Strasbourg, 5 September 2011
[pa08_2011.doc]

T-PVS/PA (2011) 8

CONVENTION ON THE CONSERVATION OF EUROPEAN WILDLIFE
AND NATURAL HABITATS

Group of Experts on
Protected Areas and Ecological Networks

3rd meeting
19 – 20 September 2011
Council of Europe, Strasbourg,
Room 6

INTERPRETATION MANUAL OF THE EMERALD HABITATS

RESOLUTION 4 VERSION 2010

First draft

Document established by
the Directorate of Culture and Cultural and Natural Heritage
in collaboration with ETC/BD and Marc Roekaerts

CONTENTS

Introduction

Resolution 4, the list of habitat types to be protected by the Emerald network of Areas of Special Conservation Interest (ASCI's) under the Berne Convention was adopted in 1996. The 1996 list of habitat types was taken from the Palaearctic classification (Devilliers & Devilliers-Terschuren 1996).

However as the Palaearctic classification is no longer supported the Standing Committee of the Convention on the conservation of European wildlife and natural habitats agreed in December 2010 to adopt a revised edition of Resolution 4 based on the EUNIS habitats classification developed and supported by the European Environment Agency and its European Topic Centre on Biological Diversity. This change will allow for future revision of Resolution 4, including the addition of new habitat types.

In most cases habitat types from the Palaearctic classification had an equivalent in the EUNIS system but in some cases one Palaearctic habitat type has become two or more EUNIS classes or two or more Palaearctic classes one EUNIS class. In a small number of cases, the original habitat type now has a slightly wider definition.

Experience from the European Union's Natura 2000 network has shown the value of a guide to interpreting habitat types, many of which can be variable (Evans 2010). A draft manual to help identify the Resolution 4 habitat types was prepared by the PHARE Topic Link on Nature Conservation in 2000 (PTL-NC 2000), largely based on information derived from the PHYSIS database and focused on the central European countries included in the PHARE programme. The present version uses information from the EEA's EUNIS website[1] supplemented with information from a variety of other sources, including the PHARE manual and the European Union's Interpretation Manual of European Union Habitats (European Commission 2007). The aim is to allow those responsible for site selection for the Emerald Network to identify the Resolution 4 habitat types and to ensure as much coherence in the interpretation of the habitat types between countries as possible.

Explanatory notes

Habitat type code and name

Codes and names are taken from the current version of the EUNIS habitats classification which is a hierarchical system. Habitat types listed on Resolution 4 are indicated with an exclamation mark (!), other habitat types, are listed purely as headings, for example 'A Marine habitats' and 'A1 Littoral rock and other hard substrata'.

Plant communities

Where appropriate the plant communities associated with the habitat type are given, they are mostly based on the synopsis of European syntaxa published by the European Vegetation Survey (Rodwell et al 2002)

Species

A short list of species characteristic for the habitat type, and in some instances for sub types, is given, generally, species noted in the description are not repeated here. The list is not exhaustive and not all species listed will be found in every example of a habitat type.

[1] http://eunis.eea.europa.eu

Corresponding class in other classifications

The correspondence to other classification systems, both national and regional, is given for a limited number of classifications.

EU Habitats Directive Annex I

Relationship between the Resolution 4 habitat type and those listed on Annex I of the EU Habitats Directive.

Associated Habitat types

In some instances, notes are given to indicate that a given habitat is often found in association with another. For example 'A2.5 Coastal saltmarshes and saline reedbeds often occur as a component of 'X01 Estuaries'.

References

Only bibliographic references other than those given in EUNIS are listed.

Where there is no entry for a given heading, the heading has been omitted

References

Council of Europe (2010) *Revised Annex I of Resolution 4 (1996) of the Bern Convention on endangered natural habitat types using the Eunis Habitat Classification.* T-PVS/PA(2010)10 revE 09. Strasbourg. https://wcd.coe.int/wcd/com.instranet.InstraServlet?command=com.instranet.CmdBlobGet&InstranetImage=1763389&SecMode=1&DocId=1648180&Usage=2

Devilliers P. & Devilliers-Terschuren J., (1996). *A classification of Palaearctic habitats*. Nature and environment, No. 78, Council of Europe, Strasbourg, 194 p.

European Commission (2007) *Interpretation Manual of European Union Habitats –EUR27* http://ec.europa.eu/environment/nature/legislation/habitatsdirective/docs/2007_07_im.pdf

Evans, D. (2010). Interpreting the habitats of Annex I: past, present and future. *Acta Botanica Gallica* 157 (4) 677-686.

