandy, stony, sometimes somewhat argilous or peaty, calcareous sedimentary substrates soaked by cold water, in moraines and on the edge of springs, rivulets, glacial torrents of the alpine or subalpine levels, or on alluvial sands of pure, cold, slow-flowing rivers and calm backwaters. The highly characteristic constituents, with a boreoarctic or glacial relict distribution, are *Carex bicolor*, *Carex microglochis*, *Carex maritima*, *Carex atrofusca*, *Carex vaginata*, *Kobresia simpliciuscula*, *Scirpus pumilus*, *Juncus arcticus*, *Juncus alpinoarticulatus*, *Juncus castaneus*, *Juncus triglumis*, *Typha minima*, *Typha lugdunensis*, *Typha shuttleworthii*, *Tofieldia pusilla*; they are often accompanied by *Carex davalliana*, *Carex dioica*, *Carex capillaris*, *Carex panicea*, *Carex nigra*, *Blysmus compressus*, *Eleocharis quinqueflora*, *Scirpus cespitosus*, *Primula farinosa*, *Equisetum variegatum*, *Drepanocladus intermedius*, *Campyllum stellatum*.

**Source** Devillers, P., Devillers-Terschuren, J. and Vander Linden, C. (2001)

**Legal instruments**

Legal instrument	Legally designated habitat	Code
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EU Habitats Directive Annex I	Alpine pioneer formations of the <i>Caricion bicoloris-atrofuscae</i>	7240
Council of Europe Bern Convention	Arcto-alpine riverine swards	54.3
Res. No. 4 1996		

#### Descriptive or diagnostic parameters

Parameter	Value(s)
Altitude zones (terrestrial and marine):	Montane (sensu lato)
Climate zones:	Arctic
Species richness (when used in criteria):	Species rich
Characteristics of wetness or dryness:	Waterlogged
Characteristics of water flow, source & quality:	Ground or river water
Chemical attributes:	Base-rich; Calcareous
Substrate types:	Peat; Waterlogged peat
Related phytosociological units:	<i>Caricion atrofusco-saxatilis</i> ; <i>Caricion davallianae</i> ; <i>Caricion fuscae</i>

**EUNIS habitat code and names** D5 Sedge and reedbeds, normally without free-standing water

#### Description

Sedge and reedbeds forming terrestrial mire habitats, not closely associated with open water. Excluded are reedbeds and sedges where they form emergent or fringing vegetation beside water bodies (C3.2).

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004b)

#### Descriptive or diagnostic parameters

Parameter	Value(s)
Dominant life forms:	Tall graminoids/grasses; Tall emergent vegetation / helophytes
Species richness (when used in criteria):	Species poor
Characteristics of wetness or dryness:	Waterlogged
Characteristics of water flow, source & quality:	Ground or river water

**EUNIS habitat code and names** D5.1 Reedbeds normally without free-standing water

#### Description

Terrestrialized stands of tall helophyte *Poaceae*, *Schoenoplectus* spp., *Typha* spp., horsetails or forbs, usually species-poor and often dominated by one species, growing on waterlogged ground. They are classified according to dominant species which give them a distinctive appearance. These species also grow as emergents and fringing vegetation beside water bodies (C3.2).

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004a)

#### Descriptive or diagnostic parameters

Parameter	Value(s)
Dominant life forms:	Tall graminoids/grasses; Tall emergent vegetation / helophytes
Species richness (when used in criteria):	Species poor
Characteristics of wetness or dryness:	Waterlogged
Characteristics of water flow, source & quality:	Ground or river water
Related phytosociological units:	<i>Cirsio brachycephali-Bolboschoenion</i> ; <i>Oenanthion aquaticae</i> ; <i>Phalaridion arundinaceae</i> ; <i>Phragmition communis</i> ; <i>Scirpion maritime</i>

**EUNIS habitat code and names** D5.2 Beds of large sedges normally without free-standing water

#### Description

Terrestrialized stands of tall *Carex*, *Cladium* and *Cyperus*, usually species-poor and often dominated by one species, growing on waterlogged ground. These species also grow as emergents and fringing vegetation beside water bodies (C3.2).

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004b)

#### Legal instruments

Legal instrument	Legally designated habitat	Code
EU Habitats Directive Annex I	Calcareous fens with <i>Cladium mariscus</i> and species of the <i>Caricion davallianae</i>	7210
Council of Europe Bern Convention	Fen-sedge beds	53.3
Res. No. 4 1996		

#### Descriptive or diagnostic parameters

Parameter	Value(s)
Dominant life forms:	Tall graminoids/grasses; Tall emergent vegetation / helophytes

Species richness (when used in criteria): Species poor  
 Characteristics of wetness or dryness: Waterlogged  
 Characteristics of water flow, source & quality: Ground or river water  
 Related phytosociological units: *Armerion maritimae*; *Calthion palustris*; *Caricion broterianae*; *Caricion davalliana*; *Carici-Rumicion hydrolapathi*; *Filipendulion*; *Magnocaricion elatae*; *Molinio-Holoschoenion*; *Phragmitetalia*; *Phragmition communis*

**EUNIS habitat code and names** D5.3 English name: Swamps and marshes dominated by soft rush or other large rushes  
 Scientific name: Swamps and marshes dominated by *Juncus effusus* or other large *Juncus* spp.

**Description**

Stands of large *Juncus* spp. invading heavily grazed and trampled marshes or fens or (with *Juncus effusus*) eutrophicated poor fens and bogs, e.g. in the vicinity of bird colonies. Excludes stands of rushes in wet grassland (E3.4), where the ground is waterlogged for less than half the year.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004a)

**Descriptive or diagnostic parameters**

<b>Parameter</b>	<b>Value(s)</b>
Dominant life forms:	Tall graminoids/grasses; Tall emergent vegetation / helophytes
Species richness (when used in criteria):	Species poor
Characteristics of wetness or dryness:	Waterlogged
Characteristics of water flow, source & quality:	Ground or river water
Related phytosociological units:	<i>Agropyro-Rumicion</i> ; <i>Caricion fuscae</i> ; <i>Molinietalia</i>

**EUNIS habitat code and names** D6 Inland saline and brackish marshes and reedbeds

**Description**

Saline wetlands, with closed or open vegetation, which are the non-coastal analogue of coastal saltmarshes and saline reedbeds (A2.5). Drier saline habitats are classified as inland salt steppe (E6) or saline scrubland (F6.8).

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004b)

**Descriptive or diagnostic parameters**

<b>Parameter</b>	<b>Value(s)</b>
Dominant life forms:	Tall emergent vegetation / helophytes; Halophile species
Characteristics of wetness or dryness:	Waterlogged
Characteristics of water flow, source & quality:	Ground or river water
Chemical attributes:	Saline; Brackish

**EUNIS habitat code and names** D6.1 Inland saltmarshes

**Description**

Salt meadows and swards of *Salicornia* and other *Chenopodiaceae* of inland salt basins of the nemoral zone. Inland saltmarshes of middle Europe are remarkable, extremely threatened communities occurring in a few isolated stations of Saxony and Lower Saxony, Schleswig-Holstein, Thuringia, Hesse, Lorraine, Auvergne, the Midlands and southeastern Poland (lower Nida valley).

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004a)

**Legal instruments**

<u>Legal instrument</u>	<u>Legally designated habitat</u>	<u>Code</u>
EU Habitats Directive Annex I	Inland salt meadows	1340

**Descriptive or diagnostic parameters**

<b>Parameter</b>	<b>Value(s)</b>
Dominant life forms:	Tall graminoids/grasses; Tall emergent vegetation / helophytes; Halophile species
Species richness (when used in criteria):	Species poor
Characteristics of wetness or dryness:	Waterlogged
Characteristics of water flow, source & quality:	Ground or river water
Chemical attributes:	Saline; Brackish
Related phytosociological units:	<i>Armerion maritimae</i> ; <i>Halo-Trichophorion pumili</i> ; <i>Potentillion anserinae</i> ; <i>Puccinellion limosae</i> ; <i>Puccinellion maritimae</i> ; <i>Puccinellio-Spergularion salinae</i> ; <i>Scorzonero-Juncion gerardii</i>

EUNIS habitat **code and names** D6.2 Inland saline or brackish species-poor helophyte beds normally without free-standing water

**Description**

Terrestrialized stands of tall salt-tolerant helophytes, notably *Phragmites australis* and *Cyperus laevigatus*. These species also grow as emergents and fringing vegetation beside saline water bodies (C3.27).

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004b)

**Legal instruments**

<u>Legal instrument</u>	<u>Legally designated habitat</u>	<u>Code</u>
EU Habitats Directive Annex I	Mediterranean salt meadows ( <i>Juncetalia maritimi</i> )	1410

**Descriptive or diagnostic parameters**

<b>Parameter</b>	<b>Value(s)</b>
Dominant life forms:	Low-growing herbs; Low-growing emergent vegetation; Halophile species
Species richness (when used in criteria):	Species poor
Characteristics of wetness or dryness:	Waterlogged
Characteristics of water flow, source & quality:	Ground or river water
Chemical attributes:	Saline; Brackish
Related phytosociological units:	<i>Limonion catalaunico-viciosoi</i> ; <i>Lygeo sparti-Limonion furfuracei</i> ; <i>Lygeo-Lepidion cardaminis</i> ; <i>Puccinellion caespitosae</i>

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## E GRASSLANDS AND LANDS DOMINATED BY FORBS, MOSSES OR LICHENS

### Description

Non-coastal land which is dry or only seasonally wet (with the water table at or above ground level for less than half of the year) with greater than 30% vegetation cover. The vegetation is dominated by grasses and other non-woody plants, including mosses, macrolichens, ferns, sedges and herbs. Includes semiarid steppes with scattered *Artemisia* scrub. Includes successional weedy vegetation and managed grasslands such as recreation fields and lawns. Excludes regularly tilled habitats (I1) dominated by cultivated herbaceous vegetation such as arable fields.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004b)

### Descriptive or diagnostic parameters

Parameter	Value(s)
Dominant life forms:	Herbs; Forbs; Grasses; Bryophytes; Lichens
Cover characteristics (when used as criteria):	Vegetation >30%

### EUNIS habitat code and names E1 Dry grasslands

#### Description

Well-drained or dry lands dominated by grass or herbs, mostly not fertilized and with low productivity. Included are *Artemisia* steppes. Excluded are dry mediterranean lands with shrubs of other genera where the shrub cover exceeds 10%; these are listed as garrigue (F6).

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004b)

### Descriptive or diagnostic parameters

Parameter	Value(s)
Dominant life forms:	Herbs; Low-growing herbs; Forbs; Grasses; Lower plants; Bryophytes and lichens; Bryophytes; Lichens
Cover characteristics (when used as criteria):	Vegetation >30%
Characteristics of wetness or dryness:	Dry; Arid

### EUNIS habitat code and names E1.1 Inland sand and rock with open vegetation

#### Description

Open, thermophile vegetation of sands or rock debris in the nemoral zone and locally, in boreal or submediterranean lowland to montane areas of Europe. Included are open grasslands on strongly to slightly calcareous inland sands, and vegetation formed mostly by annuals and succulents or semisucculents on decomposed rock surfaces of edges, ledges or knolls, with calcareous or siliceous soils.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004a)

### Legal instruments

Legal instrument	Legally designated habitat	Code
EU Habitats Directive Annex I	Rupicolous calcareous or basophilic grasslands of the Alysso-Sedion Xeric sand calcareous grasslands	6110 6120

### Descriptive or diagnostic parameters

Parameter	Value(s)
Dominant life forms:	Herbs; Low-growing herbs; Grasses; Lower plants
Cover characteristics (when used as criteria):	Vegetation >30%; bare ground >30%
Characteristics of wetness or dryness:	Dry; Arid
Chemical attributes:	Base-rich
Substrate types:	Sandy soils; Detritic soils
Related phytosociological units:	<i>Alyso alyssoidis-Sedion albi</i> ; <i>Bromo pannonici-Festucion pallentis</i> ; <i>Diantho lumnitzeri-Seslerion albicantis</i> ; <i>Helianthemo-Globularion</i> ; <i>Hyperico perforati-Scleranthion perennis</i> ; <i>Koelerion arenariae</i> ; <i>Koelerion glaucae</i> ; <i>Sedion anglici</i> ; <i>Sedo albi-Veronicion dillenii</i> ; <i>Sedo-Cerastion</i> ; <i>Sedo-Scleranthion biennis</i>

### EUNIS habitat code and names E1.2 Perennial calcareous grassland and basic steppes

#### Description

Perennial grasslands, often nutrient-poor and species-rich, on calcareous and other basic soils of the nemoral and steppe zones and of adjacent parts of the subboreal and submediterranean zones. Includes the calcareous grasslands of central and western Europe, alvar grasslands of the Baltic region, and basic grasslands of the steppe zone.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004b)

**Legal instruments**

<u>Legal instrument</u>	<u>Legally designated habitat</u>	<u>Code</u>
EU Habitats Directive Annex I	Semi-natural dry grasslands and scrubland facies on calcareous substrates ( <i>Festuco-Brometalia</i> ) (* important orchid sites)	6210
	Sub-Pannonic steppic grasslands	6240
	Pannonic loess steppic grasslands	6250
	Pannonic sand steppes	6260
	Nordic alvar and precambrian calcareous flatrocks	6280
Council of Europe Bern Convention	Dense perennial grasslands and middle European steppes	34.3
Res. No. 4 1996	Continental steppes	34.9
	Sand steppes	34.A

**Descriptive or diagnostic parameters**

<b>Parameter</b>	<b>Value(s)</b>
Altitude zones (terrestrial and marine):	Planar; Collinar; Montane (sensu lato); Submontane
Dominant life forms:	Herbs; Low-growing herbs; Forbs; Grasses
Cover characteristics (when used as criteria):	Vegetation >30%
Characteristics of wetness or dryness:	Dry
Chemical attributes:	Base-rich; Calcareous
Substrate types:	Immature soil
Related phytosociological units:	<i>Agropyron pectinati</i> ; <i>Agropyro-Kochion</i> ; <i>Alysson bertolonii</i> ; <i>Alyso alyssoidis-Sedion albi</i> ; <i>Alyso saxatilis-Festucion pallentis</i> ; <i>Amygdalion nanae</i> ; <i>Asplenio septentrionali-Festucion pallentis</i> ; <i>Asplenion serpentini</i> ; <i>Avenulo adsurgentis-Festucion pallentis</i> ; <i>Brachypodion phoenicoidis</i> ; <i>Bromion erecti</i> ; <i>Bromion tectorum</i> ; <i>Bromo pannonici-Festucion pallentis</i> ; <i>Centaureon sumensis</i> ; <i>Chrysopogoni-Saturejon</i> ; <i>Chrysopogono-Danthonion</i> ; <i>Chrysopogono-Festucion dalmaticae</i> ; <i>Cirsio-Brachypodion pinnati</i> ; <i>Cynodonto-Teucrion polii</i> ; <i>Danthonio-Brachypodion</i> ; <i>Danthonio-Stipion tirsae</i> ; <i>Diantho lumnitzeri-Seslerion albicantis</i> ; <i>Diplachnion</i> ; <i>Festucetalia valesiaca</i> ; <i>Festucion beckeri</i> ; <i>Festucion vaginatae</i> ; <i>Festucion valesiaca</i> ; <i>Galio campanulatae-Poion versicoloris</i> ; <i>Halacsyetalia sendtneri</i> ; <i>Helianthemo cani-Festucion pallentis</i> ; <i>Helianthemo-Globularion</i> ; <i>Helictotricho desertori-Stipion rubentis</i> ; <i>Helictotricho-Stipetalia</i> ; <i>Koelerion arenariae</i> ; <i>Koelerion glaucae</i> ; <i>Koelerio-Phleion phleoidis</i> ; <i>Orostachyion spinosae</i> ; <i>Pimpinello-Thymion zygoidi</i> ; <i>Plantagini-Festucion ovinae</i> ; <i>Potentillo montanae-Brachypodion rupestris</i> ; <i>Salsolion ruthenicae</i> ; <i>Scabiosion ucranicae</i> ; <i>Scorzonero austriaca-Koelerion sclerophyllae</i> ; <i>Sedo-Cerastion</i> ; <i>Sedo-Scleranthetalia</i> ; <i>Seslerion rigidae</i> ; <i>Seslerio-Xerobromion</i> ; <i>Stipion lessingiana</i> ; <i>Stipo pulcherrimae-Festucetalia pallentis</i> ; <i>Stipo-Poion carniolicae</i> ; <i>Stipo-Poion xerophila</i> ; <i>Thymo cretaei-Hyssopetalia cretaei</i> ; <i>Verbascion pinnatifidii</i> ; <i>Xerobromion</i>

**EUNIS habitat code and names** E1.3 Mediterranean xeric grassland

**Description**

Meso- and thermo-Mediterranean xerophile, mostly open, short-grass perennial grasslands rich in therophytes; therophyte communities of oligotrophic soils on base-rich, often calcareous substrates.

**Source** Devillers, P., Devillers-Terschuren, J. and Vander Linden, C. (2001)

**Legal instruments**

<u>Legal instrument</u>	<u>Legally designated habitat</u>	<u>Code</u>
EU Habitats Directive Annex I	Pseudo-steppe with grasses and annuals of the Thero-Brachypodietea	6220
Council of Europe Bern Convention	Mediterranean xeric grasslands	34.5
Res. No. 4 1996		

**Descriptive or diagnostic parameters**

<b>Parameter</b>	<b>Value(s)</b>
Climate zones:	Mediterranean
Dominant life forms:	Herbs; Low-growing herbs; Grasses; Short grasses
Cover characteristics (when used as criteria):	Vegetation >30%
Characteristics of wetness or dryness:	Dry; Arid
Chemical attributes:	Base-rich
Related phytosociological units:	<i>Armerion girardii</i> ; <i>Brachypodietalia phoenicoidis</i> ; <i>Bromopsietalia cappadocicae</i> ; <i>Cymbopogoni-Brachypodietalia</i> ; <i>Cymbopogoni-Brachypodion ramosi</i> ; <i>Dauco-Catananchion luteae</i> ; <i>Diantho humilis-Velezion rigidae</i> ; <i>Helianthemetalia guttati</i> ; <i>Moricandio-Lygeion sparti</i> ; <i>Omphalodion commutatae</i> ; <i>Plantagini-Catapodion marini</i> ; <i>Poetalia bulbosae</i> ; <i>Sedo-Ctenopsion gypsophila</i> ; <i>Stipion retortae</i> ; <i>Thero-Brachypodietalia</i> ; <i>Thero-Brachypodion</i> ; <i>Trachynion distachyae</i>

**EUNIS habitat code and names** E1.4 English name: Mediterranean tall-grass and wormwood

(*Artemisia*) steppes; Scientific name: Mediterranean tall-grass and *Artemisia* steppes

#### Description

Meso-, thermo- and sometimes supra-Mediterranean formations of the Mediterranean basin, physiognomically dominated by tall grasses, between which may grow communities of annuals or sometimes chamaephytes. They include silicolous as well as basiphile formations. In the Mediterranean region proper, they are most characteristic of the Iberian peninsula and of the Mediterranean rim of Anatolia, with local representations in southern Provence, Sardinia, southern peninsular Italy, Sicily and Greece. In the semiarid regions between the Mediterranean and the deserts of western Asia, they dominate the landscape, forming a major steppe belt in which low scrub of *Artemisia* may be prominent.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004a)

#### Descriptive or diagnostic parameters

Parameter	Value(s)
Climate zones:	Mediterranean
Dominant life forms:	Herbs; Forbs; Grasses; Tall graminoids/grasses
Cover characteristics (when used as criteria):	Vegetation >30%
Characteristics of wetness or dryness:	Dry
Chemical attributes:	Base-rich
Related phytosociological units:	<i>Agropyro pectinati-Lygeion sparti</i> ; <i>Dactylorhizo-Juncion striati</i> ; <i>Festucion scariosae</i> ; <i>Holoschoenetalia</i> ; <i>Hyparrhenion hirtae</i> ; <i>Paspalo-Agrostidion semiverticillati</i> ; <i>Stipion tenacissimae</i>

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#### EUNIS habitat code and names E1.5 Mediterranean-montane grassland

##### Description

Open perennial grasslands, often rich in chamaephytes, most characteristic of the thermophilous oak level of Iberia, southern France, southern Italy, Greece and the Balkans. Some of the largest remaining expanses of unbroken grasslands in Europe, of evident importance as faunal habitats, belong to this division.

**Source** Devillers, P., Devillers-Terschuren, J. and Vander Linden, C. (2001)

#### Descriptive or diagnostic parameters

Parameter	Value(s)
Altitude zones (terrestrial and marine):	Montane (sensu lato)
Climate zones:	Mediterraneo-montane
Dominant life forms:	Herbs; Low-growing herbs; Forbs; Grasses
Cover characteristics (when used as criteria):	Vegetation >30%; bare ground >30%
Characteristics of wetness or dryness:	Dry
Chemical attributes:	Base-rich
Related phytosociological units:	<i>Aphyllanthion</i> ; <i>Festucion burnatii</i> ; <i>Genistion lobelii</i> ; <i>Minuartio-Poion ligulatae</i> ; <i>Ononidion striatae</i> ; <i>Phleo ambigu-Bromion erecti</i> ; <i>Plantagini discoloris-Thymion mastigophori</i> ; <i>Scorzonero-Chrysopogonetalia</i> ; <i>Seslerion elegantissimae</i>

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#### EUNIS habitat code and names E1.6 Subnitrophilous annual grassland

##### Description

Land dominated by annual grasses and herbs, on soils slightly enriched in nitrates, in the meso- and thermo-Mediterranean zones. Characteristic are *Bromus*, *Aegilops*, *Avena*, *Vulpia*, crucifers and leguminous plants. These annuals occur as pioneers of bare soils slightly nitrified by aeration or organic addition, along roads, on land-fills and in interstitial spaces of cultivation. They also replace the oligotrophic annual vegetation of Mediterranean xeric grasslands (E1.3) under the influence of pastoral activities. Subnitrophilous annual grassland is widespread as a successional stage after cultivation. Woody recolonisation may lead to maquis (F5) or garrigues (F6).

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004a)

#### Descriptive or diagnostic parameters

Parameter	Value(s)
Human activities and impacts:	Fertilisation
Dominant life forms:	Herbs; Forbs; Grasses
Cover characteristics (when used as criteria):	Vegetation >30%
Characteristics of wetness or dryness:	Dry
Chemical attributes:	Base-rich; Nitrate-enriched
Related phytosociological units:	<i>Alysso granatensis-Brassicion barrelieri</i> ; <i>Geranio-Cardaminetalia hirsutae</i> ; <i>Resedo lanceolatae-Moricandion</i> ; <i>Taeniathero-Aegilopion geniculatae</i> ; <i>Thero-Brometalia</i>

EUNIS habitat **code and names** E1.7 Non-Mediterranean dry acid and neutral closed grassland

**Description**

Closed, dry or mesophile, perennial grasslands occupying acid soils in Atlantic or sub-Atlantic lowland to montane regions of northern Europe, middle Europe and western Iberia, with *Nardus stricta*, *Festuca filiformis* (*Festuca tenuifolia*), *Festuca ovina*, *Festuca rubra*, *Agrostis capillaris*, *Danthonia decumbens*, *Anthoxanthum odoratum*, *Deschampsia flexuosa*, *Poa angustifolia*, *Galium saxatile*, *Polygala vulgaris*, *Viola canina*, *Meum athamanticum*, *Arnica montana*, *Centaurea nigra*, *Dianthus deltoides*, *Gentianella campestris*, *Chamaespartium sagittale*, *Jasione laevis*, *Potentilla erecta*, *Carex pilulifera*. Any of the grasses listed can dominate or codominate distinctive facies; *Calamagrostis epigejos* or *Carex arenaria* also can invade and dominate some formations.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004a)

**Legal instruments**

<u>Legal instrument</u>	<u>Legally designated habitat</u>	<u>Code</u>
EU Habitats Directive Annex I	Species-rich <i>Nardus</i> grasslands, on siliceous substrates in mountain areas (and submountain areas in Continental Europe)	6230
	Fennoscandian lowland species-rich dry to mesic grasslands	6270

**Descriptive or diagnostic parameters**

<b>Parameter</b>	<b>Value(s)</b>
Dominant life forms:	Herbs; Grasses
Cover characteristics (when used as criteria):	Vegetation >30%
Characteristics of wetness or dryness:	Dry
Chemical attributes:	Acid; Neutral
Related phytosociological units:	<i>Agrostion curtisii</i> ; <i>Carici piluliferae-Epilobion angustifolii</i> ; <i>Koelerion arenariae</i> ; <i>Nardetalia strictae</i> ; <i>Plantagini-Festucion ovinae</i> ; <i>Polygalo-Koelerion</i> ; <i>Violion caninae</i>

EUNIS habitat **code and names** E1.8 Mediterranean dry acid and neutral closed grassland

**Description**

Perennial grasslands on acid soils of the supra-Mediterranean zone, dominated by e.g. *Festuca elegans* or *Nardus stricta*. Mediterranean annual-rich siliceous grassland of siliceous gravelly, sandy or silty, usually shallow, soils that remain cohesive during the dry season.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004b)

**Descriptive or diagnostic parameters**

<b>Parameter</b>	<b>Value(s)</b>
Dominant life forms:	Herbs; Grasses
Cover characteristics (when used as criteria):	Vegetation >30%
Characteristics of wetness or dryness:	Dry
Chemical attributes:	Acid; Neutral
Related phytosociological units:	<i>Campanulo herminii-Nardion strictae</i> ; <i>Corynephero-Malcolmion patulae</i> ; <i>Festucion elegantis</i> ; <i>Helianthemion guttati</i> ; <i>Malcolmietalia</i> ; <i>Potentillion calabri</i> ; <i>Potentillo ternatae-Nardion</i> ; <i>Vulpio-Lotion</i>

EUNIS habitat **code and names** E1.9 Non-Mediterranean dry acid and neutral open grassland, including inland dune grassland

**Description**

Open grassland, often with therophytes, of the nemoral, boreonemoral and submediterranean zones, developed on raw non-calcareous soils, especially on inland dunes and fixed sands.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004b)

**Legal instruments**

<u>Legal instrument</u>	<u>Legally designated habitat</u>	<u>Code</u>
EU Habitats Directive Annex I	Inland dunes with open <i>Corynephorus</i> and <i>Agrostis</i> grasslands	2330
	Pannonic inland dunes	2340

**Descriptive or diagnostic parameters**

<b>Parameter</b>	<b>Value(s)</b>
Dominant life forms:	Herbs; Low-growing herbs; Grasses
Cover characteristics (when used as criteria):	Vegetation >30%; bare ground >30%
Characteristics of wetness or dryness:	Dry
Chemical attributes:	Acid; Neutral
Related phytosociological units:	<i>Bromion tectorum</i> ; <i>Corynephorion canescentis</i> ; <i>Festucetalia vaginatae</i> ; <i>Festucion vaginatae</i> ; <i>Festucion valesiaca</i> ; <i>Genistion pilosae</i> ; <i>Hyperico</i>

*perforati-Scleranthion perennis; Jasiono sessiliflorae-Koelerietalia crassipedis; Koelerion arenariae; Koelerion glaucae; Koelerio-Phleion phleoidis; Malcolmietalia; Plantagini-Festucion ovinae; Sedo-Cerastion; Thero-Airion; Thero-Brometalia*

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**EUNIS habitat code and names** E1.A Mediterranean dry acid and neutral open grassland

**Description**

Sandy open ground with vernal therophytes, not necessarily grasses, in the Mediterranean region. Open perennial grasslands and pastures on siliceous, usually skeletal, soils of the supra-Mediterranean zone.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004b)

**Descriptive or diagnostic parameters**

Parameter	Value(s)
Dominant life forms:	Herbs; Low-growing herbs; Grasses
Cover characteristics (when used as criteria):	Vegetation >30%; bare ground >30%
Characteristics of wetness or dryness:	Dry
Chemical attributes:	Acid; Neutral
Related phytosociological units:	<i>Agrostio castellanae-Stipion giganteae; Corynephoro-Malcolmion patulae; Hieracio castellani-Plantaginion radicatae; Malcolmietalia</i>

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**EUNIS habitat code and names** E1.B Heavy-metal grassland

**Description**

Dry, short grasslands, often rich in lichens and mosses, colonizing western and central European soils with a high content in heavy metals such as zinc and lead, and comprising uniquely adapted species, ecotypes or populations mostly related to, or derived from, otherwise montane, boreomontane or steppic species; heavy metal grasslands of distinctly alpine affinities, though spanning an altitudinal range that extends from the montane level and lowland dealpine stations to the subalpine and alpine levels, are included.

**Source** Devillers, P., Devillers-Terschuren, J. and Vander Linden, C. (2001)

**Legal instruments**

Legal instrument	Legally designated habitat	Code
EU Habitats Directive Annex I	Calaminarian grasslands of the <i>Violetalia calaminariae</i>	6130
Council of Europe Bern Convention Res. No. 4 1996	Lowland heavy metal grasslands	34.2

**Descriptive or diagnostic parameters**

Parameter	Value(s)
Dominant life forms:	Herbs; Low-growing herbs; Grasses; Lower plants; Bryophytes and lichens; Bryophytes; Lichens
Cover characteristics (when used as criteria):	Vegetation >30%
Characteristics of wetness or dryness:	Dry; Arid
Chemical attributes:	Heavy metal-rich
Related phytosociological units:	<i>Amerion halleri; Plantagini-Festucion ovinae; Thlaspietalia rotundifolii; Thlaspion calaminariae; Thlaspion rotundifolii</i>

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**EUNIS habitat code and names** E1.C Dry mediterranean lands with unpalatable non-vernal herbaceous vegetation

**Description**

Dry lands with shrub cover < 10%, and with a large component of non-vernal unpalatable plants, including geophytes (*Asphodelus*, *Urginea*), thistles (*Carthamus*, *Carlina*, *Centaurea*, *Onopordum*), *Ferula* and *Phlomis*, especially characteristic of the drier parts of the Mediterranean basin. These habitats usually result from over-grazing of garrigue, which eliminates the shrubs.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004a)

**Descriptive or diagnostic parameters**

Parameter	Value(s)
Climate zones:	Mediterranean
Human activities and impacts:	Grazing
Levels of habitat usage (when used in criteria):	Overuse
Dominant life forms:	Shrubs; Forbs; Grasses
Characteristics of wetness or dryness:	Dry; Arid
Related phytosociological units:	<i>Artemisietea vulgaris; Brachypodion phoenicoidis; Carthametalia lanati; Cisto-Micromerietea julianae; Cymbopogoni-Brachypodietalia; Silybo-Urticion</i>

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**EUNIS habitat code and names** E2 Mesic grasslands**Description**

Lowland and montane mesotrophic and eutrophic pastures and hay meadows of the boreal, nemoral, warm-temperate humid and mediterranean zones. They are generally more fertile than dry grasslands (E1), and include sports fields and agriculturally improved and reseeded pastures.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004a)

**Descriptive or diagnostic parameters**

<b>Parameter</b>	<b>Value(s)</b>
Dominant life forms:	Herbs; Low-growing herbs; Forbs; Grasses; Lower plants; Bryophytes and lichens; Bryophytes; Lichens
Cover characteristics (when used as criteria):	Vegetation >30%
Characteristics of wetness or dryness:	Moist / mesic

**EUNIS habitat code and names** E2.1 Permanent mesotrophic pastures and aftermath-grazed meadows**Description**

Regularly grazed mesotrophic pastures of Europe, fertilised and on well-drained soils, with *Lolium perenne*, *Cynosurus cristatus*, *Poa* spp., *Festuca* spp., *Trifolium repens*, *Leontodon autumnalis*, *Bellis perennis*, *Ranunculus repens*, *Ranunculus acris*, *Cardamine pratensis*; they are most characteristic of the nemoral and boreonemoral zones Europe, but extend to the Cordillera Central, the Apennines and the supra-Mediterranean zone of the Balkan peninsula and Greece.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004a)

**Legal instruments**

<u>Legal instrument</u>	<u>Legally designated habitat</u>	<u>Code</u>
EU Habitats Directive Annex I	Macaronesian mesophile grasslands	6180

**Descriptive or diagnostic parameters**

<b>Parameter</b>	<b>Value(s)</b>
Human activities and impacts:	Grazing
Levels of habitat usage (when used in criteria):	Active management
Dominant life forms:	Herbs; Low-growing herbs; Grasses
Cover characteristics (when used as criteria):	Vegetation >30%
Characteristics of wetness or dryness:	Moist / mesic
Chemical attributes:	Mesotrophic
Related phytosociological units:	<i>Alopecurion pratensis</i> ; <i>Arrhenatherion</i> ; <i>Calthion palustris</i> ; <i>Cynosurion cristati</i> ; <i>Poion alpinae</i> ; <i>Potentillion anserinae</i>

**EUNIS habitat code and names** E2.2 Low and medium altitude hay meadows**Description**

Mesotrophic hay meadows of low altitudes of Europe, fertilised and well-drained, with *Arrhenatherum elatius*, *Trisetum flavescens*, *Anthriscus sylvestris*, *Heracleum sphondylium*, *Daucus carota*, *Crepis biennis*, *Knautia arvensis*, *Leucanthemum vulgare*, *Pimpinella major*, *Trifolium dubium*, *Geranium pratense*; they are most characteristic of the nemoral and boreonemoral zones of Europe, but extend to the Cordillera Central, the Apennines and the supra-Mediterranean zone of the Balkan peninsula and Greece.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004a)

**Legal instruments**

<u>Legal instrument</u>	<u>Legally designated habitat</u>	<u>Code</u>
EU Habitats Directive Annex I	Fennoscandian lowland species-rich dry to mesic grasslands	6270
	Lowland hay meadows ( <i>Alopecurus pratensis</i> , <i>Sanguisorba</i> )	6510

**Descriptive or diagnostic parameters**

<b>Parameter</b>	<b>Value(s)</b>
Altitude zones (terrestrial and marine):	Planar; Collinar
Human activities and impacts:	Mowing / cutting
Levels of habitat usage (when used in criteria):	Active management
Dominant life forms:	Herbs; Low-growing herbs; Grasses
Cover characteristics (when used as criteria):	Vegetation >30%
Characteristics of wetness or dryness:	Moist / mesic
Related phytosociological units:	<i>Alopecurion pratensis</i> ; <i>Arrhenatherion</i> ; <i>Cynosurion cristati</i> ; <i>Gaudinio fragilis-Cynosurion cristati</i> ; <i>Glycyrrhizion echinatae</i> ; <i>Glycyrrhizion glabrae</i> ; <i>Phyteumo-Triqueton</i> ; <i>Plantaginion cupanii</i> ; <i>Trisetum-Polygonion bistortae</i>

**EUNIS habitat code and names** E2.3 Mountain hay meadows**Description**

Often species-rich hay meadows of the montane and subalpine levels of higher mountains of the nemoral and southern boreal zones.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004a)

**Legal instruments**

<u>Legal instrument</u>	<u>Legally designated habitat</u>	<u>Code</u>
EU Habitats Directive Annex I	Mountain hay meadows	6520

**Descriptive or diagnostic parameters**

<b>Parameter</b>	<b>Value(s)</b>
Altitude zones (terrestrial and marine):	Montane (sensu stricto)
Human activities and impacts:	Mowing / cutting
Levels of habitat usage (when used in criteria):	Active management
Dominant life forms:	Herbs; Low-growing herbs; Grasses
Cover characteristics (when used as criteria):	Vegetation >30%
Characteristics of wetness or dryness:	Moist / mesic
Related phytosociological units:	<i>Phyteumo-Trisetion</i> ; <i>Trisetio-Polygonion bistortae</i>

**EUNIS habitat code and names** E2.4 Iberian summer pastures (vallicares)**Description**

Summer pastures of the Iberian peninsula, subject to poor drainage, brief flooding and rapid desiccation with the first heat, composed of perennial and annual grasses, most commonly by *Agrostis castellana*, *Agrostis pourretii* (*Agrostis salmantica*), *Gaudinia fragilis*, *Festuca ampla*, *Periballia involuocrata*, *Vulpia ciliata*, *Vulpia myuros*, *Vulpia bromoides*, *Holcus setiglumis*, *Molineriella minuta*, *Anthoxanthum aristatum*, *Anthoxanthum ovatum* and often with *Juncus capitatus* and clovers such as *Trifolium campestre*.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004a)

**Descriptive or diagnostic parameters**

<b>Parameter</b>	<b>Value(s)</b>
Human activities and impacts:	Grazing
Levels of habitat usage (when used in criteria):	Active management
Dominant life forms:	Herbs; Low-growing herbs; Grasses
Cover characteristics (when used as criteria):	Vegetation >30%
Characteristics of wetness or dryness:	Intermittent flooding; Intermittent desiccation
Related phytosociological units:	<i>Agrostion castellanae</i>

**EUNIS habitat code and names** E2.5 Meadows of the steppe zone**Description**

Lowland and montane mesotrophic pastures and hay meadows of the steppe zone of eastern Europe and Anatolia.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004a)

**Descriptive or diagnostic parameters**

<b>Parameter</b>	<b>Value(s)</b>
Dominant life forms:	Herbs; Low-growing herbs; Grasses
Cover characteristics (when used as criteria):	Vegetation >30%
Characteristics of wetness or dryness:	Moist / mesic
Related phytosociological units:	<i>Agrostion vinealis</i> ; <i>Artemision ponticae</i> ; <i>Polygonion krascheninnikovii</i> ; <i>Seselion libanotis</i> ; <i>Trifolion montani</i>

**EUNIS habitat code and names** E2.6 Agriculturally-improved, re-seeded and heavily fertilised grassland, including sports fields and grass lawns**Description**

Land occupied by heavily fertilised or reseeded permanent grasslands, sometimes treated by selective herbicides, with very impoverished flora and fauna, used for grazing, soil protection and stabilization, landscaping or recreation.

**Source** Devillers, P., Devillers-Terschuren, J. and Vander Linden, C. (2001)

**Descriptive or diagnostic parameters**

<b>Parameter</b>	<b>Value(s)</b>
Human activities and impacts:	Large-scale, high intensity agricultural use; Small-scale, high intensity agricultural use; Fertilisation; Grazing; Mowing / cutting; Sports pitch;

Levels of habitat usage (when used in criteria):	Anthropogenic impacts Intensive use / disturbance
Dominant life forms:	Herbs; Low-growing herbs; Grasses
Cover characteristics (when used as criteria):	Vegetation >30%
Species richness (when used in criteria):	Species poor
Characteristics of wetness or dryness:	Moist / mesic
Related phytosociological units:	<i>Cynosurion cristati</i> ; <i>Potentillion anserinae</i>

## EUNIS habitat code and names E2.7 Unmanaged mesic grassland

### Description

Mesic grassland that is not currently mown or used for pasture.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004b)

### Descriptive or diagnostic parameters

Parameter	Value(s)
Levels of habitat usage (when used in criteria):	No human use
Dominant life forms:	Herbs; Low-growing herbs; Forbs; Grasses
Cover characteristics (when used as criteria):	Vegetation >30%
Characteristics of wetness or dryness:	Moist / mesic

## EUNIS habitat code and names E3 Seasonally wet and wet grasslands

### Description

Unimproved or lightly improved wet meadows and tall herb communities of the boreal, nemoral, warm-temperate humid, steppic and mediterranean zones.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004a)

### Descriptive or diagnostic parameters

Parameter	Value(s)
Dominant life forms:	Herbs; Low-growing herbs; Forbs; Grasses; Lower plants; Bryophytes and lichens; Bryophytes; Lichens
Cover characteristics (when used as criteria):	Vegetation >30%
Characteristics of wetness or dryness:	Intermittent flooding; Wet and very wet; Seasonally wet; Intermittent desiccation

## EUNIS habitat code and names E3.1 Mediterranean tall humid grassland

### Description

Mediterranean humid grasslands of tall grasses and rushes with *Scirpus holoschoenus* (*Holoschoenus vulgaris*), *Agrostis stolonifera*, *Agrostis reuteri*, *Calamagrostis epigejos*, *Galium debile*, *Molinia caerulea*, *Briza minor*, *Melica cupanii*, *Cyperus longus*, *Linum tenue*, *Trifolium resupinatum*, *Schoenus nigricans*, *Peucedanum hispanicum*, *Carex mairii*, *Juncus maritimus*, *Juncus acutus*, *Asteriscus aquaticus*, *Hypericum tomentosum*, *Hypericum tetrapterum*, *Inula viscosa*, *Oenanthe pimpinelloides*, *Oenanthe lachenalii*, *Eupatorium cannabinum*, *Prunella vulgaris*, *Pulicaria dysenterica*, *Tetragonolobus maritimus*, *Orchis laxiflora*, *Dactylorhiza elata*, *Succisa pratensis*, *Sonchus maritimus* ssp. *aquatilis*, *Silaum silaus*, *Sanguisorba officinalis*, *Serratula tinctoria*, *Genista tinctoria*, *Cirsium monspessulanum*, *Cirsium pyrenaicum*, *Senecio doria*, *Dorycnium rectum*, *Erica terminalis*, *Euphorbia pubescens*, *Lysimachia ephemerum*, widespread in the entire Mediterranean basin, extending, along the coasts of the Black Sea, in particular in dune systems, north to the Dobrogea and the Danube Delta, and, in valleys of the Balkan peninsula, north to the Banat.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004a)

### Legal instruments

<u>Legal instrument</u>	<u>Legally designated habitat</u>	<u>Code</u>
EU Habitats Directive Annex I	Mediterranean tall humid grasslands of the Molinio-Holoschoenion	6420
	Peat grasslands of Troodos	6460
Council of Europe Bern Convention Res. No. 4 1996	Mediterranean tall humid grasslands	37.4

### Descriptive or diagnostic parameters

Parameter	Value(s)
Climate zones:	Mediterranean
Dominant life forms:	Herbs; Tall herbs; Forbs; Grasses
Cover characteristics (when used as criteria):	Vegetation >30%
Characteristics of wetness or dryness:	Wet and very wet; Seasonally wet
Related phytosociological units:	<i>Molinio-Holoschoenion</i>



**EUNIS habitat code and names** E3.2 Mediterranean short humid grassland**Description**

Very short grasslands of impermeable compact soils or marls, wet for a large part of the year, and desiccated in summer, characteristic of the Mediterranean basin, with irradiations north to the Illyrian zone of the northwestern Balkan peninsula, with *Deschampsia media*, *Centaurium pulchellum*, *Lotus tenuis*, *Trifolium lappaceum*, *Prunella hyssopifolia*, *Plantago maritima* ssp. *serpentina*, *Centaurea timbali*.