PTL-NC (2000) *Interpretation Manual of the Emerald Habitats.* (Unpublished report)

Rodwell, J., Schaminee, J., Mucina, L., Pignatti, S., Dring, J. & Moss, D. (2002). *The Diversity of European Vegetation. An overview of Phytosociological Alliances and their relationships to EUNIS Habitats.* Landbouw, natuurbeheer en visserij, Wageningen.

A Marine habitats

A1 Littoral rock and other hard substrata

A1.1 High energy littoral rock

! ***A1.11 Mussel 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 winkle *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* .

EU Habitats Directive Annex I

Included in 1170 Reefs

Associated Habitat types

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).

A1.14 Mediterranean and Black Sea communities of lower mediolittoral rock very exposed to wave action

! A1.141 Association with *Lithophyllum byssoides*

Description

This association is characterised by the red alga species *Lithophyllum byssoides* (ex *Lithophyllum lichenoides*). This is one of the most important bio-constructors of the Mediterranean "trottoir", particularly important because of its high aesthetic interest and its conservation value.

Species

Lithophyllum byssoides, Lithophyllum lichenoides

Corresponding class in other classifications

EU Habitats Directive Annex I

Included in 1170 Reefs

A1.2 Moderate energy littoral rock

A1.22 Mussels 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 lap*illus 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).

EU Habitats Directive Annex I

Included in 1170 Reefs

Associated Habitat types

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.

A1.4 Features of littoral rock

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 fucoid 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), fucoids and kelp (A1.412) and hydroids and littorinid molluscs may occur also on the floor of cave entrances. 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. Fucoids 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).

Species

Cladophora rupestris, Hildenbrandia rubra, Prasiola stipitata

EU Habitats Directive Annex I

8330 Submerged or partially submerged sea caves

A2 Littoral sediment

! 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.

Plant communities

Species

Corresponding class in other classifications

EU Habitats Directive Annex I

Can occur as part of the following;-
1130 Estuaries
1140 Mudflats and sandflats not covered by seawater at low tide
1150 Coastal lagoons
1160 Large shallow inlets and bays

! 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.

Plant communities

Species
Ulva lactuca

EU Habitats Directive Annex I
Can occur as part of the following;-
1130 Estuaries
1140 Mudflats and sandflats not covered by seawater at low tide
1150 Coastal lagoons
1160 Large shallow inlets and bays

! **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.

Species
Aphelochaeta marioni, Cerastoderma edule, Corophium volutator, Melinna palmate, Scrobicularia plana, Streblospio shrubsolii, Tubificoides benedii, Tubificoides pseudogaster

EU Habitats Directive Annex I

1130 Estuaries
1140 Mudflats and sandflats not covered by seawater at low tide
1150 Coastal lagoons
1160 Large shallow inlets and bays

! **A2.5 Coastal saltmarshes and saline reedbeds**

includes the following subtypes separately listed in or split units from the 1998 version:

A2.521 Atlantic and Baltic brackish saltmarsh communities
A2.531 Atlantic upper shore communities
A2.542 Atlantic lower shore communities
A2.5514 Salicornia veneta swards
A2.5515 Black Sea annual Salicornia , Suaeda and Salsola saltmarshes
A2.553 Atlantic Sagina maritima communities

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.

Plant communities

Aegopodion podagrariae, Salicornio-Puccinellion, Eleocharition uniglumis, Armerion maritimae, Salicornion patulae, Glauco maritimae-Juncion maritime, Limonion ferulacei, Thero-Atriplicion, Thero-Suaedion, Juncion maritime, Frankenion pulverulentae, Hordeion marini, Suaedion braun-blanqueti, Arthrocnemion glauci, Caricion fuscae, Cypero-Spergularion salinae, Puccinellio-Spergularion salinae, Agropyrion pungentis, Puccinellion phryganodis, Limoniastrion monopetali, Salicornion herbaceae, Puccinellion limosae, Romulion, Atriplicion littoralis, Saginion maritimae, Salicornion fruticosae, Agropyro-Artemision coerulescentis, Thero-Salicornion, Puccinellion maritimae, Plantaginion crassifoliae, Honckenyo-Crambion maritimae, Suaedion verae, Trifolion squamosi, Spartinion maritimae, Saginetea maritimae, Saginetalia maritimae, Salicornietalia fruticosae, Thero-Salicornietea, Glauco-Puccinellietalia, Crypsidetalia aculeatae, Thero-Salicornietalia