**Source** Devillers, P., Devillers-Terschuren, J. and Vander Linden, C. (2001)

**Descriptive or diagnostic parameters**

Parameter	Value(s)
Climate zones:	Mediterranean
Dominant life forms:	Herbs; Low-growing herbs; Grasses
Cover characteristics (when used as criteria):	Vegetation >30%
Characteristics of wetness or dryness:	Intermittent flooding; Intermittent desiccation
Related phytosociological units:	<i>Deschampsion mediae</i>

**EUNIS habitat code and names** E3.3 Sub-mediterranean humid meadows**Description**

Humid meadows rich in clover (*Trifolium* spp.) of sub- and supramediterranean regions remote from Atlantic influence, in particular, of the Balkan peninsula, of the Apennines and of Mediterranean Anatolia, mostly developed above the lowlands but below the montane level.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004a)

**Descriptive or diagnostic parameters**

Parameter	Value(s)
Altitude zones (terrestrial and marine):	Collinar
Climate zones:	Sub-Mediterranean
Dominant life forms:	Herbs; Low-growing herbs; Grasses
Cover characteristics (when used as criteria):	Vegetation >30%
Characteristics of wetness or dryness:	Intermittent flooding; Wet and very wet; Seasonally wet
Related phytosociological units:	<i>Alopecurion pratensis</i> ; <i>Molinio-Arrhenatheretea</i> ; <i>Molinio-Hordeion secalini</i> ; <i>Ranunculion velutini</i> ; <i>Trifolion pallidi</i> ; <i>Trifolion resupinati</i>

**EUNIS habitat code and names** E3.4 Moist or wet eutrophic and mesotrophic grassland**Description**

Wet eutrophic and mesotrophic grasslands and flood meadows of the boreal and nemoral zones, dominated by grasses *Poaceae*, rushes *Juncus* spp. or club-rush *Scirpus sylvaticus*.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004b)

**Legal instruments**

Legal instrument	Legally designated habitat	Code
EU Habitats Directive Annex I	Alluvial meadows of river valleys of the <i>Cnidion dubii</i>	6440
	Northern boreal alluvial meadows	6450
Council of Europe Bern Convention Res. No. 4 1996	Eutrophic humid grasslands	37.2

**Descriptive or diagnostic parameters**

Parameter	Value(s)
Dominant life forms:	Herbs; Low-growing herbs; Forbs; Grasses
Cover characteristics (when used as criteria):	Vegetation >30%
Characteristics of wetness or dryness:	Intermittent flooding; Wet and very wet; Seasonally wet
Chemical attributes:	Mesotrophic; Eutrophic
Related phytosociological units:	<i>Agropyro-Rumicion</i> ; <i>Agrostio stoloniferae-Beckmannion eruciformis</i> ; <i>Alopecurion pratensis</i> ; <i>Arrhenatherion</i> ; <i>Calthion palustris</i> ; <i>Caricion davallianae</i> ; <i>Caricion fuscae</i> ; <i>Cnidion venosi</i> ; <i>Cynosurion cristati</i> ; <i>Deschampsion cespitosae</i> ; <i>Festucion beckeri</i> ; <i>Festucion vaginatae</i> ; <i>Filipendulion</i> ; <i>Glycyrrhizion glabrae</i> ; <i>Juncion acutiflori</i> ; <i>Lythro-Euphorbion</i> ; <i>Molinion caeruleae</i> ; <i>Plantagini-Prunellion</i> ; <i>Potentillion anserinae</i>

**EUNIS habitat code and names** E3.5 Moist or wet oligotrophic grassland**Description**

Grasslands on wet, nutrient-poor, often peaty soils, of the boreal, nemoral and steppe zones. Includes coarse acid grassland dominated by *Molinia caerulea* and shorter wet heathy grasslands with *Juncus squarrosus*, *Nardus stricta* and *Scirpus cespitosus*.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004a)

**Legal instruments**

<u>Legal instrument</u>	<u>Legally designated habitat</u>	<u>Code</u>
EU Habitats Directive Annex I	Molinia meadows on calcareous, peaty or clayey-silt-laden soils (Molinion caeruleae)	6410
Council of Europe Bern Convention Res. No. 4 1996	Oligotrophic humid grasslands	37.3

**Descriptive or diagnostic parameters**

<b>Parameter</b>	<b>Value(s)</b>
Dominant life forms:	Herbs; Low-growing herbs; Forbs; Grasses
Cover characteristics (when used as criteria):	Vegetation >30%
Characteristics of wetness or dryness:	Intermittent flooding; Wet and very wet; Seasonally wet
Chemical attributes:	Oligotrophic
Related phytosociological units:	<i>Juncion acutiflori</i> ; <i>Juncion squarrosi</i> ; <i>Junco-Molinion</i> ; <i>Molinion caeruleae</i>

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**EUNIS habitat code and names** E4 Alpine and subalpine grasslands

**Description**

Primary and secondary grass- or sedge- dominated formations of the alpine and subalpine levels of boreal, nemoral, mediterranean, warm-temperate humid and Anatolian mountains.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004a)

**Descriptive or diagnostic parameters**

<b>Parameter</b>	<b>Value(s)</b>
Altitude zones (terrestrial and marine):	Subalpine; Alpine; Nival
Climate zones:	Alpine
Dominant life forms:	Herbs; Low-growing herbs; Forbs; Grasses; Lower plants; Bryophytes and lichens; Bryophytes; Lichens
Cover characteristics (when used as criteria):	Vegetation >30%

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**EUNIS habitat code and names** E4.1 Vegetated snow-patch

**Description**

Vegetated areas that retain late-lying snow. Dominants may be mosses, liverworts, macrolichens, graminoids, ferns and small herbs. Snow patches are well developed in boreal and arctic mountains and in subarctic lowlands; they are well represented, though of much smaller extent, above the tree limit in the Alps, Pyrenees, Carpathians and Caucasus. They are found very locally in the Paeonian mountains, Sierra Nevada, Cordillera Central, Monti Sibillini, Abruzzi, Scottish Highlands and Sudeten.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004a)

**Descriptive or diagnostic parameters**

<b>Parameter</b>	<b>Value(s)</b>
Altitude zones (terrestrial and marine):	Alpine; Nival
Climate zones:	Alpine
Exposure characteristics:	Snow
Dominant life forms:	Herbs
Cover characteristics (when used as criteria):	Vegetation >30%
Related phytosociological units:	<i>Adenostylion alliariae</i> ; <i>Arabidion caeruleae</i> ; <i>Deschampsio-Anthoxanthion</i> ; <i>Luzulion nivalis</i> ; <i>Mucizonion sedoidis</i> ; <i>Potentillo-Polygonion vivipari</i> ; <i>Salicetalia herbaceae</i> ; <i>Salicion herbaceae</i> ; <i>Saxifrago-Ranunculion nivalis</i>

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**EUNIS habitat code and names** E4.2 Moss and lichen dominated mountain summits, ridges and exposed slopes

**Description**

Includes fjell fields in which mosses and lichens are dominant, often with low cover of *Carex bigelowii*. Fjell fields are best developed in boreal and arctic mountains and in subarctic lowlands.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004b)

**Descriptive or diagnostic parameters**

<b>Parameter</b>	<b>Value(s)</b>
Exposure characteristics:	Frost; Extremely exposed to wind action; Very exposed to wind action; Exposed to wind action
Dominant life forms:	Bryophytes and lichens
Related phytosociological units:	<i>Juncion trifidi</i> ; <i>Loiseleurio-Diapension</i> ; <i>Saxifrago stellaris-Oxyrion digynae</i>

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**EUNIS habitat code and names** E4.3 Acid alpine and subalpine grassland**Description**

Alpine and subalpine grasslands developed over crystalline rocks and other lime-deficient substrates or on decalcified soils of mountains. On boreal mountains, *Carex bigelowii* and *Juncus trifidus* often dominate. The acid alpine grasslands of central Europe are more mixed, with *Armeria alpina*, *Armeria alliacea* (*Armeria montana*), *Euphrasia minima*, *Gentiana alpina*, *Geum montanum*, *Juncus trifidus*, *Lychnis alpina*, *Pedicularis pyrenaica*, *Phyteuma hemisphaericum*, *Pulsatilla alpina* ssp. *sulphurea*, *Ranunculus pyrenaicus*, *Sempervivum montanum*, *Botrychium lunaria*.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004a)

**Legal instruments**

<u>Legal instrument</u>	<u>Legally designated habitat</u>	<u>Code</u>
EU Habitats Directive Annex I	Siliceous Pyrenean Festuca eskia grasslands	6140
	Siliceous alpine and boreal grasslands	6150
	Oro-Iberian Festuca indigesta grasslands	6160
	Alpine and subalpine calcareous grasslands	6170
	Species-rich Nardus grasslands, on silicious substrates in mountain areas (and submountain areas in Continental Europe)	6230

**Descriptive or diagnostic parameters**

<b>Parameter</b>	<b>Value(s)</b>
Dominant life forms:	Herbs
Chemical attributes:	Acid
Related phytosociological units:	<i>Achilleo-Arnicion</i> ; <i>Agrostion schraderanae</i> ; <i>Campanulo herminii-Nardion strictae</i> ; <i>Caricetalia curvulae</i> ; <i>Caricion curvulae</i> ; <i>Deschampsio-Anthoxanthion</i> ; <i>Festucetalia spadiceae</i> ; <i>Festucion eskiae</i> ; <i>Festucion spadiceae</i> ; <i>Festucion supinae</i> ; <i>Festucion variae</i> ; <i>Hieracio castellani-Plantaginion radicatae</i> ; <i>Jasionion orbiculatae</i> ; <i>Juncion trifidi</i> ; <i>Loiseleurio-Diapension</i> ; <i>Minuartio-Festucion curvifoliae</i> ; <i>Nardion strictae</i> ; <i>Nardo-Agrostion tenuis</i> ; <i>Nardo-Caricion rigidae</i> ; <i>Plantaginion insularis</i> ; <i>Plantaginion thalackeri</i> ; <i>Poion violaceae</i> ; <i>Potentillion calabri</i> ; <i>Potentillo ternatae-Nardion</i> ; <i>Ptilotrichion purpurei</i> ; <i>Sedo-Phleion brachystachyi</i> ; <i>Sesamoido-Poion violaceae</i> ; <i>Seslerietalia comosae</i> ; <i>Seslerion comosae</i> ; <i>Teesdaliopsio-Luzulion caespitosae</i> ; <i>Trifolietalia parnassii</i> ; <i>Trifolion parnassii</i>

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**EUNIS habitat code and names** E4.4 Calcareous alpine and subalpine grassland**Description**

Alpine and subalpine grasslands of base-rich soils of the high mountains of the nemoral, submediterranean and supramediterranean zones. Characteristic species of the Alps include *Dryas octopetala*, *Gentiana nivalis*, *Gentiana campestris*, *Alchemilla hoppeana*, *Alchemilla conjuncta*, *Alchemilla flabellata*, *Anthyllis vulneraria*, *Astragalus alpinus*, *Aster alpinus*, *Draba aizoides*, *Globularia nudicaulis*, *Helianthemum nummularium* ssp. *grandiflorum*, *Helianthemum oelandicum* ssp. *alpestre*, *Pulsatilla alpina* ssp. *alpina*, *Phyteuma orbiculare*, *Astrantia major* and *Polygala alpestris*.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004a)

**Legal instruments**

<u>Legal instrument</u>	<u>Legally designated habitat</u>	<u>Code</u>
EU Habitats Directive Annex I	Alpine and subalpine calcareous grasslands	6170

**Descriptive or diagnostic parameters**

<b>Parameter</b>	<b>Value(s)</b>
Dominant life forms:	Herbs
Chemical attributes:	Base-rich; Calcareous
Related phytosociological units:	<i>Agrostion alpinae</i> ; <i>Armerion cantabricae</i> ; <i>Avenion montanae</i> ; <i>Avenion sempervirentis</i> ; <i>Campanulion linifoliae</i> ; <i>Carici rupestris-Kobresietea bellardii</i> ; <i>Caricion austroalpinae</i> ; <i>Caricion curvulae</i> ; <i>Caricion ferrugineae</i> ; <i>Caricion firmae</i> ; <i>Caricion nardinae</i> ; <i>Crepidetalia dinaricae</i> ; <i>Edraiantho-Seslerion</i> ; <i>Festucion pungentis</i> ; <i>Festucion scopariae</i> ; <i>Festuco-Knaution longifoliae</i> ; <i>Laserpitio-Ranunculion thorae</i> ; <i>Onobrychido-Seslerietalia</i> ; <i>Ononidion cenisiae</i> ; <i>Oxytropidion urumovii</i> ; <i>Oxytropido-Elynion</i> ; <i>Primulion intricatae</i> ; <i>Seslerietalia albicantis</i> ; <i>Seslerietalia tenuifoliae</i> ; <i>Seslerio-Festucion xanthinae</i> ; <i>Seslerion albicantis</i> ; <i>Seslerion bielzii</i> ; <i>Seslerion nitidae</i> ; <i>Seslerion rigidae</i> ; <i>Seslerion tatrae</i> ; <i>Seslerion tenuifoliae</i>

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**EUNIS habitat code and names** E4.5 Alpine and subalpine enriched grassland

**Description**

Enriched pastures of the subalpine and lower alpine levels of mountains. Enriched hay meadows are listed under E2.3.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004a)

**Descriptive or diagnostic parameters**

Parameter	Value(s)
Human activities and impacts:	Fertilisation; Grazing; Manuring
Dominant life forms:	Herbs
Chemical attributes:	Nitrate-enriched
Related phytosociological units:	<i>Nardion strictae</i> ; <i>Poion alpinae</i> ; <i>Triseti-Polygonion bistortae</i>

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**EUNIS habitat code and names** E5 Woodland fringes and clearings and tall forb stands**Description**

Stands of tall herbs or ferns, occurring on disused urban or agricultural land, by watercourses, at the edge of woods, or invading pastures. Stands of shorter herbs forming a distinct zone (seam) at the edge of woods.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004b)

**Descriptive or diagnostic parameters**

Parameter	Value(s)
Dominant life forms:	Herbs; Tall herbs; Forbs; Tall forbs; Grasses; Ferns; Tall ferns; Bracken
Cover characteristics (when used as criteria):	Vegetation >30%

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**EUNIS habitat code and names** E5.1 Anthropogenic herb stands**Description**

Stands of herbs developing on abandoned urban or agricultural land, on land that has been reclaimed, on transport networks, or on land used for waste disposal.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004b)

**Descriptive or diagnostic parameters**

Parameter	Value(s)
Human activities and impacts:	Fertilisation; Anthropogenic impacts
Dominant life forms:	Forbs
Chemical attributes:	Nitrate-enriched

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**EUNIS habitat code and names** E5.2 Thermophile woodland fringes**Description**

Woodland edge (seam) vegetation of the nemoral, boreo-nemoral and submediterranean zones, composed of warmth-requiring drought-resistant herbaceous perennials and shrubs, which form a belt between dry or mesophile grasslands and the shrubby forest mantle, on the sunny side, where the nutrient supply is limited, or, sometimes, pioneering the woodland colonization into the grasslands.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004a)

**Descriptive or diagnostic parameters**

Parameter	Value(s)
Dominant life forms:	Herbs; Tall forbs
Temperature attributes (when used in criteria):	Thermophile
Related phytosociological units:	<i>Dictamno-Ferulagion galbaniferae</i> ; <i>Galio littoralis-Geranium sanguinei</i> ; <i>Geranium sanguinei</i> ; <i>Linariae triornithophorae</i> ; <i>Melampyrium pratensis</i> ; <i>Origanion virentis</i> ; <i>Potentillo erectae-Holcicion mollis</i> ; <i>Trifolium medii</i>

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**EUNIS habitat code and names** E5.3 English name: Bracken fields;  
Scientific name: *Pteridium aquilinum* fields**Description**

Atlantic, sub-Atlantic, sub-Mediterranean and Macaronesian communities dominated by the large fern *Pteridium aquilinum*, extensive and often closed.

**Source** Devillers, P., Devillers-Terschuren, J. and Vander Linden, C. (2001)

**Descriptive or diagnostic parameters**

Parameter	Value(s)
Dominant life forms:	Bracken
Species richness (when used in criteria):	Species poor

Related phytosociological units:

*Potentillo erectae-Holcion mollis*; *Pruno-Rubion radulae*; *Pruno-Rubion ulmifolii*; *Quercion roboris*

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**EUNIS habitat code and names** E5.4 Moist or wet tall-herb and fern fringes and meadows

**Description**

Tall-herb and fern vegetation of the nemoral and boreal zones, including stands of tall herbs on hills and mountains below the montane level. Tall herbs are often dominant along watercourses, in wet meadows and in shade at the edge of woodlands.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004a)

**Legal instruments**

<u>Legal instrument</u>	<u>Legally designated habitat</u>	<u>Code</u>
EU Habitats Directive Annex I	Constantly flowing Mediterranean rivers with Paspalo-Agrostidion species and hanging curtains of <i>Salix</i> and <i>Populus alba</i>	3280
	Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels	6430

**Descriptive or diagnostic parameters**

<b>Parameter</b>	<b>Value(s)</b>
Dominant life forms:	Tall herbs; Ferns
Characteristics of wetness or dryness:	Moist / mesic
Temperature attributes (when used in criteria):	Mesophile
Related phytosociological units:	<i>Aegopodion podagrariae</i> ; <i>Bidentetea tripartiti</i> ; <i>Filipendulion</i> ; <i>Fimbristylion dichotomae</i> ; <i>Galio-Alliarion</i> ; <i>Impatienti noli-tangere-Stachyion sylvaticae</i> ; <i>Lythro-Euphorbion</i> ; <i>Paspalo-Agrostidion semiverticillati</i> ; <i>Senecionion fluviatilis</i> ; <i>Verbenion supinae</i> ; <i>Veronico longifoliae-Lysimachion vulgaris</i>

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**EUNIS habitat code and names** E5.5 Subalpine moist or wet tall-herb and fern stands

**Description**

Luxuriant tall herb formations of deep, humid soils in the montane to alpine, but mostly subalpine, levels of the higher mountains, with *Cicerbita alpina*, *Cicerbita alpina plumieri*, *Cirsium helenioides*, *Cirsium spinosissimum*, *Cirsium flavispina*, *Geranium sylvaticum*, *Polygonatum verticillatum*, *Ranunculus platanifolius*, *Aconitum vulparia*, *Aconitum napellus*, *Aconitum nevadense*, *Adenostyles alliariae*, *Senecio elodes*, *Veratrum album*, *Trollius europaeus*, *Peucedanum ostruthium*, *Doronicum austriacum*, *Pedicularis foliosa*, *Eryngium alpinum*, *Leuzea rhapontica* (*Centaurea rhapontica*), *Valeriana pyrenaica*, *Tozzia alpina*.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004a)

**Legal instruments**

<u>Legal instrument</u>	<u>Legally designated habitat</u>	<u>Code</u>
EU Habitats Directive Annex I	Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels	6430

**Descriptive or diagnostic parameters**

<b>Parameter</b>	<b>Value(s)</b>
Altitude zones (terrestrial and marine):	Montane (sensu stricto); Subalpine; Alpine
Dominant life forms:	Tall herbs; Ferns
Characteristics of wetness or dryness:	Moist / mesic
Substrate types:	Loamy soils
Related phytosociological units:	<i>Adenostyletalia alliariae</i> ; <i>Adenostyletalia briquetii</i> ; <i>Adenostylion alliariae</i> ; <i>Adenostylion pyrenaicae</i> ; <i>Aegopodion podagrariae</i> ; <i>Calamagrostion arundinaceae</i> ; <i>Calamagrostion villosae</i> ; <i>Calthion palustris</i> ; <i>Cirsion appendiculati</i> ; <i>Cirsion flavispinae</i> ; <i>Doronicion corsici</i> ; <i>Dryopterido-Athyron</i> ; <i>Festucion carpaticae</i> ; <i>Filipendulion</i> ; <i>Poo chaixii-Deschampsion caespitosae</i> ; <i>Rumicion alpini</i> ; <i>Seslerion bielzii</i>

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**EUNIS habitat code and names** E6 Inland salt steppes

**Description**

Saline land with dominant salt-tolerant grasses and herbs. Excludes saline scrubland, listed under F6.8 xero-halophile scrubs.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004b)

**Descriptive or diagnostic parameters**

<b>Parameter</b>	<b>Value(s)</b>
Dominant life forms:	Herbs; Low-growing herbs; Forbs; Grasses
Cover characteristics (when used as criteria):	Vegetation >30%
Chemical attributes:	Saline

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**EUNIS habitat code and names** E6.1 Mediterranean inland salt steppes**Description**

Vegetated saline land of Mediterranean coastal regions and of the fringes of semiarid salt basins that lack drainage to the sea; often dominated by perennial, rosette-forming *Limonium* spp. or esparto grass, *Lygeum spartum*. The soils are temporarily permeated (though not inundated) by saline water and subject to extreme summer drying, with formation of salt efflorescences.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004a)

**Legal instruments**

<u>Legal instrument</u>	<u>Legally designated habitat</u>	<u>Code</u>
EU Habitats Directive Annex I	Mediterranean salt steppes (Limonietalia)	1510
Council of Europe Bern Convention Res. No. 4 1996	Mediterranean salt steppes	15.8

**Descriptive or diagnostic parameters**

<b>Parameter</b>	<b>Value(s)</b>
Climate zones:	Mediterranean
Dominant life forms:	Herbs; Grasses
Chemical attributes:	Saline
Related phytosociological units:	<i>Frankenion pulverulentae</i> ; <i>Hordeion marini</i> ; <i>Limonium gmelinii</i> ; <i>Lygeo sparti-Limonion furfuracei</i> ; <i>Lygeo-Lepidion cardaminis</i> ; <i>Puccinellio-Spergularion salinae</i> ; <i>Romulion</i> ; <i>Thero-Salicornion</i>

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**EUNIS habitat code and names** E6.2 Continental inland salt steppes**Description**

Salt steppes and their associated salt-tolerant herbaceous communities outside the Mediterranean zone. In Europe they are found in the substeppe and steppe zones eastwards from the Hungarian Plain.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004a)

**Legal instruments**

<u>Legal instrument</u>	<u>Legally designated habitat</u>	<u>Code</u>
EU Habitats Directive Annex I	Pannonic salt steppes and salt marshes	1530
Council of Europe Bern Convention Res. No. 4 1996	Continental salt steppes and saltmarshes	15.A

**Descriptive or diagnostic parameters**

<b>Parameter</b>	<b>Value(s)</b>
Climate zones:	Continental; Subcontinental
Dominant life forms:	Herbs; Grasses
Chemical attributes:	Saline
Related phytosociological units:	<i>Agropyro-Artemision coerulescentis</i> ; <i>Armerion maritimae</i> ; <i>Beckmannion eruciformis</i> ; <i>Crypsidetalia aculeatae</i> ; <i>Cypero-Spergularion salinae</i> ; <i>Festucion pseudovinae</i> ; <i>Festuco-Limonietalia</i> ; <i>Festuco-Limonion gmelinii</i> ; <i>Glycyrrhizetalia glabrae</i> ; <i>Glycyrrhizion echinatae</i> ; <i>Juncion maritimi</i> ; <i>Lepidietalia latifolii</i> ; <i>Limonium gmelinii</i> ; <i>Malvion neglectae</i> ; <i>Peucedano officinalis-Asterion sedifolii</i> ; <i>Potentillion anserinae</i> ; <i>Puccinellietalia</i> ; <i>Puccinellion limosae</i> ; <i>Puccinellion peisonis</i> ; <i>Puccinellio-Spergularion salinae</i> ; <i>Salicornion herbaceae</i> ; <i>Scorzonero-Juncetalia gerardii</i> ; <i>Scorzonero-Juncion gerardii</i> ; <i>Thero-Salicornion</i>

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**EUNIS habitat code and names** E7 Sparsely wooded grasslands**Description**

Grasslands with a wooded overstorey that normally has less than 10% cover.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004b)

**Descriptive or diagnostic parameters**

<b>Parameter</b>	<b>Value(s)</b>
Human activities and impacts:	Agriculture/Horticulture; Grazing
Dominant life forms:	Trees; Herbs; Low-growing herbs; Forbs; Grasses
Cover characteristics (when used as criteria):	Vegetation >30%; trees 5-10%

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**EUNIS habitat code and names** E7.1 Atlantic parkland**Description**

Extensive surfaces of Atlantic regions of nemoral Europe occupied by grassland dotted with widely planted trees, characteristic of the British Isles, where they are usually enclosed, used for cattle or deer grazing.

**Source** Devillers, P., Devillers-Terschuren, J. and Vander Linden, C. (2001)

**Descriptive or diagnostic parameters**

Parameter	Value(s)
Climate zones:	Atlantic
Human activities and impacts:	Agriculture/Horticulture
Dominant life forms:	Herbs

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**EUNIS habitat code and names** E7.2 Sub-continental parkland

**Description**

Grassland dotted with widely planted trees, to the east of the Atlantic zone of nemoral Europe.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004b)

**Descriptive or diagnostic parameters**

Parameter	Value(s)
Climate zones:	Subcontinental
Human activities and impacts:	Agriculture/Horticulture
Dominant life forms:	Herbs

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**EUNIS habitat code and names** E7.3 Dehesa

**Description**

A characteristic landscape of the southwestern quadrant of the Iberian peninsula in which crops, pasture land or Mediterranean scrub, in juxtaposition or rotation, are shaded by a fairly closed to very open canopy of native oaks, *Quercus suber*, *Quercus rotundifolia*, *Quercus pyrenaica*, *Quercus faginea*. It is an important habitat of raptors, including the threatened Iberian endemic eagle *Aquila adalberti*, of the crane *Grus grus*, of large insects and their predators and of the endangered Iberian lynx *Lynx pardinus*.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004a)

**Legal instruments**

<u>Legal instrument</u>	<u>Legally designated habitat</u>	<u>Code</u>
EU Habitats Directive Annex I	Dehesas with evergreen <i>Quercus</i> spp	6310
Council of Europe Bern Convention Res. No. 4 1996	Dehesa	91.2

**Descriptive or diagnostic parameters**

Parameter	Value(s)
Climate zones:	Mediterranean
Human activities and impacts:	Grazing
Dominant life forms:	Herbs

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## F HEATHLAND, SCRUB AND TUNDRA

### Description

Non-coastal land which is dry or only seasonally inundated (with the water table at or above ground level for less than half of the year) with greater than 30% vegetation cover. Tundra is characterised by the presence of permafrost. Heathland and scrub are defined as vegetation dominated by shrubs or dwarf shrubs of species that typically do not exceed 5 m maximum height. Includes shrub orchards, vineyards, hedges (which may have occasional tall trees). Also includes stands of climatically-limited dwarf trees (krummholz) < 3 m high, such as occur in extreme alpine conditions. Includes *Salix* and *Frangula* carrs. Excludes coppice (G5.7) and *Alnus* and *Populus* swamp woodland (G1.4).

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004b)

### Descriptive or diagnostic parameters

Parameter	Value(s)
Human activities may include:	Horticulture; Large-scale, high intensity horticultural use; Large-scale, low intensity horticultural use; Small-scale, high intensity horticultural use; Small-scale, low intensity horticultural use; Whole plant harvesting; Fruit and nut orchards; Fruit other than vines; Vines; Leaf or branch cultivation
Dominant life forms:	Shrubs; Dwarf shrubs; Bryophytes; Lichens
Cover characteristics (when used as criteria):	Vegetation >30%
Characteristics of wetness or dryness:	Waterlogged
Substrate types:	Frozen subsoil

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### EUNIS habitat code and names F1 Tundra

#### Description

Vegetated land with graminoids, shrubs, mosses or macrolichens overlying permafrost. European tundras are limited to Spitzbergen and northern Russia. Vegetation with the same species also occurs on boreal mountains and in the low arctic remote from the main permafrost region, notably in Fennoscandia and Iceland; these oroboreal and low arctic habitats are listed under alpine and subalpine grassland E4 or arctic, alpine and subalpine scrub F2.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004a)

### Descriptive or diagnostic parameters

Parameter	Value(s)
Dominant life forms:	Bryophytes; Lichens
Cover characteristics (when used as criteria):	Vegetation >30%
Substrate types:	Frozen subsoil

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### EUNIS habitat code and names F1.1 Shrub tundra

#### Description

Tundras of the southernmost tundra belt, characterized by an abundance of medium small and small shrubs, =including 1-2 m tall *Alnus fruticosa*, 0.5-0.8 m tall *Salix lanata*, *Betula nana*, *Betula exilis*, *Salix reptans*, *Salix pulchra*, and of dwarf shrubs, in particular, *Vaccinium uliginosum*, *Vaccinium vitis-idaea*, *Ledum decumbens*, *Rubus chamaemorus*, *Empetrum hermaphroditum*, *Empetrum nigrum*, *Arctostaphylos alpina*. They extend south to the wooded taiga belt.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004a)

### Descriptive or diagnostic parameters

Parameter	Value(s)
Dominant life forms:	Shrubs

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### EUNIS habitat code and names F1.2 Moss and lichen tundra

#### Description

Tundras of the middle tundra belt, characterized by a thick cover of mosses, formed notably by *Hylocomium splendens*, *Aulacomnium turgidum*, *Tomentypnum nitens*, *Ptilidium ciliare*, with dwarf shrubs, particularly *Dryas octopetala*, *Cassiope tetragona*, *Salix reptans*, *Vaccinium vitis-idaea*, sedges, among which the often dominant *Carex ensifolia*. Drier stands alternate in mosaic fashion with wetter areas dominated by sedges, in particular, *Carex stans*, *Eriophorum angustifolium*, *Eriophorum scheuchzeri*, and grasses, notably *Arctophila fulva*, *Dupontia fischeri*.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004a)



**Descriptive or diagnostic parameters**

<b>Parameter</b>	<b>Value(s)</b>
Dominant life forms:	Bryophytes; Lichens
Related phytosociological units:	<i>Juncetea trifidi</i> ; <i>Loiseleurio-Vaccinion</i> ; <i>Salicetea herbaceae</i>

**EUNIS habitat code and names** F2 Arctic, alpine and subalpine scrub**Description**

Scrub occurring north of or above the climatic tree limit, but outside the permafrost zone. Scrub occurring close to but below the climatic tree limit, where trees are suppressed either by late-lying snow or by wind or repeated browsing.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004b)

**Descriptive or diagnostic parameters**

<b>Parameter</b>	<b>Value(s)</b>
Climate zones:	Cold; Cold-temperate
Dominant life forms:	Shrubs; Dwarf shrubs; Ericoid shrubs; Evergreen shrubs; Mixed deciduous and evergreen shrubs; Broadleaved deciduous shrubs
Cover characteristics (when used as criteria):	Vegetation >30%

**EUNIS habitat code and names** F2.1 Subarctic and alpine dwarf willow scrub**Description**

*Salix* scrub composed of species that rarely exceed 1.5 m in height. Dwarf willow scrub is well developed in boreal and arctic mountains and in subarctic lowlands. In mountains of the nemoral and warm-temperate zones, stands of dwarf willow scrub are of much smaller extent and are characteristic of late-lying snow patches. They occur in the Alps, Pyrenees, Carpathians and Caucasus, and very locally to the south in the Paeonian mountains, Sierra Nevada, Cordillera Central, Monti Sibillini and Abruzzi. They occur locally in the Scottish Highlands and in the Sudeten.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004a)

**Descriptive or diagnostic parameters**

<b>Parameter</b>	<b>Value(s)</b>
Exposure characteristics:	Snow
Dominant life forms:	Dwarf shrubs
Related phytosociological units:	<i>Adenostylion alliariae</i> ; <i>Arabidion caeruleae</i> ; <i>Deschampsio-Anthoxanthion</i> ; <i>Salicetalia herbaceae</i> ; <i>Salicion herbaceae</i> ; <i>Saxifrago-Ranunculion nivalis</i>

**EUNIS habitat code and names** F2.2 Evergreen alpine and subalpine heath and scrub**Description**

Small, dwarf or prostrate shrub formations of the alpine and subalpine zones of mountains, dominated by ericaceous species, *Dryas octopetala*, dwarf junipers, brooms or greenweeds; *Dryas* heaths of the British Isles.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004a)

**Legal instruments**

<u>Legal instrument</u>	<u>Legally designated habitat</u>	<u>Code</u>
EU Habitats Directive Annex I	Alpine and Boreal heaths	4060

**Descriptive or diagnostic parameters**

<b>Parameter</b>	<b>Value(s)</b>
Exposure characteristics:	Frost
Dominant life forms:	Ericoid shrubs; Evergreen shrubs
Related phytosociological units:	<i>Berberidion vulgaris</i> ; <i>Bruckenthalion spiculifoliae</i> ; <i>Caricion firmae</i> ; <i>Caricion nardinae</i> ; <i>Chrysopogoni-Saturejon</i> ; <i>Cymbalarion hepaticifoliae</i> ; <i>Cytision oromediterranei</i> ; <i>Ericion carnea</i> ; <i>Erico-Pinion sylvestris</i> ; <i>Genistion pilosae</i> ; <i>Genisto-Vaccinion</i> ; <i>Juniperion nanae</i> ; <i>Loiseleurio-Diapension</i> ; <i>Loiseleurio-Vaccinion</i> ; <i>Oxytropido-Elynon</i> ; <i>Phyllodoco-Vaccinion myrtilli</i> ; <i>Piceion excelsae</i> ; <i>Pino mugo-Ericion</i> ; <i>Pino sylvestris-Juniperion sabinae</i> ; <i>Rhododendro-Vaccinion</i> ; <i>Seslerietalia albicantis</i> ; <i>Seslerietalia tenuifoliae</i>

**EUNIS habitat code and names** F2.3 Subalpine deciduous scrub**Description**

Subalpine scrubs of *Alnus*, *Betula*, *Salix* and Rosaceae (*Amelanchier*, *Potentilla*, *Rubus*, *Sorbus*), less than 5 m tall, often accompanied by tall herbs that in the absence of scrub would be classified as E5.5. Excludes dwarf

*Salix* scrub (F2.1), which is composed of species that rarely exceed 1.5 m in height, and scrub on waterlogged soils (F9.2).

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004a)

**Legal instruments**

<u>Legal instrument</u>	<u>Legally designated habitat</u>	<u>Code</u>
EU Habitats Directive Annex I	Sub-Arctic <i>Salix</i> spp scrub	4080

**Descriptive or diagnostic parameters**

<b>Parameter</b>	<b>Value(s)</b>
Exposure characteristics:	Sheltered from frost ; Sheltered from wind action; Very sheltered from wind action; Extremely sheltered from wind action; Ultra sheltered from wind action
Dominant life forms:	Broadleaved deciduous shrubs
Related phytosociological units:	<i>Adenostyletalia alliariae</i> ; <i>Adenostylon alliariae</i> ; <i>Alnion viridis</i> ; <i>Calamagrostion arundinaceae</i> ; <i>Calamagrostion villosae</i> ; <i>Cymbalarion hepaticifoliae</i> ; <i>Juniperion nanae</i> ; <i>Linarion filicaulis</i> ; <i>Piceion excelsae</i> ; <i>Rhododendro-Vaccinion</i> ; <i>Salicion helveticae</i> ; <i>Salicion pentandrae</i> ; <i>Salicion silesiaca</i> ; <i>Sambuco racemosae-Salicion capreae</i>

**EUNIS habitat code and names** F2.4 Conifer scrub close to the tree limit

**Description**

Scrubland with dwarf conifers (krummholz), often with incomplete canopy cover, close to the tree limit. At the arctic tree limit, the trees are of species that can grow to large stature under favourable conditions. However *Pinus mugo* of central and southern Europe is often genetically fixed as a shrub. Excluded are stands of forest conifers with height > 3 m (G3).

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004a)

**Legal instruments**

<u>Legal instrument</u>	<u>Legally designated habitat</u>	<u>Code</u>
EU Habitats Directive Annex I	Bushes with <i>Pinus mugo</i> and <i>Rhododendron hirsutum</i> ( <i>Mugo-Rhododendretum hirsuti</i> )	4070

**Descriptive or diagnostic parameters**

<b>Parameter</b>	<b>Value(s)</b>
Dominant life forms:	Evergreen shrubs
Related phytosociological units:	<i>Ledo-Pinion</i> ; <i>Piceion excelsae</i> ; <i>Pinion mugo</i> ; <i>Pino mugo-Ericion</i> ; <i>Rhododendro-Vaccinion</i>

**EUNIS habitat code and names** F3 Temperate and mediterranean-montane scrub

**Description**

Shrub communities of nemoral affinities. They include deciduous and evergreen scrubs or brushes of the nemoral zone, and deciduous scrubs of the submediterranean and supramediterranean zones. Excluded are heathlands with dominant *Ericaceae* F4, and the typically mediterranean maquis F5, garrigue F6 and phrygana F7.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004a)

**Descriptive or diagnostic parameters**

<b>Parameter</b>	<b>Value(s)</b>
Climate zones:	Mediterraneo-montane; Temperate
Dominant life forms:	Trees < =5m / low trees; Shrubs; Dwarf shrubs; Evergreen shrubs; Mixed deciduous and evergreen shrubs; Broadleaved deciduous shrubs
Cover characteristics (when used as criteria):	Vegetation >30%

**EUNIS habitat code and names** F3.1 Temperate thickets and scrub

**Description**

Successional and plagioclimax scrub, mostly deciduous, of Atlantic, sub-Atlantic or subcontinental affinities, characteristic of the nemoral zone, but also colonizing cool, moist or disturbed stations of the mediterranean evergreen forest zone. Included are thickets of *Buxus sempervirens*, *Corylus avellana*, *Cytisus scoparius*, *Juniperus communis*, *Prunus spinosa*, *Rubus fruticosus* and *Ulex europaeus*.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004a)

**Legal instruments**

<u>Legal instrument</u>	<u>Legally designated habitat</u>	<u>Code</u>
EU Habitats Directive Annex I	Stable xerothermophilous formations with <i>Buxus sempervirens</i> on rock slopes ( <i>Berberidion</i> pp)	5110
	<i>Juniperus communis</i> formations on heaths or calcareous grasslands	5130

### Descriptive or diagnostic parameters

Parameter	Value(s)
Climate zones:	Temperate
Dominant life forms:	Shrubs; Mixed deciduous and evergreen shrubs; Broadleaved deciduous shrubs
Related phytosociological units:	<i>Adenocarpion decorticans</i> ; <i>Berberidion vulgaris</i> ; <i>Carpinion betuli</i> ; <i>Carpinion orientalis</i> ; <i>Carpino-Prunio</i> ; <i>Dicrano-Pinion</i> ; <i>Frangulo alni-Pyrion cordatae</i> ; <i>Genistion floridae</i> ; <i>Genistion polygaliphyllae</i> ; <i>Prunetalia spinosae</i> ; <i>Pruno-Rubion radulae</i> ; <i>Rhamno-Prunetea</i> ; <i>Sambucetalia racemosae</i> ; <i>Tilio-Acerion</i> ; <i>Ulicetalia minoris</i>

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### EUNIS habitat code and names F3.2 Submediterranean deciduous thickets and brushes

#### Description

Successional and plagioclimax scrub, mostly deciduous, of the submediterranean and supramediterranean zones, but also colonizing cool, moist or disturbed stations of the mediterranean evergreen forest zone. Included are some non-leafy brushes, for example *Cytisus purgans* and *Genista aetnensis*.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004a)

#### Legal instruments

Legal instrument	Legally designated habitat	Code
EU Habitats Directive Annex I	Mountain <i>Cytisus purgans</i> formations	5120

### Descriptive or diagnostic parameters

Parameter	Value(s)
Climate zones:	Mediterraneo-montane
Dominant life forms:	Shrubs; Mixed deciduous and evergreen shrubs; Broadleaved deciduous shrubs
Related phytosociological units:	<i>Berberidion vulgaris</i> ; <i>Carpinion orientalis</i> ; <i>Cytision oromediterranei</i> ; <i>Fagion sylvaticae</i> ; <i>Fraxino orn-Cotinion</i> ; <i>Genistion floridae</i> ; <i>Genistion polygaliphyllae</i> ; <i>Lonicero-Berberidion hispanicae</i> ; <i>Paliuro-Carpinion orientalis</i> ; <i>Pruno tenellae-Syringion</i> ; <i>Pruno-Rubion ulmifolii</i> ; <i>Sambuco racemosae-Salicion capreae</i> ; <i>Syringo-Carpinion orientalis</i>

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### EUNIS habitat code and names F4 Temperate shrub heathland

#### Description

Shrub communities of nemoral affinities, in which *Ericaceae* are dominant or at least prominent. Such heaths are best developed on acid soils in the Atlantic zone and also in sub-Atlantic Europe.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004a)

### Descriptive or diagnostic parameters

Parameter	Value(s)
Climate zones:	Mediterraneo-montane; Temperate
Dominant life forms:	Shrubs; Dwarf shrubs; Ericoid shrubs; Evergreen shrubs
Cover characteristics (when used as criteria):	Vegetation >30%

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### EUNIS habitat code and names F4.1 Wet heaths

#### Description

Wet or humid ericoid-shrub dominated heaths of the Atlantic and sub-Atlantic zones, developed on peaty or semipeaty soils, waterlogged for at least part of the year, sometimes temporarily inundated, and usually moist even in summer.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004a)

#### Legal instruments

Legal instrument	Legally designated habitat	Code
EU Habitats Directive Annex I	Northern Atlantic wet heaths with <i>Erica tetralix</i>	4010
	Temperate Atlantic wet heaths with <i>Erica ciliaris</i> and <i>Erica tetralix</i>	4020
Council of Europe Bern Convention Res. No. 4 1996	European wet heaths	31.1

### Descriptive or diagnostic parameters

Parameter	Value(s)
Dominant life forms:	Ericoid shrubs
Characteristics of wetness or dryness:	Seasonally wet; Moist / mesic
Related phytosociological units:	<i>Daboecion cantabricae</i> ; <i>Ericion tetralicis</i> ; <i>Genistion micrantho-anglicae</i> ; <i>Oxycocco-Ericion tetralicis</i> ; <i>Ulici-Ericion ciliaris</i> ; <i>Ulicion minoris</i>

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**EUNIS habitat code and names** F4.2 Dry heaths**Description**

Heaths on siliceous, podsolic, rarely- or never-waterlogged soils in moist Atlantic and sub-Atlantic climates of the plains and low mountains of Western and Central Europe.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004a)

**Legal instruments**

<u>Legal instrument</u>	<u>Legally designated habitat</u>	<u>Code</u>
EU Habitats Directive Annex I	Dry sand heaths with <i>Calluna</i> and <i>Genista</i>	2310
	Dry sand heaths with <i>Calluna</i> and <i>Empetrum nigrum</i>	2320
	European dry heaths	4030
	Dry Atlantic coastal heaths with <i>Erica vagans</i>	4040
Council of Europe Bern Convention Res. No. 4 1996	European dry heaths	31.2

**Descriptive or diagnostic parameters**

<b>Parameter</b>	<b>Value(s)</b>
Dominant life forms:	Shrubs; Ericoid shrubs
Characteristics of wetness or dryness:	Dry
Related phytosociological units:	<i>Daboecion cantabricae</i> ; <i>Dactylido maritimae-Ulicion maritimi</i> ; <i>Ericion cinereae</i> ; <i>Ericion umbellatae</i> ; <i>Genistion micrantho-anglicae</i> ; <i>Genistion pilosae</i> ; <i>Genisto-Vaccinion</i> ; <i>Koelerio-Phleion phleoidis</i> ; <i>Loiseleurio-Diapension</i> ; <i>Loiseleurio-Vaccinion</i> ; <i>Ulici-Ericion ciliaris</i> ; <i>Ulicion minoris</i> ; <i>Violion caninae</i>

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**EUNIS habitat code and names** F4.3 Macaronesian heaths**Description**

Heaths of the Canary Islands, Azores and Madeira.

**Source** Devillers, P., Devillers-Terschuren, J. and Vander Linden, C. (2001)

**Legal instruments**

<u>Legal instrument</u>	<u>Legally designated habitat</u>	<u>Code</u>
EU Habitats Directive Annex I	Endemic macaronesian heaths	4050
Council of Europe Bern Convention Res. No. 4 1996	Macaronesian heaths	31.3

**Descriptive or diagnostic parameters**

<b>Parameter</b>	<b>Value(s)</b>
Dominant life forms:	Shrubs; Ericoid shrubs
Related phytosociological units:	<i>Myrico fayae-Ericion arboreae</i> ; <i>Pruno-Lauretea azoricae</i>

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**EUNIS habitat code and names** F5 Maquis, arborescent matorral and thermo-Mediterranean brushes**Description**

Evergreen sclerophyllous or lauriphyllous shrub vegetation, with a closed or nearly closed canopy structure, having nearly 100% cover of shrubs, with few annuals and some vernal geophytes; trees are nearly always present, some of which may be in shrub form. Shrubs, sometimes tall, of *Arbutus*, *Cistus*, *Cytisus*, *Erica*, *Genista*, *Lavandula*, *Myrtus*, *Phillyrea*, *Pistacia*, *Quercus* and *Spartium* are typical. Included is pseudomaquis, in which the dominants are mixed deciduous and evergreen shrubs.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004a)

**Descriptive or diagnostic parameters**

<b>Parameter</b>	<b>Value(s)</b>
Climate zones:	Mediterranean; Sub-desert
Dominant life forms:	Shrubs; Evergreen shrubs; Sclerophyllous shrubs; Mixed deciduous and evergreen shrubs; Broadleaved deciduous shrubs
Cover characteristics (when used as criteria):	Vegetation >30%; bare ground negligible
Characteristics of wetness or dryness:	Dry

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**EUNIS habitat code and names** F5.1 Arborescent matorral**Description**

Successional and plagioclimax evergreen sclerophyllous or lauriphyllous vegetation of mediterranean or warm-temperate humid affinities with a more or less dense, broken or low arborescent cover and with a usually thick, high evergreen shrub stratum. Arborescent matorral derives mostly from degradation or regrowth of broad-leaved

evergreen forests (G2) or is intermediate between them and maquis (F5.2); some derives from thermophilous deciduous (G1.7) or conifer (G3.7) forests.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004a)

**Legal instruments**

<u>Legal instrument</u>	<u>Legally designated habitat</u>	<u>Code</u>
EU Habitats Directive Annex I	Arborescent matorral with <i>Juniperus</i> spp	5210
	Arborescent matorral with <i>Zyziphus</i>	5220
	Arborescent matorral with <i>Laurus nobilis</i>	5230
	Dehesas with evergreen <i>Quercus</i> spp	6310

**Descriptive or diagnostic parameters**

<b>Parameter</b>	<b>Value(s)</b>
Dominant life forms:	Arborescent shrubs
Characteristics of wetness or dryness:	Dry
Related phytosociological units:	<i>Acer sempervirens-Cupression sempervirentis</i> ; <i>Arbuto andrachnae-Quercion cocciferae</i> ; <i>Arbuto unedonis-Laurion nobilis</i> ; <i>Asterion creticae</i> ; <i>Carpinion betuli</i> ; <i>Ceratonio-Rhamnion oleoidis</i> ; <i>Cisto-Ericion</i> ; <i>Juniperion turbinatae</i> ; <i>Periplocion angustifoliae</i> ; <i>Pistacio lentisci-Rhamnietalia alaterni</i> ; <i>Quercetalia ilicis</i> ; <i>Quercetalia ilicis</i> ; <i>Quercion confertae</i> ; <i>Quercion ilicis</i> ; <i>Rosmarinetalia officinalis</i> ; <i>Verbascion spinosi</i>

**EUNIS habitat code and names** F5.2 Maquis

**Description**

Evergreen sclerophyllous or lauriphylous shrub vegetation, with a more or less closed canopy structure, and with few annuals, some geophytes and often scattered trees, some of which may be in shrub form. Unlike arborescent matorral, maquis is typically dominated by species that do not have the potential to grow into tall trees. In high maquis these may be *Arbutus* spp., *Erica arborea*, *Erica scoparia*, *Juniperus oxycedrus*, *Phillyria* spp. In low maquis, *Cistus* spp., *Erica* spp., *Genista* spp., *Lavandula* spp. may predominate.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004b)

**Descriptive or diagnostic parameters**

<b>Parameter</b>	<b>Value(s)</b>
Dominant life forms:	Shrubs; Evergreen shrubs; Sclerophyllous shrubs
Characteristics of wetness or dryness:	Dry
Related phytosociological units:	<i>Asparago albi-Rhamnion oleoidis</i> ; <i>Ceratonio-Rhamnion oleoidis</i> ; <i>Cistion ladaniferi</i> ; <i>Cistion laurifolii</i> ; <i>Cisto-Ericion</i> ; <i>Coremion albi</i> ; <i>Cytisetalia scopario-striati</i> ; <i>Ericion arboreae</i> ; <i>Ericion umbellatae</i> ; <i>Juniperion turbinatae</i> ; <i>Lavanduletalia stoechadis</i> ; <i>Oleo-Ceratonion siliquae</i> ; <i>Periplocion angustifoliae</i> ; <i>Quercetalia ilicis</i> ; <i>Quercion ilicis</i> ; <i>Rhamno lycioidis-Quercion cocciferae</i> ; <i>Stauracanthion boivinii</i> ; <i>Ulicetalia minoris</i> ; <i>Ulici argentei-Cistion ladaniferi</i>

**EUNIS habitat code and names** F5.3 Pseudomaquis

**Description**

Mixed sclerophyllous evergreen and deciduous shrub thickets of the periphery of the range of Mediterranean sclerophyllous scrublands. They include, in particular, shrub formations of the Balkan and Italian peninsulas intermediate between Mediterranean maquis and schibljak, resulting from the degradation of thermophilous deciduous woodland G1.7, with a mixture of evergreen and deciduous bushes including *Quercus coccifera*, *Juniperus oxycedrus*, *Quercus trojana*, *Carpinus orientalis*, *Ostrya carpinifolia*, *Pistacia terebinthus*, *Buxus sempervirens*, *Berberis cretica*, *Paliurus spina-christi*, *Pyrus spinosa*, *Rosa* spp., similar Iberian formations with *Amelanchier ovalis*, *Prunus lusitanica*, *Ilex aquifolium*, French and Italian formations with *Quercus pubescens* and *Quercus ilex*, formations of Mediterranean Asia Minor and the Levant dominated by mixed deciduous and evergreen shrubs or small trees, in particular, *Quercus coccifera* (*Quercus calliprinos*) and *Pistacia palaestina*.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004a)

**Descriptive or diagnostic parameters**

<b>Parameter</b>	<b>Value(s)</b>
Dominant life forms:	Mixed deciduous and evergreen shrubs
Characteristics of wetness or dryness:	Dry
Related phytosociological units:	<i>Carpinion orientalis</i> ; <i>Juniperio excelsae-Quercion pubescentis</i> ; <i>Paliuro-Carpinion orientalis</i> ; <i>Pruno-Rubion radulae</i> ; <i>Quercetalia pubescentis</i> ; <i>Quercion petraeae</i> ; <i>Quercion rotundifoliae-Oleion sylvestris</i> ; <i>Syringo-Carpinion orientalis</i>

**EUNIS habitat code and names** F5.4 English name: Spanish-broom (*Spartium junceum*)

fields;

Scientific name: *Spartium junceum* fields

#### Description

Thickets and brushes of Spanish broom, *Spartium junceum*, widespread in mediterranean and sub-mediterranean areas of western Europe.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004a)

#### Descriptive or diagnostic parameters

Parameter	Value(s)
Dominant life forms:	Shrubs; Sclerophyllous shrubs
Characteristics of wetness or dryness:	Dry
Related phytosociological units:	<i>Artemisietea vulgaris</i> ; <i>Brometalia erecti</i> ; <i>Quercetea ilicis</i> ; <i>Quercetea pubescentis</i> ; <i>Rhamno-Prunetea</i>

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#### EUNIS habitat code and names F5.5 Thermo-Mediterranean scrub

##### Description

Shrub formations characteristic of the thermo-Mediterranean zone. Included here are those formations, for the most part indifferent to the siliceous or calcareous nature of the substrate, that reach their greatest extent or optimal development in the thermo-Mediterranean zone, typically with abundant *Pistacia lentiscus*, *Myrtus communis*, *Phillyrea* spp., *Erica manipuliflora*, *Styrax officinalis*, *Genista fasselata*, *Euphorbia dendroides*, *Calicotome villosa* and *Sarcopoterium spinosum*. Also included are the numerous, strongly characterized, thermophile formations endemic to the south of the Iberian peninsula, mostly thermo-Mediterranean but sometimes meso-Mediterranean; in their great local diversity they are a western counterpart of, and sometimes approach in appearance, the mostly eastern Mediterranean phrygas F7.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004a)

##### Legal instruments

Legal instrument	Legally designated habitat	Code
EU Habitats Directive Annex I	Cistus palhinhae formations on maritime wet heaths	5140
	Laurus nobilis thickets	5310
	Low formations of Euphorbia close to cliffs	5320
	Thermo-Mediterranean and pre-desert scrub	5330

#### Descriptive or diagnostic parameters

Parameter	Value(s)
Climate zones:	Thermo-Mediterranean
Dominant life forms:	Shrubs; Sclerophyllous shrubs
Characteristics of wetness or dryness:	Dry
Related phytosociological units:	<i>Adenocarpion decorticantis</i> ; <i>Anthyllido terniflorae-Salsolion papillosae</i> ; <i>Asparago albi-Rhamnion oleoidis</i> ; <i>Ceratonio-Rhamnion oleoidis</i> ; <i>Coremion albi</i> ; <i>Cymbopogoni-Brachypodietalia</i> ; <i>Cytisetea scopario-striati</i> ; <i>Ericion umbellatae</i> ; <i>Eryngio trifidi-Ulicion erinacei</i> ; <i>Genistion floridae</i> ; <i>Genistion micrantho-anglicae</i> ; <i>Genistion polygaliphyllae</i> ; <i>Genisto spartioidis-Phlomidion almeriensis</i> ; <i>Juniperion turbinatae</i> ; <i>Oleo-Ceratonion siliquae</i> ; <i>Periplocion angustifoliae</i> ; <i>Pistacio lentisci-Rhamnetalia alaterni</i> ; <i>Pruno-Rubion radulae</i> ; <i>Retamion sphaerocarphae</i> ; <i>Rhamno lycioidis-Quercion cocciferae</i> ; <i>Rosmarinion officinalis</i> ; <i>Sideritidion bourgaeanae</i> ; <i>Staehelino-Ulicion baetici</i> ; <i>Stauracanthion boivinii</i> ; <i>Teucrion mari</i> ; <i>Thymo moroderi-Sideritidion leucanthae</i> ; <i>Ulici argentei-Cistion ladaniferi</i> ; <i>Ulici europaei-Cytision striate</i>

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#### EUNIS habitat code and names F6 Garrigue

##### Description

Evergreen sclerophyllous or lauriphyllous shrub vegetation, with an open canopy structure and some bare ground, usually with many winter annuals and vernal geophytes. Low shrubs of *Cistus*, *Lavandula*, *Rosmarinus* and *Stoechas* are usually present, and there may be some larger shrubs and scattered trees. Garrigue is found mostly in the Mediterranean, Macaronesian and Pontic regions, where it typically derives from degradation or regrowth of broad-leaved evergreen forests (G2), but it extends into deciduous forest areas in the supra-Mediterranean zone and sub-Mediterranean zones and into steppe areas in Anatolia. Includes scrubby land with mainly herbaceous vegetation and a large component of unpalatable non-vernal monocots (*Asphodelus*, *Urginia*) and thistles, provided that shrub cover exceeds 10%.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004a)

#### Descriptive or diagnostic parameters

Parameter	Value(s)
Climate zones:	Mediterranean; Sub-desert
Dominant life forms:	Evergreen shrubs; Sclerophyllous shrubs; Mixed deciduous and evergreen shrubs; Broadleaved deciduous shrubs

Cover characteristics (when used as criteria): Vegetation >30%; bare ground >30%  
Characteristics of wetness or dryness: Dry

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### EUNIS habitat code and names F6.1 Western garrigues

#### Description

Shrubby formations, often low, on mostly calcareous soils of the meso-mediterranean zone of the Iberian peninsula, France, Italy and the large western Mediterranean islands, notably the Balearics, Corsica, Sardinia, Sicily and Malta. Included here are those formations that reach their optimal development within the meso-mediterranean zone although they often enter the thermo- or supra-mediterranean levels.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004a)

#### Descriptive or diagnostic parameters

Parameter	Value(s)
Dominant life forms:	Evergreen shrubs; Sclerophyllous shrubs; Mixed deciduous and evergreen shrubs; Broadleaved deciduous shrubs
Characteristics of wetness or dryness:	Dry
Related phytosociological units:	<i>Anthyllion hermanniae</i> ; <i>Aphyllanthion</i> ; <i>Crithmo-Staticetea</i> ; <i>Helichryso stoechadis-Santolinetalia squarrosae</i> ; <i>Hypericion balearici</i> ; <i>Hypericion ericoidis</i> ; <i>Ononidetalia striatae</i> ; <i>Quercion ilicis</i> ; <i>Rhamno lycioidis-Quercion cocciferae</i> ; <i>Rosmarinetalia officinalis</i> ; <i>Rosmarinetea officinalis</i> ; <i>Rosmarinion officinalis</i> ; <i>Sideritido incanae-Salvion lavandulifoliae</i> ; <i>Thero-Brachypodion</i>

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### EUNIS habitat code and names F6.2 Eastern garrigues

#### Description

Shrubby formations, often low, of the meso-, thermo- and occasionally supramediterranean zones of Greece, southern Albania, Cyprus and southern Anatolia. Included here are all sclerophyllous formations, regardless of substrate, except those with conspicuous spiny cushion structure (F7), those with abundant thermo-Mediterranean scrub species (F5.5) and high maquis with *Erica arborea* and *Arbutus* spp. (F5.2).

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004a)

#### Descriptive or diagnostic parameters

Parameter	Value(s)
Dominant life forms:	Evergreen shrubs; Sclerophyllous shrubs; Mixed deciduous and evergreen shrubs; Broadleaved deciduous shrubs
Characteristics of wetness or dryness:	Dry
Related phytosociological units:	<i>Arbuto andrachnae-Quercion cocciferae</i> ; <i>Cisto-Hypericion bithynici</i> ; <i>Cisto-Micromerietea julianae</i> ; <i>Dorycnio-Coridothymion capitati</i> ; <i>Hyparrhenion hirtae</i> ; <i>Hyperico empetrifolii-Micromerion graecae</i> ; <i>Paliuro-Carpinion orientalis</i> ; <i>Pistacio lentisci-Rhamnetalia alaterni</i>

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### EUNIS habitat code and names F6.3 Illyrian garrigues

#### Description

Shrubby formations, often low, of the meso- and occasionally supra-Mediterranean zones of the Adriatic lowlands of the Balkan peninsula from Istria to southern Albania. Included here are all sclerophyllous formations, regardless of substrate, except high maquis (F5.2) with *Erica arborea* and *Arbutus* spp.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004a)

#### Descriptive or diagnostic parameters

Parameter	Value(s)
Dominant life forms:	Evergreen shrubs; Sclerophyllous shrubs; Mixed deciduous and evergreen shrubs; Broadleaved deciduous shrubs
Characteristics of wetness or dryness:	Dry
Related phytosociological units:	<i>Cisto-Ericion</i> ; <i>Cisto-Hypericion bithynici</i> ; <i>Cisto-Micromerietea julianae</i> ; <i>Paliuro-Carpinion orientalis</i> ; <i>Pistacio lentisci-Rhamnetalia alaterni</i> ; <i>Quercion ilicis</i>

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### EUNIS habitat code and names F6.4 Black Sea garrigues

#### Description

Shrubby formations of the Mediterranean enclaves of the Black Sea coasts, in Crimea, southern Bulgaria, Turkey-in-Europe and northern Anatolia, as well as of the Mediterraneo-steppic zone of southern Thrace. Included here are all sclerophyllous formations, regardless of substrate, except high maquis (F5.2) with *Erica arborea* and *Arbutus* spp. and *Phryganas* (F7).

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004a)

**Descriptive or diagnostic parameters**

<b>Parameter</b>	<b>Value(s)</b>
Dominant life forms:	Evergreen shrubs; Sclerophyllous shrubs; Mixed deciduous and evergreen shrubs; Broadleaved deciduous shrubs
Characteristics of wetness or dryness:	Dry
Related phytosociological units:	<i>Cisto-Micromerietea julianae</i> ; <i>Ptilostemonion</i>

**EUNIS habitat code and names** F6.5 Macaronesian garrigues**Description**

Low shrub vegetation with an open canopy, of the Canary Islands, Azores and Madeira.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004b)

**Descriptive or diagnostic parameters**

<b>Parameter</b>	<b>Value(s)</b>
Dominant life forms:	Evergreen shrubs; Sclerophyllous shrubs; Mixed deciduous and evergreen shrubs; Broadleaved deciduous shrubs
Characteristics of wetness or dryness:	Dry

**EUNIS habitat code and names** F6.6 Supra-Mediterranean garrigues**Description**

Low shrub formations with pronounced Mediterranean affinities formed as a degradation stage of thermophilous deciduous woodland (G1.7) or sometimes of evergreen *Quercus* woodland (G2.1) in the supra-Mediterranean belt of the Mediterranean region. Included here are only those formations that are characteristic of the supra-Mediterranean level; formations, particularly of the lower supra-Mediterranean, that are closely related to meso-Mediterranean communities have been included under F6.1, F6.2, F6.3 or F6.4.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004a)

**Descriptive or diagnostic parameters**

<b>Parameter</b>	<b>Value(s)</b>
Climate zones:	Supra-Mediterranean
Dominant life forms:	Evergreen shrubs; Sclerophyllous shrubs; Mixed deciduous and evergreen shrubs; Broadleaved deciduous shrubs; Thermophile species
Characteristics of wetness or dryness:	Dry
Related phytosociological units:	<i>Aphyllanthion</i> ; <i>Calluno-Ulicetea</i> ; <i>Lavandulo lanatae-Genistion boissieri</i> ; <i>Ononidetalia striatae</i> ; <i>Ononidion striatae</i> ; <i>Paliuro-Carpinion orientalis</i> ; <i>Prunetalia spinosae</i> ; <i>Rosmarinetea officinalis</i>

**EUNIS habitat code and names** F6.7 Mediterranean gypsum scrubs**Description**

Garrigues occupying gypsum-rich soils of the Iberian peninsula, usually very open and floristically characterised by the presence of numerous gypsophilous species, among which *Gypsophila struthium*, *Gypsophila hispanica*, *Centaurea hyssopifolia*, *Teucrium libanitis*, *Ononis tridentata*, *Lepidium subulatum*, *Herniaria fruticosa*, *Reseda stricta*, *Helianthemum squamatum*. They are often rich in thymes (*Thymus*), germanders (*Teucrium*), rockroses (*Helianthemum*), composites (*Centaurea*, *Jurinea*, *Santolina*), *Frankenia*.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004a)

**Legal instruments**

<u>Legal instrument</u>	<u>Legally designated habitat</u>	<u>Code</u>
EU Habitats Directive Annex I	Iberian gypsum vegetation (Gypsophiletalia)	1520
Council of Europe Bern Convention Res. No. 4 1996	Mediterranean gypsum scrubs	15.9

**Descriptive or diagnostic parameters**

<b>Parameter</b>	<b>Value(s)</b>
Dominant life forms:	Evergreen shrubs; Sclerophyllous shrubs; Mixed deciduous and evergreen shrubs; Broadleaved deciduous shrubs; Gypsophile species
Cover characteristics (when used as criteria):	Bare ground >30%
Characteristics of wetness or dryness:	Dry
Chemical attributes:	Gypsum-rich
Related phytosociological units:	<i>Lepidion subulati</i> ; <i>Thymo-Teucrium verticillati</i>

**EUNIS habitat code and names** F6.8 Xero-halophile scrubs



**Description**

Salt-tolerant shrub formations of dry ground in low-precipitation areas of the mediterranean zone, in particular, the Iberian peninsula and Sicily, and of the Macaronesian Islands.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004a)

**Legal instruments**

<u>Legal instrument</u>	<u>Legally designated habitat</u>	<u>Code</u>
EU Habitats Directive Annex I	Halo-nitrophilous scrubs (Pegano-Salsoletea)	1430
Council of Europe Bern Convention Res. No. 4 1996	Mediterraneo-Canarian xero-halophile scrubs	15.7

**Descriptive or diagnostic parameters**

<b>Parameter</b>	<b>Value(s)</b>
Dominant life forms:	Evergreen shrubs; Sclerophyllous shrubs; Mixed deciduous and evergreen shrubs; Broadleaved deciduous shrubs; Halophile species
Characteristics of wetness or dryness:	Dry; Arid
Chemical attributes:	Saline
Related phytosociological units:	<i>Chenoleion tomentosae</i> ; <i>Cisto monspeliensis-Micromerietalia hyssopifoliae</i> ; <i>Forsskaoleo angustifoliae-Rumicetalia lunariae</i> ; <i>Helichryso stoechadis-Santolinetalia squarrosae</i> ; <i>Oleo cerasiformis-Rhamnetea crenulatae</i> ; <i>Oleo-Rhamnetalia crenulatae</i> ; <i>Polycarpaeo niveae-Traganetea moquini</i> ; <i>Salsolo vermiculatae-Peganelalia harmalae</i>

**EUNIS habitat code and names** F7 Spiny Mediterranean heaths (phrygana, hedgehog-heaths and related coastal cliff vegetation)

**Description**

Shrublands with dominant low spiny shrubs, widespread in Mediterranean and Anatolian regions with a summer-dry climate, occurring from sea level to high altitudes on dry mountains.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004b)

**Legal instruments**

<u>Legal instrument</u>	<u>Legally designated habitat</u>	<u>Code</u>
Council of Europe Bern Convention Res. No. 4 1996	Hedgehog-heaths PHRYGANA	31.7 33

**Descriptive or diagnostic parameters**

<b>Parameter</b>	<b>Value(s)</b>
Dominant life forms:	Sclerophyllous shrubs; Spiny cushion-forming shrubs
Cover characteristics (when used as criteria):	Vegetation >30%
Characteristics of wetness or dryness:	Dry

**EUNIS habitat code and names** F7.1 West Mediterranean spiny heaths

**Description**

Spiny shrublands, mainly on coastal cliffs, of the western Mediterranean region.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004b)

**Legal instruments**

<u>Legal instrument</u>	<u>Legally designated habitat</u>	<u>Code</u>
EU Habitats Directive Annex I	West Mediterranean clifftop phryganas ( <i>Astragalo-Plantaginetum subulatae</i> )	5410
Council of Europe Bern Convention Res. No. 4 1996	Endemic phryganas of the Euphorbio-Verbascion PHRYGANA	5430 33

**Descriptive or diagnostic parameters**

<b>Parameter</b>	<b>Value(s)</b>
Altitude zones (terrestrial and marine):	Coastal; Planar; Collinar
Dominant life forms:	Sclerophyllous shrubs; Spiny cushion-forming shrubs
Characteristics of wetness or dryness:	Dry
Related phytosociological units:	<i>Crithmo-Staticetalia</i> ; <i>Crithmo-Staticion</i> ; <i>Launaeion cervicornis</i> ; <i>Pistacio lentisci-Rhamnetalia alaterni</i>

**EUNIS habitat code and names** F7.2 Central Mediterranean spiny heaths

**Description**

Spiny shrublands, mainly coastal, of the central Mediterranean region.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004b)

#### Legal instruments

<u>Legal instrument</u>	<u>Legally designated habitat</u>	<u>Code</u>
EU Habitats Directive Annex I	Endemic phryganas of the Euphorbio-Verbascion	5430
Council of Europe Bern Convention Res. No. 4 1996	PHRYGANA	33

#### Descriptive or diagnostic parameters

<b>Parameter</b>	<b>Value(s)</b>
Altitude zones (terrestrial and marine):	Coastal; Planar; Collinar
Dominant life forms:	Sclerophyllous shrubs; Spiny cushion-forming shrubs
Characteristics of wetness or dryness:	Dry
Related phytosociological units:	<i>Anthyllion hermanniae</i> ; <i>Crithmo-Staticion</i> ; <i>Erico-Pinion sylvestris</i> ; <i>Hypericion balearici</i> ; <i>Piceion excelsae</i> ; <i>Pinion mugo</i> ; <i>Pino mugo-Ericion</i> ; <i>Rhododendro-Vaccinion</i> ; <i>Rosmarinion officinalis</i>

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### EUNIS habitat code and names F7.3 East Mediterranean phrygana

#### Description

Spiny shrublands, widespread at low and middle altitudes in the eastern Mediterranean and Anatolian regions. *Sarcopoterium spinosum* is a common dominant in the Aegean region.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004b)

#### Legal instruments

<u>Legal instrument</u>	<u>Legally designated habitat</u>	<u>Code</u>
EU Habitats Directive Annex I	Sarcopoterium spinosum phryganas	5420
Council of Europe Bern Convention Res. No. 4 1996	Endemic phryganas of the Euphorbio-Verbascion PHRYGANA	5430 33

#### Descriptive or diagnostic parameters

<b>Parameter</b>	<b>Value(s)</b>
Altitude zones (terrestrial and marine):	Coastal; Planar; Collinar
Dominant life forms:	Sclerophyllous shrubs; Spiny cushion-forming shrubs
Characteristics of wetness or dryness:	Dry
Related phytosociological units:	<i>Dorycnio-Coridothymion capitati</i> ; <i>Micromerion julianae</i> ; <i>Poterietalia spinosi</i> ; <i>Verbascion spinosi</i>

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### EUNIS habitat code and names F7.4 Hedgehog-heaths

#### Description

Primary cushion heaths of the high, dry mountains of the Mediterranean region and Anatolia, with low, cushion-forming, often spiny shrubs, in particular of genera *Acantholimon*, *Astragalus*, *Erinacea*, *Vella*, *Bupleurum*, *Ptilotrichum*, *Genista*, *Echinopartum*, *Anthyllis*, and various composites and labiates; secondary, zoogenic cushion heaths of the same regions, either downslope extensions of the high-altitude formations, and dominated by the same species, or specifically montane or steppic, often *Genista*-dominated in the Mediterranean region. Excluded are cushion-heaths of thermo-Mediterranean lowlands (F7.1, F7.2 and F7.3).

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004a)

#### Legal instruments

<u>Legal instrument</u>	<u>Legally designated habitat</u>	<u>Code</u>
EU Habitats Directive Annex I	Endemic oro-Mediterranean heaths with gorse	4090
Council of Europe Bern Convention Res. No. 4 1996	Hedgehog-heaths	31.7

#### Descriptive or diagnostic parameters

<b>Parameter</b>	<b>Value(s)</b>
Altitude zones (terrestrial and marine):	Montane (sensu stricto); Oromontane
Dominant life forms:	Sclerophyllous shrubs; Spiny cushion-forming shrubs
Characteristics of wetness or dryness:	Dry
Related phytosociological units:	<i>Andryalion agardhii</i> ; <i>Anthyllion hermanniae</i> ; <i>Aphyllanthion</i> ; <i>Armerion nebrodensis</i> ; <i>Asterion creticae</i> ; <i>Astragalo angustifolii-Seslerion coerulantis</i> ; <i>Campanulion jacquinii</i> ; <i>Cerastio-Astragalion nebrodensis</i> ; <i>Cistion ladaniferi</i> ; <i>Cytision oromediterranei</i> ; <i>Cytiso-Bromion caprini</i> ; <i>Daphno-Festucetea</i> ; <i>Echinopartion horridi</i> ; <i>Eryngio multifidi-Bromion fibrosi</i> ; <i>Festuco-Armerion sardoae</i> ; <i>Genistion lobelii</i> ; <i>Genistion occidentalis</i> ; <i>Genistion polygaliphyllae</i> ; <i>Hypericion balearici</i> ; <i>Lavandulo lanatae-Genistion boissieri</i> ; <i>Ononidetalia striatae</i> ; <i>Poterietalia spinosi</i> ; <i>Rumici-Astragalion siculi</i> ; <i>Saturejo-Scutellarietalia</i> ; <i>Seslerietalia tenuifoliae</i> ; <i>Spartocytision nubigeni</i> ; <i>Stipo pulcherrimae-Morinion persicae</i> ; <i>Teucrio pyrenaici-Bromion erecti</i> ; <i>Thlaspietalia rotundifolii</i> ; <i>Verbascion spinosi</i> ; <i>Xeroacantho-Erinaceion</i>

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**EUNIS habitat code and names** F8 Thermo-Atlantic xerophytic scrub

**Description**

Xerophytic scrub formations of the lower slopes of the Canary Islands and Madeira, rich in succulents, in particular cactiform or dendroid spurge *Euphorbia* spp., rosette-forming *Aeonium* spp. and composites.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004a)

**Descriptive or diagnostic parameters**

Parameter	Value(s)
Dominant life forms:	Succulents and composites
Cover characteristics (when used as criteria):	Vegetation >30%
Characteristics of wetness or dryness:	Dry

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**EUNIS habitat code and names** F8.1 Canary Island xerophytic scrub

**Description**

Xerophytic scrub of the Canary Islands. Varied types include stem succulents, leaf succulents and woody sclerophyllous shrubs.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004b)

**Descriptive or diagnostic parameters**

Parameter	Value(s)
Dominant life forms:	Succulents and composites
Characteristics of wetness or dryness:	Dry
Related phytosociological units:	<i>Aeonio-Euphorbion canariensis</i> ; <i>Greenovion aureae</i> ; <i>Launaeo arborescentis-Schizogynion sericeae</i> ; <i>Soncho-Sempervivion</i>

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**EUNIS habitat code and names** F8.2 Madeiran xerophytic scrub

**Description**

Xerophytic scrub of Madeira.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004b)

**Descriptive or diagnostic parameters**

Parameter	Value(s)
Dominant life forms:	Succulents and composites
Characteristics of wetness or dryness:	Dry
Related phytosociological units:	<i>Aeonio-Euphorbion canariensis</i> ; <i>Forsskaoleo angustifoliae-Rumicetalia lunariae</i> ; <i>Soncho-Sempervivion</i>

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**EUNIS habitat code and names** F9 Riverine and fen scrubs

**Description**

Riversides, lakesides, fens and marshy floodplains dominated by woody vegetation less than 5 m high.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004b)

**Descriptive or diagnostic parameters**

Parameter	Value(s)
Dominant life forms:	Shrubs
Cover characteristics (when used as criteria):	Vegetation >30%
Characteristics of wetness or dryness:	Fringing watercourses / riparian; Waterlogged; Wet and very wet

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**EUNIS habitat code and names** F9.1 Riverine scrub

**Description**

Scrub of broad-leaved willows, e.g. *Salix aurita*, *Salix cinerea*, *Salix pentandra*, beside rivers. Scrub of *Alnus* spp. and narrow-leaved willows, e.g. *Salix eleagnos*, where these are less than 5 m tall. Riverside scrub of *Hippophae rhamnoides* and *Myricaria germanica*. Excludes riversides dominated by taller narrow-leaved willows *Salix alba*, *Salix purpurea*, *Salix viminalis* (G1.1).

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004b)

**Legal instruments**

Legal instrument	Legally designated habitat	Code
EU Habitats Directive Annex I	Alpine rivers and their ligneous vegetation with <i>Myricaria germanica</i>	3230

Council of Europe Bern Convention Alpine rivers and their ligneous vegetation with *Salix elaeagnos* 3240  
 Res. No. 4 1996 Riparian willow formations 44.1

**Descriptive or diagnostic parameters**

<b>Parameter</b>	<b>Value(s)</b>
Dominant life forms:	Shrubs; Broadleaved deciduous shrubs
Characteristics of wetness or dryness:	Fringing watercourses / riparian
Related phytosociological units:	<i>Salicetalia purpureae</i> ; <i>Salicion albae</i> ; <i>Salicion eleagno-daphnoidis</i> ; <i>Salicion incanae</i> ; <i>Salicion salviifoliae</i> ; <i>Salicion triandrae</i> ; <i>Salicion triandro-neotrichae</i> ; <i>Tamaricion parviflorae</i>

**EUNIS habitat code and names** F9.2 English name: Willow carr and fen scrub;  
 Scientific name: *Salix* carr and fen scrub

**Description**

Low woods and scrubs colonizing fens, marshy floodplains and fringes of lakes and ponds, dominated by large or medium sized shrubby willows, generally *Salix aurita*, *Salix cinerea*, *Salix atrocinerea*, *Salix pentandra*, alone or in association with *Frangula alnus*, *Rhamnus cathartica*, *Alnus glutinosa* or *Betula pubescens*, any of which may dominate the upper canopy. In boreal regions and on cold subboreal plateaux, small shrubs may dominate, e.g. dwarf *Salix* spp. associated with *Betula humilis* or *Betula nana*. Excludes boreal and subalpine lakeside scrub on well drained soils (F2).

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004a)

**Descriptive or diagnostic parameters**

<b>Parameter</b>	<b>Value(s)</b>
Dominant life forms:	Shrubs; Broadleaved deciduous shrubs
Characteristics of wetness or dryness:	Waterlogged; Wet and very wet
Related phytosociological units:	<i>Salicion cinereae</i>

**EUNIS habitat code and names** F9.3 Southern riparian galleries and thickets

**Description**

Tamarisk, oleander, chaste tree galleries and thickets and similar low woody vegetation of permanent or temporary streams and wetlands of the thermo-Mediterranean zone and southwestern Iberia.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004a)

**Legal instruments**

<u>Legal instrument</u>	<u>Legally designated habitat</u>	<u>Code</u>
EU Habitats Directive Annex I	Southern riparian galleries and thickets (Nerio-Tamaricetea and Securinegion tinctoriae)	92D0
Council of Europe Bern Convention Res. No. 4 1996	Southern riparian galleries and thickets	44.8

**Descriptive or diagnostic parameters**

<b>Parameter</b>	<b>Value(s)</b>
Dominant life forms:	Shrubs
Characteristics of wetness or dryness:	Fringing watercourses / riparian
Related phytosociological units:	<i>Arbuto unedonis-Laurion nobilis</i> ; <i>Nerion oleandri</i> ; <i>Pruno-Lauretalia azoricae</i> ; <i>Salicion cinereae</i> ; <i>Securinegion buxifoliae</i> ; <i>Tamaricetalia africanae</i> ; <i>Tamaricion africanae</i> ; <i>Tamaricion boveano-canariensis</i>

**EUNIS habitat code and names** FA Hedgerows

**Description**

Woody vegetation forming strips within a matrix of grassy or cultivated land or along roads, typically used for controlling livestock, marking boundaries or providing shelter. Hedgerows differ from lines of trees (G5.1) in being composed of shrub species, or if composed of tree species then being regularly cut to a height less than 5 m.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004a)

**Descriptive or diagnostic parameters**

<b>Parameter</b>	<b>Value(s)</b>
Dominant life forms:	Shrubs
Cover characteristics (when used as criteria):	Vegetation >30%
Spatial characteristics (when used in criteria):	Linear feature

EUNIS habitat **code and names** FA.1 Hedgerows of non-native species

**Description**

Hedges planted with species not native in the vicinity. They may be exotics such as *Ligustrum ovalifolium* or European species outside their native range.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004b)

**Descriptive or diagnostic parameters**

<b>Parameter</b>	<b>Value(s)</b>
Human activities and impacts:	Anthropogenic impacts
Dominant life forms:	Shrubs
Species richness (when used in criteria):	Exotic species

---

EUNIS habitat **code and names** FA.2 Highly-managed hedgerows of native species

**Description**

Regularly clipped hedges composed of native species that were planted as a hedge.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004b)

**Descriptive or diagnostic parameters**

<b>Parameter</b>	<b>Value(s)</b>
Human activities and impacts:	Hedge trimming; Anthropogenic impacts
Levels of habitat usage (when used in criteria):	Intensive use / disturbance
Dominant life forms:	Shrubs
Species richness (when used in criteria):	Native species

---

EUNIS habitat **code and names** FA.3 Species-rich hedgerows of native species

**Description**

Hedgerows composed mainly of native species, with on average at least five native woody species per 25 m length, excluding undershrubs such as *Rubus fruticosus* or climbers such as *Clematis vitalba* or *Hedera helix*. In western Europe, many such hedges are thought to be medieval in origin.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004b)

**Descriptive or diagnostic parameters**

<b>Parameter</b>	<b>Value(s)</b>
Levels of habitat usage (when used in criteria):	Low level use / disturbance; No human use
Dominant life forms:	Shrubs; Herbs
Species richness (when used in criteria):	Species rich; native species

---

EUNIS habitat **code and names** FA.4 Species-poor hedgerows of native species

**Description**

Hedgerows composed mainly of native species, not neatly clipped or obviously planted as a hedge, with on average less than five woody species per 25 m length, excluding undershrubs such as *Rubus fruticosus* or climbers such as *Clematis vitalba* or *Hedera helix*.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004b)

**Descriptive or diagnostic parameters**

<b>Parameter</b>	<b>Value(s)</b>
Levels of habitat usage (when used in criteria):	Low level use / disturbance; No human use
Dominant life forms:	Shrubs
Species richness (when used in criteria):	Monospecific; species poor; native species

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EUNIS habitat **code and names** FB Shrub plantations

**Description**

Plantations of dwarf trees, shrubs, espaliers or perennial woody climbers, mostly cultivated for fruit or flower production, either intended to have permanent cover of woody plants when mature, or else for wood or small tree production with a regular whole-plant harvesting regime.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004a)

**Descriptive or diagnostic parameters**

<b>Parameter</b>	<b>Value(s)</b>
Human activities and impacts:	Horticulture; Large-scale, high intensity horticultural use; Large-scale, low intensity horticultural use; Small-scale, high intensity horticultural use; Small-

Dominant life forms: scale, low intensity horticultural use; Whole plant harvesting; Fruit and nut orchards; Fruit other than vines; Vines; Leaf or branch cultivation; Anthropogenic impacts  
 Cover characteristics (when used as criteria): Shrubs  
 Vegetation >30%

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**EUNIS habitat code and names** FB.1 Shrub plantations for whole-plant harvesting

**Description**

Includes shrub nurseries. Excludes tree nurseries and plantations of Christmas trees (G5.7).

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004b)

**Descriptive or diagnostic parameters**

<b>Parameter</b>	<b>Value(s)</b>
Human activities and impacts:	Whole plant harvesting; Anthropogenic impacts
Levels of habitat usage (when used in criteria):	Active management
Dominant life forms:	Shrubs

---

**EUNIS habitat code and names** FB.2 Shrub plantations for leaf or branch harvest

**Description**

Includes tea *Camellia sinensis* plantations, and osier *Salix viminalis* beds grown for basket-making.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004b)

**Descriptive or diagnostic parameters**

<b>Parameter</b>	<b>Value(s)</b>
Human activities and impacts:	Leaf or branch cultivation; Anthropogenic impacts
Levels of habitat usage (when used in criteria):	Active management
Dominant life forms:	Shrubs

---

**EUNIS habitat code and names** FB.3 Shrub plantations for ornamental purposes or for fruit, other

than vineyards

**Description**

Plantations of dwarf trees, shrubs, espaliers or perennial woody climbers other than grapevines, cultivated for fruit or flower production. They include, among others, berry-bearing bushes of *Ribes* and *Rubus*.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004b)

**Descriptive or diagnostic parameters**

<b>Parameter</b>	<b>Value(s)</b>
Human activities and impacts:	Fruit other than vines; Anthropogenic impacts
Levels of habitat usage (when used in criteria):	Active management
Dominant life forms:	Shrubs
Species richness (when used in criteria):	Exotic species

---

**EUNIS habitat code and names** FB.4 Vineyards

**Description**

Plantations of grapevine *Vitis vinifera*.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004a)

**Descriptive or diagnostic parameters**

<b>Parameter</b>	<b>Value(s)</b>
Human activities and impacts:	Vines; Anthropogenic impacts
Levels of habitat usage (when used in criteria):	Active management
Dominant life forms:	Shrubs

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## G WOODLAND, FOREST AND OTHER WOODED LAND

### Description

Woodland and recently cleared or burnt land where the dominant vegetation is, or was until very recently, trees with a canopy cover of at least 10%. Trees are defined as woody plants, typically single-stemmed, that can reach a height of 5 m at maturity unless stunted by poor climate or soil. Includes lines of trees, coppices, regularly tilled tree nurseries, and tree-crop plantations. Includes *Alnus* and *Populus* swamp woodland and riverine *Salix* woodland. Excludes *Corylus avellana* scrub and *Salix* and *Frangula* carrs. Excludes stands of climatically-limited dwarf trees (krummholz) < 3m high, such as occur at the arctic or alpine tree limit. Excludes parkland and dehesa with canopy less than 10%, which are listed under sparsely wooded grasslands E7.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004b)

### Descriptive or diagnostic parameters

Parameter	Value(s)
Human activities may include:	Forest planting; Artificial planting; Forest replanting
Dominant life forms:	Trees

### EUNIS habitat code and names G1 Broadleaved deciduous woodland

#### Description

Woodland, forest and plantations dominated by summer-green non-coniferous trees that lose their leaves in winter. Includes woodland with mixed evergreen and deciduous broadleaved trees, provided that the deciduous cover exceeds that of evergreens. Excludes mixed forests (G4) where the proportion of conifers exceeds 25%

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004b)

### Descriptive or diagnostic parameters

Parameter	Value(s)
Human activities may include:	Forestry practices; Forest planting; Artificial planting; Forest replanting
Levels of habitat usage (when used in criteria):	Low level use / disturbance; No human use
Dominant life forms:	Trees; Trees > 5m / tall trees; Broadleaved deciduous trees
Cover characteristics (when used as criteria):	Trees >10%

### EUNIS habitat code and names G1.1 English name: Riparian and gallery woodland, with dominant alder, birch, poplar or willow; Scientific name: Riparian and gallery woodland, with dominant *Alnus*, *Betula*, *Populus* or *Salix*

#### Description

Riparian woods of the boreal, boreo-nemoral, nemoral and submediterranean and steppe zones, with one or few dominant species, typically *Alnus*, *Betula*, *Populus* or *Salix*. Includes woods dominated by narrow-leaved willows *Salix alba*, *Salix eleagnos*, *Salix purpurea*, *Salix viminalis* in all zones including the mediterranean. Excludes riverine scrub of broad-leaved willows, e.g. *Salix aurita*, *Salix cinerea*, *Salix pentandra* (F9.1).