Species

Anthemis glaberrima, Aster sorrentinii, Corophium volutator, Hippuris tetraphylla, Hydrobia ulvae, Kosteletzkya pentacarpos, Ligularia sibirica, Linum maritimum, Manayunkia aestuarina, Primula nutans, Puccinellia fasciculata ssp. pungens, Puccinellia phryganodes, Rumex rupestris, Salicornia veneta

EU Habitats Directive Annex I

1130 Estuaries
1150 Coastal lagoons
1160 Large shallow inlets and bays
1310 Salicornia and other annuals colonizing mud and sand
1320 Spartina swards (Spartinion maritimae)
1330 Atlantic salt meadows (Glauco-Puccinellietalia maritimae)
1410 Mediterranean salt meadows (Juncetalia maritimi)
1420 Mediterranean and thermo-Atlantic halophilous scrubs (Sarcocornetea fruticosi)
1630 Boreal Baltic coastal meadows

Associated Habitat types

A2.5 Coastal saltmarshes and saline reedbeds often occur as a component of X01 Estuaries

A2.6 Littoral sediments dominated by aquatic angiosperms

! ***A2.61 Seagrass beds on littoral sediments***

Description

Beds of submerged marine vascular plants ('seagrasses') growing on coastal sediments in shallow water. Depth varies with water quality but is usually 30m or less.

Plant communities

Zosterion marinae, Posidonion oceanicae, Cymodoceion nodosae

Species

Zostera sp. Posidonia oceanica

EU Habitats Directive Annex I

1120 *Posidonia* beds (*Posidonion oceanicae*)
1140 Mudflats and sandflats not covered by seawater at low tide
1160 Large shallow inlets and bays

References

Green, E P., & F T. Short. 2003. *World Atlas of Seagrasses*. UNEP World Conservation Monitoring Centre, University of California Press, Berkeley

A2.62 Marine* Cyperaceae *beds

! A2.621 *Eleocharis* beds

Description

Emergent *Eleocharis parvula* or *Eleocharis acicularis* formations of brackish seas, sea inlets, estuaries, permanent pools of mud or sand flats, and coastal lagoons, occurring in the open sea only in the Baltic, limited to coastal waterbodies elsewhere, and very rare.

Plant communities

Scirpion parvuli, Ruppion maritimae

Species

Eleocharis parvula, Eleocharis acicularis

A2.7 Littoral biogenic reefs

! ***A2.72 Littoral mussel 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 fucoid algae.

Species

Ascophyllum nodosum, Fucus vesiculosus, Mytilus edulis

Corresponding class in other classifications

EU Habitats Directive Annex I
Included in 1170 Reefs

! A3 Infralittoral rock and other hard substrata

includes the following subtypes separately listed in or split units from the 1998 version:

A3.71 Robust faunal cushions and crusts in surge gullies and caves
A3.74 Caves and overhangs in infralittoral rock

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.

Species
Alaria esculenta, Laminaria digitata, L. hyperborea, L. saccharina

Corresponding class in other classifications

EU Habitats Directive Annex I
1170 Reefs
8330 Submerged or partially submerged sea caves

! A4 Circalittoral rock and other hard substrata

includes the following subtypes separately listed in or split units from the 1998 version:

A4.24 Mussel beds on circalittoral rock
A4.26 Mediterranean coralligenous communities moderately exposed to hydrodynamic action
A4.32 Mediterranean coralligenous communities sheltered from hydrodynamic action
A4.71 Communities of circalittoral caves and overhangs

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.

Species

Pachymatisma johnstonia, Halichondria panacea, Esperiopsis fucorum, Myxilla incrustans, Tubularia indivisa, Balanus crenatus, Alcyonium digitatum, Sabellaria spinulosa, Neocrania anomala, Ciona intestinalis, Ascidia mentula, Alcyonium digitatum, Metridium senile

EU Habitats Directive Annex I

1170 Reefs
8330 Submerged or partially submerged sea caves

! **A5 Sublittoral sediment**

includes the following subtypes separately listed in or split units from the 1998 version:
A5.627 Baltic mussel beds in the infralittoral photic zone

Description

Sediments and associated fauna 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.

Species

Echinocardium cordatum, Cerastoderma glaucum, Amphiura spp*, Virgularia mirabilis Nephrops norvegicus, Laminaria saccharina, Phymatolithon calcareum, Modiolus modiolus, Mytilus edulis, Lophelia pertusa.*

EU Habitats Directive Annex I

1170 Reefs

A6 Deep-sea bed

A6.9 Vents, seeps, hypoxic and anoxic habitats of the deep sea

A6.91 Deep-sea reducing habitats

! A6.911 Seeps in the deep-sea bed

Description

Deep-sea habitats characterised by chemical conditions. 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.