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004b)

### Legal instruments

Legal instrument	Legally designated habitat	Code
EU Habitats Directive Annex I	Natural forests of primary succession stages of landupheaval coast	9030
	Alluvial forests with <i>Alnus glutinosa</i> and <i>Fraxinus excelsior</i> (Alno-Padion, Alnion incanae, Salicion albae)	91E0
	<i>Salix alba</i> and <i>Populus alba</i> galleries	92A0
	Riparian formations on intermittent Mediterranean water courses with <i>Rhododendron ponticum</i> , <i>Salix</i> and others	92B0

### Descriptive or diagnostic parameters

Parameter	Value(s)
Levels of habitat usage (when used in criteria):	Low level use / disturbance; No human use
Dominant life forms:	Trees; Trees > 5m / tall trees; Broadleaved deciduous trees
Cover characteristics (when used as criteria):	Trees >10%
Spatial characteristics (when used in criteria):	Linear feature
Characteristics of wetness or dryness:	Fringing watercourses / riparian; Intermittent flooding
Related phytosociological units:	<i>Alnion incanae</i> ; <i>Fraxinion angustifoliae</i> ; <i>Osmundo-Alnion</i> ; <i>Populetaalia albae</i> ; <i>Populion albae</i> ; <i>Salicetea purpureae</i> ; <i>Salicion albae</i> ; <i>Salicion canariensis</i> ; <i>Salicion cinerea</i>

**EUNIS habitat code and names** G1.2 Mixed riparian floodplain and gallery woodland**Description**

Mixed riparian forests, sometimes structurally complex and species-rich, of floodplains and of galleries beside slow- and fast-flowing rivers of the nemoral, boreo-nemoral, steppe and submediterranean zones. Gallery woods with *Acer*, *Fraxinus*, *Prunus* or *Ulmus*, together with species listed for G1.1. Floodplain woodland characterized by mixtures of *Alnus*, *Fraxinus*, *Populus*, *Quercus*, *Ulmus*, *Salix*.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004b)

**Legal instruments**

<u>Legal instrument</u>	<u>Legally designated habitat</u>	<u>Code</u>
EU Habitats Directive Annex I	Alluvial forests with <i>Alnus glutinosa</i> and <i>Fraxinus excelsior</i> ( <i>Alno-Padion</i> , <i>Alnion incanae</i> , <i>Salicion albae</i> )	91E0
	Riparian mixed forests of <i>Quercus robur</i> , <i>Ulmus laevis</i> and <i>Ulmus minor</i> , <i>Fraxinus excelsior</i> or <i>Fraxinus angustifolia</i> , along the great rivers ( <i>Ulmenion minoris</i> )	91F0

**Descriptive or diagnostic parameters**

<b>Parameter</b>	<b>Value(s)</b>
Levels of habitat usage (when used in criteria):	Low level use / disturbance; No human use
Dominant life forms:	Trees; Trees > 5m / tall trees; Broadleaved deciduous trees
Cover characteristics (when used as criteria):	Trees >10%
Characteristics of wetness or dryness:	Fringing watercourses / riparian; Intermittent flooding
Related phytosociological units:	<i>Alnion glutinosae</i> ; <i>Alnion incanae</i> ; <i>Carpinion betuli</i> ; <i>Fraxinion angustifoliae</i>

**EUNIS habitat code and names** G1.3 Mediterranean riparian woodland**Description**

Alluvial forests and gallery woods of the mediterranean region. Dominance may be of a single species, of few species or mixed with many species including *Fraxinus*, *Liquidambar*, *Platanus*, *Populus*, *Salix*, *Ulmus*. Excludes mediterranean *Salix* woods (G1.1) and shrubby riparian vegetation (F9.3).

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004b)

**Legal instruments**

<u>Legal instrument</u>	<u>Legally designated habitat</u>	<u>Code</u>
EU Habitats Directive Annex I	<i>Salix alba</i> and <i>Populus alba</i> galleries	92A0
	<i>Platanus orientalis</i> and <i>Liquidambar orientalis</i> woods ( <i>Platanion orientalis</i> )	92C0

**Descriptive or diagnostic parameters**

<b>Parameter</b>	<b>Value(s)</b>
Levels of habitat usage (when used in criteria):	Low level use / disturbance; No human use
Dominant life forms:	Trees; Trees > 5m / tall trees; Broadleaved deciduous trees
Cover characteristics (when used as criteria):	Trees >10%
Spatial characteristics (when used in criteria):	Linear feature
Characteristics of wetness or dryness:	Fringing watercourses / riparian; Intermittent flooding
Related phytosociological units:	<i>Alnion glutinosae</i> ; <i>Alnion incanae</i> ; <i>Carpinion orientalis</i> ; <i>Fraxinion angustifoliae</i> ; <i>Platanetalia orientalis</i> ; <i>Platanion orientalis</i> ; <i>Populion albae</i> ; <i>Salicion albae</i>

**EUNIS habitat code and names** G1.4 Broadleaved swamp woodland not on acid peat**Description**

Broadleaved swamp woodland not on acid peat. Includes *Alnus*, *Populus*, *Quercus* swamp woods. Excludes *Salix* carr, with shrubby willows, e.g. *Salix aurita*, *Salix cinerea*, *Salix pentandra* (F9.2).

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004b)

**Descriptive or diagnostic parameters**

<b>Parameter</b>	<b>Value(s)</b>
Levels of habitat usage (when used in criteria):	Low level use / disturbance; No human use
Dominant life forms:	Trees; Trees > 5m / tall trees; Broadleaved deciduous trees
Cover characteristics (when used as criteria):	Trees >10%
Characteristics of wetness or dryness:	Waterlogged
Chemical attributes:	Neutral; Base-rich
Related phytosociological units:	<i>Alnetea glutinosae</i> ; <i>Alnion glutinosae</i> ; <i>Carpinion betuli</i> ; <i>Osmundo-Alnion</i>

**EUNIS habitat code and names** G1.5 Broadleaved swamp woodland on acid peat**Description**

Broadleaved woodland on wet acid peat, dominated by *Betula pubescens* or rarely *Alnus glutinosa*, sometimes with an admixture of conifers or shrubby *Salix* species. *Sphagnum* spp. are normally prominent in the ground



vegetation.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004b)

#### Legal instruments

<u>Legal instrument</u>	<u>Legally designated habitat</u>	<u>Code</u>
EU Habitats Directive Annex I	Fennoscandian deciduous swamp woods	9080
	Bog woodland	91D0

#### Descriptive or diagnostic parameters

<b>Parameter</b>	<b>Value(s)</b>
Levels of habitat usage (when used in criteria):	Low level use / disturbance; No human use
Dominant life forms:	Trees; Trees > 5m / tall trees; Broadleaved deciduous trees
Cover characteristics (when used as criteria):	Trees >10%
Characteristics of wetness or dryness:	Waterlogged
Chemical attributes:	Acid
Substrate types:	Peat
Related phytosociological units:	<i>Alnion glutinosae</i> ; <i>Betulion pubescentis</i> ; <i>Osmundo-Alnion</i> ; <i>Salicion cinereae</i>

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**EUNIS habitat code and names** G1.6 English name: Beech woodland;  
Scientific name: *Fagus woodland*

#### Description

Forests dominated by beech *Fagus sylvatica* in western and central Europe, and *Fagus orientalis* and other *Fagus* species in southeastern Europe and the Pontic region. Many montane formations are mixed beech-fir or beech-fir-spruce forests, which are listed under G4.6

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004a)

#### Legal instruments

<u>Legal instrument</u>	<u>Legally designated habitat</u>	<u>Code</u>
EU Habitats Directive Annex I	Luzulo-Fagetum beech forests	9110
	Atlantic acidophilous beech forests with Ilex and sometimes also Taxus in the shrublayer ( <i>Quercion robori-petraeae</i> or <i>Ilici-Fagenion</i> )	9120
	Asperulo-Fagetum beech forests	9130
	Medio-European subalpine beech woods with Acer and Rumex	9140
	Medio-European limestone beech forests of the Cephalanthero-Fagion	9150
	Apennine beech forests with Taxus and Ilex	9210
	Apennine beech forests with Abies alba and beech forests with Abies nebrodensis	9220
	Hellenic beech forests with Abies borisii-regis	9270
	Quercus frainetto woods	9280
Council of Europe Bern Convention Res. No. 4 1996	Beech forests	41.1

#### Descriptive or diagnostic parameters

<b>Parameter</b>	<b>Value(s)</b>
Levels of habitat usage (when used in criteria):	Low level use / disturbance; No human use
Dominant life forms:	Trees; Trees > 5m / tall trees; Broadleaved deciduous trees
Cover characteristics (when used as criteria):	Trees >10%
Characteristics of wetness or dryness:	Seasonally wet; Moist / mesic; Dry
Related phytosociological units:	<i>Aremonio-Fagion</i> ; <i>Carpinion betuli</i> ; <i>Cephalanthero-Fagion</i> ; <i>Doronico orientalis-Fagion moesiaci</i> ; <i>Erythronio-Carpinion</i> ; <i>Fagion sylvaticae</i> ; <i>Geranio nodosi-Fagion</i> ; <i>Geranio striati-Fagion</i> ; <i>Ilici-Fagion</i> ; <i>Lonicero alpigenae-Fagion</i> ; <i>Luzulo-Fagion</i> ; <i>Quercion confertae</i> ; <i>Quercion roboris</i> ; <i>Rhododendro pontici-Fagion orientalis</i> ; <i>Scillo lilio-hyacinthi-Fagion</i> ; <i>Symphyto cordati-Fagion</i> ; <i>Tilio-Acerion</i>

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**EUNIS habitat code and names** G1.7 Thermophilous deciduous woodland

#### Description

Forests or woods of submediterranean climate regions and supramediterranean altitudinal levels, and of western Eurasian steppe and substeppe zones, dominated by deciduous or semideciduous thermophilous *Quercus* species or by other southern trees such as *Carpinus orientalis*, *Castanea sativa* or *Ostrya carpinifolia*. Thermophilous deciduous trees may, under local microclimatic or edaphic conditions, replace the evergreen oak forests in mesomediterranean or thermomediterranean areas, and occur locally to the north in central and western Europe.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004a)

#### Legal instruments

<u>Legal instrument</u>	<u>Legally designated habitat</u>	<u>Code</u>
EU Habitats Directive Annex I	Thermophilous Fraxinus angustifolia woods	91B0
	Pannonian woods with Quercus pubescens	91H0
	Euro-Siberian steppic woods with Quercus spp	91I0

	Galicio-Portuguese oak woods with <i>Quercus robur</i> and <i>Quercus pyrenaica</i>	9230
	<i>Quercus faginea</i> and <i>Quercus canariensis</i> Iberian woods	9240
	<i>Quercus trojana</i> woods	9250
	<i>Castanea sativa</i> woods	9260
	Aegean <i>Quercus brachyphylla</i> woods	9310
	<i>Quercus macrolepis</i> forests	9350
Council of Europe Bern Convention Res. No. 4 1996	Thermophilous and supra-Mediterranean oak woods	41.7

#### Descriptive or diagnostic parameters

Parameter	Value(s)
Climate zones:	Mediterranean; Warm non-mediterranean
Levels of habitat usage (when used in criteria):	Low level use / disturbance; No human use
Dominant life forms:	Trees; Trees > 5m / tall trees; Broadleaved deciduous trees; Thermophile species
Cover characteristics (when used as criteria):	Trees >10%
Characteristics of wetness or dryness:	Seasonally wet; Moist / mesic; Dry
Related phytosociological units:	<i>Aceri granatensis-Quercion fagineae</i> ; <i>Aceri tatarici-Quercion</i> ; <i>Alnion incanae</i> ; <i>Aremonio-Fagion</i> ; <i>Carpinion betuli</i> ; <i>Carpinion orientalis</i> ; <i>Fraxino orni-Cotinion</i> ; <i>Genisto germanicae-Quercion</i> ; <i>Junipero excelsae-Quercion pubescentis</i> ; <i>Lathyrion veneti</i> ; <i>Melitto-Quercion</i> ; <i>Quercetalia pubescenti-petraeae</i> ; <i>Quercetalia roboris</i> ; <i>Quercion broteroi</i> ; <i>Quercion confertae</i> ; <i>Quercion ilicis</i> ; <i>Quercion petraeae</i> ; <i>Quercion pubescenti-sessiliflorae</i> ; <i>Quercion pyrenaicae</i> ; <i>Quercion roboris</i> ; <i>Quercion rotundifoliae-Oleion sylvestris</i> ; <i>Salicion albae</i> ; <i>Syringio-Carpinion orientalis</i> ; <i>Tilio-Acerion</i>

**EUNIS habitat code and names** G1.8 English name: Acidophilous oak-dominated woodland;  
Scientific name: Acidophilous *Quercus*-dominated

woodland

#### Description

Forests of *Quercus robur* or *Quercus petraea* on acid soils with an herb layer mostly constituted by the ecological groups of *Deschampsia flexuosa*, *Vaccinium myrtillus*, *Pteridium aquilinum*, *Lonicera periclymenum*, *Holcus mollis*, and of *Maianthemum bifolium*, *Convallaria majalis*, *Hieracium sabaudum*, *Hypericum pulchrum*, *Luzula pilosa*, and the mosses *Polytrichum formosum* and *Leucobryum glaucum*.

**Source** Devillers, P., Devillers-Terschuren, J. and Vander Linden, C. (2001)

#### Legal instruments

Legal instrument	Legally designated habitat	Code
EU Habitats Directive Annex I	Old acidophilous oak woods with <i>Quercus robur</i> on sandy plains	9190
	Old sessile oak woods with <i>Ilex</i> and <i>Blechnum</i> in the British Isles	91A0
Council of Europe Bern Convention Res. No. 4 1996	Acidophilous oak forests	41.5

#### Descriptive or diagnostic parameters

Parameter	Value(s)
Levels of habitat usage (when used in criteria):	Low level use / disturbance; No human use
Dominant life forms:	Trees; Trees > 5m / tall trees; Broadleaved deciduous trees; Acidophile species
Cover characteristics (when used as criteria):	Trees >10%
Characteristics of wetness or dryness:	Seasonally wet; Moist / mesic; Dry
Chemical attributes:	Acid; Oligotrophic
Related phytosociological units:	<i>Alnion incanae</i> ; <i>Carpinion betuli</i> ; <i>Genisto germanicae-Quercion</i> ; <i>Ilici-Fagion</i> ; <i>Pino-Quercion</i> ; <i>Quercion petraeae</i> ; <i>Quercion pyrenaicae</i> ; <i>Quercion roboris</i>

**EUNIS habitat code and names** G1.9 English name: Non-riverine woodland with birch, aspen  
or

rowan; Scientific name: Non-riverine woodland with  
*Betula*, *Populus tremula* or *Sorbus aucuparia*

#### Description

Forests or woods dominated by *Betula*, *Populus tremula* or *Sorbus aucuparia*. Excludes swamp woods (G1.4), woods on wet peat (G1.5) and riparian woods (G1.1).

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004b)

#### Legal instruments

Legal instrument	Legally designated habitat	Code
EU Habitats Directive Annex I	Western Taiga	9010
	Natural forests of primary succession stages of landupheaval coast	9030
	Nordic subalpine/subarctic forests with <i>Betula pubescens</i> ssp	9040

**Descriptive or diagnostic parameters**

Parameter	Value(s)
Levels of habitat usage (when used in criteria):	Low level use / disturbance; No human use
Dominant life forms:	Trees; Trees > 5m / tall trees; Broadleaved deciduous trees
Cover characteristics (when used as criteria):	Trees >10%
Characteristics of wetness or dryness:	Seasonally wet; Moist / mesic; Dry
Related phytosociological units:	<i>Adenostyletalia alliariae</i> ; <i>Alnion incanae</i> ; <i>Betulion fontquerio-celtibericae</i> ; <i>Corylo-Populion tremulae</i> ; <i>Dicrano-Pinion</i> ; <i>Fagion sylvaticae</i> ; <i>Genisto germanicae-Quercion</i> ; <i>Luzulo-Fagion</i> ; <i>Phyllodoco-Vaccinon myrtilli</i> ; <i>Piceion excelsae</i> ; <i>Prunetalia spinosae</i> ; <i>Quercetalia pubescenti-petraeae</i> ; <i>Quercion confertae</i> ; <i>Quercion pubescenti-sessiliflorae</i> ; <i>Quercion pyrenaicae</i> ; <i>Quercion roboris</i> ; <i>Sambuco racemosae-Salicion capreae</i>

<b>EUNIS habitat code and names</b>	G1.A	English name: Meso- and eutrophic oak, hornbeam, ash, sycamore, lime, elm and related woodland; Scientific name: Meso- and eutrophic <i>Quercus</i> , <i>Carpinus</i> , <i>Fraxinus</i> , <i>Acer</i> , <i>Tilia</i> , <i>Ulmus</i> and related woodland
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**Description**

Woods, typically with mixed canopy composition, on rich and moderately rich soils. Includes woods dominated by *Acer*, *Carpinus*, *Fraxinus*, *Quercus* (especially *Quercus petraea* and *Quercus robur*), *Tilia* and *Ulmus*. Excludes acid *Quercus* woodland (G1.8) and woodland with a large representation of southern species such as *Fraxinus ornus* or *Quercus pubescens* (G1.7).

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004b)

**Legal instruments**

Legal instrument	Legally designated habitat	Code
EU Habitats Directive Annex I	Fennoscandian hemiboreal natural old broad-leaved deciduous forests ( <i>Quercus</i> , <i>Tilia</i> , <i>Acer</i> , <i>Fraxinus</i> or <i>Ulmus</i> ) rich in epiphytes	9020
	Sub-Atlantic and medio-European oak or oak-hornbeam forests of the Carpinion betuli	9160
	Galio-Carpinetum oak-hornbeam forests	9170
	Tilio-Acerion forests of slopes, screes and ravines	9180
	Pannonic woods with <i>Quercus petraea</i> and <i>Carpinus betulus</i>	91G0

**Descriptive or diagnostic parameters**

Parameter	Value(s)
Levels of habitat usage (when used in criteria):	Low level use / disturbance; No human use
Dominant life forms:	Trees; Trees > 5m / tall trees; Broadleaved deciduous trees
Cover characteristics (when used as criteria):	Trees >10%
Characteristics of wetness or dryness:	Seasonally wet; Moist / mesic; Dry
Chemical attributes:	Mesotrophic; Eutrophic
Related phytosociological units:	<i>Aceri tatarici-Quercion</i> ; <i>Alnion incanae</i> ; <i>Alno-Quercion roboris</i> ; <i>Aremonio-Fagion</i> ; <i>Berberidion vulgaris</i> ; <i>Carpinion betuli</i> ; <i>Carpinion orientalis</i> ; <i>Castaneo-Quercion petraeae</i> ; <i>Cephalanthero-Fagion</i> ; <i>Erythronio-Carpinion</i> ; <i>Fagion sylvaticae</i> ; <i>Junipero excelsae-Quercion pubescentis</i> ; <i>Prunetalia spinosae</i> ; <i>Pulmonario longifoliae-Quercion roboris</i> ; <i>Quercetalia pubescenti-petraeae</i> ; <i>Querco roboris-Tilion cordatae</i> ; <i>Salicion albae</i> ; <i>Tilio-Acerion</i>

<b>EUNIS habitat code and names</b>	G1.B	English name: Non-riverine alder woodland; Scientific name: Non-riverine <i>Alnus</i> woodland
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**Description**

Nonriparian, nonmarshy woods dominated by *Alnus* spp.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004a)

**Legal instruments**

Legal instrument	Legally designated habitat	Code
EU Habitats Directive Annex I	Western Taïga	9010
	Natural forests of primary succession stages of landupheaval coast	9030

**Descriptive or diagnostic parameters**

Parameter	Value(s)
Levels of habitat usage (when used in criteria):	Low level use / disturbance; No human use
Dominant life forms:	Trees; Trees > 5m / tall trees; Broadleaved deciduous trees
Cover characteristics (when used as criteria):	Trees >10%

Characteristics of wetness or dryness: Seasonally wet; Moist / mesic; Dry  
Related phytosociological units: *Alnion incanae*; *Fagion sylvaticae*

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**EUNIS habitat code and names** G1.C Highly artificial broadleaved deciduous forestry plantations

**Description**

Cultivated deciduous broad-leaved tree formations planted for the production of wood, composed of exotic species, of native species out of their natural range, or of native species planted in clearly unnatural stands, often as monocultures.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004a)

**Descriptive or diagnostic parameters**

<b>Parameter</b>	<b>Value(s)</b>
Human activities and impacts:	Forestry practices; Forest planting; Artificial planting; Forest replanting; Forestry clearance; Removal of forest undergrowth; Removal of dead and dying trees; Forest exploitation without replanting; Anthropogenic impacts
Levels of habitat usage (when used in criteria):	Intensive use / disturbance; Active management
Dominant life forms:	Trees; Trees > 5m / tall trees; Broadleaved deciduous trees
Cover characteristics (when used as criteria):	Trees >10%
Spatial characteristics (when used in criteria):	> 0.5 ha

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**EUNIS habitat code and names** G1.D Fruit and nut tree orchards

**Description**

Stands of trees cultivated for fruit or flower production, providing permanent tree cover once mature.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004a)

**Descriptive or diagnostic parameters**

<b>Parameter</b>	<b>Value(s)</b>
Human activities and impacts:	Fruit and nut orchards; Forest planting; Artificial planting; Forest replanting; Anthropogenic impacts
Levels of habitat usage (when used in criteria):	Intensive use / disturbance; Active management
Dominant life forms:	Trees; Trees > 5m / tall trees; Broadleaved deciduous trees
Cover characteristics (when used as criteria):	Trees >10%
Spatial characteristics (when used in criteria):	> 0.5 ha

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**EUNIS habitat code and names** G2 Broadleaved evergreen woodland

**Description**

Temperate forests dominated by broad-leaved sclerophyllous or lauriphyllous evergreen trees, or by palms. They are characteristic of the Mediterranean and warm-temperate humid zones.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004a)

**Descriptive or diagnostic parameters**

<b>Parameter</b>	<b>Value(s)</b>
Human activities may include:	Forestry practices; Forest planting; Artificial planting; Forest replanting
Levels of habitat usage (when used in criteria):	Low level use / disturbance; No human use
Dominant life forms:	Trees; Trees > 5m / tall trees; Broadleaved evergreen trees
Cover characteristics (when used as criteria):	Trees >10%

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**EUNIS habitat code and names** G2.1 English name: Mediterranean evergreen oak woodland;  
Scientific name: Mediterranean evergreen *Quercus*

woodland

**Description**

Woodland with dominant evergreen arborescent *Quercus*, e.g. *Quercus alnifolia*, *Quercus coccifera*, *Quercus ilex*, *Quercus rotundifolia*, *Quercus suber*.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004b)

**Legal instruments**

<u>Legal instrument</u>	<u>Legally designated habitat</u>	<u>Code</u>
EU Habitats Directive Annex I	<i>Quercus suber</i> forests	9330
	<i>Quercus ilex</i> and <i>Quercus rotundifolia</i> forests	9340
Council of Europe Bern Convention	TEMPERATE BROAD-LEAVED EVERGREEN FORESTS	45

**Descriptive or diagnostic parameters**

Parameter	Value(s)
Levels of habitat usage (when used in criteria):	Low level use / disturbance; No human use
Dominant life forms:	Trees; Trees > 5m / tall trees; Broadleaved evergreen trees
Cover characteristics (when used as criteria):	Trees >10%
Related phytosociological units:	<i>Aceri granatensis-Quercion fagineae</i> ; <i>Arbuto andrachnae-Quercion cocciferae</i> ; <i>Cistion laurifolii</i> ; <i>Lathyrion veneti</i> ; <i>Oleo-Ceratonion siliquae</i> ; <i>Paeonio broteroi-Abietion pinsapo</i> ; <i>Quercetalia ilicis</i> ; <i>Quercion broteroi</i> ; <i>Quercion ilicis</i> ; <i>Quercion pubescenti-sessiliflorae</i> ; <i>Quercion pyrenaicae</i> ; <i>Quercion rotundifoliae-Oleion sylvestris</i>

**EUNIS habitat code and names** G2.2 Eurasian continental sclerophyllous woodland**Description**

Lauriphyllous and mixed lauriphyllous-xerophyllous evergreen forests of the Warm-Temperate Humid zones of the Eurasian continent and continental shelf islands and of humid enclaves within the Mediterranean zones. Lauriphyllous forests of the oceanic Macaronesian archipelagoes are listed separately under G2.3.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004a)

**Legal instruments**

Legal instrument	Legally designated habitat	Code
Council of Europe Bern Convention Res. No. 4 1996	TEMPERATE BROAD-LEAVED EVERGREEN FORESTS	45

**Descriptive or diagnostic parameters**

Parameter	Value(s)
Levels of habitat usage (when used in criteria):	Low level use / disturbance; No human use
Dominant life forms:	Trees; Trees > 5m / tall trees; Broadleaved evergreen trees
Cover characteristics (when used as criteria):	Trees >10%
Related phytosociological units:	<i>Quercion ilicis</i>

**EUNIS habitat code and names** G2.3 English name: Macaronesian laurel woodland;  
Scientific name: Macaronesian *Laurus* woodland**Description**

Humid to hyper-humid, mist-bound, luxuriant, evergreen, lauriphyllous forests of the cloud belt of the Macaronesian islands, extremely rich in floral and faunal species, among which many are restricted to these communities. Genera such as *Picconia*, *Semele*, *Gesnouinia*, *Lactucosonchus*, *Ixanthus* are entirely endemic to these communities, while others, such as *Isoplexis*, *Visnea* and *Phyllis* reach in them their maximum development; in addition, each of the formations of the various archipelagoes harbours distinctive endemic species. Laurel forests are the most complex and remarkable relict of the humid sub-tropical vegetation of the Miocene-Pliocene late Tertiary of southern Europe. Areas of intact forests have been drastically reduced to a level below which the preservation of their elements could not be sustained.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004a)

**Legal instruments**

Legal instrument	Legally designated habitat	Code
EU Habitats Directive Annex I Council of Europe Bern Convention Res. No. 4 1996	Macaronesian laurel forests ( <i>Laurus</i> , <i>Ocotea</i> ) TEMPERATE BROAD-LEAVED EVERGREEN FORESTS	9360 45

**Descriptive or diagnostic parameters**

Parameter	Value(s)
Levels of habitat usage (when used in criteria):	Low level use / disturbance; No human use
Dominant life forms:	Trees; Trees > 5m / tall trees; Broadleaved evergreen trees
Cover characteristics (when used as criteria):	Trees >10%
Related phytosociological units:	<i>Ixantho-Laurion azoricae</i> ; <i>Pruno-Lauretea azoricae</i> ; <i>Sibthorpio peregrinae-Clethrion arborea</i>

**EUNIS habitat code and names** G2.4 English name: Olive - carob woodland;  
Scientific name: *Olea europaea* - *Ceratonion siliqua***woodland****Description**

Thermo-Mediterranean or thermo-Canarian woodland dominated by arborescent *Olea europaea* var. *sylvestris*,

*Ceratonia siliqua*, *Pistacia lentiscus*, *Myrtus communis* or, in the Canary Islands, by *Olea europaea* ssp. *cerasiformis* and *Pistacia atlantica*. Most formations will be listed as arborescent matorral F5.1, but a few stands have a sufficiently tall, closed canopy to qualify for this unit.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004a)

#### Legal instruments

<u>Legal instrument</u>	<u>Legally designated habitat</u>	<u>Code</u>
EU Habitats Directive Annex I	Olea and Ceratonia forests	9320
Council of Europe Bern Convention Res. No. 4 1996	TEMPERATE BROAD-LEAVED EVERGREEN FORESTS	45

#### Descriptive or diagnostic parameters

<u>Parameter</u>	<u>Value(s)</u>
Levels of habitat usage (when used in criteria):	Low level use / disturbance; No human use
Dominant life forms:	Trees; Trees > 5m / tall trees; Broadleaved evergreen trees
Cover characteristics (when used as criteria):	Trees >10%
Related phytosociological units:	<i>Ceratonio-Rhamnion oleoidis</i> ; <i>Mayteno-Juniperion canariensis</i> ; <i>Oleo-Ceratonion siliquae</i>

**EUNIS habitat code and names** G2.5 English name: Palm groves; Scientific name: *Phoenix* groves

#### Description

Woods, often riparian, formed by palm trees of the Mediterranean and Macaronesian zones, *Phoenix theophrasti* of Crete and western Anatolia, and *Phoenix canariensis* of the Canary Islands.

**Source** Devillers, P., Devillers-Terschuren, J. and Vander Linden, C. (2001)

#### Legal instruments

<u>Legal instrument</u>	<u>Legally designated habitat</u>	<u>Code</u>
EU Habitats Directive Annex I	Palm groves of Phoenix	9370
Council of Europe Bern Convention Res. No. 4 1996	TEMPERATE BROAD-LEAVED EVERGREEN FORESTS	45

#### Descriptive or diagnostic parameters

<u>Parameter</u>	<u>Value(s)</u>
Levels of habitat usage (when used in criteria):	Low level use / disturbance; No human use
Dominant life forms:	Trees; Trees > 5m / tall trees; Broadleaved evergreen trees
Cover characteristics (when used as criteria):	Trees >10%
Related phytosociological units:	<i>Kleinio neriifoliae-Euphorbietea canariensis</i> ; <i>Oleo cerasiformis-Rhamnietea crenulatae</i> ; <i>Quercion ilicis</i>

**EUNIS habitat code and names** G2.6 English name: Holly woods; Scientific name: *Ilex aquifolium* woods

#### Description

Woods dominated by tall arborescent *Ilex aquifolium*. They occur in the supra-Mediterranean level of Sardinia and Corsica and in Atlantic mountains of northwestern Spain, mostly as a facies of relict yew-holly forests G3.9. Other scattered occurrences exist in the nemoral zone of western Europe, as facies of beech forest G1.6 or acidophilous oak forest G1.8.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004a)

#### Legal instruments

<u>Legal instrument</u>	<u>Legally designated habitat</u>	<u>Code</u>
EU Habitats Directive Annex I	Forests of <i>Ilex aquifolium</i>	9380
Council of Europe Bern Convention Res. No. 4 1996	TEMPERATE BROAD-LEAVED EVERGREEN FORESTS	45

#### Descriptive or diagnostic parameters

<u>Parameter</u>	<u>Value(s)</u>
Levels of habitat usage (when used in criteria):	Low level use / disturbance; No human use
Dominant life forms:	Trees; Trees > 5m / tall trees; Broadleaved evergreen trees
Cover characteristics (when used as criteria):	Trees >10%
Related phytosociological units:	<i>Carpinion betuli</i> ; <i>Fagion sylvaticae</i> ; <i>Quercion ilicis</i> ; <i>Quercion roboris</i>

**EUNIS habitat code and names** G2.7 Canary Island heath woodland

#### Description

Very tall, forest-like, formations dominated by *Erica arborea*, *Myrica faya*, *Arbutus canariensis* or *Visnea*

*mocanera*, occurring naturally in the most wind-exposed and the driest stations within the "monte verde" of the Canary Island cloud belt; they also occur extensively as degradation stages of the *Laurus* woodland G2.3 or as secondary colonists.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004a)

#### Legal instruments

<u>Legal instrument</u>	<u>Legally designated habitat</u>	<u>Code</u>
Council of Europe Bern Convention Res. No. 4 1996	TEMPERATE BROAD-LEAVED EVERGREEN FORESTS	45

#### Descriptive or diagnostic parameters

<b>Parameter</b>	<b>Value(s)</b>
Levels of habitat usage (when used in criteria):	Low level use / disturbance; No human use
Dominant life forms:	Trees; Trees > 5m / tall trees; Broadleaved evergreen trees
Cover characteristics (when used as criteria):	Trees >10%
Related phytosociological units:	<i>Myrica fayae-Ericion arboreae</i>

### EUNIS habitat code and names G2.8 Highly artificial broadleaved evergreen forestry plantations

#### Description

Cultivated evergreen broad-leaved tree formations planted for the production of wood, composed of exotic species, of native species out of their natural range, or of native species planted in clearly unnatural stands, often as monocultures.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004a)

#### Descriptive or diagnostic parameters

<b>Parameter</b>	<b>Value(s)</b>
Human activities and impacts:	Forestry practices; Forest planting; Artificial planting; Forest replanting; Forestry clearance; Removal of forest undergrowth; Removal of dead and dying trees; Forest exploitation without replanting; Anthropogenic impacts
Levels of habitat usage (when used in criteria):	Intensive use / disturbance; Active management
Dominant life forms:	Trees; Trees > 5m / tall trees; Broadleaved evergreen trees
Cover characteristics (when used as criteria):	Trees >10%
Spatial characteristics (when used in criteria):	> 0.5 ha

### EUNIS habitat code and names G2.9 Evergreen orchards and groves

#### Description

In Europe these are mostly olives and citrus.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004b)

#### Descriptive or diagnostic parameters

<b>Parameter</b>	<b>Value(s)</b>
Human activities and impacts:	Fruit and nut orchards; Artificial planting; Forest replanting; Anthropogenic impacts
Levels of habitat usage (when used in criteria):	Intensive use / disturbance; Active management
Dominant life forms:	Trees; Trees > 5m / tall trees; Broadleaved evergreen trees
Cover characteristics (when used as criteria):	Trees >10%
Spatial characteristics (when used in criteria):	> 0.5 ha

### EUNIS habitat code and names G3 Coniferous woodland

#### Description

Woodland, forest and plantations dominated by coniferous trees, mainly evergreen (*Abies*, *Cedrus*, *Picea*, *Pinus*, *Taxus*, Cupressaceae) but also deciduous *Larix*. Excludes mixed forests (G4) where the proportion of broadleaved trees exceeds 25%.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004b)

#### Descriptive or diagnostic parameters

<b>Parameter</b>	<b>Value(s)</b>
Human activities and impacts:	Forestry practices; Forest planting; Artificial planting; Forest replanting
Levels of habitat usage (when used in criteria):	Low level use / disturbance; No human use
Dominant life forms:	Trees; Trees > 5m / tall trees; Coniferous trees
Cover characteristics (when used as criteria):	Trees >10%

EUNIS habitat **code and names** G3.1 English name: Fir and spruce woodland;  
Scientific name: *Abies* and *Picea* woodland

**Description**

Woodland dominated by *Abies* or *Picea*.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004b)

**Legal instruments**

<u>Legal instrument</u>	<u>Legally designated habitat</u>	<u>Code</u>
EU Habitats Directive Annex I	Hellenic beech forests with <i>Abies borisii-regis</i>	9270
	Acidophilous <i>Picea</i> forests of the montane to alpine levels (Vaccinio-Piceetea)	9410
	Southern Apennine <i>Abies alba</i> forests	9510
	<i>Abies pinsapo</i> forests	9520

**Descriptive or diagnostic parameters**

<b>Parameter</b>	<b>Value(s)</b>
Levels of habitat usage (when used in criteria):	Low level use / disturbance; No human use
Dominant life forms:	Trees; Trees > 5m / tall trees; Coniferous trees; Pine trees
Cover characteristics (when used as criteria):	Trees >10%
Characteristics of wetness or dryness:	Moist / mesic; Dry
Related phytosociological units:	<i>Abietion cephalonicae</i> ; <i>Abieti-Piceion</i> ; <i>Aremonio-Fagion</i> ; <i>Carpinion betuli</i> ; <i>Chrysanthemo rotundifolii-Piceion</i> ; <i>Doronico orientalis-Fagion moesiaci</i> ; <i>Fagetalia sylvaticae</i> ; <i>Fagion sylvaticae</i> ; <i>Geranio striati-Fagion</i> ; <i>Lonicero alpigenae-Fagion</i> ; <i>Piceion excelsae</i> ; <i>Pinion mugo</i> ; <i>Quercion ilicis</i> ; <i>Rhododendro pontici-Fagion orientalis</i> ; <i>Symphphyto cordati-Fagion</i>

EUNIS habitat **code and names** G3.2 English name: Alpine larch - Arolla woodland;  
Scientific name: Alpine *Larix* - *Pinus cembra* woodland

**Description**

Forests of the subalpine and sometimes montane levels of the Alps and the Carpathians, dominated by *Larix decidua* or *Pinus cembra*; the two species may form either pure or mixed stands, and may be associated with *Picea abies* or, in the western Alps, *Pinus uncinata*.

**Source** Devillers, P., Devillers-Terschuren, J. and Vander Linden, C. (2001)

**Legal instruments**

<u>Legal instrument</u>	<u>Legally designated habitat</u>	<u>Code</u>
EU Habitats Directive Annex I	Alpine <i>Larix decidua</i> and/or <i>Pinus cembra</i> forests	9420

**Descriptive or diagnostic parameters**

<b>Parameter</b>	<b>Value(s)</b>
Levels of habitat usage (when used in criteria):	Low level use / disturbance; No human use
Dominant life forms:	Trees; Trees > 5m / tall trees; Coniferous trees; Pine trees
Cover characteristics (when used as criteria):	Trees >10%
Characteristics of wetness or dryness:	Moist / mesic; Dry
Related phytosociological units:	<i>Erico-Pinion sylvestris</i> ; <i>Piceion excelsae</i> ; <i>Pinion mugo</i> ; <i>Pino mugo-Ericion</i> ; <i>Quercion pubescenti-sessiliflorae</i> ; <i>Rhododendro-Vaccinion</i>

EUNIS habitat **code and names** G3.3 English name: Mountain pine (*Pinus uncinata*) woodland;  
Scientific name: *Pinus uncinata* woodland

**Description**

Mostly subalpine forests of the Alps, the Jura, the Pyrenees and the Iberian Range, dominated by *Pinus uncinata*, usually open and with a very developed shrubby understory.

**Source** Devillers, P., Devillers-Terschuren, J. and Vander Linden, C. (2001)

**Legal instruments**

<u>Legal instrument</u>	<u>Legally designated habitat</u>	<u>Code</u>
EU Habitats Directive Annex I	Subalpine and montane <i>Pinus uncinata</i> forests (if on gypsum or limestone)	9430

**Descriptive or diagnostic parameters**

<b>Parameter</b>	<b>Value(s)</b>
Altitude zones (terrestrial and marine):	Subalpine
Levels of habitat usage (when used in criteria):	Low level use / disturbance; No human use
Dominant life forms:	Trees; Trees > 5m / tall trees; Coniferous trees; Pine trees
Cover characteristics (when used as criteria):	Trees >10%
Characteristics of wetness or dryness:	Moist / mesic; Dry
Related phytosociological units:	<i>Cytision oromediterranei</i> ; <i>Erico-Pinion sylvestris</i> ; <i>Juniperion nanae</i> ; <i>Junipero</i>



**EUNIS habitat code and names** G3.4 English name: Scots pine woodland south of the taiga;  
Scientific name: *Pinus sylvestris* woodland south of the

taiga

**Description**

Forests of *Pinus sylvestris* ssp. *sylvestris* and *Pinus sylvestris* ssp. *hamata* of the Nemoral and Mediterranean zones and of their transitions to the Steppe zone. Included are, in particular, the forests of Scotland, of the Alpine system, of the Mediterranean peninsulas, of the lowlands of Central Europe, of the East European Nemoral zone and its adjacent wooded steppes, formed by *Pinus sylvestris* ssp. *sylvestris*, as well as those of Anatolia, of the Caucasus and of Crimea, formed by *Pinus sylvestris* ssp. *hamata*. Excluded are the formations situated within the range of natural lowland occurrence of *Picea abies*.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004a)

**Legal instruments**

<u>Legal instrument</u>	<u>Legally designated habitat</u>	<u>Code</u>
EU Habitats Directive Annex I	Caledonian forest	91C0

**Descriptive or diagnostic parameters**

<b>Parameter</b>	<b>Value(s)</b>
Altitude zones (terrestrial and marine):	Planar; Collinar; Submontane; Montane (sensu stricto)
Levels of habitat usage (when used in criteria):	Low level use / disturbance; No human use
Dominant life forms:	Trees; Trees > 5m / tall trees; Coniferous trees; Pine trees
Cover characteristics (when used as criteria):	Trees >10%
Characteristics of wetness or dryness:	Moist / mesic; Dry
Related phytosociological units:	<i>Betulion pubescentis</i> ; <i>Cytision oromediterranei</i> ; <i>Cytiso ruthenici-Pinion</i> ; <i>Dicrano-Pinion</i> ; <i>Erico-Pinetalia</i> ; <i>Erico-Pinetea</i> ; <i>Erico-Pinion sylvestris</i> ; <i>Festuco vaginatae-Pinion</i> ; <i>Fraxino orni-Ericion</i> ; <i>Fraxino orni-Pinion nigrae</i> ; <i>Ononido-Pinion</i> ; <i>Piceion excelsae</i> ; <i>Pinion kochianae</i> ; <i>Pino sylvestris-Juniperion sabinae</i> ; <i>Pino-Juniperetalia</i> ; <i>Pino-Juniperetea</i> ; <i>Pino-Quercion</i> ; <i>Pyrolo-Pinetea</i> ; <i>Quercetalia pubescenti-petraeae</i> ; <i>Quercion roboris</i>

**EUNIS habitat code and names** G3.5 English name: Black pine (*Pinus nigra*) woodland;  
Scientific name: *Pinus nigra* woodland

**Description**

Forests dominated by pines of the *Pinus nigra* group.

**Source** Devillers, P., Devillers-Terschuren, J. and Vander Linden, C. (2001)

**Legal instruments**

<u>Legal instrument</u>	<u>Legally designated habitat</u>	<u>Code</u>
EU Habitats Directive Annex I	(Sub-) Mediterranean pine forests with endemic black pines	9530

**Descriptive or diagnostic parameters**

<b>Parameter</b>	<b>Value(s)</b>
Levels of habitat usage (when used in criteria):	Low level use / disturbance; No human use
Dominant life forms:	Trees; Trees > 5m / tall trees; Coniferous trees; Pine trees
Cover characteristics (when used as criteria):	Trees >10%
Characteristics of wetness or dryness:	Moist / mesic; Dry
Related phytosociological units:	<i>Abietion cephalonicae</i> ; <i>Aceri granatensis-Quercion fagineae</i> ; <i>Erico-Pinion sylvestris</i> ; <i>Fagion sylvaticae</i> ; <i>Fraxino orni-Pinion nigrae</i> ; <i>Juniperion thuriferae</i>

**EUNIS habitat code and names** G3.6 English name: Subalpine mediterranean pine woodland;  
Scientific name: Subalpine mediterranean *Pinus*

woodland

**Description**

Woods of *Pinus heldreichii*, *Pinus leucodermis* or *Pinus peuce*.

**Source** Devillers, P., Devillers-Terschuren, J. and Vander Linden, C. (2001)

**Legal instruments**

<u>Legal instrument</u>	<u>Legally designated habitat</u>	<u>Code</u>
Council of Europe Bern Convention Res. No. 4 1996	High oro-Mediterranean pine forests	42.7

**Descriptive or diagnostic parameters**

Parameter	Value(s)
Altitude zones (terrestrial and marine):	Montane (sensu stricto); Subalpine
Levels of habitat usage (when used in criteria):	Low level use / disturbance; No human use
Dominant life forms:	Trees; Trees > 5m / tall trees; Coniferous trees; Pine trees
Cover characteristics (when used as criteria):	Trees >10%
Characteristics of wetness or dryness:	Moist / mesic; Dry
Related phytosociological units:	<i>Pinion heldreichii</i> ; <i>Pinion peucis</i>

**EUNIS habitat code and names** G3.7 English name: Lowland to montane mediterranean pine woodland (excluding black pine *Pinus nigra*); Scientific name: Lowland to montane mediterranean *Pinus* woodland (excluding *Pinus nigra*)

#### Description

Mediterranean and thermo-Atlantic forests of thermophilous pines, mostly appearing as successional stages or plagioclimax replacements of Mediterranean evergreen broadleaved woodland G2.1 or G2.4. Long-established plantations of these pines, within their natural area of occurrence, and with an undergrowth basically similar to that of G2.1 and G2.4, are included.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004a)

#### Legal instruments

Legal instrument	Legally designated habitat	Code
EU Habitats Directive Annex I	Wooded dunes with <i>Pinus pinea</i> and/or <i>Pinus pinaster</i>	2270
	Mediterranean pine forests with endemic Mesogean pines	9540

#### Descriptive or diagnostic parameters

Parameter	Value(s)
Altitude zones (terrestrial and marine):	Planar; Collinar; Submontane; Montane (sensu stricto)
Levels of habitat usage (when used in criteria):	Low level use / disturbance; No human use
Dominant life forms:	Trees; Trees > 5m / tall trees; Coniferous trees; Pine trees; Thermophile species
Cover characteristics (when used as criteria):	Trees >10%
Characteristics of wetness or dryness:	Moist / mesic; Dry
Related phytosociological units:	<i>Ceratonio-Rhamnion oleoidis</i> ; <i>Cisto-Ericion</i> ; <i>Cisto-Lavanduletea</i> ; <i>Fagion sylvaticae</i> ; <i>Junipero excelsae-Quercion pubescentis</i> ; <i>Junipero intermediae-Pinion catalaunicae</i> ; <i>Oleo-Ceratonion siliquae</i> ; <i>Quercetalia ilicis</i> ; <i>Quercetia ilicis</i> ; <i>Quercion ilicis</i>

**EUNIS habitat code and names** G3.8 English name: Canary Island pine (*Pinus canariensis*) woodland; Scientific name: Canary Island *Pinus canariensis* woodland

#### Description

Forests of endemic *Pinus canariensis*, of the dry montane level at around 800 to 2000 m (locally down to 500 and up to 2500 m) in Tenerife, La Palma, Gran Canaria and Hierro, with *Chamaecytisus proliferus*, *Adenocarpus foliolosus*, *Cistus symphytifolius*, *Lotus campylocladus*, *Lotus hillebrandii*, *Lotus spartioides*, *Daphne gnidium*, *Juniperus cedrus*, *Micromeria* spp.; these forests, of which well-preserved examples have become rare, are the only habitat of *Fringilla teydea*, *Dendrocopos major canariensis* and *Dendrocopos major thanneri*.

**Source** Devillers, P., Devillers-Terschuren, J. and Vander Linden, C. (2001)

#### Legal instruments

Legal instrument	Legally designated habitat	Code
EU Habitats Directive Annex I	Canarian endemic pine forests	9550
Council of Europe Bern Convention Res. No. 4 1996	Canary Island pine forests	42.9

#### Descriptive or diagnostic parameters

Parameter	Value(s)
Levels of habitat usage (when used in criteria):	Low level use / disturbance; No human use
Dominant life forms:	Trees; Trees > 5m / tall trees; Coniferous trees; Pine trees
Cover characteristics (when used as criteria):	Trees >10%
Characteristics of wetness or dryness:	Moist / mesic; Dry
Related phytosociological units:	<i>Cisto-Pinion canariensis</i> ; <i>Juniperion brevifoliae</i> ; <i>Myrico fayae-Ericion arboreae</i> ; <i>Rubio periclymeni-Rubion ulmifolii</i>

**EUNIS habitat code and names** G3.9 Coniferous woodland dominated by *Cupressaceae* or

## Taxaceae

### Description

Woods dominated by *Cupressus sempervirens*, *Juniperus* spp. or *Taxus baccata* of the nemoral and Mediterranean mountains and hills.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004a)

### Legal instruments

<u>Legal instrument</u>	<u>Legally designated habitat</u>	<u>Code</u>
EU Habitats Directive Annex I	Taxus baccata woods of the British Isles	91J0
	Cupressus forests (Acero-Cupression)	9290
	Endemic forests with Juniperus spp	9560
	Tetraclinis articulata forests	9570
	Mediterranean Taxus baccata woods	9580
Council of Europe Bern Convention Res. No. 4 1996	Western Palaearctic cypress, juniper and yew forests	42.A

### Descriptive or diagnostic parameters

<u>Parameter</u>	<u>Value(s)</u>
Levels of habitat usage (when used in criteria):	Low level use / disturbance; No human use
Dominant life forms:	Trees; Trees > 5m / tall trees; Coniferous trees; Cupressus trees; Yew trees
Cover characteristics (when used as criteria):	Trees >10%
Characteristics of wetness or dryness:	Moist / mesic; Dry
Related phytosociological units:	<i>Acero sempervirenti-Cupression sempervirentis</i> ; <i>Fagion sylvaticae</i> ; <i>Juniperion brevifoliae</i> ; <i>Juniperion excelsae</i> ; <i>Juniperion thuriferae</i> ; <i>Juniperio excelsae-Quercion pubescentis</i> ; <i>Mayteno-Juniperion canariensis</i> ; <i>Oleo-Ceratonion siliquae</i> ; <i>Periplocion angustifoliae</i> ; <i>Quercetea pubescentis</i> ; <i>Quercion ilicis</i>

**EUNIS habitat code and names** G3.A English name: Spruce taiga woodland;  
Scientific name: *Picea* taiga woodland

### Description

Boreal spruce or spruce-pine forests of Fennoscandia, northeastern Poland, the Baltic States, Belarus and European Russia, with G3.B constituting the westernmost section of the continuous Eurasian northern taiga belt.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004a)

### Legal instruments

<u>Legal instrument</u>	<u>Legally designated habitat</u>	<u>Code</u>
EU Habitats Directive Annex I	Western Taiga	9010
	Fennoscandian herb-rich forests with Picea abies	9050

### Descriptive or diagnostic parameters

<u>Parameter</u>	<u>Value(s)</u>
Climate zones:	Boreal
Levels of habitat usage (when used in criteria):	Low level use / disturbance; No human use
Dominant life forms:	Trees; Trees > 5m / tall trees; Coniferous trees; Pine trees
Cover characteristics (when used as criteria):	Trees >10%
Characteristics of wetness or dryness:	Moist / mesic; Dry
Related phytosociological units:	<i>Aconito septentrionalis-Piceion obovatae</i> ; <i>Athyrio-Piceetalia</i> ; <i>Piceion excelsae</i> ; <i>Vaccinio-Piceetea</i>

**EUNIS habitat code and names** G3.B English name: Pine taiga woodland;  
Scientific name: *Pinus* taiga woodland

### Description

Boreal pine forests of Fennoscandia, northeastern Poland, the Baltic States, Belarus and European Russia, with G3.A constituting the westernmost section of the continuous Eurasian northern taiga belt.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004a)

### Legal instruments

<u>Legal instrument</u>	<u>Legally designated habitat</u>	<u>Code</u>
EU Habitats Directive Annex I	Western Taiga	9010

### Descriptive or diagnostic parameters

<u>Parameter</u>	<u>Value(s)</u>
Climate zones:	Boreal
Levels of habitat usage (when used in criteria):	Low level use / disturbance; No human use
Dominant life forms:	Trees; Trees > 5m / tall trees; Coniferous trees; Pine trees
Cover characteristics (when used as criteria):	Trees >10%
Characteristics of wetness or dryness:	Moist / mesic; Dry
Related phytosociological units:	<i>Aconito septentrionalis-Piceion obovatae</i> ; <i>Athyrio-Piceetalia</i> ; <i>Cytiso ruthenic-Pinion</i> ; <i>Dicrano-Pinion</i> ; <i>Phyllodoce-Vaccinion myrtilli</i>

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**EUNIS habitat code and names** G3.C English name: Larch taiga woodland;  
Scientific name: *Larix* taiga woodland

**Description**

Boreal larch, forests of Fennoscandia, the Baltic States, Belarus and European Russia, occurring in limited, edaphic pockets within the area dominated by G3.A and G3.B.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004a)

**Descriptive or diagnostic parameters**

Parameter	Value(s)
Climate zones:	Boreal
Levels of habitat usage (when used in criteria):	Low level use / disturbance; No human use
Dominant life forms:	Trees; Trees > 5m / tall trees; Coniferous trees; Pine trees
Cover characteristics (when used as criteria):	Trees >10%
Characteristics of wetness or dryness:	Moist / mesic; Dry

---

**EUNIS habitat code and names** G3.D Boreal bog conifer woodland

**Description**

Woods of *Pinus* spp. or *Picea* spp., sometimes mixed with *Betula pubescens*, colonizing bogs and fens in the boreal and boreonemoral zones.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004a)

**Legal instruments**

Legal instrument	Legally designated habitat	Code
EU Habitats Directive Annex I	Bog woodland	91D0
Council of Europe Bern Convention Res. No. 4 1996	Birch and conifer mire woods	44.A

**Descriptive or diagnostic parameters**

Parameter	Value(s)
Climate zones:	Boreal
Levels of habitat usage (when used in criteria):	Low level use / disturbance; No human use
Dominant life forms:	Trees; Trees > 5m / tall trees; Coniferous trees
Cover characteristics (when used as criteria):	Trees >10%
Characteristics of wetness or dryness:	Waterlogged; Wet and very wet; Seasonally wet

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**EUNIS habitat code and names** G3.E Nemoral bog conifer woodland

**Description**

Woods of *Pinus* spp. or *Picea* spp., sometimes mixed with *Betula pubescens*, colonizing bogs and fens in the nemoral zone. Conifer-dominated bog woodland occurs mainly in the boreal and boreonemoral zones, but extends into the nemoral, wooded steppe and steppe zones.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004a)

**Legal instruments**

Legal instrument	Legally designated habitat	Code
EU Habitats Directive Annex I	Bog woodland	91D0
Council of Europe Bern Convention Res. No. 4 1996	Birch and conifer mire woods	44.A

**Descriptive or diagnostic parameters**

Parameter	Value(s)
Levels of habitat usage (when used in criteria):	Low level use / disturbance; No human use
Dominant life forms:	Trees; Trees > 5m / tall trees; Coniferous trees
Cover characteristics (when used as criteria):	Trees >10%
Characteristics of wetness or dryness:	Waterlogged; Wet and very wet; Seasonally wet
Related phytosociological units:	<i>Betulion pubescentis</i> ; <i>Dicrano-Pinion</i> ; <i>Piceion excelsae</i> ; <i>Salicion cinereae</i> ; <i>Sphagnion medii</i> ; <i>Sphagno-Betuletalia</i>

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**EUNIS habitat code and names** G3.F Highly artificial coniferous plantations

**Description**

Plantations of exotic conifers or of European conifers out of their natural range, or of native species planted in clearly unnatural stands, typically as monocultures in situations where other species would naturally dominate.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004a)

### Descriptive or diagnostic parameters

Parameter	Value(s)
Human activities and impacts:	Forest planting; Artificial planting; Forest replanting; Anthropogenic impacts
Levels of habitat usage (when used in criteria):	Intensive use / disturbance
Dominant life forms:	Trees; Trees > 5m / tall trees; Coniferous trees
Cover characteristics (when used as criteria):	Trees >10%
Spatial characteristics (when used in criteria):	> 0.5 ha

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### EUNIS habitat code and names G4 Mixed deciduous and coniferous woodland

#### Description

Forest and woodland of mixed broad-leaved deciduous or evergreen and coniferous trees of the nemoral, boreal, warm-temperate humid and mediterranean zones. They are mostly characteristic of the boreonemoral transition zone between taiga and temperate lowland deciduous forests, and of the montane level of the major mountain ranges to the south. Neither coniferous, nor broadleaved species account for more than 75% of the crown cover. Deciduous forests with an understorey of conifers or with a small admixture of conifers in the dominant layer are included in unit G1. Conifer forests with an understorey of deciduous trees or with a small admixture of deciduous trees in the dominant layer are included in unit G3.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004a)

### Descriptive or diagnostic parameters

Parameter	Value(s)
Human activities and impacts:	Forestry practices; Forest planting; Artificial planting; Forest replanting
Levels of habitat usage (when used in criteria):	Low level use / disturbance; No human use
Dominant life forms:	Trees; Trees > 5m / tall trees; Mixed broadleaved and coniferous trees
Cover characteristics (when used as criteria):	Trees >10%

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### EUNIS habitat code and names G4.1 Mixed swamp woodland

#### Description

Broadleaved swamp woodland (G1.4 or G1.5) in combination with bog conifer woodland (G3.D or G3.E). Includes *Pinus* spp. or *Picea* spp. mixed with *Betula pubescens*, *Alnus*, *Populus* or *Quercus*.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004b)

### Descriptive or diagnostic parameters

Parameter	Value(s)
Levels of habitat usage (when used in criteria):	Low level use / disturbance; No human use
Dominant life forms:	Trees; Trees > 5m / tall trees; Mixed broadleaved and coniferous trees
Characteristics of wetness or dryness:	Waterlogged

---

### EUNIS habitat code and names G4.2 English name: Mixed taiga woodland with birch; Scientific name: Mixed taiga woodland with *Betula*

#### Description

Boreal taiga conifer woodland (G3.A, G3.B or G3.C) mixed with a significant component of *Betula* woodland (G1.91).

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004b)

### Descriptive or diagnostic parameters

Parameter	Value(s)
Levels of habitat usage (when used in criteria):	Low level use / disturbance; No human use
Dominant life forms:	Trees; Trees > 5m / tall trees; Mixed broadleaved and coniferous trees
Cover characteristics (when used as criteria):	Trees >10%

---

### EUNIS habitat code and names G4.3 English name: Mixed sub-taiga woodland with acidophilous oak;

Scientific name: Mixed sub-taiga woodland with  
*Quercus*

#### Description

The boreo-nemoral southern fringe of the taiga conifer woodland (G3.A, G3.B or G3.C) mixed with a significant component of acidophilous *Quercus robur* or *Quercus petraea* woodland (G1.8).

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004b)

**Descriptive or diagnostic parameters**

Parameter	Value(s)
Levels of habitat usage (when used in criteria):	Low level use / disturbance; No human use
Dominant life forms:	Trees; Trees > 5m / tall trees; Mixed broadleaved and coniferous trees
Cover characteristics (when used as criteria):	Trees >10%
Related phytosociological units:	<i>Aconito septentrionalis-Piceion obovatae</i> ; <i>Fagetalia sylvaticae</i> ; <i>Fagion sylvaticae</i>

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**EUNIS habitat code and names** G4.4 English name: Mixed Scots pine - birch woodland;  
Scientific name: Mixed *Pinus sylvestris* - *Betula*

woodland

**Description**

*Pinus sylvestris* woodland south of the taiga (G3.4) intimately mixed with *Betula* woodland (G1.9).

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004b)

**Descriptive or diagnostic parameters**

Parameter	Value(s)
Levels of habitat usage (when used in criteria):	Low level use / disturbance; No human use
Dominant life forms:	Trees; Trees > 5m / tall trees; Mixed broadleaved and coniferous trees
Cover characteristics (when used as criteria):	Trees >10%

---

**EUNIS habitat code and names** G4.5 English name: Mixed Scots pine - beech woodland;  
Scientific name: Mixed *Pinus sylvestris* - *Fagus*

woodland

**Description**

*Pinus sylvestris* woodland south of the taiga (G3.4) intimately mixed with *Fagus* woodland (G1.6).

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004b)

**Descriptive or diagnostic parameters**

Parameter	Value(s)
Levels of habitat usage (when used in criteria):	Low level use / disturbance; No human use
Dominant life forms:	Trees; Trees > 5m / tall trees; Mixed broadleaved and coniferous trees
Cover characteristics (when used as criteria):	Trees >10%

---

**EUNIS habitat code and names** G4.6 English name: Mixed fir - spruce - beech woodland;  
Scientific name: Mixed *Abies* - *Picea* - *Fagus* woodland

**Description**

Forests in which *Fagus sylvatica* in western and central Europe or other *Fagus* species including *Fagus orientalis* in southeastern Europe and Pontic Asia (G1.6), is associated in the main canopy with fir *Abies* spp. and/or spruce *Picea* spp. (G3.1), sometimes with an admixture of other conifers, in particular, pines *Pinus* spp. Characteristic of the montane level of the major European mountains south of the boreal zone.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004a)

**Descriptive or diagnostic parameters**

Parameter	Value(s)
Levels of habitat usage (when used in criteria):	Low level use / disturbance; No human use
Dominant life forms:	Trees; Trees > 5m / tall trees; Mixed broadleaved and coniferous trees
Cover characteristics (when used as criteria):	Trees >10%
Related phytosociological units:	<i>Abieti-Piceion</i> ; <i>Fagion sylvaticae</i>

---

**EUNIS habitat code and names** G4.7 English name: Mixed Scots pine - acidophilous oak  
woodland;  
Scientific name: Mixed *Pinus sylvestris* - acidophilous  
*Quercus* woodland

**Description**

*Pinus sylvestris* woodland south of the taiga (G3.4) intimately mixed with acidophilous *Quercus* woodland (G1.8).

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004b)

**Descriptive or diagnostic parameters**

Parameter	Value(s)
Levels of habitat usage (when used in criteria):	Low level use / disturbance; No human use
Dominant life forms:	Trees; Trees > 5m / tall trees; Mixed broadleaved and coniferous trees; Acidophile species
Cover characteristics (when used as criteria):	Trees >10%
Related phytosociological units:	<i>Cytiso ruthenici-Pinion</i>

---

**EUNIS habitat code and names** G4.8 Mixed non-riverine deciduous and coniferous woodland

**Description**

Mixed non-riverine woodland without a significant *Pinus* component, comprising elements of *Fagus*, *Betula*, *Populus tremula* or *Sorbus aucuparia* (G1.6 or G1.9) together with *Abies* and *Picea* woodland (G3.1).

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004b)

**Descriptive or diagnostic parameters**

Parameter	Value(s)
Levels of habitat usage (when used in criteria):	Low level use / disturbance; No human use
Dominant life forms:	Trees; Trees > 5m / tall trees; Mixed broadleaved and coniferous trees
Cover characteristics (when used as criteria):	Trees >10%

---

**EUNIS habitat code and names** G4.9 Mixed deciduous woodland with *Cupressaceae* or *Taxaceae*

**Description**

Mixed non-riverine woodland without a significant *Pinus* component, comprising elements of meso- and eutrophic *Quercus*, *Carpinus*, *Fraxinus*, *Acer*, *Tilia*, *Ulmus* and related woodland (G1.A) together with *Cupressaceae* or *Taxaceae* woodland (G3.9).

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004b)

**Descriptive or diagnostic parameters**

Parameter	Value(s)
Levels of habitat usage (when used in criteria):	Low level use / disturbance; No human use
Dominant life forms:	Trees; Trees > 5m / tall trees; Cupressus trees; Yew trees; Mixed broadleaved and coniferous trees
Cover characteristics (when used as criteria):	Trees >10%

---

**EUNIS habitat code and names** G4.A Mixed woodland with *Cupressaceae*, *Taxaceae* and evergreen oak

**Description**

Mediterranean evergreen oak woodland (G2.1) in combination with *Cupressaceae* or *Taxaceae* woodland (G3.9).

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004b)

**Descriptive or diagnostic parameters**

Parameter	Value(s)
Levels of habitat usage (when used in criteria):	Low level use / disturbance; No human use
Dominant life forms:	Broadleaved evergreen trees; Cupressus trees; Yew trees; Mixed broadleaved and coniferous trees

---

**EUNIS habitat code and names** G4.B English name: Mixed mediterranean pine - thermophilous oak

woodland; Scientific name: Mixed mediterranean *Pinus* - thermophilous *Quercus* woodland

**Description**

Mediterranean and thermo-Atlantic forests of thermophilous pines (G3.7) in combination with deciduous or semideciduous thermophilous *Quercus* species or by other southern trees such as *Carpinus orientalis*, *Castanea sativa* or *Ostrya carpinifolia* (G1.7).

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004b)

**Descriptive or diagnostic parameters**

Parameter	Value(s)
Climate zones:	Mediterranean; Warm non-mediterranean

Levels of habitat usage (when used in criteria): Low level use / disturbance; No human use  
Dominant life forms: Trees; Trees > 5m / tall trees; Mixed broadleaved and coniferous trees;  
Thermophile species  
Cover characteristics (when used as criteria): Trees >10%

---

**EUNIS habitat code and names** G4.C English name: Mixed Scots pine - thermophilous oak woodland;  
Scientific name: Mixed *Pinus sylvestris* - thermophilous *Quercus* woodland

**Description**

Forests or woods of sub-Mediterranean climate regions and supra-Mediterranean altitudinal levels, and of western Eurasian steppe and substeppe zones, in which deciduous or semideciduous thermophilous *Quercus* species, or sometimes *Carpinus* spp., *Ostrya carpinifolia*, share the main canopy with *Pinus sylvestris*, *Pinus pallasiana*, *Pinus saltzmannii*, *Pinus nigra*, thermophilous pines, junipers or cypresses. They constitute pine-oak facies of thermophilous deciduous woodland (G1.7).

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004a)

**Descriptive or diagnostic parameters**

Parameter	Value(s)
Climate zones:	Mediterranean; Warm non-mediterranean
Levels of habitat usage (when used in criteria):	Low level use / disturbance; No human use
Dominant life forms:	Trees; Trees > 5m / tall trees; Mixed broadleaved and coniferous trees; Thermophile species
Cover characteristics (when used as criteria):	Trees >10%
Related phytosociological units:	<i>Abietion cephalonicae</i> ; <i>Carpinion orientalis</i> ; <i>Erico-Pinion sylvestris</i> ; <i>Fraxino orni-Ericion</i> ; <i>Fraxino orni-Pinion nigrae</i> ; <i>Juniperion excelsae</i> ; <i>Pinion heldreichii</i> ; <i>Pinion kochiana</i>

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**EUNIS habitat code and names** G4.D English name: Mixed Black pine (*Pinus nigra*) - evergreen oak woodland;  
Scientific name: Mixed *Pinus nigra* - evergreen *Quercus* woodland

**Description**

Mediterranean evergreen oak woodland (G2.1) in combination with *Pinus nigra* woodland (G3.5).

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004b)

**Descriptive or diagnostic parameters**

Parameter	Value(s)
Levels of habitat usage (when used in criteria):	Low level use / disturbance; No human use
Dominant life forms:	Trees; Trees > 5m / tall trees; Broadleaved evergreen trees; Mixed broadleaved and coniferous trees
Cover characteristics (when used as criteria):	Trees >10%

---

**EUNIS habitat code and names** G4.E Mixed mediterranean pine - evergreen oak woodland

**Description**

Mediterranean evergreen oak woodland (G2.1) in combination with lowland to montane mediterranean pine woodland (excluding woodland with significant *Pinus nigra* (G3.7))

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004b)

**Descriptive or diagnostic parameters**

Parameter	Value(s)
Levels of habitat usage (when used in criteria):	Low level use / disturbance; No human use
Dominant life forms:	Trees; Trees > 5m / tall trees; Broadleaved evergreen trees; Mixed broadleaved and coniferous trees
Cover characteristics (when used as criteria):	Trees >10%

---

**EUNIS habitat code and names** G4.F Mixed forestry plantations

**Description**

Mixed plantations of coniferous and deciduous species where at least one constituent is exotic or outside its



natural range, or if composed of native species then planted in clearly unnatural stands.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004b)

**Descriptive or diagnostic parameters**

<b>Parameter</b>	<b>Value(s)</b>
Human activities and impacts:	Forest planting; Artificial planting; Forest replanting; Anthropogenic impacts
Levels of habitat usage (when used in criteria):	Intensive use / disturbance
Dominant life forms:	Trees; Trees > 5m / tall trees; Mixed broadleaved and coniferous trees
Cover characteristics (when used as criteria):	Trees >10%
Spatial characteristics (when used in criteria):	> 0.5 ha

---

**EUNIS habitat code and names** G5 Lines of trees, small Anthropogenic woodlands, recently felled woodland, early-stage woodland and coppice

**Description**

Stands of trees greater than 5 m in height or with the potential to achieve this height, either in more or less continuous narrow strips or in small (less than about 0.5 ha) plantations or small (less than about 0.5 ha) intensively-managed woods. Woodland and coppice that is temporarily in a successional or non-woodland stage but which can be expected to develop into woodland in the future. Excludes parkland (E7.1, E7.2).

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004b)

**Descriptive or diagnostic parameters**

<b>Parameter</b>	<b>Value(s)</b>
Human activities and impacts:	Forestry practices; Forest planting; Artificial planting; Forest replanting; Forestry clearance; Coppicing
Levels of habitat usage (when used in criteria):	Intensive use / disturbance
Dominant life forms:	Trees; Trees > 5m / tall trees; Trees < =5m / low trees
Cover characteristics (when used as criteria):	Trees >10%
Spatial characteristics (when used in criteria):	< 0.5 ha; linear feature

---

**EUNIS habitat code and names** G5.1 Lines of trees

**Description**

More or less continuous lines of trees forming strips within a matrix of grassy or cultivated land or along roads, typically used for shelter or shading. Lines of trees differ from hedgerows (FA) in being composed of species that can grow to at least 5 m in height and are not regularly cut down to a height below 5 m.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004a)

**Descriptive or diagnostic parameters**

<b>Parameter</b>	<b>Value(s)</b>
Dominant life forms:	Trees > 5m / tall trees
Cover characteristics (when used as criteria):	Trees >10%
Spatial characteristics (when used in criteria):	Linear feature

---

**EUNIS habitat code and names** G5.2 Small broadleaved deciduous Anthropogenic woodlands

**Description**

Plantations and small intensively-managed woods of deciduous broadleaved trees less than about 0.5 ha in area. If evergreen broadleaved species are present, they have a lower canopy cover than deciduous species.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004b)

**Descriptive or diagnostic parameters**

<b>Parameter</b>	<b>Value(s)</b>
Human activities and impacts:	Forestry practices; Anthropogenic impacts
Levels of habitat usage (when used in criteria):	Intensive use / disturbance
Dominant life forms:	Trees; Trees > 5m / tall trees; Broadleaved deciduous trees
Cover characteristics (when used as criteria):	Trees >10%
Spatial characteristics (when used in criteria):	< 0.5 ha

---

**EUNIS habitat code and names** G5.3 Small broadleaved evergreen Anthropogenic woodlands

**Description**

Plantations and small intensively-managed woods of broadleaved evergreen trees less than about 0.5 ha in area. If deciduous broadleaved species are present, they have a lower canopy cover than evergreen species.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004b)

### Descriptive or diagnostic parameters

Parameter	Value(s)
Human activities and impacts:	Forestry practices; Anthropogenic impacts
Levels of habitat usage (when used in criteria):	Intensive use / disturbance
Dominant life forms:	Trees; Trees > 5m / tall trees; Broadleaved evergreen trees
Cover characteristics (when used as criteria):	Trees >10%
Spatial characteristics (when used in criteria):	< 0.5 ha

---

### EUNIS habitat code and names G5.4 Small coniferous Anthropogenic woodlands

#### Description

Plantations and small intensively-managed woods of coniferous trees less than about 0.5 ha in area. If broadleaved species present, they have canopy cover less than 25%.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004b)

### Descriptive or diagnostic parameters

Parameter	Value(s)
Human activities and impacts:	Forestry practices; Anthropogenic impacts
Levels of habitat usage (when used in criteria):	Intensive use / disturbance
Dominant life forms:	Trees > 5m / tall trees; Coniferous trees
Cover characteristics (when used as criteria):	Trees >10%
Spatial characteristics (when used in criteria):	< 0.5 ha

---

### EUNIS habitat code and names G5.5 Small mixed broadleaved and coniferous Anthropogenic woodlands

#### Description

Plantations and small intensively-managed woods less than about 0.5 ha in area, with mixed of coniferous and broadleaved trees. The proportion of conifers is in the range 25-75%.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004b)

### Descriptive or diagnostic parameters

Parameter	Value(s)
Human activities and impacts:	Forestry practices; Anthropogenic impacts
Levels of habitat usage (when used in criteria):	Intensive use / disturbance
Dominant life forms:	Trees; Trees > 5m / tall trees; Mixed broadleaved and coniferous trees
Cover characteristics (when used as criteria):	Trees >10%
Spatial characteristics (when used in criteria):	< 0.5 ha

---

### EUNIS habitat code and names G5.6 Early-stage natural and semi-natural woodlands and regrowth

#### Description

Early stages of woodland regrowth or newly-colonizing woodland composed predominantly of young individuals of high-forest species that are still less than 5 m in height. Includes young native woodland replanted with indigenous trees and naturally-colonizing stands of non-native trees.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004b)

#### Legal instruments

<u>Legal instrument</u>	<u>Legally designated habitat</u>	<u>Code</u>
EU Habitats Directive Annex I	Active raised bogs	7110

### Descriptive or diagnostic parameters

Parameter	Value(s)
Human activities and impacts:	Whole plant harvesting
Levels of habitat usage (when used in criteria):	No human use
Dominant life forms:	Trees < =5m / low trees
Cover characteristics (when used as criteria):	Trees >10%
Related phytosociological units:	<i>Betulion pubescentis</i> ; <i>Ledo-Pinion</i> ; <i>Quercetea pubescentis</i> ; <i>Querc-Fagetea</i> ; <i>Rhamno-Prunetea</i> ; <i>Vaccinio-Piceetea</i>

---

### EUNIS habitat code and names G5.7 Coppice and early-stage plantations

#### Description

Woodland treated as coppice without standards. Plantations with a dominant canopy of young trees that are still less than 5 m in height. Plantations of dwarf trees or shrubs cultivated for wood or small-tree production, with a

regular whole-plant harvesting regime, including short-rotation *Salix* beds for biomass production, Christmas tree crops, tree nurseries.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004b)

**Descriptive or diagnostic parameters**

<b>Parameter</b>	<b>Value(s)</b>
Human activities and impacts:	Whole plant harvesting; Forestry practices; Forest planting; Artificial planting; Forest replanting; Coppicing; Anthropogenic impacts
Levels of habitat usage (when used in criteria):	Intensive use / disturbance
Dominant life forms:	Trees; Trees < =5m / low trees
Cover characteristics (when used as criteria):	Trees >10%

---

**EUNIS habitat code and names** G5.8 Recently felled areas

**Description**

Land that recently has supported deciduous or coniferous woodland after the trees have been clear-felled or burnt. Includes woodland with successional vegetation dominated by tall herbs, grasses or shrubs, provided that these will soon be overtopped by a tree canopy.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004a)

**Descriptive or diagnostic parameters**

<b>Parameter</b>	<b>Value(s)</b>
Human activities and impacts:	Forestry practices; Forestry clearance; Forest exploitation without replanting; Anthropogenic impacts
Levels of habitat usage (when used in criteria):	Active management
Related phytosociological units:	<i>Atropion</i> ; <i>Carici piluliferae-Epilobion angustifolii</i> ; <i>Sambuco racemosae-Salicion capreae</i>

## H INLAND UNVEGETATED OR SPARSELY VEGETATED HABITATS

### Description

Non-coastal habitats with less than 30% vegetation cover (other than in crevices of rocks, screes or cliffs) which are dry or only seasonally wet (with the water table at or above ground level for less than half of the year). Subterranean non-marine caves and passages including underground waters and disused underground mines. Habitats characterised by the presence of permanent snow and surface ice other than marine ice bodies.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004b)

### Descriptive or diagnostic parameters

Parameter	Value(s)
Geomorphology or landform:	Underground river and lake; Grotto, cave; Underground passage or tunnel
Cover characteristics (when used as criteria):	Vegetation <30%

---

**EUNIS habitat code and names** H1 Terrestrial underground caves, cave systems, passages and waterbodies

### Description

Natural caves, cave systems, underground waters and subterranean interstitial spaces. Caves and their associated waters harbour varied, but paucispecific, communities of animals, fungi and algae that are restricted to them (troglobiont organisms), or are physiologically and ecologically capable of conducting their entire life cycle within them (troglophile organisms), or are dependent on them for part of the life cycle (subtroglophile organisms). Underground waters not associated with caves (stygon) and interstitial spaces harbour distinctive faunas.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004a)

### Descriptive or diagnostic parameters

Parameter	Value(s)
Human activities and impacts:	Disused mine
Geomorphology or landform:	Underground river and lake; Grotto, cave; Underground passage or tunnel

---

**EUNIS habitat code and names** H1.1 Cave entrances

### Description

The exterior part of caves, including the twilight zone where light penetrating from the outer world is sufficient to permit human vision.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004b)

### Legal instruments

Legal instrument	Legally designated habitat	Code
EU Habitats Directive Annex I	Caves not open to the public	8310
Council of Europe Bern Convention Res. No. 4 1996	CAVES	65

### Descriptive or diagnostic parameters

Parameter	Value(s)
Geomorphology or landform:	Grotto, cave
Light intensity (when used in criteria):	Low intensity light
Temperature attributes (when used in criteria):	Fluctuating temperature

---

**EUNIS habitat code and names** H1.2 Cave interiors

### Description

The interior part of caves, lacking light, with or without troglobiont or troglophile organisms. Excludes dark underground passages (H1.3).

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004b)

### Legal instruments

Legal instrument	Legally designated habitat	Code
EU Habitats Directive Annex I	Caves not open to the public	8310
Council of Europe Bern Convention Res. No. 4 1996	CAVES	65

### Descriptive or diagnostic parameters

Parameter	Value(s)
Geomorphology or landform:	Grotto, cave
Light intensity (when used in criteria):	Beyond limit of light
Temperature attributes (when used in criteria):	Thermally stable

**EUNIS habitat code and names** H1.3 Dark underground passages

**Description**

Cavities within cave systems that are much longer than wide or high and may join larger cavities.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004b)

**Descriptive or diagnostic parameters**

Parameter	Value(s)
Geomorphology or landform:	Underground passage or tunnel
Spatial characteristics (when used in criteria):	Linear feature
Light intensity (when used in criteria):	Beyond limit of light
Temperature attributes (when used in criteria):	Thermally stable

**EUNIS habitat code and names** H1.4 Lava tubes

**Description**

Caves formed in lava flows by open-ended tubes or passages resulting from the cooling of the surface whose molten interior continued to flow. Near the coast, they may contain salt water not connected to the sea and be colonized by specialized (anchihaline) communities.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004a)

**Legal instruments**

<u>Legal instrument</u>	<u>Legally designated habitat</u>	<u>Code</u>
EU Habitats Directive Annex I	Fields of lava and natural excavations	8320

**Descriptive or diagnostic parameters**

Parameter	Value(s)
Geomorphology or landform:	Lava tube

**EUNIS habitat code and names** H1.5 Underground standing waterbodies

**Description**

Underground waterbodies, without perceptible flow, which may be permanent or temporary, and may or may not be part of a cave system.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004b)

**Descriptive or diagnostic parameters**

Parameter	Value(s)
Human activities and impacts:	Disused mine
Geomorphology or landform:	Underground river and lake; Grotto, cave; Underground passage or tunnel
Characteristics of water flow, source & quality:	Still

**EUNIS habitat code and names** H1.6 Underground running waterbodies

**Description**

Underground waterbodies, with perceptible flow, which may be permanent or temporary, and may or may not be part of a cave system.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004b)

**Descriptive or diagnostic parameters**

Parameter	Value(s)
Human activities and impacts:	Disused mine
Geomorphology or landform:	Underground river and lake; Grotto, cave; Underground passage or tunnel
Characteristics of water flow, source & quality:	Slow or laminar flow; Fast and turbulent flow; Variable flow; Intermittent flow

**EUNIS habitat code and names** H1.7 Disused underground mines and tunnels

**Description**

Artificial underground spaces. They may constitute important substitution habitats for cave-dwelling bats and for significant subterranean invertebrates such as crustaceans, planarians etc.

**Source** Devillers, P., Devillers-Terschuren, J. and Vander Linden, C. (2001)

**Descriptive or diagnostic parameters**

<b>Parameter</b>	<b>Value(s)</b>
Human activities and impacts:	Disused mine
Levels of habitat usage (when used in criteria):	Disused / abandoned
Geomorphology or landform:	Underground passage or tunnel

---

**EUNIS habitat code and names** H2 Screes

**Description**

Accumulations of boulders, stones, rock fragments, pebbles, gravels or finer material, of non-aeolian depositional origin, unvegetated, occupied by lichens or mosses, or colonized by sparse herbs or shrubs. Included are screes and scree slopes produced by slope processes, moraines and drumlins originating from glacial deposition, sandar, eskers and kames resulting from fluvio-glacial deposition, block slopes, block streams and block fields constructed by periglacial depositional processes of downslope mass movement, ancient beach deposits constituted by former coastal constructional processes. Deposits originating from aeolian depositional processes (dunes) or from eruptive volcanic activity are not included; they are included in H5 and H6 respectively. High mountain, boreal and mediterranean unstable screes are colonized by highly specialised plant communities. They or their constituting species may also inhabit moraines and other depositional debris accumulations in the same areas. A very few communities form in lowland areas elsewhere.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004a)

**Descriptive or diagnostic parameters**

<b>Parameter</b>	<b>Value(s)</b>
Geomorphology or landform:	Scree
Cover characteristics (when used as criteria):	Vegetation <30%
Characteristics of wetness or dryness:	Dry
Substrate types:	Mobile rock
Related phytosociological units:	<i>Arenarion norvegicae</i> ; <i>Veronico-Poion glaucae</i>

---

**EUNIS habitat code and names** H2.1 Cold siliceous screes

**Description**

Noncalcareous screes of the mountains and uplands of the boreal zone, developed on siliceous substrates including basic to ultrabasic igneous or metamorphic substrates. Included are the screes of northern Europe including Iceland.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004a)

**Descriptive or diagnostic parameters**

<b>Parameter</b>	<b>Value(s)</b>
Climate zones:	Arctic; Boreal
Geomorphology or landform:	Scree
Cover characteristics (when used as criteria):	Vegetation <30%
Characteristics of wetness or dryness:	Dry
Chemical attributes:	Acid
Substrate types:	Granite; Gneiss; Quartzite; Sandstone; Slate; Shale; Mobile rock
Related phytosociological units:	<i>Antitrichio-Rhodiolion roseae</i> ; <i>Cerastio-Saxifragion cernuae</i> ; <i>Salicion herbaceae</i> ; <i>Saxifrago-Ranunculion nivalis</i> ; <i>Veronico-Poion glaucae</i>

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**EUNIS habitat code and names** H2.2 Cold limestone screes

**Description**

Unstable, gravelly, humus-poor, highly calcareous screes of the subalpine, low alpine and middle alpine levels of boreal and arctic mountains. Characteristic plants are *Arenaria norvegica* and a number of endemic species or species of restricted range, including *Arenaria humifusa*, *Arenaria pseudofrigida*, *Artemisia norvegica*, *Papaver* species of the *Papaver radicum* group, *Papaver relictum*, *Papaver laestadianum*, *Braya linearis*.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004a)

**Descriptive or diagnostic parameters**

<b>Parameter</b>	<b>Value(s)</b>
Climate zones:	Arctic; Boreal
Geomorphology or landform:	Scree
Cover characteristics (when used as criteria):	Vegetation <30%
Characteristics of wetness or dryness:	Dry
Chemical attributes:	Base-rich
Substrate types:	Limestone; Chalk; Serpentine; Mobile rock

---

**EUNIS habitat code and names** H2.3 Temperate-montane acid siliceous screes

**Description**

Siliceous screes of high altitudes and cool sites in mountain ranges of the nemoral zone, including the Alps, Pyrenees and Caucasus.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004a)

**Legal instruments**

<u>Legal instrument</u>	<u>Legally designated habitat</u>	<u>Code</u>
EU Habitats Directive Annex I	Siliceous scree of the montane to snow levels ( <i>Androsacetalia alpinae</i> and <i>Galeopsietalia ladani</i> )	8110
	Medio-European upland siliceous screes	8150

**Descriptive or diagnostic parameters**

<b>Parameter</b>	<b>Value(s)</b>
Climate zones:	Mediterranean; Temperate
Exposure characteristics:	Exposed to north
Geomorphology or landform:	Scree
Cover characteristics (when used as criteria):	Vegetation <30%
Characteristics of wetness or dryness:	Dry
Chemical attributes:	Acid
Temperature attributes (when used in criteria):	Relatively cool microclimate
Substrate types:	Granite; Gneiss; Quartzite; Sandstone; Slate; Shale; Mobile rock
Related phytosociological units:	<i>Allosuro-Athyrium alpestris</i> ; <i>Androsacion alpinae</i> ; <i>Festucion pictae</i> ; <i>Galeopsion segetum</i> ; <i>Salicion herbaceae</i>

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**EUNIS habitat code and names** H2.4 Temperate-montane calcareous and ultra-basic screes

**Description**

Calcareous and calcschist screes of high altitudes and cool sites in mountain ranges of the nemoral zone, including the Alps, Pyrenees and Caucasus.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004a)

**Legal instruments**

<u>Legal instrument</u>	<u>Legally designated habitat</u>	<u>Code</u>
EU Habitats Directive Annex I	Calcareous and calcschist screes of the montane to alpine levels ( <i>Thlaspietea rotundifolii</i> )	8120

**Descriptive or diagnostic parameters**

<b>Parameter</b>	<b>Value(s)</b>
Climate zones:	Mediterranean; Temperate
Exposure characteristics:	Exposed to north
Geomorphology or landform:	Scree
Cover characteristics (when used as criteria):	Vegetation <30%
Characteristics of wetness or dryness:	Dry
Chemical attributes:	Base-rich; Calcareous
Temperature attributes (when used in criteria):	relatively cool microclimate
Substrate types:	Limestone; Chalk; Serpentine; Mobile rock
Related phytosociological units:	<i>Drabion hoppeanae</i> ; <i>Papaverion tatrici</i> ; <i>Papavero-Thymion pulcherrimi</i> ; <i>Petasition paradoxii</i> ; <i>Thlaspiion rotundifolii</i> ; <i>Veronico-Papaverion degenii</i>

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**EUNIS habitat code and names** H2.5 Acid siliceous screes of warm exposures

**Description**

Siliceous screes of warm exposures in mountain ranges of the nemoral zone, including the Alps, Pyrenees and Caucasus, and of Mediterranean mountains, hills and lowlands and, locally, of warm, sunny middle European upland or lowland sites.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004a)

**Legal instruments**

<u>Legal instrument</u>	<u>Legally designated habitat</u>	<u>Code</u>
EU Habitats Directive Annex I	Western Mediterranean and thermophilous scree	8130

**Descriptive or diagnostic parameters**

<b>Parameter</b>	<b>Value(s)</b>
Climate zones:	Mediterranean; Temperate
Exposure characteristics:	Exposed to south
Geomorphology or landform:	Scree

Cover characteristics (when used as criteria): Vegetation <30%  
 Characteristics of wetness or dryness: Dry  
 Chemical attributes: Acid  
 Temperature attributes (when used in criteria): Relatively warm microclimate  
 Substrate types: Granite; Gneiss; Quartzite; Slate; Shale; Mobile rock  
 Related phytosociological units: *Holcion caespitosi*; *Linario saxatilis-Senecionion carpetani*; *Linaron filicaulis*; *Senecionion leucophylli*

**EUNIS habitat code and names** H2.6 Calcareous and ultra-basic screes of warm exposures

**Description**

Calcareous and calcschist screes of warm exposures in mountain ranges of the nemoral zone, including the Alps, Pyrenees and Caucasus, and of Mediterranean mountains, hills and lowlands and, locally, of warm, sunny middle European upland or lowland sites.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004b)

**Legal instruments**

<u>Legal instrument</u>	<u>Legally designated habitat</u>	<u>Code</u>
EU Habitats Directive Annex I	Western Mediterranean and thermophilous scree	8130
	Eastern Mediterranean screes	8140
	Medio-European calcareous scree of hill and montane levels	8160

**Descriptive or diagnostic parameters**

<b>Parameter</b>	<b>Value(s)</b>
Climate zones:	Mediterranean; Temperate
Exposure characteristics:	Exposed to south
Geomorphology or landform:	Scree
Cover characteristics (when used as criteria):	Vegetation <30%
Characteristics of wetness or dryness:	Dry
Chemical attributes:	Base-rich; Calcareous
Temperature attributes (when used in criteria):	Relatively warm microclimate
Substrate types:	Limestone; Chalk; Serpentine; Mobile rock
Related phytosociological units:	<i>Bunion alpini</i> ; <i>Campanulion hawkinsianae</i> ; <i>Dryopteridion oreadis</i> ; <i>Drypidetalia spinosae</i> ; <i>Galio-Parietaria officinalis</i> ; <i>Iberidion spathulatae</i> ; <i>Iberido-Linaron propinqua</i> ; <i>Leontodontion hyoseroidis</i> ; <i>Linario-Festucion dimorphae</i> ; <i>Linaron filicaulis</i> ; <i>Linaron purpureae</i> ; <i>Peltarion alliaceae</i> ; <i>Petasition paradoxii</i> ; <i>Pimpinello-Gouffeion</i> ; <i>Platycapno saxicolae-Iberidion granatensis</i> ; <i>Saxifragion praetermissae</i> ; <i>Saxifragion prenjae</i> ; <i>Scrophularion juratensis</i> ; <i>Scrophularion sciophilae</i> ; <i>Silenion caesia</i> ; <i>Silenion marginatae</i> ; <i>Stipion calamagrostis</i> ; <i>Teucrium montani</i> ; <i>Thlaspietalia rotundifolii</i> ; <i>Thlaspion rotundifolii</i> ; <i>Thlaspion stylosi</i>

**EUNIS habitat code and names** H3 Inland cliffs, rock pavements and outcrops

**Description**

Unvegetated, sparsely vegetated, and bryophyte- or lichen-vegetated cliffs, rock faces and rock pavements, not presently adjacent to the sea, and not resulting from recent volcanic activity. Parts of seacliffs free from the influence of wave or wind transported marine salt are included. Rock accumulations resulting from depositional processes are excluded and listed under H2 or H5.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004a)

**Descriptive or diagnostic parameters**

<b>Parameter</b>	<b>Value(s)</b>
Cover characteristics (when used as criteria):	Vegetation <30%
Substrate types:	Bedrock

**EUNIS habitat code and names** H3.1 Acid siliceous inland cliffs

**Description**

Dry non-calcareous inland cliffs. Specific plant associations colonize montane and Mediterranean cliffs. Most of the subdivisions refer to them. Northern lowland cliffs usually support fragments of other less specialized communities.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004a)

**Legal instruments**

<u>Legal instrument</u>	<u>Legally designated habitat</u>	<u>Code</u>
EU Habitats Directive Annex I	Siliceous rocky slopes with chasmophytic vegetation	8220

**Descriptive or diagnostic parameters**



Parameter	Value(s)
Geomorphology or landform:	Inland cliff
Chemical attributes:	Acid
Substrate types:	Bedrock; Granite; Gneiss; Quartzite; Sandstone; Slate; Shale
Related phytosociological units:	<i>Androsacetalia vandellii</i> ; <i>Androsacion vandellii</i> ; <i>Antirrhinion asarinae</i> ; <i>Asplenion septentrionalis</i> ; <i>Asplenion serpentini</i> ; <i>Cheilanthon hispanicae</i> ; <i>Dianthion gratianopolitani</i> ; <i>Hypno-Polypodium vulgaris</i> ; <i>Koelerio-Corynephoretea</i> ; <i>Phagnalo saxatilis-Cheilanthon maderensis</i> ; <i>Potentillion crassinerviae</i> ; <i>Pruno-Rubion radulae</i> ; <i>Saxifragion nevadensis</i> ; <i>Saxifragion pedemontanae</i> ; <i>Saxifragion willkommianae</i> ; <i>Silenion lerchenfeldiana</i>

### EUNIS habitat code and names H3.2 Basic and ultra-basic inland cliffs

#### Description

Dry, calcareous inland cliffs. Specific plant associations colonize montane and Mediterranean cliffs. Most of the subdivisions refer to them. Northern lowland cliffs usually support fragments of other less specialized communities.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004a)

#### Legal instruments

Legal instrument	Legally designated habitat	Code
EU Habitats Directive Annex I	Calcareous rocky slopes with chasmophytic vegetation	8210

#### Descriptive or diagnostic parameters

Parameter	Value(s)
Geomorphology or landform:	Inland cliff
Chemical attributes:	Base-rich
Substrate types:	Bedrock; Limestone; Chalk; Serpentine
Related phytosociological units:	<i>Agropyretalia repentis</i> ; <i>Amphoricarpetalia</i> ; <i>Androsacetalia vandellii</i> ; <i>Androsacion vandellii</i> ; <i>Androsaco-Drabion tomentosae</i> ; <i>Anomodonto-Polypodietalia</i> ; <i>Arenarion bertolonii</i> ; <i>Asperulion garganicae</i> ; <i>Asplenietalia glandulosi</i> ; <i>Asplenion glandulosi</i> ; <i>Brassicion insularis</i> ; <i>Brassicico balearicae-Helichryson rupestris</i> ; <i>Campanulion versicoloris</i> ; <i>Capparo-Amaracion</i> ; <i>Centaureo-Campanuletalia</i> ; <i>Centaureo-Campanulion</i> ; <i>Centaureo-Portenschlagiellion</i> ; <i>Cirsietalia chamaepeucis</i> ; <i>Cymbalario-Asplenion</i> ; <i>Cystopteridion</i> ; <i>Dianthion rupicolae</i> ; <i>Edraianthon</i> ; <i>Edraiantho graminifolii-Erysimum comati</i> ; <i>Galion degenii</i> ; <i>Gypsophilion petraeae</i> ; <i>Inulion heterolepidis</i> ; <i>Jasionion foliosae</i> ; <i>Micromerion croatica</i> ; <i>Micromerion pulegii</i> ; <i>Moltkeetalia petraeae</i> ; <i>Onopordetalia acanthii</i> ; <i>Onosmetalia frutescentis</i> ; <i>Parietarietalia</i> ; <i>Petromaruletalia pinnati</i> ; <i>Petromarulo-Centaurion argenteae</i> ; <i>Polypodium serrati</i> ; <i>Potentilletalia caulescentis</i> ; <i>Potentilletalia speciosae</i> ; <i>Potentillion caulescentis</i> ; <i>Ramondion nathaliae</i> ; <i>Salicion incanae</i> ; <i>Saxifragion australis</i> ; <i>Saxifragion camposii</i> ; <i>Saxifragion lingulatae</i> ; <i>Saxifragion mediae</i> ; <i>Saxifragion scardicae</i> ; <i>Saxifragion trifurcato-canaliculatae</i> ; <i>Scutellarion sieberi</i> ; <i>Silenion auriculatae</i> ; <i>Sisymbrietalia</i> ; <i>Teucrium buxifolii</i>

### EUNIS habitat code and names H3.3 Macaronesian inland cliffs

#### Description

Inland cliffs of the Canary Islands, Madeira and the Azores, extremely rich in endemic species of both plants and animals, including vertebrates (the endangered *Pterodroma madeira*). The genus *Aeonium* is particularly representative.

**Source** Devillers, P., Devillers-Terschuren, J. and Vander Linden, C. (2001)

#### Descriptive or diagnostic parameters

Parameter	Value(s)
Geomorphology or landform:	Inland cliff
Substrate types:	Bedrock
Related phytosociological units:	<i>Aeonio-Greenovietae</i> ; <i>Bartramio-Polypodium serrate</i>

### EUNIS habitat code and names H3.4 Wet inland cliffs

#### Description

Very wet, dripping, overhanging or vertical rocks of hills, mountains and Mediterranean lowlands.

**Source** Devillers, P., Devillers-Terschuren, J. and Vander Linden, C. (2001)

#### Descriptive or diagnostic parameters

Parameter	Value(s)
Geomorphology or landform:	Inland cliff
Characteristics of wetness or dryness:	Wet and very wet

Substrate types: Bedrock  
 Related phytosociological units: *Adiantetetea*; *Anomodonto-Polypodietaalia*; *Asplenio celtiberici-Saxifragion cuneatae*; *Cystopteridion*; *Potentilletalia caulescentis*

**EUNIS habitat code and names** H3.5 Almost bare rock pavements, including limestone pavements

**Description**

More or less level surfaces of rock exposed by glacial erosion, by weathering processes, or by aeolian scouring, bare or colonized by mosses, algae or lichens. The hard rock surface may be exposed or partially covered by erosional rock debris, in particular, those produced by frost weathering, heaving, thrusting or cracking. Included are rock surfaces in karst landscapes, rock dome tops, whaleback, roche moutonné, flyggberg and rock basin formations of periglacial areas, golec and felsenmeer formations, level surfaces of dykes and old lava flows. Vascular plant communities may colonize cracks and weathered surfaces.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004a)

**Descriptive or diagnostic parameters**

Parameter	Value(s)
Geomorphology or landform:	Limestone pavement; Rock pavement (not limestone)
Cover characteristics (when used as criteria):	Vegetation <30%
Substrate types:	Bedrock; Limestone
Related phytosociological units:	<i>Koelerio-Corynephoretea</i>

**EUNIS habitat code and names** H3.6 Weathered rock and outcrop habitats

**Description**

Rocks and outcrops colonized by pioneer communities, especially of *Crassulaceae*. The substrates are mostly siliceous, occurring in the alpine or montane levels of higher mountains of the nemoral zone. The communities are dominated by succulent *Sempervivum arachnoideum* ssp. *arachnoideum*, *Sempervivum arachnoideum* ssp. *tomentosum*, *Sempervivum montanum* ssp. *montanum*, *Sempervivum montanum* ssp. *stiriacum*, *Sempervivum wulfenii*, *Jovibarba arenaria*, *Sedum montanum*, *Sedum anglicum* ssp. *pyrenaicum*, *Sedum sexangulare*, *Sedum album*, *Sedum annuum*, *Saxifraga aspera*, accompanied by *Silene rupestris*, *Scleranthus polycarpus*, *Veronica fruticans*, *Thymus praecox* ssp. *polytrichus*, *Viola tricolor* ssp. *saxatilis*, by small crucifers, lichens and mosses.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004a)

**Legal instruments**

Legal instrument	Legally designated habitat	Code
EU Habitats Directive Annex I	Siliceous rock with pioneer vegetation of the Sedo-Scleranthion or of the Sedo albi-Veronicion dillenii	8230

**Descriptive or diagnostic parameters**

Parameter	Value(s)
Geomorphology or landform:	Rocky outcrop
Cover characteristics (when used as criteria):	Vegetation <30%
Related phytosociological units:	<i>Androsacion vandellii</i> ; <i>Sedion pyrenaici</i> ; <i>Sedo-Scleranthion biennis</i>

**EUNIS habitat code and names** H4 Snow or ice-dominated habitats

**Description**

High mountain zones and high latitude land masses occupied by glaciers or by perennial snow. They may be inhabited by algae and invertebrates.

**Source** Devillers, P., Devillers-Terschuren, J. and Vander Linden, C. (2001)

**Descriptive or diagnostic parameters**

Parameter	Value(s)
Geomorphology or landform:	Glaciers and glacial formations; Glacier; Moraine; Snow pack; Rock glacier
Cover characteristics (when used as criteria):	Vegetation <30%
Substrate types:	Snow; Ice

**EUNIS habitat code and names** H4.1 Snow packs

**Description**

Near-permanent snow packs, in particular in avalanche corridors.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004a)

**Descriptive or diagnostic parameters**

Parameter	Value(s)
Geomorphology or landform:	Snow pack
Cover characteristics (when used as criteria):	Vegetation <30%
Substrate types:	Snow

**EUNIS habitat code and names** H4.2 Ice caps and true glaciers**Description**

Permanent and near-permanent ice. Includes ice sheets, ice caps, cirque glaciers, valley glaciers, and small ice masses (glacierets) that are either permanent or persist for a few years.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004b)

**Legal instruments**

Legal instrument	Legally designated habitat	Code
EU Habitats Directive Annex I	Permanent glaciers	8340

**Descriptive or diagnostic parameters**

Parameter	Value(s)
Geomorphology or landform:	Glaciers and glacial formations; Glacier
Substrate types:	Ice

**EUNIS habitat code and names** H4.3 Rock glaciers and unvegetated ice-dominated moraines**Description**

Mixtures of ice and rocks in which the rocks ride on top of the ice (rock glaciers), or form ridges or mounds of morainic material containing buried ice (ice-core moraines), or are in the process of losing the ice to become glacial moraines. Excludes unvegetated glacial moraines where ice is no longer dominant (H5.2).

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004b)

**Legal instruments**

Legal instrument	Legally designated habitat	Code
EU Habitats Directive Annex I	Permanent glaciers	8340

**Descriptive or diagnostic parameters**

Parameter	Value(s)
Geomorphology or landform:	Glaciers and glacial formations; Moraine; Rock glacier
Substrate types:	Ice

**EUNIS habitat code and names** H5 Miscellaneous inland habitats with very sparse or no vegetation**Description**

Miscellaneous bare habitats, including glacial moraines, freeze-thaw features, inland sand dunes, burnt ground and trampled areas. Vegetation, if present, is dominated by algae, lichens or bryophytes, with vascular plants absent or very sparse.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004a)

**Descriptive or diagnostic parameters**

Parameter	Value(s)
Cover characteristics (when used as criteria):	Vegetation <30%

**EUNIS habitat code and names** H5.1 Fjell fields and other freeze-thaw features with very sparse

or no vegetation

**Description**

Bare or very sparsely vegetated terrain in which freeze-thaw cycles result in patterned ground with much rock debris. Excludes moss- and lichen-dominated fjell-field (E4.2).

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004b)

**Descriptive or diagnostic parameters**

Parameter	Value(s)
Geomorphology or landform:	Fjell field
Cover characteristics (when used as criteria):	Vegetation <30%

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**EUNIS habitat code and names** H5.2 Glacial moraines with very sparse or no vegetation

**Description**

Glacial moraines that have lost their ice and which have not yet revegetated. Excludes moraines where ice is still dominant (H4.3).

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004b)

**Descriptive or diagnostic parameters**

Parameter	Value(s)
Geomorphology or landform:	Moraine
Cover characteristics (when used as criteria):	Vegetation <30%
Related phytosociological units:	<i>Androsacetalia alpinae</i>

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**EUNIS habitat code and names** H5.3 Sparsely- or un-vegetated habitats on mineral substrates not resulting from recent ice activity

**Description**

Accumulations of sand, boulders, stones, rock fragments, pebbles or gravels, unvegetated, occupied by lichens or mosses, or colonized by sparse herbs or shrubs. Included are inland dunes, moraines and drumlins originating from glacial deposition, sandar, eskers and kames resulting from fluvio-glacial deposition, block slopes, block streams and block fields constructed by periglacial depositional processes of downslope mass movement, ancient beach deposits constituted by former coastal constructional processes. Excludes mobile screes (H2) and deposits originating from eruptive volcanic activity (H6).

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004a)

**Descriptive or diagnostic parameters**

Parameter	Value(s)
Cover characteristics (when used as criteria):	Vegetation <30%
Related phytosociological units:	<i>Honckenyo-Elymion arenarii</i> ; <i>Potentillion anserinae</i>

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**EUNIS habitat code and names** H5.4 Dry organic substrates with very sparse or no vegetation

**Description**

Unvegetated raw humus that is not the result of burning.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004b)

**Descriptive or diagnostic parameters**

Parameter	Value(s)
Cover characteristics (when used as criteria):	Vegetation <30%
Characteristics of wetness or dryness:	Dry
Substrate types:	Organic; Peat; Dry peat

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**EUNIS habitat code and names** H5.5 Burnt areas with very sparse or no vegetation

**Description**

Burnt ground that has not yet developed cover of vascular plants. Excludes recently burnt woodland (G5.8).

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004b)

**Descriptive or diagnostic parameters**

Parameter	Value(s)
Human activities and impacts:	Burning
Cover characteristics (when used as criteria):	Vegetation <30%

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**EUNIS habitat code and names** H5.6 Trampled areas

**Description**

Bare ground resulting from trampling by humans or by other vertebrates including birds.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004b)

**Descriptive or diagnostic parameters**

Parameter	Value(s)
Human activities and impacts:	Paths, tracks; Trampling; Anthropogenic impacts
Cover characteristics (when used as criteria):	Vegetation <30%

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**EUNIS habitat code and names** H6 Recent volcanic features**Description**

Hard rock surfaces, rock jumbles, loose material deposits, soils, water bodies resulting from recent or present volcanic activity, unvegetated, occupied by lichens or mosses, or colonized by specialised, relatively sparse herb- or shrub-dominated communities.

**Source** Devillers, P., Devillers-Terschuren, J. and Vander Linden, C. (2001)

**Descriptive or diagnostic parameters**

<b>Parameter</b>	<b>Value(s)</b>
Geomorphology or landform:	Volcanoes and volcanic features; Crater, cone; Lava outflow; Lava debris; Volcanic dome, plug, neck; Terrestrial gas or vapour vent; Lava tube
Cover characteristics (when used as criteria):	Vegetation <30%
Substrate types:	Volcanic lava

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**EUNIS habitat code and names** H6.1 Active volcanic features**Description**

Orifices in volcanic areas emitting hot or cold gases and vapours. Their very extreme environment is colonized by highly distinct communities with few species. Included are steam vents (fumaroles), vapour and hot sulphurous gas vents (solfatares), paint pots, porridge pots and mud volcanoes, as well as cold carbon dioxide, methane and nitrogen vents (mofettes), that emit directly into the open atmosphere. Excludes marine (A6.9) and subterranean (H1.4) vents.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004a)

**Legal instruments**

<u>Legal instrument</u>	<u>Legally designated habitat</u>	<u>Code</u>
EU Habitats Directive Annex I	Fields of lava and natural excavations	8320

**Descriptive or diagnostic parameters**

<b>Parameter</b>	<b>Value(s)</b>
Geomorphology or landform:	Volcanoes and volcanic features; Crater, cone; Terrestrial gas or vapour vent
Cover characteristics (when used as criteria):	Vegetation <30%
Substrate types:	Volcanic lava
Related phytosociological units:	<i>Helianthemion guttati</i>

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**EUNIS habitat code and names** H6.2 Inactive recent volcanic features**Description**

Features of active volcanoes where emissions of hot or cold gases are absent. Includes barren lava flows, fields of volcanic ash and summits of dormant volcanoes.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004b)

**Legal instruments**

<u>Legal instrument</u>	<u>Legally designated habitat</u>	<u>Code</u>
EU Habitats Directive Annex I	Fields of lava and natural excavations	8320

**Descriptive or diagnostic parameters**

<b>Parameter</b>	<b>Value(s)</b>
Geomorphology or landform:	Volcanoes and volcanic features; Crater, cone; Lava outflow; Lava debris; Volcanic dome, plug, neck; Lava tube
Cover characteristics (when used as criteria):	Vegetation <30%
Substrate types:	Volcanic lava
Related phytosociological units:	<i>Greenovion aureae</i> ; <i>Rumici-Astragalion siculi</i> ; <i>Spartocytision nubigeni</i>

## I REGULARLY OR RECENTLY CULTIVATED AGRICULTURAL, HORTICULTURAL AND DOMESTIC HABITATS

### Description

Habitats maintained solely by frequent tilling or arising from recent abandonment of previously tilled ground such as arable land and gardens. Includes tilled ground subject to inundation. Excludes lawns and sports fields (E2.6), shrub orchards (FB), tree nurseries (G5.7) and tree-crop plantations (G3.F etc.).

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004b)

### Descriptive or diagnostic parameters

<b>Parameter</b>	<b>Value(s)</b>
Human activities and impacts:	Agriculture/Horticulture; Agricultural use; Large-scale, high intensity agricultural use; Large-scale, low intensity agricultural use; Small-scale, high intensity agricultural use; Small-scale, low intensity agricultural use; Arable practices; Horticulture; Large-scale, high intensity horticultural use; Large-scale, low intensity horticultural use; Small-scale, high intensity horticultural use; Small-scale, low intensity horticultural use; Whole plant harvesting; Leaf or branch cultivation; Bare tilled; Anthropogenic impacts
Dominant life forms:	Herbs

### EUNIS habitat code and names 11 Arable land and market gardens

#### Description

Croplands planted for annually or regularly harvested crops other than those that carry trees or shrubs. They include fields of cereals, of sunflowers and other oil seed plants, of beets, legumes, fodder, potatoes and other forbs. Croplands comprise intensively cultivated fields as well as traditionally and extensively cultivated crops with little or no chemical fertilisation or pesticide application. Faunal and floral quality and diversity depend on the intensity of agricultural use and on the presence of borders of natural vegetation between fields.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004a)

### Descriptive or diagnostic parameters

<b>Parameter</b>	<b>Value(s)</b>
Human activities and impacts:	Agriculture/Horticulture; Agricultural use; Large-scale, high intensity agricultural use; Large-scale, low intensity agricultural use; Small-scale, high intensity agricultural use; Arable practices; Horticulture; Large-scale, high intensity horticultural use; Large-scale, low intensity horticultural use; Small-scale, high intensity horticultural use; Whole plant harvesting; Leaf or branch cultivation; Bare tilled; Anthropogenic impacts
Levels of habitat usage (when used in criteria):	Intensive use / disturbance; Active management
Dominant life forms:	Herbs
Species richness (when used in criteria):	Monospecific; Species poor

### EUNIS habitat code and names 11.1 Intensive unmixed crops

#### Description

Cereal and other crops grown on large, unbroken surfaces in open field landscapes.

**Source** Devillers, P., Devillers-Terschuren, J. and Vander Linden, C. (2001)

### Descriptive or diagnostic parameters

<b>Parameter</b>	<b>Value(s)</b>
Human activities and impacts:	Agriculture/Horticulture; Agricultural use; Large-scale, high intensity agricultural use; Arable practices; Large-scale, high intensity horticultural use; Fertilisation; Use of pesticides ; Anthropogenic impacts
Levels of habitat usage (when used in criteria):	Active use; Intensive use / disturbance; Active management
Dominant life forms:	Herbs
Species richness (when used in criteria):	Monospecific

### EUNIS habitat code and names 11.2 Mixed crops of market gardens and horticulture

#### Description

Intensive cultivation of vegetables, flowers, small fruits, usually in alternating strips of different crops. Includes allotments and small-scale market gardens.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004a)

### Descriptive or diagnostic parameters

Parameter	Value(s)
Human activities and impacts:	Agriculture/Horticulture; Agricultural use; Arable practices; Horticulture; Anthropogenic impacts
Levels of habitat usage (when used in criteria):	Active use; Intensive use / disturbance; Active management
Dominant life forms:	Herbs

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**EUNIS habitat code and names** 11.3 Arable land with unmixed crops grown by low-intensity agricultural methods

**Description**

Traditionally and extensively cultivated crops, in particular, of cereals, harbouring a rich and threatened flora of field weeds including *Agrostemma githago*, *Centaurea cyanus*, *Legousia speculum-veneris*, *Chrysanthemum segetum*, *Calendula arvensis*, *Adonis* spp., *Consolida* spp., *Nigella* spp., *Papaver* spp.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004a)

**Descriptive or diagnostic parameters**

Parameter	Value(s)
Human activities and impacts:	Agriculture/Horticulture; Agricultural use; Large-scale, low intensity agricultural use; Arable practices; Large-scale, low intensity horticultural use; Anthropogenic impacts
Levels of habitat usage (when used in criteria):	Active use; Low level use / disturbance
Dominant life forms:	Herbs
Species richness (when used in criteria):	Monospecific
Related phytosociological units:	<i>Roemerion hybridae</i> ; <i>Stellarietea mediae</i>

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**EUNIS habitat code and names** 11.4 Inundated or inundatable croplands, including rice fields

**Description**

Inundated or inundatable fields used for the cultivation of rice (*Oryza sativa*). When not too heavily treated, they may provide substitution habitats for some wetland faunal elements, in particular, birds, including ducks, rails and herons.

**Source** Devillers, P., Devillers-Terschuren, J. and Vander Linden, C. (2001)

**Descriptive or diagnostic parameters**

Parameter	Value(s)
Human activities and impacts:	Agriculture/Horticulture; Agricultural use; Large-scale, high intensity agricultural use; Large-scale, low intensity agricultural use; Small-scale, high intensity agricultural use; Arable practices; Flooding; Management of water levels; Anthropogenic impacts
Levels of habitat usage (when used in criteria):	Active use; Intensive use / disturbance; Active management
Dominant life forms:	Herbs
Species richness (when used in criteria):	Monospecific; species poor
Characteristics of wetness or dryness:	Intermittent flooding

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**EUNIS habitat code and names** 11.5 Bare tilled, fallow or recently abandoned arable land

**Description**

Fields abandoned or left to rest, and other interstitial spaces on disturbed ground. Set-aside or abandoned arable land with forbs planted for purposes of soil protection, stabilization, fertilisation or reclamation. Abandoned fields are colonised by numerous pioneering, introduced or nitrophilous plants. They sometimes provide habitats that can be used by animals of open spaces.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004a)

**Descriptive or diagnostic parameters**

Parameter	Value(s)
Human activities and impacts:	Agriculture/Horticulture; Arable practices; Bare tilled; Anthropogenic impacts
Levels of habitat usage (when used in criteria):	Active management
Related phytosociological units:	<i>Artemisietea vulgaris</i> ; <i>Oryzo sativae-Echinochloion oryzoidis</i> ; <i>Stellarietea mediae</i>

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**EUNIS habitat code and names** 12 Cultivated areas of gardens and parks

**Description**

Cultivated areas of small-scale and large-scale gardens, including kitchen gardens, ornamental gardens and small parks in city squares. Excludes allotment gardens (11.2).

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004b)

### Descriptive or diagnostic parameters

Parameter	Value(s)
Human activities and impacts:	Agriculture/Horticulture; Small-scale, low intensity agricultural use; Small-scale, low intensity horticultural use; Leaf or branch cultivation; Anthropogenic impacts
Levels of habitat usage (when used in criteria):	Intensive use / disturbance; Active management
Species richness (when used in criteria):	Exotic species

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### EUNIS habitat code and names I2.1 Large-scale ornamental garden areas

#### Description

Cultivated areas of large-scale recreational gardens. The vegetation, usually composed mainly of introduced species or cultivars, can nevertheless include many native plants and supports a varied fauna when not intensively managed. Large-scale gardens are treated as habitat complexes (X23).

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004a)

### Descriptive or diagnostic parameters

Parameter	Value(s)
Human activities and impacts:	Agriculture/Horticulture; Large-scale, high intensity horticultural use; Large-scale, low intensity horticultural use; Anthropogenic impacts
Levels of habitat usage (when used in criteria):	Active management
Species richness (when used in criteria):	Exotic species

---

### EUNIS habitat code and names I2.2 Small-scale ornamental and domestic garden areas

#### Description

Cultivated areas of ornamental gardens and small parks beside houses or in city squares. Kitchen gardens in the immediate vicinity of dwelling places. Excludes allotment gardens (I1.2). Small gardens are treated as habitat complexes (X22, X24, X25).

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004b)

### Descriptive or diagnostic parameters

Parameter	Value(s)
Human activities and impacts:	Agriculture/Horticulture; Small-scale, high intensity horticultural use; Small-scale, low intensity horticultural use; Anthropogenic impacts
Levels of habitat usage (when used in criteria):	Active management
Species richness (when used in criteria):	Exotic species

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### EUNIS habitat code and names I2.3 Recently abandoned garden areas

#### Description

Abandoned flowerbeds and vegetable plots in gardens are rapidly colonized by abundant weeds (E5.1).

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004b)

### Descriptive or diagnostic parameters

Parameter	Value(s)
Human activities and impacts:	Agriculture/Horticulture; Abandoned cultivation; Anthropogenic impacts
Levels of habitat usage (when used in criteria):	Disused / abandoned
Related phytosociological units:	<i>Artemisietea vulgaris</i> ; <i>Galio-Urticetea</i> ; <i>Stellarietea mediae</i>

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## J CONSTRUCTED, INDUSTRIAL AND OTHER ARTIFICIAL HABITATS

### Description

Primarily human settlements, buildings, industrial developments, the transport network, waste dump sites. Includes highly artificial saline and non-saline waters with wholly constructed beds or heavily contaminated water (such as industrial lagoons and saltworks) which are virtually devoid of plant and animal life. Excludes disused underground mines (H1.7).

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004b)

### Descriptive or diagnostic parameters

<b>Parameter</b>	<b>Value(s)</b>
Human activities and impacts:	Mining and extraction activities; Extractive industries (general); Sand and gravel extraction; Quarries; Open cast mining; Mines; Urbanised areas, human habitation, constructed artificial surfaces; Continuous urbanisation; Discontinuous urbanisation; Dispersed habitation; Industrial or commercial areas; Public non-industrial buildings; Factory; Industrial stockage ; Other industrial / commercial areas; Agricultural structures; Paved areas; Constructed boundaries; Paths, tracks; Demolition or construction; Disused buildings; Communication networks; Paths, tracks, cycling tracks with man-made surface; Roads, motorways, tracks; Railway lines, TGV; Port areas; Airport; Aerodrome, heliport; Bridge, viaduct; Tunnel; Paths, tracks, cycling tracks with soil surface; Camping and caravans (general); Camping and caravans (high density); Camping and caravans (low density); Disposal of inert materials; Disposal of industrial waste; Disposal of household waste; Agricultural/horticultural wastes; Non-agricultural organic wastes (human); Non-agricultural organic waste; Anthropogenic impacts
Dominant life forms:	No dominant lifeform
Species richness (when used in criteria):	Exotic species; Species absent
Characteristics of wetness or dryness:	Aquatic; Frequently submerged

### EUNIS habitat code and names J1 Buildings of cities, towns and villages

#### Description

Buildings in built-up areas where buildings, roads and other impermeable surfaces occupy at least 30% of the land. Includes agricultural building complexes where the built area exceeds 1 ha.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004b)

#### Descriptive or diagnostic parameters

<b>Parameter</b>	<b>Value(s)</b>
Human activities and impacts:	Urbanised areas, human habitation, constructed artificial surfaces; Continuous urbanisation; Discontinuous urbanisation; Dispersed habitation; Industrial or commercial areas; Public non-industrial buildings; Factory; Industrial stockage ; Other industrial / commercial areas; Agricultural structures; Disused buildings; Camping and caravans (general); Camping and caravans (high density); Anthropogenic impacts
Levels of habitat usage (when used in criteria):	Intensive use / disturbance

### EUNIS habitat code and names J1.1 Residential buildings of city and town centres

#### Description

Buildings in urban areas where buildings, roads and other impermeable surfaces occupy at least 80% of the land, and with continuous or nearly continuous buildings, which may be houses, flats or buildings occupied for only part of the day.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004a)

#### Descriptive or diagnostic parameters

<b>Parameter</b>	<b>Value(s)</b>
Human activities and impacts:	Urbanised areas, human habitation, constructed artificial surfaces; Continuous urbanisation; Discontinuous urbanisation; Camping and caravans (high density); Anthropogenic impacts
Levels of habitat usage (when used in criteria):	Intensive use / disturbance

### EUNIS habitat code and names J1.2 Residential buildings of villages and urban peripheries

#### Description

Residential buildings in suburbs and villages where buildings and other impermeable surfaces occupy between

30% and 80% of the land area.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004b)

**Descriptive or diagnostic parameters**

<b>Parameter</b>	<b>Value(s)</b>
Human activities and impacts:	Urbanised areas, human habitation, constructed artificial surfaces; Continuous urbanisation; Discontinuous urbanisation; Anthropogenic impacts
Levels of habitat usage (when used in criteria):	Intensive use / disturbance

---

**EUNIS habitat code and names** J1.3 Urban and suburban public buildings

**Description**

Buildings with public access, such as hospitals, schools, churches, cinemas, government buildings, shopping complexes and other places of public resort.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004b)

**Descriptive or diagnostic parameters**

<b>Parameter</b>	<b>Value(s)</b>
Human activities and impacts:	Urbanised areas, human habitation, constructed artificial surfaces; Continuous urbanisation; Discontinuous urbanisation; Public non-industrial buildings; Anthropogenic impacts
Levels of habitat usage (when used in criteria):	Intensive use / disturbance; Disused / abandoned

---

**EUNIS habitat code and names** J1.4 Urban and suburban industrial and commercial sites still in active use

**Description**

Buildings in sites with current industrial or commercial use. Includes office blocks, factories, industrial units, large (greater than 1 ha) greenhouse complexes, large animal-rearing batteries and large farm units.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004b)

**Descriptive or diagnostic parameters**

<b>Parameter</b>	<b>Value(s)</b>
Human activities and impacts:	Urbanised areas, human habitation, constructed artificial surfaces; Continuous urbanisation; Industrial or commercial areas; Factory; Industrial stockage ; Other industrial / commercial areas; Anthropogenic impacts
Levels of habitat usage (when used in criteria):	Intensive use / disturbance

---

**EUNIS habitat code and names** J1.5 Disused constructions of cities, towns and villages

**Description**

Disused factories, houses, offices, factories or other buildings; these structures would, while in use, have been classified as J1.1, J1.2, J1.3 or J1.4.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004b)

**Descriptive or diagnostic parameters**

<b>Parameter</b>	<b>Value(s)</b>
Human activities and impacts:	Urbanised areas, human habitation, constructed artificial surfaces; Continuous urbanisation; Discontinuous urbanisation; Public non-industrial buildings; Disused buildings; Anthropogenic impacts
Levels of habitat usage (when used in criteria):	Disused / abandoned

---

**EUNIS habitat code and names** J1.6 Urban and suburban construction and demolition sites

**Description**

Non-rural sites in which buildings are being constructed or demolished; this land, when in use, would have been or will be classified as J1.1, J1.2, J1.3 or J1.4.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004b)

**Descriptive or diagnostic parameters**

<b>Parameter</b>	<b>Value(s)</b>
Human activities and impacts:	Urbanised areas, human habitation, constructed artificial surfaces; Continuous urbanisation; Discontinuous urbanisation; Public non-industrial buildings; Demolition or construction; Anthropogenic impacts
Levels of habitat usage (when used in criteria):	Intensive use / disturbance

---

**EUNIS habitat code and names** J1.7 High density temporary residential units

**Description**

Residential buildings that are not intended to be present for more than 10 years.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004b)

**Descriptive or diagnostic parameters**

<b>Parameter</b>	<b>Value(s)</b>
Human activities and impacts:	Urbanised areas, human habitation, constructed artificial surfaces; Continuous urbanisation; Discontinuous urbanisation; Camping and caravans (general); Camping and caravans (high density); Anthropogenic impacts
Levels of habitat usage (when used in criteria):	Intensive use / disturbance

---

**EUNIS habitat code and names** J2 Low density buildings

**Description**

Buildings in rural and built-up areas where buildings, roads and other impermeable surfaces are at a low density, typically occupying less than 30% of the ground. Excludes agricultural building complexes where the built area exceeds 1 ha (J1.4).

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004b)

**Descriptive or diagnostic parameters**

<b>Parameter</b>	<b>Value(s)</b>
Human activities and impacts:	Discontinuous urbanisation; Dispersed habitation; Agricultural structures; Constructed boundaries; Disused buildings; Camping and caravans (general); Camping and caravans (low density); Anthropogenic impacts
Levels of habitat usage (when used in criteria):	Low level use / disturbance

---

**EUNIS habitat code and names** J2.1 Scattered residential buildings

**Description**

Houses or flats in areas where buildings, roads and other impermeable surfaces are at a low density.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004b)

**Descriptive or diagnostic parameters**

<b>Parameter</b>	<b>Value(s)</b>
Human activities and impacts:	Dispersed habitation; Anthropogenic impacts
Levels of habitat usage (when used in criteria):	Low level use / disturbance

---

**EUNIS habitat code and names** J2.2 Rural public buildings

**Description**

Rural buildings with public access, such as government buildings, schools, shops or places of worship.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004b)

**Descriptive or diagnostic parameters**

<b>Parameter</b>	<b>Value(s)</b>
Human activities and impacts:	Public non-industrial buildings; Camping and caravans (general); Camping and caravans (low density); Anthropogenic impacts
Levels of habitat usage (when used in criteria):	Low level use / disturbance

---

**EUNIS habitat code and names** J2.3 Rural industrial and commercial sites still in active use

**Description**

Rural buildings used for industry, offices, warehousing etc. Excludes high concentrations of buildings on sites greater than 1 ha (J1.4).

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004b)

**Descriptive or diagnostic parameters**

<b>Parameter</b>	<b>Value(s)</b>
Human activities and impacts:	Industrial or commercial areas; Factory; Industrial stockage ; Other industrial / commercial areas; Anthropogenic impacts
Levels of habitat usage (when used in criteria):	Low level use / disturbance

---

**EUNIS habitat code and names** J2.4 Agricultural constructions

**Description**

Structures dispersed within the rural or natural environment established for the purpose of agricultural activities, permanent or temporary residences, small-scale commercial, artisanal or industrial activities, recreation, research, environmental protection. They include isolated greenhouses, animal shelters, harvest-drying structures, sheds and huts, field and pasture enclosures. Excludes high concentrations of buildings on sites greater than 1 ha (J1.4).

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004a)

**Descriptive or diagnostic parameters**

Parameter	Value(s)
Human activities and impacts:	Agricultural structures; Anthropogenic impacts
Levels of habitat usage (when used in criteria):	Low level use / disturbance

---

**EUNIS habitat code and names** J2.5 Constructed boundaries

**Description**

Walls and fences in areas where buildings are at low density. Includes sea walls.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004b)

**Descriptive or diagnostic parameters**

Parameter	Value(s)
Human activities and impacts:	Constructed boundaries; Anthropogenic impacts
Levels of habitat usage (when used in criteria):	Low level use / disturbance

---

**EUNIS habitat code and names** J2.6 Disused rural constructions

**Description**

Disused constructions that while in use would have been classified as J2.1, J2.2, J2.3 or J2.4.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004b)

**Descriptive or diagnostic parameters**

Parameter	Value(s)
Human activities and impacts:	Disused buildings; Anthropogenic impacts
Levels of habitat usage (when used in criteria):	Low level use / disturbance
Related phytosociological units:	<i>Agropyretalia repentis</i> ; <i>Carthametalia lanati</i> ; <i>Onopordetalia acanthii</i> ; <i>Sisymbrietalia</i> ; <i>Thero-Brometalia</i>

---

**EUNIS habitat code and names** J2.7 Rural construction and demolition sites

**Description**

Rural sites in which buildings are being constructed or demolished.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004b)

**Descriptive or diagnostic parameters**

Parameter	Value(s)
Human activities and impacts:	Demolition or construction; Anthropogenic impacts
Levels of habitat usage (when used in criteria):	Low level use / disturbance

---

**EUNIS habitat code and names** J3 Extractive industrial sites

**Description**

Sites in which minerals are extracted. Includes quarries, open-cast mines and active underground mines. Excludes disused underground mines (H1.7).

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004b)

**Descriptive or diagnostic parameters**

Parameter	Value(s)
Human activities and impacts:	Mining and extraction activities; Extractive industries (general); Sand and gravel extraction; Quarries; Open cast mining; Anthropogenic impacts
Levels of habitat usage (when used in criteria):	Active use

---

**EUNIS habitat code and names** J3.1 Active underground mines

**Description**

Artificial underground spaces. They may constitute important substitution habitats for cave-dwelling bats and for significant subterranean invertebrates such as crustaceans, planarians etc. Excludes disused mines

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004a)

**Descriptive or diagnostic parameters**

<b>Parameter</b>	<b>Value(s)</b>
Human activities and impacts:	Mining and extraction activities; Anthropogenic impacts
Levels of habitat usage (when used in criteria):	Active use
Geomorphology or landform:	Underground mines

---

**EUNIS habitat code and names** J3.2 Active opencast mineral extraction sites, including quarries

**Description**

Areas used for open-sky mining and quarrying activities and presently in operation.

**Source** Devillers, P., Devillers-Terschuren, J. and Vander Linden, C. (2001)

**Descriptive or diagnostic parameters**

<b>Parameter</b>	<b>Value(s)</b>
Human activities and impacts:	Mining and extraction activities; Extractive industries (general); Sand and gravel extraction; Quarries; Open cast mining; Anthropogenic impacts
Levels of habitat usage (when used in criteria):	Active use

---

**EUNIS habitat code and names** J3.3 Recently abandoned above-ground spaces of extractive industrial sites

**Description**

Disused sites that were formerly quarries or open-cast mines of type J3.2.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004b)

**Descriptive or diagnostic parameters**

<b>Parameter</b>	<b>Value(s)</b>
Human activities and impacts:	Mining and extraction activities; Extractive industries (general); Sand and gravel extraction; Quarries; Open cast mining; Anthropogenic impacts

---

**EUNIS habitat code and names** J4 Transport networks and other constructed hard-surfaced areas

**Description**

Includes roads, car parks, railways, paved footpaths and hard-surfaced areas of airports, water ports and recreational areas.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004b)

**Descriptive or diagnostic parameters**

<b>Parameter</b>	<b>Value(s)</b>
Human activities and impacts:	Paved areas; Communication networks; Paths, tracks, cycling tracks with man-made surface; Roads, motorways, tracks; Railway lines, TGV; Port areas; Airport; Aerodrome, heliport; Bridge, viaduct; Tunnel; Paths, tracks, cycling tracks with soil surface; Anthropogenic impacts
Levels of habitat usage (when used in criteria):	Active use

---

**EUNIS habitat code and names** J4.1 Disused road, rail and other constructed hard-surfaced areas

**Description**

Disused land that when in use was of type J4.2, J4.3, J4.4, J4.5 or J4.6. Such land can be colonised by herbaceous weed vegetation (E5.1) or by trees (G5.6).

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004b)

**Descriptive or diagnostic parameters**

<b>Parameter</b>	<b>Value(s)</b>
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Human activities and impacts: Anthropogenic impacts  
Dominant life forms: Weed species

---

**EUNIS habitat code and names** J4.2 Road networks

**Description**

Road surfaces and car parks, together with the immediate highly-disturbed environment adjacent to roads, which may consist of roadside banks or verges.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004b)

**Descriptive or diagnostic parameters**

<b>Parameter</b>	<b>Value(s)</b>
Human activities and impacts:	Paved areas; Communication networks; Roads, motorways, tracks; Anthropogenic impacts
Levels of habitat usage (when used in criteria):	Active use; Intensive use / disturbance; Low level use / disturbance

---

**EUNIS habitat code and names** J4.3 Rail networks

**Description**

Railway tracks, and the immediate highly-disturbed environment adjacent to railways, which may consist of banks or verges.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004b)

**Descriptive or diagnostic parameters**

<b>Parameter</b>	<b>Value(s)</b>
Human activities and impacts:	Communication networks; Railway lines, TGV; Anthropogenic impacts
Levels of habitat usage (when used in criteria):	Active use; Intensive use / disturbance; Low level use / disturbance

---

**EUNIS habitat code and names** J4.4 Airport runways and aprons

**Description**

In airports, hard surfaces other than buildings.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004b)

**Descriptive or diagnostic parameters**

<b>Parameter</b>	<b>Value(s)</b>
Human activities and impacts:	Paved areas; Communication networks; Airport; Anthropogenic impacts
Levels of habitat usage (when used in criteria):	Active use; Intensive use / disturbance; Low level use / disturbance

---

**EUNIS habitat code and names** J4.5 Hard-surfaced areas of ports

**Description**

In ports, hard surfaces other than buildings.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004b)

**Descriptive or diagnostic parameters**

<b>Parameter</b>	<b>Value(s)</b>
Human activities and impacts:	Paved areas; Communication networks; Port areas; Anthropogenic impacts
Levels of habitat usage (when used in criteria):	Active use; Intensive use / disturbance; Low level use / disturbance

---

**EUNIS habitat code and names** J4.6 Pavements and recreation areas

**Description**

Paved areas, city squares and hard-surfaced recreation areas where the traffic is on foot or if wheeled then does not use the hard-surfaced area as a route.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004b)

**Descriptive or diagnostic parameters**

<b>Parameter</b>	<b>Value(s)</b>
Human activities and impacts:	Paved areas; Sports pitch; Anthropogenic impacts
Levels of habitat usage (when used in criteria):	Active use; Intensive use / disturbance; Low level use / disturbance

---

**EUNIS habitat code and names** J4.7 Constructed parts of cemeteries

**Description**

Hard-surfaced areas within cemeteries.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004b)

**Descriptive or diagnostic parameters**

<b>Parameter</b>	<b>Value(s)</b>
Human activities and impacts:	Paved areas; Anthropogenic impacts
Levels of habitat usage (when used in criteria):	Intensive use / disturbance

---

**EUNIS habitat code and names** J5 Highly artificial man-made waters and associated structures

**Description**

Inland artificial waterbodies with wholly-constructed beds or heavily contaminated water, and their associated conduits and containers. Includes saltworks by the coast. Excludes man-made but semi-natural waterbodies (C1, C2, C3).

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004b)

**Descriptive or diagnostic parameters**

<b>Parameter</b>	<b>Value(s)</b>
Human activities and impacts:	Urbanised areas, human habitation, constructed artificial surfaces; Other industrial / commercial areas; Port areas; Anthropogenic impacts
Dominant life forms:	No dominant lifeform
Species richness (when used in criteria):	Exotic species; species absent
Characteristics of wetness or dryness:	Aquatic; Frequently submerged

---

**EUNIS habitat code and names** J5.1 Highly artificial saline and brackish standing waters

**Description**

Highly artificial inland saline or brackish waterbodies with no perceptible flow, together with their associated containers. Includes saltworks with active or recently abandoned salt-extraction evaporation basins.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004b)

**Descriptive or diagnostic parameters**

<b>Parameter</b>	<b>Value(s)</b>
Human activities and impacts:	Other industrial / commercial areas; Port areas; Anthropogenic impacts
Dominant life forms:	No dominant lifeform
Species richness (when used in criteria):	species absent
Characteristics of wetness or dryness:	Aquatic; Frequently submerged
Characteristics of water flow, source & quality:	Still
Chemical attributes:	Saline; Brackish

---

**EUNIS habitat code and names** J5.2 Highly artificial saline and brackish running waters

**Description**

Highly artificial inland saline or brackish waterbodies with perceptible flow.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004b)

**Descriptive or diagnostic parameters**

<b>Parameter</b>	<b>Value(s)</b>
Human activities and impacts:	Other industrial / commercial areas; Anthropogenic impacts
Dominant life forms:	No dominant lifeform
Species richness (when used in criteria):	species absent
Characteristics of wetness or dryness:	Aquatic; Frequently submerged
Characteristics of water flow, source & quality:	Slow or laminar flow; Fast and turbulent flow; Variable flow; Intermittent flow; Vertical flow upwards
Chemical attributes:	Saline; Brackish

---

**EUNIS habitat code and names** J5.3 Highly artificial non-saline standing waters

**Description**

Artificial watercourses and basins, together with their associated containers, holding fresh water with no perceptible flow. Includes ponds and lakes with completely man-made substrate, water storage tanks, intensively managed fish ponds, and standing waterbodies of extractive industries.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004a)

**Descriptive or diagnostic parameters**

Parameter	Value(s)
Human activities and impacts:	Other industrial / commercial areas; Port areas; Anthropogenic impacts
Dominant life forms:	No dominant lifeform
Species richness (when used in criteria):	Exotic species; species absent
Characteristics of wetness or dryness:	Aquatic; Frequently submerged
Characteristics of water flow, source & quality:	Still

---

**EUNIS habitat code and names** J5.4 Highly artificial non-saline running waters**Description**

Artificial watercourses and basins, together with their associated containers, carrying fresh water with perceptible flow. Includes sewers, running discharges from extractive industrial sites, subterranean artificial watercourses, and channels with completely man-made substrate. Excludes fountains and cascades.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004a)

**Descriptive or diagnostic parameters**

Parameter	Value(s)
Human activities and impacts:	Other industrial / commercial areas; Anthropogenic impacts
Dominant life forms:	No dominant lifeform
Species richness (when used in criteria):	Exotic species; species absent
Characteristics of wetness or dryness:	Aquatic; Frequently submerged
Characteristics of water flow, source & quality:	Slow or laminar flow; Fast and turbulent flow; Variable flow; Intermittent flow

---

**EUNIS habitat code and names** J5.5 Highly artificial non-saline fountains and cascades**Description**

Artificial watercourses and basins, together with their associated containers, with fresh water that spurts or splashes.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004b)

**Descriptive or diagnostic parameters**

Parameter	Value(s)
Human activities and impacts:	Anthropogenic impacts
Dominant life forms:	No dominant lifeform
Species richness (when used in criteria):	Species absent
Characteristics of wetness or dryness:	Aquatic
Characteristics of water flow, source & quality:	Vertical flow

---

**EUNIS habitat code and names** J6 Waste deposits**Description**

Tips, landfill sites and slurries produced as byproducts, usually unwanted, of human activity.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004b)

**Descriptive or diagnostic parameters**

Parameter	Value(s)
Human activities and impacts:	Disposal of inert materials; Disposal of industrial waste; Disposal of household waste; Agricultural/horticultural wastes; Non-agricultural organic wastes (human); Non-agricultural organic waste; Anthropogenic impacts

---

**EUNIS habitat code and names** J6.1 Waste resulting from building construction or demolition**Description**

Dumps of building waste when not forming a part of construction or demolition sites, or when so large as to constitute a separate habitat.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004b)

**Descriptive or diagnostic parameters**

Parameter	Value(s)
Human activities and impacts:	Disposal of inert materials; Anthropogenic impacts

---

**EUNIS habitat code and names** J6.2 Household waste and landfill sites



**Description**

Sites used for disposal of household waste, including landfill sites that may be used for several types of waste.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004b)

**Descriptive or diagnostic parameters****Parameter**

Human activities and impacts:

**Value(s)**

Disposal of household waste; Anthropogenic impacts

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**EUNIS habitat code and names** J6.3 Non-agricultural organic waste**Description**

Sewage waste, sewage slurries.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004b)

**Descriptive or diagnostic parameters****Parameter**

Human activities and impacts:

**Value(s)**

Non-agricultural organic wastes (human); Anthropogenic impacts

---

**EUNIS habitat code and names** J6.4 Agricultural and horticultural waste**Description**

Dung heaps, slurry lagoons, decaying straw, dumps of unwanted produce.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004b)

**Descriptive or diagnostic parameters****Parameter**

Human activities and impacts:

**Value(s)**

Agricultural/horticultural wastes; Anthropogenic impacts

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**EUNIS habitat code and names** J6.5 Industrial waste**Description**

Heaps, tips and mounds formed as byproducts of industrial activities. Includes slag heaps, mine waste, dumped quarry waste, and mineral wastes resulting from chemical processes.

**Source** Hill, M.O., Moss, D. & Davies, C.E. (2004a)

**Descriptive or diagnostic parameters****Parameter**

Human activities and impacts:

**Value(s)**

Disposal of industrial waste; Anthropogenic impacts

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## 4 GLOSSARY

### Glossary

- aapa mire** Minerotrophic mires with a shallow peat layer and a depressed centre. In late spring floods, the centres of aapa mires are often covered in water, which may prevent sphagnum moss from becoming dominant. The surface of an aapa mire is distinctive, consisting of high strings and low pools. These patterns are unstable, and the strings may move several tens of centimetres a year, probably pushed by hydrostatic pressure from the pools.
- abandoned** No longer managed or used.
- abandonment** The cessation of management.
- abiotic factor** Physical, chemical and other non-living environmental factors, including climate, soil parent material and sediment lithology.
- abyssal** Relating to ocean depths from 2000 to 5000 m.
- abyssal hill** Relatively low-relief hill rising up from an abyssal plain.
- abyssal zone** Applied to the deepest part of the ocean, below about 2000 m. The abyssal zone lies seaward of, and deeper than, the bathyal zone, and covers approximately 75% of the ocean floor. It is the most extensive Earth environment, cold, dark, with slow-moving currents (less than a few centimetres per second), supporting fauna that are typically black or grey, delicately structures and not streamlined. (cf. neritic. See also bathyal zone, hadal zone.)
- acid soil** Soil that has a pH less than 6.5. Degrees of soil acidity are recognised. Soil is regarded as 'very acid' when the reaction is less than pH 5.0. The Nordic Vegetation Classification defines soils with a reaction of less than pH 4.5 as highly acid; pH 4.5-5.5, acid; and pH 5.6-6.5, moderately acid. Soils with a reaction between pH 6.5 and 7.2 are regarded as neutral. Surface soil horizons of acid brown earths have a reaction of pH 5.0 or less. (See also alkaline soil.)
- acid water** Water with a pH less than 6.5 is regarded as acid. Degrees of acidity are recognised. Water with a reaction less than pH 5 is regarded as highly acid; and 5.0-6.5, moderately acid. Water with a reaction between pH 6.5 and 7.5 is regarded as neutral. (See also alkaline water.)
- acidophile** An organism that thrives in a relatively acid environment.
- acidophilous** Growing well in an acid medium.
- aerobic** 1. Of an environment: one in which oxygen is present. 2. Of an organism: one requiring the presence of oxygen for its existence.
- afforestation** Establishment of a new forest by seeding or planting of nonforested land. The planting of trees on land which was previously used for other purposes than forestry.
- aggregate species** A group of species that are so closely related that they are regarded as a single species.
- agriculture** The science or practice of cultivating the soil or rearing animals; farming. (See also horticulture.)
- algae** A large assemblage of lower plants, formerly regarded as a single group, but now usually classified in eight separate divisions or phyla, including the blue-green algae (Cyanobacteria), green algae (Chlorophyta), brown algae (Phaeophyta), red algae (Rhodophyta) and diatoms and their allies (Chrysophyta). Marine algae are commonly known as seaweeds.
- alkaline soil** Soil with a pH greater than 7.2. Degrees of soil alkalinity are recognised. The Nordic Vegetation Classification lists soils with pH 7.2-8.5 as slightly alkaline; 8.5-9.5 as alkaline; and more than 9.5 as highly alkaline. The full range of the pH scale (0-14) is not used in soils, as the reaction of most soils is between pH 3.5 and pH 10.0. A base saturation of 100% indicates a pH of about 7.0 or higher. (See also acid soil.)
- alkaline water** Water with a pH greater than 7.5. Degrees of alkalinity are recognised. Water with a reaction between pH 7.5 and 8.5 is defined as moderately alkaline; 8.5-9.5, alkaline; and >9.5, highly alkaline. Water with a reaction between 6.5 and 7.5 is regarded as neutral. (See also acid water.)
- alliance** A group of plant associations classed together on the basis of similarities in floristic and sociological characters.
- allochthonous** Not indigenous; acquired. Applied to material which did not originate in its present position (e.g. plant material in a deposit, such as a lake or marine sediment, which did not grow at that location but was introduced by some process).
- alluvial** Pertaining to clay or silt or gravel carried by rushing streams and deposited where the stream slows down.
- alluvial plain** A level or gently sloping tract or a slightly undulating land surface produced by extensive deposition of alluvium, usually adjacent to a river that periodically overflows its banks; it may be situated on a flood plain, a delta, or an alluvial fan.

## Glossary

- alluvium** Fine particles of soil or rock washed down by rain or river water and deposited in a valley or estuary. Alluvial soils are highly fertile.
- Alpine (biogeographic region)** Of, or pertaining to, high mountains. As defined for the purposes of the Habitats Directive, the region covers parts of Austria, Finland, France, Germany, Italy, Spain and Sweden.
- Alpine (climate zone)** A region that occurs above the tree line and below the (permanent) snow line on temperate and tropical mountains. The vegetation is characterised by an absence of trees and varies greatly with its aspect, the greatest contrasts being between the wet side and the dry leeward side of the mountains concerned. The elevation of the lower limit of the zone increases from about 1000 m above sea level in Scotland to over 2000 m in the Swiss Alps.
- Alpine / alpine 1. (Alpine).** Characteristic of or related to the Alps. 2. (Alpine). Geological term referring to an episode of mountain building in the Cenozoic. 3. (alpine). The parts of a mountain above the treeline and below permanent snow, or the plants and animals living in that zone.
- Alps** Central European and eastern Western European range of the Alpides, extending over south-eastern France, northern Italy, southern Germany, Switzerland, Liechtenstein, Austria and northern Slovenia, with foothills entering western Hungary. The main break between the Alps and the Dinarides is in mid-Slovenia, from the Soca Valley in the west to the Dravinja Valley in the east, so that the Julian Alps (Julijske Alpe), the Karawanken, the Steiner Alps and the Pohorje belong to the Alps, while the Slovenian karst mountains, the Jorjanci and the Velika Kapela are part of the Dinarides.
- alti-Mediterranean** Of, relating to or inhabiting the altitudinal level of Mediterranean mountains corresponding to the subalpine and alpine levels of medio-Mediterranean mountains.
- altitude** In general, a term used to describe a topographic eminence. A specific altitude or height above a given level.
- altitude zone** Conditions usually become cooler and damper with increased altitude, so that the vegetation of mountains of considerable elevation shows a corresponding zonation. The elevation of lines dividing altitude zones varies with latitude and oceanic influence. In progressively higher latitudes the elevation of the tree line gradually descends, eventually to sea level.
- anaerobic** Of an organism: one able to exist in the absence of oxygen (i.e. an anaerobe).
- angiosperms** The class of seed plants that includes all the flowering plants, characterised by the possession of flowers. The ovules, which become seeds after fertilisation, are enclosed in ovaries. The xylem contains true vessels. The Angiospermae are divided into two subclasses: Monocotyledoneae and Dicotyledoneae.
- anoxic** The condition of oxygen deficiency or absence of oxygen. Anoxic sediments and anoxic bottom waters are commonly produced where there is a deficiency of oxygen, owing to very high organic productivity, and a lack of oxygen replenishment to the water or sediment, as in the case of stagnation or stratification of the body of water.
- aquatic** Growing or living in or near water.
- aquatic habitat** Water-covered by either marine or fresh waters and including littoral zones.
- aquatic plant** Plants adapted for a partially or completely submerged life.
- archipelago** An island group consisting of numerous islands, islets and skerries of various sizes and substratum types, usually close to a mainland.
- arctic (climate zone)** Of or pertaining to the north pole, or the north polar regions. Characterised by or typical of the very cold climate of the polar region.
- Arctic-montane (biome)** Species with their main distribution either to the north of or (on mountains) above the tree line, or both.
- arid land** Lands characterised by low annual rainfall of less than 250 mm, by evaporation exceeding precipitation and a sparse vegetation.
- artificial habitat** Primarily human settlements, industrial developments, transport or waste dump sites or highly artificial waters with wholly constructed beds or heavily contaminated water.
- athalassic** Non-marine, antonym of thalassic; qualifies waterbodies not under the direct influence of the present day world ocean and its connected seas.
- Atlantic (biogeographic region)** Of, in, near or pertaining to the Atlantic Ocean. As defined for the purposes of the Habitats Directive, the region covers Ireland, the Netherlands and the UK and parts of Belgium, Denmark, France, Germany, Portugal and Spain.
- atlantic (climate zone)** Characterised by relatively high rainfall and high winter temperatures. Difference between mean temperature of the warmest and of the coldest month less than 18°C.
- atroglozoocenotic** Qualifies a cave harbouring no specialised organisms.
- basiphilous** Refers to organisms which have adapted for life in alkaline soil or other medium.

## Glossary

- bathyal zone** The oceanic zone at depths of 200–2000 m, lying seaward of the shallower neritic zone, and landward of the deeper abyssal zone. The upper limit of the bathyal zone is marked by the edge of the continental shelf. In marine ecology, it is the region of the continental slope and rise. It may be geologically active, and includes trenches and submarine canyons, with under-water erosion producing avalanches. (See also abyssal zone, hadal zone.)
- beach** The unconsolidated material that covers a gently sloping zone, typically with a concave profile, extending landward from the low-water line to the place where there is a definite change in material or physiographic form (such as a cliff), or to the line of permanent vegetation (usually the effective limit of the highest storm waves); a shore of body of water, formed and washed by waves or tides, usually covered by sand or gravel, and lacking a bare rocky surface.
- bedrock** Unweathered rock. Includes very soft rock-types such as chalk and clay.
- benthic** Of or relating to or happening on the bottom under a body of water (cf. pelagic).
- benthic zone** The lowermost region of a freshwater or marine profile in which the benthos resides. In bodies of deep water where little light penetrates to the bottom the zone is referred to as the benthic abyssal region and productivity is relatively low. In shallower (i.e. coastal) regions where the benthic zone is well lit, the zone is referred to as the benthic littoral region and it supports some of the world's most productive ecosystems.
- benthos** Those organisms attached to, living on, in or near the sea bed, river bed or lake floor.
- Bern Convention** Name given to the Convention on the Conservation of European Wildlife and Natural Habitats. It aims to protect all forms of endangered wildlife in specified parts of Europe.
- biocoenosis** A community or natural assemblage of organisms; often used as an alternative to ecosystem but strictly is the fauna/flora association excluding physical aspects of the environment.
- biodiversity** Genetic diversity: the variation between individuals and between populations within a species; species diversity: the different types of plants, animals and other life forms within a region; community or ecosystem diversity: the variety of habitats found within an area (grassland, marsh, and woodland for instance).
- biogenic** Resulting from the actions of living organisms.
- biogenic reef** A structure formed by the aggregation or concretion of individuals or the development of colonies into a structure which is firm or solid and distinct from the surrounding seabed. The reef may be composed almost entirely of the reef building species and its tubes or shells, or it may be intermixed with sediments, stones and shells bound together by the reef building species. The reef provides a relatively stable surface upon which an epibiota community may develop. (cf. reef.)
- biogenic rock** An organic rock produced by the physiological activities of plant or animal organisms.
- biogeographic region** Area of the Earth's surface defined by the species of fauna and flora it contains.
- bioherm** A mound, dome, or reef-like mass of rock that is composed almost exclusively of the remains of sedentary marine organisms and is embedded in rock of different physical character.
- biome** A biological subdivision that reflects the ecological and physiognomic character of the vegetation. Biomes are the largest geographical biotic communities that it is convenient to recognise. They broadly correspond with climatic regions, although other environmental controls are sometimes important. They are the equivalent to the concept of major plant formations in plant ecology, but are defined in terms of all living organisms and of their interaction with the environment (and not only with the dominant vegetation type). Typically, distinctive biomes are recognised for all the major climatic regions of the world, emphasising the adaptation of living organisms to their environment.
- biotic factor** The influence upon the environment of organisms owing to the presence and activities of other organisms (e.g. the casting of shade and competition), as distinct from a physical, abiotic environmental factor.
- biotope** An area of relatively uniform environmental conditions, occupied by a given plant community and its associated animal community.
- bocage** The wooded countryside characteristic of northern France, with small irregular-shaped fields and many hedges and copses.
- bog** A plant community of acidic, wet areas. Decomposition rates in it are slow, favouring peat development. In Britain and high northern latitudes typical plants include bog-mosses (*Sphagnum* spp.), sedges (e.g. *Eriophorum* spp), and heathers (e.g. *Calluna vulgaris* and *Erica tetralix*). Insectivorous plants (e.g. sundews, *Drosera* spp.) are especially characteristic; they compensate for low nutrient levels by trapping and digesting insects. Different types of bog community are recognised reflecting the different physiographic and climatic conditions that may give rise to bog formation.

## Glossary

- Bonn Convention** Convention of the Conservation of Migratory Species of Wild Animals, which was drawn up to protect all migratory species considered to be endangered through all or part of their range. The Convention came into effect in 1983 and imposes strict conservation responsibilities. Hunting or trapping of 51 species threatened with extinction, half of them birds, is strictly prohibited. The Convention also aims to encourage countries along migration routes to draw up agreements to protect another 2000 threatened species.
- Boreal (biogeographic region)** Pertaining to the north; northern; circumpolar. As defined for the purposes of the Habitats Directive, the region covers parts of Finland and Sweden.
- boreal (climate zone)** The boreal (taiga) forest zone of Eurasia, where it extends to 65-70° N in the west and 50° N in the east, and North America, where it extends from the fringe of the tundra southwards to 55° N in the east. Winters are long and cold, with temperatures below 6°C for 6-9 months, and summers short, with temperatures averaging more than 10°C. Precipitation, as snow in winter, typically amounts to 380-635 mm per annum.
- Boreal-montane (biome)** Species with their main distribution in the coniferous forest zone. They may occur in the Boreal zonobiome, and/or in the coniferous forest zone of mountains to the south. This zone also includes subalpine or subarctic forests of birch (*Betula pubescens*).
- Boreo-nemoral (biome)** Zone in which boreal coniferous and temperate broadleaved tree species are intermixed.
- botanical garden** A garden maintained for the study of plants or conservation of ex-situ specimens. (See also garden.)
- boulder** Mineral substrate with dominant particle size > 256 mm. Very large boulders (>1024 mm), large boulders (512-1024 mm), small boulders (256-512 mm). (Wentworth scale of particle sizes.)
- brackish water** Water with a salt concentration between 5-18 ppt (dividing point from Surface Water Directive (75/440/EEC) Annex II). (See also saline, oligohaline, mesohaline, euhaline, polyhaline.)
- broadleaved tree** Trees other than conifers, not quite co-terminous with deciduous trees because on the one hand the deciduous larch is a conifer and on the other a few broad-leaved trees such as holly are evergreen.
- broadleaved woodland** Wooded land on which more than 75% of the tree crown cover consists of broadleaved species. (See also coniferous woodland, mixed woodland.)
- brushwood** A type of degraded vegetation composed of shrubs, usually not exceeding three meters in height, the majority having small, hard, leathery, often spiny or needle-like drought-resistant leaves and occurring in areas with a Mediterranean climate.
- bryophytes** A major grouping or phylum of green lower plants, comprising the mosses, liverworts and hornworts.
- calcareous** Applied to substances containing calcium carbonate.
- calcareous soil** Soil that contains enough free calcium carbonate to effervesce visibly, releasing carbon dioxide gas, when treated with cold 0.1N hydrochloric acid, and which could also be regarded as an alkaline soil.
- calcicolous** Applied to an organism that prefers to grow in, or can only grow in habitats rich in calcium.
- calcifuge** A plant species not usually found on soils containing free calcium carbonate.
- canal** A man-made waterway or artificially improved river used for irrigation, shipping or travel.
- carr** Low woods and scrubs colonizing fens, with neutral (not extremely acidic) waters and good nutrient status. Typically comprises *Frangula* sp., willow (*Salix* spp.), *Rhamnus* sp., *Alnus* spp. or *Betula* spp.
- cave / cavern** A natural cavity, chamber or recess which leads beneath the surface of the earth, generally in a horizontal or obliquely inclined direction. It may be in the form of a passage or a gallery, its shape depending in part on the joint pattern or structure of the rock and partly on the type of process involved in its excavation. Thus, caves worn by subterranean rivers may be different in character from, and of considerably greater extent than, a sea-cave eroded by marine waves. / A natural underground open space, generally with a connection to the surface and large enough for a person to enter. The most common type of cave is formed in a limestone by dissolution.
- chasmophytic** Plants growing in crevices.
- chionophilous** Snow loving; refers to species growing in localities where snow lingers, or at the limit of permanent snow.
- circalittoral** Sub-tidal or non-tidal water, with insufficient light penetration to allow algae to dominate. May have some wave action, and tidal currents may exert a strong influence. (See also littoral, infralittoral, supralittoral.)
- cliff** A steep rock face.

## Glossary

- climate** The long-term prevalent weather conditions of an area. / The average weather condition in a region of the world. Many aspects of the Earth's geography affect the climate. Equatorial, or low, latitudes are hotter than the polar latitudes because of the angle at which the rays of sunlight arrive at the Earth's surface. The difference in temperature at the equator and at the poles has an influence on the global circulation of huge masses of air. Cool air at the poles sinks and spreads along the surface of the Earth towards the equator. Cool air forces its way under the lower density warmer air in the lower regions, pushing the lighter air up and toward the poles, where it will cool and descend.
- climate type** Continental climate, desert climate, equatorial climate, microclimate, oceanic climate, temperate climate, tropical climate (list from GEMET v.1.0.)
- climate zone** A region or zone that is characterised by a generally consistent climate. Climatic zones approximate to distinct latitude belts around the earth. The elevation of the lower limit of a zone increases with decreasing latitude.
- climax** A botanical term referring to the terminal community said to be achieved when a sere (a sequential development of a plant community or group of plant communities on the same site over a period of time) achieves dynamic equilibrium with its environment and in particular with its prevailing climate. Each of the world's major vegetation climaxes is equivalent to a biome. Many botanists believe that climate is the master factor in a plant environment and that even if several types of plant succession occur in an area they will all tend to converge towards a climax form of vegetation.
- coarse sand** Mineral substrate with dominant particle size 1-4 mm. (Wentworth scale of particle sizes.)
- coastal area / coastal environment** The areas where the land masses meet the seas. Coastal areas throughout the world are under enormous environmental stress, which is caused by a wide range of factors, including pollution and the destruction and deterioration of marine habitats. The areas of land and sea bordering the shoreline and extending seaward through the breaker zone.
- cobble** Mineral substrate with dominant particle size 64-256 mm. (Wentworth scale of particle sizes.)
- compensation level** The depth at which light penetration in aquatic ecosystems is so reduced that oxygen production by photosynthesis just balances oxygen consumption by respiration. Generally this implies a light intensity of about 1% of full daylight.
- coniferous woodland** Coniferous woodland is defined as wooded land on which more than 75% of the tree crown cover consists of coniferous species. (See also broadleaved woodland, mixed woodland.)
- conifers (Gymnospermae: Coniferae)**. Monoecious trees or shrubs.
- Continental (biogeographic region)** Of, pertaining to or characteristic of mainland Europe. As defined for the purposes of the Habitats Directive, the region covers Luxembourg and parts of Austria, Belgium, Denmark, France, Germany and Italy.
- continental (climate zone)** Designating a climate characteristic of large land masses, with hot summers, cold winters and low rainfall. Difference between mean temperature of the warmest and of the coldest month greater than 18°C.
- continental shelf** The gently seaward-sloping seabed surface that extends between the shoreline and the top of the continental slope at about 150 m depth. The average gradient of the shelf is between 1:500 and 1:1000 and, although it varies greatly, the average width is approximately 70 km.
- continental slope** The relatively steeply-sloping surface that extends from the outer edge of a continental shelf down to the continental rise. The total relief is substantial, ranging from 1 km to 10 km, but the slope is not precipitous and ranges from 10 to 150 of slope (average 40). Along many coasts of the world the slope is furrowed by deep submarine canyons, terminating as fan-shaped deposits at the base.
- coppice** 1. A traditional European method of woodland management and wood production in which shoots are allowed to grow up from the base of a felled tree. Trees are felled in a rotation, commonly of 12-15 years. A coppice may be large, in which case trees, usually ash (*Fraxinus*) or maple (*Acer*), are cut, leaving a massive stool from which up to 10 trunks arise; or small, in which case trees, usually hazel (*Corylus*), hawthorn (*Crataegus*), or willow (*Salix*), are cut to leave small, underground stools producing many short stems. 2. The smaller trees and bushes that regenerate from cut stumps and occasionally (in *Ulmus* species) from root suckering.
- coppice-with-standards** A coppice system in which scattered trees, typically oak (*Quercus* spp.) are allowed to grow to their full height (standards) for use as structural timber, while the understorey, commonly of hazel (*Corylus* sp.), is coppiced.
- crenon** Ecological environment formed by a spring. Upstream waters of the fluvial ecosystem.
- cultivation** Tilling the soil by ploughing, digging, draining and/or smoothing. It is done in the course of seeding, transplanting, loosening soil, controlling weeds, or incorporating residues.

## Glossary

- dealpine** Qualifies low-altitude populations of high-altitude species or low-altitude representatives of high-altitude communities that have migrated downslope from their characteristic range along the rivers issued from the Alps or other major Alpides.
- deciduous forest** Forests composed of trees which shed their leaves at maturity or at certain seasons. The temperate forests comprised of trees that seasonally shed their leaves, located in the east of the USA, in Western Europe from the Alps to Scandinavia, and in the eastern Asia. The trees of deciduous forests usually produce nuts and winged seeds. A relatively small number of mammals live in the forests, including bears, badgers, deer, wild pigs and squirrels, but their seed and nut-gathering activities have a considerable effect on the distribution of seed and, therefore, the survival of deciduous forest trees.
- deciduous tree** Applied to trees that sheds their leaves seasonally.
- deep seabed** Generally over 200 m in depth.
- dehesa** Landscape where crops, pasture land or Mediterranean scrub, in juxtaposition or rotation, are shaded by a fairly closed to very open canopy of native oaks, *Quercus suber*, *Quercus rotundifolia*, *Quercus pyrenaica*, *Quercus faginea*. Characteristic of the southwestern quadrant of the Iberian peninsula.
- desert** A wide, open, comparatively barren tract of land with few forms of life and little rainfall.
- ditch** A long, narrow excavation artificially dug in the ground; especially an open and usually unpaved waterway, channel, or trench for conveying water for drainage or irrigation, and usually smaller than a canal. Some ditches may be natural watercourses.
- dolomite** 1. A light-tinted, especially yellowish, brownish or white mineral, essentially  $\text{CaMg}(\text{CO}_3)_2$ . 2. A type of limestone consisting largely of the mineral dolomite. Also called 'dolomitic limestone', 'magnesian limestone'.
- driftline** High tide line on the sea shore characterised by lines of wave-deposited organic material.
- dune** A hill or ridge of wind-blown sand, especially one barren of vegetation. Also called 'sand-dune'.
- dune slack** A flat-bottomed, hollow zone within a sand-dune system that has developed over impervious strata. The slack may result from erosion or blow-out of the dune system, and the flat base level is therefore close to or at the permanent water-table level. Characteristically, dune slacks have a rich, marshy flora, with *Salix* species (willow) as typical woody colonisers.
- dwarf shrubs** Low-growing shrub species, including ericaceous species and cushion-forming and often thorny shrubs.
- dystrophic** Applied to a lake that is usually shallow, rich in humus giving its water a brown colour, with variable amounts of nutrients, and with the deeper water often depleted of oxygen. (See also oligotrophic, mesotrophic, eutrophic.)
- early-stage woodland** Young stages of forest re-growth or early colonisation by tree species, and coppice, where tree species are artificially maintained in the shrub phase. (See also forest habitat, other wooded land, tree-lines.)
- embryonic soil** The zone of weathering of mineral substrates constituting the very early stages of soil development.
- endemism** The situation in which a species or other taxonomic group is restricted to a particular geographic region, owing to factors such as isolation or response to soil or climatic conditions. Such a taxon is said to be endemic to that region. The size of the region in this context will usually depend on the status of the taxon: thus a family will be endemic to a much larger area than a species, all other things being equal.
- epilimnion** The upper, warm, circulating water in a thermally stratified lake or sea in summer. Usually it forms a layer that is thin compared to the hypolimnion.
- epipotamal** Of, related to or living in the upper part of the potamon, lower zone of a river, where the slope is less than 1% and where the current is the slowest.
- epipotamon** The upper part of the potamon, lower zone of a river, where the slope is less than 1% and where the current is the slowest.
- epirhitral (epirithral / epirhithral)** Of, relating to or living in the upper part of the upper zone of a stream (brooks and small rivers) with a slope of more than 2%, and with fast flowing, summer-cool, well-oxygenated waters.
- epirhitron (epirithron / epirhithral)** Upper part of the upper zone of a stream (brooks and small rivers) with a slope of more than 2%, and with fast flowing, summer-cool, well-oxygenated waters. Epi-, meta-et hyporhitral zones are generally distinguished.
- ericaceous** Of or pertaining to the family Ericaceae, which comprises chiefly shrubs and small trees and includes the heaths, heather, rhododendron and azalea.

## Glossary

- ericoid** Belonging to plants of the genus *Erica* and allied genera; resembling such plants, especially in respect of their narrow revolute leaves.
- ermes** Very dry over-grazed Mediterranean habitats, characterised by unpalatable tall herb species, for example asphodels, thistles, Jerusalem sage or fennel.
- euhaline** Water with a salt content of 30 to 40 ppt. (See also brackish, saline water, oligohaline, mesohaline, polyhaline.)
- euhydrophyte** A plant that is completely submerged, except for its inflorescences, or is anchored to the substratum and has floating leaves, or has floating and submerged leaves. The definition includes submerged, free-floating plants. Euhydrophytes occupy bodies of water in the euphotic zone not taken over by emergent plants or shaded out by more permanent surface-floating vegetation.
- eulittoral** The marine intertidal zone subject to wave action; the shore of a lake between high and low water marks.
- euphotic zone** The upper, illuminated zone of aquatic ecosystems: it is above the compensation level and therefore the zone of effective photosynthesis. In marine ecosystems it is much thinner than the deeper aphotic zone (below the level of effective light penetration), typically reaching 30 m in coastal waters but extending to 100-200 m in open ocean waters.
- euryhaline** Able to tolerate a wide range of degrees of salinity.
- eurythermal** Able to tolerate a wide temperature range.
- eutrophic** Originally applied to nutrient-rich waters with high primary productivity but now also applied to soils. Typically, eutrophic lakes are shallow, with a dense plankton population and well-developed littoral vegetation. The high organic content may mean that in summer, when there is stagnation caused by thermal stratification, oxygen supplies in the hypolimnion become limiting for some fish species (e.g. trout). (See also mesotrophic, oligotrophic, dystrophic.)
- eutrophication** Over-enrichment of a waterbody with nutrients, resulting in excessive growth of organisms and depletion of oxygen concentration. / A process of pollution that occurs when a lake or stream becomes over-rich in plant nutrient. It becomes overgrown in algae and other aquatic plants. The plants die and decompose. In decomposing the plants rob the water of oxygen and the lake, river or stream becomes lifeless. Nitrate fertilisers which drain from the fields, nutrients from animal wastes and human sewage are the primary causes of eutrophication. They have high biological oxygen demand (BOD). This is the figure showing how much oxygen is needed to purify water affected by a particular form of contamination.
- exposed** Prevailing wind is onshore although there is a degree of shelter because of extensive shallow areas offshore, offshore obstructions, a restricted (>90 deg) window to open water. Not generally exposed to strong or regular swell. Also refers to open coasts facing away from prevailing winds but where strong winds with a long fetch are frequent. (See also extremely exposed, very exposed, moderately exposed.)
- extractive industries** The removal of mineral matter from the ground; quarries, mines etc.
- extremely exposed** Applied to the few open coastlines which face into prevailing wind and receive ocean swell without any offshore breaks (such as islands or shallows) for several thousand km and where deep water is close to the shore (50 m depth contour within about 300 m, e.g. Rockall). (See also very exposed, exposed, moderately exposed.)
- extremely sheltered** Fully enclosed with a fetch no greater than about 3 km. (See also sheltered, very sheltered, ultra sheltered.)
- fallow area** Pertaining to land normally used for crop production but left unsown for one or more growing seasons.
- fauna** The entire animal life of a given region, habitat or geological stratum.
- fayal** From the Spanish *faya*, *Myrica faya*. Canary Island tall forest-like heath dominated by *Myrica faya*.
- fen** An area of wet peat that is typically alkaline in reaction, or sometimes neutral or only slightly acidic. Alkalinity is due to groundwater draining from surrounding calcareous rocks. Usually characterised by reeds.
- fern** Any of a large number of vascular plants composing the division Polypodiophyta, without flowers and fruits.
- field** (A piece of) land, appropriated to pasture or tillage or some particular use, and usually bounded by hedges, fences, etc.
- fine sand** Mineral substrate with dominant particle size 0.063-0.25 mm. (Wentworth scale of particle sizes.)



## Glossary

- fjell (fjäll / fell)** field An area within the tundra belt of frost-shattered stony debris with interstitial fine particles, which supports various plant species in a mixed community. The vegetation is sparse, however, and typically occupies less than half the ground. Frequently fjell fields display patterned-ground phenomena due to freeze-thaw activity in the soil.
- flora (biology)** The plant life characterising a specific geographic region or environment.
- flow** Flow categories for aquatic systems.
- forb** A non-grassy, herbaceous species (e.g. legumes and composites). (See also herb.)
- forest** A continuous tract over a large area where the dominant organisms are trees. Trees are of height >5 m, tree crown cover of >10%, area >0.5 ha and width >20 m. (See also early-stage woodland, other wooded land, tree-lines.)
- forestry** The management of forest lands for wood, forages, water, wildlife, and recreation. / Forestry is defined as the "art and science of growing forests". Current ecological and social problems suggests that the quality of both art and science has been rather lacking. The human-created forest estate around the world provides a living statement of the poor criteria applied. The present stock of man-made forests comprises an uncomfortable short list of species. Although these forests provide timber and wind or erosion control, they do not provide social or environmental stability and biodiversity conservation.
- freshwater** Water with a salt concentration less than 5 ppt.
- freshwater ecosystem** The living organisms and nonliving materials of an inland aquatic environment.
- fringe forests** Ribbon-like tracts of trees on flood plains near rivers. (See also riparian gallery forests.)
- garden** A piece of ground (often enclosed) where fruits, flowers, herbs or vegetables are cultivated; especially one adjoining a house or other residential building.
- garrigue** A low-growing, secondary vegetation which is widespread in the Mediterranean basin and is derived from the original evergreen mixed forest. The dominant plants are aromatic herbs and prickly dwarf shrubs, with drought resistant foliage, many belonging to the families Labiatae or Leguminosae. (See also maquis, matorral). Always with some bare ground and dominated by vernal species.
- geolittoral** The terrestrial part of the shore of the Baltic Sea that is flooded episodically.
- geophyte** Land plants that survive an unfavourable period by means of underground food storage organs, e.g. rhizomes, tubers and bulbs. Buds arise from these to produce new aerial shoots when favourable growth conditions return.
- Germano-** As a prefix in compound geographical expressions, characteristic of or related to, in particular, the North Sea (Mare Germanica) and its basin. Notably, in the expression Germano-Baltic, characteristic of or related to the North Sea, the southern Baltic and/or the lowland regions that surround them.
- glacier** Slow moving masses of ice which have accumulated either on mountains or in polar regions. They are found where warm, moist air or warm water meets cold air or water. They move, influenced by the force of gravity and the pressure of the ice, above the underlying slush layers and slide downhill, eventually melting at lower levels to form rivers or reaching sea-level, where they form ice shelves or fall into the water as icebergs.
- graminoid** Grasses and other grass-like plants, especially in the families Cyperaceae and Juncaceae.
- grasses** Monocotyledons: Poaceae. Flowering plants with very narrow leaves and small greenish petal-less flowers in heads or spikes.
- grassland** Ground covered by herbaceous vegetation that is usually dominated by grasses.
- gravel** Mineral substrate with dominant particle size 4-16 mm. (Wentworth scale of particle sizes.)
- green space** A plot of vegetated land separating or surrounding areas of intensive residential or industrial use and devoted to recreation or park uses.
- gypsophilous** Applied to plants which prefer to grow or only grow on gypsic soils.
- gypsum** A white mineral, hydrated calcium sulphate ( $\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$ ).
- habitat** Plant and animal communities as the characterising elements of the biotic environment, together with abiotic factors (soil, climate, water availability and quality, and others), operating together at a particular scale.
- hadal zone** The part of the ocean that lies in very deep trenches below the general level of the deep-ocean floor (the abyssal zone). Deep ocean trenches over 6 km deep. (See also bathyal zone, abyssal zone.)
- halocline** A zone in which there are rapid, vertical changes in the salinity. In low latitudes the halocline usually represents a decrease in salinity with increasing depth; in high latitudes it may represent the opposite. The halocline is usually well-developed in coastal regions where there is much freshwater input from rivers producing surface waters of low salinity, a zone where salinity increases rapidly with depth (the halocline) and a deeper zone of more saline, denser waters.

## Glossary

- halophile** Applied to organisms that grow best in, or can only grow in salty environments.
- halophyte** A terrestrial plant that is adapted morphologically and / or physiologically to grow in salt-rich soils and salt-laden air (e.g. *Salicornia* spp, glassworts).
- heathland** A community dominated by dwarf shrubs most typically belonging to the family Ericaceae.
- hedge** Narrow linear belts of shrubs with or without occasional trees.
- helocrene** Seepage or swamp spring where the water seeps up through the ground forming a swamp.
- helophyte** A plant typical of marshy or lake-edge environments, in which the perennating organ lies in soil or mud below the water table, but the aerial shoots protrude above the water (e.g. *Phragmites australis*, the common reed).
- herb** A small non-woody, seed-bearing plant.
- herbivore** An animal that feeds on grass and other plants.
- Hercynian** Characteristic of or related to mountains and hills of the Hercynian orogeny. The great Hercynian ranges include the Central Massif, the western Hercynian Vosges and Black Forest, the Harz and the eastern Hercynian Bohemian Quadrangle formed of the Erzgebirge (Krusne Hory, Metallic Mountains), the Bohmmer-Wald (Sumava) and Bayerisher Wald, the Sudeten (Sudetes, Krkonose-Jesenik, Riesengebirge) and the Czecho-Moravian Hills. The lesser Hercynian ranges include the Morvan, the Ardenne-Eifel and the mid-German hills (Westerwald, Hunsrück, Spessart, Taunus, Vogelsberg and volcanic Rhön, Thuringer Wald). In the Iberian peninsula, Hercynian ranges include the Iberian Range, the Central Cordillera, the Sierra Morena, the Montes de Toledo, and a number of lesser ranges in particular the Leonese and Galician mountains and hills.
- highly artificial water** Very artificial waters with wholly constructed beds or heavily contaminated water or virtually devoid of plant and animal life.
- horticulture** The science or art of cultivating plants, especially those for ornamental use, or fruit and vegetables for food. (See also agriculture.)
- hydrolittoral** The shores of non-tidal waters which lie below the mean water level and which are regularly or occasionally exposed by the action of wind.
- hypolimnion** The lower, cooler, non-circulating water in a thermally stratified lake or sea in summer. If, as often occurs, the thermocline is below the compensation level, the dissolved oxygen supply of the hypolimnion depletes gradually; replenishment by photosynthesis and by contact with the atmosphere is prevented. Re-oxygenation is possible only when the thermal stratification breaks down in autumn.
- hypopotamon** The upper part of the potamon, lower zone of a river, where the slope is less than 1% and where the current is the slowest.
- hypopotomal** Of, related to or living in the lower part of the potamon, lower zone of a river, where the slope is less than 1% and where the current is the slowest.
- hyporhithral (hyporithral / hyporhithral)** Of, relating to or living in the lower part of the upper zone of a stream (brooks and small rivers) with a slope of more than 2%, and with fast flowing, summer-cool, well-oxygenated waters.
- hyporhitron (hyporithron / hyporhithral)** Lower part of the upper zone of a stream (brooks and small rivers) with a slope of more than 2%, and with fast flowing, summer-cool, well-oxygenated waters. Epi-, meta- et hyporhithral zones are generally distinguished.
- ice pack** Large areas of floating ice, usually occurring in polar seas, consisting of separate pieces that have become massed together.
- Illyrian** Characteristic of or related to a region of south-eastern Central Europe formerly occupied by the Roman province of Illyricum, situated between the Sava, the Drina and the Adriatic, in the present territories of Slovenia, Croatia, Yugoslavia, Bosnia-Herzegovina, northern Albania, mostly occupied by the Dinarides.
- immature soil** Soil (e.g. recent alluvial or aeolian deposits) where there has been insufficient time for soil-forming processes (such as physical and chemical weathering and vertical translocation of soil constituents by water movement) to have reached equilibrium.
- Infra-Canarian** Of, relating to or living in the lowest altitudinal belt of the Macaronesian Islands. The mean annual temperature is 19°C to 20°C. The infracanarian zone extends to 200-300 m on the north-facing slopes of the wettest islands and to 400-500 m on the south-facing slopes of dry islands.
- infralittoral** Shallow sub-tidal or non-tidal water below the mean water level, wave disturbed or algal-dominated or within the euphotic zone (q.v.). (See also littoral, circalittoral, supralittoral).
- intertidal zone** The area between land and sea which is regularly exposed to the air by the tidal movement of the sea. Marine organisms that inhabit the intertidal zones have to adapt to periods of exposure to air and to the waves created by wind, which makes it the most physically demanding of the marine habitats. The shore zone between the highest and lowest tides.

## Glossary

- krummholz** Scrubby, dwarfish growth of trees, often forming a distinctive zone at the tree line of mountains.
- lagoon** Enclosed coastal saline or brackish waters, without a permanent surface connection to the sea but either with intermittent surface or sub-surface connections.
- landfill** The oldest method of waste disposal for the solid matter discarded in the domestic dustbin, along with the packaging material and paper from high street shops and offices. Landfill sites are usually disused quarries and gravel pits.
- lichens** Composite organisms formed by the symbiosis between species of fungi and an alga. They are either crusty patches or bushy growths on rocks, bare ground, tundra, tree trunks, stone walls, roofs or garden paths. Because they have no actual roots they get their sustenance from the atmosphere and rainwater. Lichens play an important role in the detection and monitoring of pollution, especially sulphur dioxide, as they are highly sensitive to pollution and different species disappear if pollution reaches specific levels.
- limestone** A sedimentary rock consisting chiefly of calcium carbonate, primarily in the form of the mineral calcite and with or without magnesium carbonate. Limestones are formed by either organic or inorganic processes, and may be detrital, chemical, oolitic, earthy, crystalline, or recrystallised; many are highly fossiliferous and clearly represent ancient shell banks or coral reefs.
- limnocrène** Spring basin in which the water wells up from below.
- lines of trees** Belts of trees, width less than 20 m. (See also forest habitat, early-stage woodland, other wooded land.)
- littoral zone** 1. Non-marine ecosystems: the area in and adjacent to shallow, fresh water, where light penetration extends to the bottom sediments, giving a zone colonised by rooted plants (helophytes). 2. Marine ecosystems: the shore area or intertidal zone, where periodic exposure and submersion by tides is normal, or in non-tidal marine ecosystems, habitats which are normally water-covered but intermittently exposed due to the action of wind or atmospheric pressure changes (see hydrolittoral). Since the precise physical limits of tidal range vary constantly, a biological definition of the zone, which essentially reflects typical physical conditions rather than more rarely experienced events, is generally more useful. Thus in Britain, for example, the littoral zone is defined as the region between the upper limit of species of the seaweed *Laminaria* and the upper limit of *Littorina* (periwinkles) or of the lichen *Verrucaria*. (See also eulittoral, infralittoral, circalittoral, supralittoral).
- low trees** Tree species when they are restricted in their growth form or of prostrate habit.
- Macaronesian** (biogeographic region) Of, or characteristic of Macaronesia, (the Canaries, Madeira and the Azores). As defined for the purposes of the Habitats Directive, the zone covers offshore parts of Portugal and Spain.
- machair** 1. An area of low, undulating tracts, supporting stable, herb-rich grassland growing on shell sand, which has developed over a long period by the accumulation of blown sand behind coastal sand-dunes, occurring most typically in the Hebrides and along the north-west coast of Scotland. 2. Characterised by wind-blown calcareous sand with a predominance of shell fragments over peat, a low proportion of sand-binding vegetation and a long history of agricultural use.
- macrophyte** A large plant, especially a large aquatic angiosperm, or alga such as kelp (variety of large brown seaweed which is a source of iodine and potash).
- maquis** Drought-resistant Mediterranean scrub, taller than garrigue, and composed of evergreen shrubs and small trees with thick, leathery leaves (sclerophylls) or spiny foliage e.g. *Olea europea* (wild olive), *Cistus* spp. (*cistus*), *Erica* spp (heather), and *Genista* spp. (broom). For the most part this sclerophyllous formation has been derived by a combination of burning and grazing from the original mixed evergreen Mediterranean forest.
- marine** Of, or pertaining to, the sea (the continuous body of water covering most of the earth's surface and surrounding its land masses). Marine waters may be fully saline, brackish or almost fresh.
- market gardening** The business of growing fruit and vegetables on a commercial scale.
- marsh** A more or less permanently wet area of mineral soil, as opposed to a peaty area, e.g. around the edges of a lake or on a flood-plain of a river.
- marshland** see 'marsh'.
- matorral** see 'maquis'.
- meadow** Strictly a term for a field of permanent grass used for hay, but also applied to rich, waterside grazing areas that are not suitable for arable cultivation.
- mediolittoral** Of, relating to or inhabiting the part of the depth gradient along the shore of a sea or ocean in which there is an alternation of immersion and emergence due to tides and waves.

## Glossary

- Mediterranean** 1. Characteristic of or related to the Mediterranean sea and/or its basin. 2. Characteristic of or related to regions of mediterranean climate regime, with mild wet winters and dry summers.
- Mediterranean (biogeographic region)** Of, pertaining to, or characteristic of the Mediterranean Sea and the countries bordering it. As defined for the purposes of the Habitats Directive, the region covers Greece and parts of France, Italy, Portugal and Spain.
- mediterranean (climate zone)** The distinctive climatic type which occurs around latitude 35° N and 35° S, and is associated with warm-temperate west coasts. Summers generally are hot and dry, winters mild to cool and rainy. The climate is strongly influenced by westerly air-streams in winter, and sub-tropical high pressure in summer. In the type area, the Mediterranean basin, there is a variety of climatic regions owing to the complex configuration of seas and mountainous peninsulas in the 3000 km incursion into Eurasia. Annual rainfall is broadly 500-900 mm, but less in more continental locations.
- mediterranean forest** Type of forest found in the Mediterranean area comprising mainly xerophilous evergreen trees.
- mediterranean wood** see 'Mediterranean forest'.
- medium sand** Mineral substrate with dominant particle size 0.25-1 mm. (Wentworth scale of particle sizes.)
- mesic** Applied to an environment that is neither extremely wet (hydric) nor extremely dry (xeric).
- meso-Canarian** Of, relating to or living in the mid-montane, dry and cool, altitudinal zone of the central Canarian islands (Gran Canaria, Tenerife, La Palma), characterised by a mean annual temperature of 11°C to 15°C and the prevalence of pine forests.
- mesohaline** Water with a salt content of 5 to 18 ppt. (See also brackish, saline water, oligohaline, euhaline, polyhaline.)
- meso-Mediterranean** Of, relating to or living in the altitudinal and latitudinal belts of sclerophyllous evergreen oak forests, situated between sea level and 400-500 m a.s.l., locally 900 m a.s.l., in regions devoid of a thermo-Mediterranean level, between 100-300 m and 600-800 m a.s.l., locally 1200 m a.s.l., in regions with a thermo-Mediterranean level, characterised by January temperatures comprised between 6° and 9°C, July temperatures comprised between 20° and 25°C and a potential evapotranspiration of 1200-1300.
- mesophile** Species that thrive in environments with intermediate temperatures.
- mesophyte** A plant adapted to environments that are neither extremely wet nor extremely dry.
- mesotrophic** Applied to waters or soils having levels of plant nutrients intermediate between those of oligotrophic and eutrophic waters or soils. (See also oligotrophic, eutrophic, dystrophic).
- metapotamal** Of, related to or living in the middle part of the potamon, lower zone of a river, where the slope is less than 1% and where the current is the slowest.
- metapotamon** The middle part of the potamon, lower zone of a river, where the slope is less than 1% and where the current is the slowest.
- metarhithral (metarhithral / metarhithral)** Of, relating to or living in the middle part of the upper zone of a stream (brooks and small rivers) with a slope of more than 2%, and with fast flowing, summer-cool, well-oxygenated waters.
- metarhitron (metarhitron / metarhithron)** Middle part of the upper zone of a stream (brooks and small rivers) with a slope of more than 2%, and with fast flowing, summer-cool, well-oxygenated waters. Epi-, meta- et hyporhithral zones are generally distinguished.
- micro-organism** A microscopic organism, including bacteria, protozoans, yeast, viruses, and algae.
- mire** A general term for a wetland area and its associated ecosystem, applied most often to peaty areas.
- mixed woodland** Wooded land on which neither coniferous, nor broadleaved species account for more than 75% of the crown cover. (See also broadleaved woodland, coniferous woodland.)
- moderately exposed** Open coasts facing away from prevailing winds and without a long fetch but where strong winds can be frequent. (See also extremely exposed, very exposed, exposed.)
- moderately strong current** The maximum tidal stream/current strength affecting the habitat is 1-3 knots (0.5-1.5 m/sec). This may differ considerably from tidal streams present nearby.
- montane** Refers to the middle altitudinal level of high mountains and the upper altitudinal level of high hills where the average temperature is at least 3°C lower than in the lowlands, but where the cold air at night is flowing down; this leads to a temperature reversal and less danger of frost. In Central Europe the lower boundary of the montane belt lies between 500 m (in the north) and 900 m above sea level. The upper limit is formed by the subalpine belt. In Western and Central Europe this level is characterised by the prevalence of forests of *Fagus sylvatica* or *Fagus sylvatica* and *Abies alba*, locally (Pyrenees) of *Pinus sylvestris*.

## Glossary

- mor** A type of surface humus (soil) horizon that is acid in reaction, low in microbial activity except that of fungi, and composed of several layers of organic matter in different degrees of decomposition. It forms beneath conifer forest and open heath and moorland in cool, moist climates, and is very acidic.
- mosses** Any plant of the class Bryophyta, occurring in nearly all damp habitats.
- mud** Wet mineral sediment with dominant particle size .004 to .063 mm. (Wentworth scale of particle sizes.) (See also silt.)
- mud (sediment)** A mixture of water and mineral particles (predominantly clay and/or silt, having particle size below 0.06 mm diameter) forming an unconsolidated plastic mass. It is deposited in low-energy environments in lakes, estuaries and lagoons and deep-sea environments.
- mud flat** A relatively level area of fine silt along a shore (as in a sheltered estuary) or around an island, alternately covered and uncovered by the tide, or covered by shallow water.
- nemoral** Of, relating to or living in the broadleaved deciduous forest vegetation zones of the world.
- neritic** The shallow-water, or near-shore, marine zone extending from low-tide level to a depth of 200 m. This zone covers about 8% of the total ocean floor and is the area most populated by benthic organisms owing to the penetration of sunlight to these shallow depths.
- neustal** The surface layer of a water body which is inhabited by minute swimming or floating organisms.
- nival** Of, relating to or living in the altitudinal level of mountains situated near permanent snowcover and the upper limit of growth of superior plants, in which the vegetation adopts a prostrate, compact appearance.
- nutrient** Chemical elements which are involved in the construction of living tissue and which are needed by both plant and animal. The most important in terms of bulk are carbon, hydrogen and oxygen, with other essential ones including nitrogen, potassium, calcium, sulphur and phosphorus.
- oaks** Trees of the genus *Quercus*.
- oligohaline** Water with a salt content of 0.05 to 5 ppt. (See also brackish, saline water, mesohaline, euhaline, polyhaline.)
- oligotrophic** Applied to waters or soils that are poor in nutrients and with low primary productivity. Typically, oligotrophic lakes are deep, with the hypolimnion (cooler, lower, non-circulating waters) much more extensive than the epilimnion (upper, warm, circulating waters). The low nutrient content means that plankton blooms are rare and littoral plants are scarce. The low organic content means that dissolved oxygen levels are high. By comparison with eutrophic lakes, oligotrophic lakes are considered geologically young, or little modified by weathering and erosion products. (See also mesotrophic, eutrophic, dystrophic).
- ombrogenous peat** A peat-forming vegetation community lying above groundwater level: it is separated from the ground flora and the mineral soil, and is thus dependent on rain water for mineral nutrients. The resulting lack of dissolved bases gives strongly acidic conditions and only specialised vegetation predominantly *Sphagnum* spp. (bog mosses), will grow.
- ombrotrophic** Applied to a mire system that is fed by rainwater. (See also soligenous, topogenous.)
- ornamental** Of, pertaining to, or serving as an ornament; especially, decorative but inessential.
- oroboreal** Of, relating to or inhabiting the boreal (taiga) forest zone.
- oro-Canarian** Of, relating to or living in the upper altitudinal level of the mountains of the Macaronesian Islands, limited to Tenerife, above 3100 m, characterised by a mean annual temperature of less than 6°C and the dominance of herbaceous vegetation.
- orogenesis** The formation of mountain ranges by intense upward displacement of the earth's crust.
- oro-Mediterranean** Of, relating to or inhabiting the altitudinal level of Mediterranean mountains corresponding to the montane level of medio-European mountains. It is characterised by the prevalence of forests of *Fagus sylvatica* and *Abies* spp.
- other wooded land** Young natural stands and all plantations which have yet to reach crown density of 10% or tree height of 5 m; areas normally part of the forest area but temporarily unstocked as a result of human intervention or natural causes; coppice; areas having cover as specified for forest, but area <0.5 ha.; lines of mature trees. (See also forest habitat, early-stage woodland, tree-lines.)
- outcrop** Rock exposed at the earth's surface which is not in the form of a more or less vertical cliff or more or less horizontal pavement.

## Glossary

- overgrazing** Intensive grazing by animals, for example cattle, sheep or goats, on an area of pasture. It has become a serious threat to the world's rangelands and grasslands. Several factors have led to overgrazing, which leads to the soil being degraded and becoming liable to erosion by wind and rain, and even to desertification. The main pressures leading to widespread overgrazing have been the need to increase the size and numbers of herds to produce more food for an increasing human population, and the transformation of traditional pasture land into plantations to grow cash crops. Throughout the dry tropics, where traditionally herds ranged over vast areas, intensive livestock-rearing schemes have taken over, mostly to provide meat for the export market. Well-digging operations have also led to heavy concentrations of animals in small areas.
- Pannonic** Characteristic of or related to the Central European basin situated between the Alps, the Carpathians and the Dinarides, on the territories of Hungary, western Romania, northern Serbia, northern Croatia, eastern Austria and southern Slovakia, formerly occupied in part by the Roman province of Pannonia.
- pasture** A grass field used for grazing domestic livestock such as- cattle, sheep or horses.
- pavement** Rock exposed at the earth's surface in the form of a more or less horizontal surface, usually with crevices or joints.
- peat** Unconsolidated soil material consisting largely of undecomposed or slightly decomposed organic matter accumulated under conditions of excessive moisture.
- peat bog** A bog in which peat has formed under conditions of acidity.
- pebbles** Mineral substrate with dominant particle size 16-63 mm. (Wentworth scale of particle sizes.)
- pelagic** Of or in open waters of lakes or seas (cf. benthic.)
- pelagic water** The open-water environment, or water column, as distinct from the bed or shore, inhabited by swimming marine or freshwater organisms.
- peri-** From the Greek element "peri", around; referring to a zone on the periphery of a region, a sea or a mountain massif.
- photosynthesis** The process by which plants tap the sun's energy. The organic compounds produced are various types of sugars, needed for building new plant tissues, food storage and the respiration needed to generate the energy to keep the plant cells operating. Synthesis of chemical compounds in light, especially the manufacture of organic compounds from carbon dioxide and a hydrogen source (water), with simultaneous liberation of oxygen, by chlorophyll-containing plant cells.
- phreatic water** Water that occupies pores, cavities, cracks and other spaces in the crustal rocks. It includes water precipitated from the atmosphere which has percolated through the soil, water that has risen from deep magmatic sources liberated during igneous activity and fossil water retained in sedimentary rocks since their formation. The presence of groundwater is necessary for virtually all weathering processes to operate. Phreatic water is synonymous with groundwater and is the most important source of any water supply.
- phrygana** Cushion-forming thermo-Mediterranean sclerophyllous formations, often thorny and summer deciduous.
- phytobenthos** Vascular plants, fungi and photosynthetic algae (including cyanobacteria) other than macrophytes living on or attached to the substrate or other organisms in surface waters. (cf. phytoplankton; macrophyte.)
- phytoplankton** Unicellular algae (e.g. diatoms and dinoflagellates) and cyanobacteria, both solitary and colonial, that live, at least for part of their lifecycle, drifting in the water (cf. phytobenthos.)
- phytosociology** The study of vegetation, including the organisation, interdependence, development, geographical distribution and classification of plant communities.
- plankton** Small organisms (animals, plants, or microbes) passively floating in water.
- plant community** A recognisably distinct group of plants growing together in the same habitat and with some degree of interdependence.
- polyhaline** Water with a salt content of 18 to 30 ppt. (See also brackish, saline water, oligohaline, mesohaline, euhaline.)
- polynya** A large expanse of water that is surrounded by ice; usually found near the shore, often at the mouth of a large river.
- Pontic** Characteristic of or related to the Black Sea (Pontus-Euxinus) and/or its basin.
- potamal** Of, related to or living in the lower zone of a river, where the slope is less than 1% and where the current is the slowest. Epi-, meta- and hypopotomal zones are generally distinguished.
- potamon** The lower zone of a river, where the slope is less than 1% and where the current is the slowest. Epi-, meta- and hypopotomal zones are generally distinguished.
- psychrophilous** Also, psychrophilic. Qualifies an organism showing optimal growth at low temperatures.

## Glossary

- quarry** An open or surface working or excavation for the extraction of building stone, ore, coal, gravel, or minerals.
- quarrying** The surface exploitation and removal of stone or mineral deposits from the earth's crust.
- reeds** Tall, firm-stemmed water or marsh grasses e.g. *Phragmites australis* (common reed), *Calamagrostis* spp., (small-reed) or *Phalaris* sp., (reed-grass).
- reef Submarine**, or exposed at low tide, rocky substrates and biogenic concretions, which arise from the sea floor in the sublittoral zone but may extend into the littoral zone where there is an uninterrupted zonation of plant and animal communities. These reefs generally support a zonation of benthic communities of algae and animal species including concretions, encrustations and corallogenic concretions. In northern Baltic areas, the upper shallow water filamentous algal-zone with great annual succession is normally well developed on gently sloping shores. (cf. biogenic reef.)
- reforestation** The planting of trees in forest areas which have been cleared.
- relief (land)** The physical shape, configuration or general unevenness of a part of the Earth's surface, considered with reference to variation of height and slope or to irregularities of the land surface; the elevation or difference in elevation, considered collectively, of a land surface.
- rheocrene** Gushing spring in which the water spurts out of horizontal or downward sloping strata and immediately races down into the valley.
- rhithral (rithral / rhithral)** Of, relating to or living in the upper zone of a stream (brooks and small rivers) with a slope of more than 2%, and with fast flowing, summer-cool, well-oxygenated waters.
- rhithron (rithron / rhithron)** Upper zone of a stream (brooks and small rivers) with a slope of more than 2%, and with fast flowing, summer-cool, well-oxygenated waters. Epi-, meta- et hyporhithral zones are generally distinguished.
- riparian** Riverine. Pertaining to a river bank.
- riparian gallery forests** Ribbon-like tracts of trees on flood plains near rivers. (See also fringe forests.)
- riparian zone** The terrestrial area adjacent to freshwater bodies, watercourses, and surface-emergent aquifers (e.g., springs, seeps, oases), the waters of which provide soil moisture significantly in excess of that otherwise available through local precipitation. The vegetation of the zone depends on these elevated soil moisture levels.
- river bed** The channel containing or formerly containing the water of a river.
- rock** Any relatively hard naturally formed mass of mineral or petrified matter; stone; any naturally formed mass of mineral mass or aggregate that forms a significant part of the earth's crust. Includes continuous bedrock and also non-mobile boulders and rocks and artificial substrata.
- rock pool** Standing water left when tide recedes.
- ruderal** A plant, or applied to a plant that is associated with human dwellings or agriculture, or that colonises waste ground. Ruderals are often weeds which have high demands for nutrients and/or are intolerant of competition.
- saline soil** Soil that contains enough soluble salt to reduce its fertility. The lower limit is usually defined to be when the conductivity of water in a saturated soil paste is 0.4 siemens per meter (4 mmhos/cm).
- saline water** Water with a salt concentration greater than 18 ppt. (See also brackish, oligohaline, mesohaline, euhaline, polyhaline.)
- salinity** A measure of the total quantity of dissolved solids in water, in parts per thousand (ppt) (per mille) by weight, when all organic matter has been completely oxidised, all carbonate has been converted to oxide, and bromide and iodide to chloride. The salinity of ocean water is in the range 33-38 ppt, with an average of 35 ppt.
- salt meadow** A meadow subject to overflow by salt water.
- salt water** Water of the seas, distinguished by high salinity.
- saltmarsh** Vegetation often found on mud banks formed at river mouths, showing regular zonation reflecting the length of time different areas are inundated by tides. Sea water has a high salt content, which produces problems of osmotic pressure for the vegetation, so that only plants adapted to this environment (halophytes) can survive. There are also inland marshes in arid areas where the water has a high salt level because of evaporation.
- sand** Mineral sediment with dominant particle size 0.063 to 4 mm. (Wentworth scale of particle sizes.)
- sand flat** A sandy tidal flat barren of vegetation. A tidal flat is an extensive, nearly horizontal, marshy or barren tract of land that is alternately covered and uncovered by the tide, and consisting of unconsolidated sediment (mostly mud and sand). It may form the top surface of a deltaic deposit.
- sand pit** An excavation dug in sand, especially as a source of sand for construction materials.

## Glossary

- sclerophyllous vegetation** Typically scrub, but also forest, in which the leaves of the trees and shrubs are evergreen, hard, thick, leathery, and usually small. These adaptations allow the plants to survive the pronounced hot, dry season of the Mediterranean-type climate in which sclerophyllous vegetation is best developed.
- scree** An accumulation of coarse rock debris that rests against the base of an inland cliff, produced by the weathering and release of fragments from the cliff face. Scree are widely found in upland areas affected by past or present peri-glacial conditions and in hot, rocky deserts.
- sea** The continuous body of salt water covering most of the earth's surface.
- sea ball** A mass of living or dead vegetation that has been compacted into a spherical shape by wave movement in shallow water.
- sea bed** The floor of the sea or the ocean.
- sea water** Aqueous solution of salts in more or less constant ratio, whose composition depends on several factors among which predominate living organisms, detrital sedimentation and the related chemical reactions. Sea-water accounts for more than 98% of the mass of the hydrosphere and covers just over 70% of the globe.
- seamount** An upward projection of the sea floor with an elevation of 1000 m or more and having either a flat or peaked top; found in all the major ocean basins; generally formed in the earth's crust and in the centre of oceanic plates.
- seasonally dry** Normally saturated, with the water table at or above ground level, but subject to occasional dry periods for less than half of the year. (See also waterlogged, seasonally wet.)
- seasonally wet** Normally with the water table below ground level, but subject to occasional periods of higher water table for less than half of the year. (See also waterlogged, seasonally dry.)
- sediment** Any material transported by water which will ultimately settle to the bottom after the water loses its transporting power. Fine waterborne matter deposited or accumulated in beds. Includes mobile or soft substrates such as cobbles, pebbles, sand and mud.
- seep** Places where gas (mainly methane) or liquid, including freshwater, bubble or pass slowly through fine pores or small openings in the substrate, often giving rise to the aggregation of sandstone by a carbonate cement resulting from microbial oxidation of gaseous emissions.
- serpentine** A greenish, brownish, or spotted mineral,  $Mg_6(Si_4O_{10})(OH)_8$ . On weathering these rocks release an excess of magnesium into the soil, and this often inhibits the development of the natural climax in the areas concerned.
- sheltered** Restricted fetch and/or open water window. Coasts can face prevailing wind but with a short fetch (say <20 km) or extensive shallow areas offshore or may face away from prevailing winds. (See also very sheltered, extremely sheltered, ultra sheltered.)
- shrub** A woody perennial plant, smaller than a tree, with several major branches arising from near the base of the main stem.
- siliceous** Contains silica, a white or colourless crystalline compound,  $SiO_2$ , occurring naturally as quartz, sand, flint, agate and many other minerals.
- silicicolous** Applied to an organism that prefers to grow, or can grow only in habitats rich in silica.
- silt** Mineral sediment with dominant particle size .004 to .063 mm. (Wentworth scale of particle sizes.) (See also mud.)
- soil** The top layer of the land surface of the earth that is composed of disintegrated rock particles, humus, water and air.
- soil moisture / soil water** Water stored in soils.
- soligenous** Water supply from groundwater arising from surface or sub-surface run-off. Of a bog, dependent upon ground water for its formation. (See also ombrogenous, topogenous).
- sparsely vegetated** Less than 30% vegetation cover.
- species-poor** Usually dominated by a single species, with very few associated species.
- species-poor vegetation** Dominated by one or two plant species and with no associated lower herb layer.
- species-rich** A variety of species present, although one or more species may dominate.
- species-rich vegetation** A variety of plant species present, which may be dominated by a single species, but which also has associated layers of smaller herbaceous species.
- spring (waters)** A place where ground water flows naturally from a rock or the soil onto the land surface or into a body of surface water.
- stenohaline** Very sensitive to changes in salinity; unable to tolerate a wide range of osmotic pressures.
- stenothermal** Unable to tolerate a wide temperature range.
- steppe** A vast, semi-arid grass-covered plain, such as that found in south-eastern Europe and Siberia.



## Glossary

- strong current** The maximum tidal stream/current strength affecting the habitat is 3-6 knots (1.5-3 m/sec). This may differ considerably from tidal streams present nearby.
- subalpine** The belt between the upper boundary of beech (*Fagus sylvatica*) (montane belt) and the potential upper boundary of tree growth (limit of alpine belt). When it is well developed the belt is of approximately 600 to 700 m altitudinal width, varying from around 1700-2400 m in the western Alps (Briançonnais) to 1400-2000 m in Bavaria. Mean annual temperature is between 0.5 to 4°C. Precipitation varies between 1000 and 3000 mm with more than 50% falling as snow. Due to humidity there is a significant acidification of the soils on all lithologies which can cause the formation of podsolis at an extreme.
- sub-continental (climate zone)** Mainly in the east of Central Europe and the adjoining parts of Eastern Europe. Situated between the (sub-)atlantic/oceanic and the continental zone.
- sublittoral (Marine habitats)** The sea-shore zone lying immediately below the littoral (inter-tidal) zone and extending to a depth of about 200 m or the edge of the continental shelf. Red and brown algae are characteristic of this area. Typical animals include sea anemones and corals on rocky shores, and shrimps, crabs and flounders on sandy shores. In non-tidal marine waters, the zone below the littoral, always covered by water.
- sub-mediterranean (climate zone)** Zone to the north of the mediterranean zone.
- submontane** The submontane belt starts at an altitude of 200-300 m in the northern part of Central Europe but not lower than 500-600 m in the south.
- subterranean** Situated or operating beneath the Earth's surface; underground. (Excluding caves beneath the ocean).
- Supra-Canarian** Of, relating to or living in the altitudinal belt of the Macaronesian islands, dominated by cushiony shrub formations. It is present only on Tenerife and La Palma, above 2000 m, with a mean annual temperature is of 6°C to 11°C.
- supralittoral** The seashore zone immediately above the littoral fringe and beyond the reach of tidal submergence, though affected by sea spray. (See also littoral, infralittoral, circalittoral.)
- supra-Mediterranean** Of, relating to or living in the altitudinal belt of Mediterranean mountains corresponding to the montane level of middle European mountains, with a mean annual temperature of 8°C to 15°C. The supra-Mediterranean level is characterised by the predominance of forests dominated by deciduous oaks (*Quercus pubescens*, *Quercus pyrenaica*, *Quercus faginea*, *Quercus cerris*, *Quercus frainetto*) by *Fagus sylvatica* or by conifers (*Juniperus thurifera*, *Pinus nigra* s.l.)
- surge gully** A narrow marine inlet on a small scale, usually formed by erosion of a rocky shoreline on exposed coasts. Their aspect, facing into waves, and their funnel effect, means that waves entering them become higher and of shorter wavelength, causing back-and-forth or multi-directional water movement of considerable force.
- swamp** A general term for an area that is waterlogged and covered with abundant vegetation, especially trees and shrubs.
- taiga** The region of boreal forest, the largely evergreen forest vegetation of northern areas of the Northern Hemisphere, below the arctic and subarctic tundra regions. Includes the more open, park-like tracts along the northern fringe of the boreal forest, otherwise known as lichen woodland.
- tectonic ridge** A ridge or rock structure directly attributable to earth movements involved in folding and faulting.
- Temperate (biome)** Species with their main distribution in the cool-temperate, broadleaved deciduous forest zone, often called the nemoral zone by European authors. These species may occur on mountains to the south or in cool steppes in continental interiors.
- temperate (climate zone)** A climate zone between the boreal in the north and the mediterranean in the south. A mid-latitude climate influenced from time to time by both tropical and polar air masses. Temperature criteria provide subdivisions into warm- or cold-temperate climates.
- terrigenous deposit / sediment** An accumulation of sedimentary material derived from land erosion and deposited in shallow ocean areas.
- tethyan** Of or pertaining to the Tethyan Ocean area (a large sea between Laurasia and Gondwanaland during Palaeozoic times.)
- thermo-Atlantic** The Atlantic regions of Iberia, the Canaries, Madeira and North Africa.
- thermo-Canarian** Of, relating to or living in the altitudinal belt of the Macaronesian islands, situated immediately below and at the level of clouds, between the infra-Canarian and meso-Canarian zones. It is the level in which develop laurisylvas and heaths.

## Glossary

- thermocline** Generally, a gradient of temperature change, but applied more particularly to the zone of rapid temperature change between the warm surface waters (epilimnion) and cooler deep waters (hypolimnion) in a thermally stratified lake or sea in summer. In the oceans this zone of rapid temperature change starts 10-500 m below the surface and can extend down to more than 1500 m. In polar regions the thermocline is generally absent, because the oceans surface is covered with ice in winter and solar radiation is small in summer.
- thermo-Mediterranean** Of, relating to or living in the altitudinal belt occupying the warmest regions of the peninsulas, archipelagos and southern shores of the Mediterranean Sea. The mean January temperatures are of the order of 9°C to 12°C, the mean July temperatures are of the order of 25°C to 28°C, the potential evapotranspiration of the order of 1300 mm or more. The natural climactic vegetation, almost everywhere destroyed, is the olive-carob forest with *Olea sylvestris*, *Pistacia lentiscus*, *Ceratonia siliqua*, *Myrtus communis* as characteristic plants.
- thermophile** Species that thrive in environments where the temperature is high, typically up to 60°C.
- thermophilous** Warmth loving; characteristic of very high temperatures.
- therophyte** A plant which completes its life cycle within a single season, being dormant as seed during unfavourable periods i.e. an annual.
- tidal cycle** The periodic rise and fall of the earth's oceans, caused by the relative gravitational attraction of the sun, moon and earth. During a tidal day (24 hours and 50 minutes) semi-diurnal tides have two high and two low waters and diurnal tides one high and one low water. The effect of the moon is about twice that of the sun, giving rise to the spring-neap cycle of tides. Spring tides are those of greater than the mean range; neap tides are of smaller range, i.e. 10-30% less than the mean tidal range. Variation in tides is caused by: a) changes in the relative positions of the sun, moon and earth; b) uneven distribution of water on the earth's surface; and c) variation in the seabed topography.
- tidal stream / current** The maximum tidal stream or current strength at the surface affecting the habitat. (See also very strong tidal stream, strong tidal stream, moderately strong tidal stream, weak tidal stream, very weak tidal stream.)
- tidal water** Any water whose level changes periodically due to tidal action.
- tide** The periodic rise and fall of the water resulting from gravitational interaction between the sun, moon and earth. In each lunar day of 24 hours and 49 minutes there are two high tides and two low tides.
- topogenous mire** A mire that develops in such places as depressions and coastal plains, where local relief results in a permanently high water table. (See also ombrogenous, soligenous.)
- transition mire** Mire developed around bodies of open water. Formed by the terrestrialisation (hydroseral) process in areas where the water table is at or near the surface and peat forms a floating raft at the water surface.
- tree** A woody plant with a single main stem (the trunk), that is unbranched near the ground; some trees (e.g. oak, (*Quercus*) and ash (*Fraxinus*)) have multi-trunked forms. At the end of each growing season there is no die-back of aerial parts, apart from the loss of foliage. Trees which are able to reach a height of 5 m at maturity. (See also 'low trees'.)
- tundra** A zone between the perpetual snow and ice of Arctic regions and the tree line (boreal taiga), having a permanently frozen sub-soil and supporting low-growing vegetation such as lichens, mosses, dwarf shrubs and stunted trees.
- ultra sheltered** With a fetch of a few tens or at most 100's of meters. (See also sheltered, very sheltered, extremely sheltered.)
- ultra-basic** Igneous rocks consisting essentially of ferromagnesian minerals to the virtual exclusion of quartz, feldspar, and feldspathoids. Most ultra-basic rocks occur in association with basic types, especially in layered igneous structures, and there are few examples of purely ultra-basic masses.
- urban area** Areas within the legal boundaries of cities and towns; suburban areas developed for residential, industrial or recreational purposes.
- valley mire** Elongated mire developed on the lower slopes and floors of small valleys and channels with a marked, though sometimes dispersed, throughflow of water along the main drainage axis. The water table is maintained, in part at least, by springs and seepage along the valley side, and there is some lateral water movement down the slopes. The topography of the valley helps maintain a high water level.
- vallicares** Summer pastures of the Iberian peninsula, submitted to poor drainage, brief flooding and rapid desiccation, constituted by perennial and annual grasses.
- vegetation** The plants of an area considered in general or as communities, but not taxonomically; the total plant cover in a particular area or on the Earth as a whole. The total mass of plant life that occupies a given area.

## Glossary

- vegetation cover** Amount of the ground surface in contact with, or directly beneath, vegetation.
- very exposed** Applied to open coastlines which face into prevailing wind and receive ocean swell without any offshore breaks (such as islands or shallows) for several thousand km but where deep water is not close (>300 m) to the shore. They can be adjacent to extremely exposed sites but face away from prevailing winds (here swell and wave action will refract towards these shores) or where, although facing away from prevailing winds, strong winds and swell often occur (e.g. the east coast of Fair Isle). (See also extremely exposed, exposed, moderately exposed.)
- very sheltered** Unlikely to have a fetch greater than 20 km, the exception being through a narrow (<30 deg) open water window. They face away from prevailing wind or have obstructions, such as reefs, offshore. (See also sheltered, extremely sheltered, ultra sheltered.)
- very strong current** The maximum tidal stream/current strength affecting the habitat is >6 knots (>3 m/sec). This may differ considerably from tidal streams present nearby.
- very weak current** The maximum tidal stream/current strength affecting the habitat is negligible. This may differ considerably from tidal streams present nearby.
- volcano** A vent in the surface of the Earth through which magma and associated gases and ash erupt; also, the form or structure, usually conical, that is produced by the ejected material.
- water column** The open-water environment, as distinct from the bed or shore, which may be inhabited by swimming marine or freshwater organisms. (See pelagic water, waterbody.)
- waterbody** Also 'waters'. Landscape features comprising any body of water, standing or flowing, including the water column, littoral zones and bed, such as the sea, lakes, river or stream etc., (cf. water column.)
- waterlogged** Saturated, with the water table at or above ground level for at least half of the year. (See also seasonally wet, seasonally dry.)
- weak current** The maximum tidal stream/current strength affecting the habitat is <1 knot (<0.5 m/sec). This may differ considerably from tidal streams present nearby.
- woodland** See 'forest'.
- xeric** 1. A dry, as opposed to a wet (hydric) or intermediate (mesic) environment. 2. Of, characterised by, or adapted to an extremely dry habitat.
- xero-halophile** Applied to organisms that grow best in, or can only grow in dry, salty environments.
- xerophilous** Flourishing in or able to withstand a dry, hot environment.
- xerophyte** A plant (usually a xeromorph i.e. morphologically adapted to withstand drought) that can grow in very dry conditions and is able to withstand periods of drought. The adaptations include an ability to store water, waxy leaves and leaves reduced to spines to avoid water loss through transpiration, and short life cycles (ephemeral) that can be completed when sufficient water is available.

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	Service	Matt	Department of Agriculture (NI)
	Service	Matt	Department of Agriculture (NI), Aquatic Science Research Division
	Simpson	Tom	DETR, Minerals and Waste Planning Division
	Stott	Andrew	DEFRA
	Tasker	Mark	Joint Nature Conservation Committee
	Tyler-Walters	Harvey	Marine Biological Association of the UK
<b>USA</b>			
	Allee	Rebecca	Office of Habitat Conservation, Watershed Division
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	Bolaños	Francesco	
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	Rey Benayas	José-Maria	
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