B Coastal habitats

B1 Coastal dunes and sandy shores

! **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.

Plant communities
Verbascion pinnatifidii, Ononido ramosissimae-Polycarpion niveae, Agropyrion juncei, Agropyro-Minuartion peploidis, Honckenyo-Elymion arenarii, Traganion moquinii, Elymion gigantei, Ammophilion arundinaceae,

Species
Ammophila arenaria, *Anchusa crispa, Elymus farctus*, *Eryngium maritimum, Honkenya peploides*, *Mertensia maritime*

EU Habitats Directive Annex I
Includes:
1640 Boreal Baltic sandy beaches with perennial vegetation
2110 Embryonic shifting dunes
2120 Shifting dunes along the shoreline with *Ammophila arenaria* ('white dunes')

Associated Habitat types
Often found as a complex with other dune habitats such as B1.4 to B1.8 (all included in Resolution 4).

! 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 clearings.

Plant communities
Corynephorion canescentis, Bromion erecti, Violion caninae, Euphorbio portlandicae-Helichrysion stoechadis, Potentillion anserinae, Galio littoralis-Geranion sanguinei, Helianthemion guttati, Plantagini-Festucion ovinae, Festucion beckeri, Anthyllido hamosae-Malcolmion lacerate, Traganion moquinii, Linarion pedunculatae, Koelerion arenariae, Thero-Airion, Hyperico perforati-Scleranthion perennis, Crucianellion maritimae, Geranion sanguinei, Scabiosion ucranicae, Juncion squarrosi, Helichrysion picardii, Ammophiletalia, Crucianelletalia maritimae, Artemisio-Koelerietalia

Species
Anchusa crispa, Apium repens, Arnica montana, Artemisia pancicii, Carduus myriacanthus, Colchicum corsicum, Dianthus arenarius ssp. arenarius, Dracocephalum austriacum, Euphrasia marchesettii, Galium litorale, Gentianella anglica, Helianthemum caput-felis, Jasione lusitanica, Kosteletzkya pentacarpos, Linaria ficalhoana, Linaria flava, Muscari gussonei, Narcissus triandrus, Narcissus triandrus ssp. capax, Rouya polygama, Rumex rupestris, Sisymbrium supinum, Stipa bavarica, Thesium ebracteatum, Thymus carnosus

EU Habitats Directive Annex I
Includes:
2130 Fixed coastal dunes with herbaceous vegetation ('grey dunes')
2210 Crucianellion maritimae fixed beach dunes
2220 Dunes with Euphorbia terracina
2230 Malcolmietalia dune grasslands

2240 Brachypodietalia dune grasslands with annuals

Associated Habitat types
Often found as a complex with other dune habitats such as B1.3 to B1.8 (all included in Resolution 4).

! **B1.5 Coastal dune heaths**

Description
Stable dunes with leached soils and vegetation dominated by ericaceous shrubs including *Calluna vulgaris*, *Empetrum nigrum* and *Erica* spp.

Plant communities
Ulicion minoris, Ericion cinereae, Genisto-Vaccinion, Genistion pilosae, Empetrion nigri, Ericion umbellatae

Species
Calluna vulgaris, Empetrum nigrum, Erica sp.

EU Habitats Directive Annex I
Includes:
2140: Decalcified fixed dunes with *Empetrum nigrum*
2150: Atlantic decalcified fixed dunes (*Calluno-Ulicetea*)

Associated Habitat types
Often found as a complex with other dune habitats such as B1.3 to B1.8 (all included in Resolution 4).

References
Gorissen, I. 2004. *Dwarf shrub heaths of Europe - from Atlantic to Caucasus and Ural.* Verlag Ingmar Gorissen, Siegburg.

! **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.

Plant communities
Pruno-Rubion radulae, Pruno-Rubion ulmifolii, Berberidion vulgaris, Oleo-Ceratonion siliquae, Juniperion turbinatae, Salicion arenariae, Ligustro-Hippophaeion, Cisto-Lavanduletea, Rosmarinetea officinalis, Quercetea ilicis, Pyro cordatae-Ulicion europaei

Species
Astragalus maritimus, Centaurea attica ssp. Megarensis, Cytisus aeolicus, Daphne rodriguezii, Dracocephalum austriacum, Gypsophila papillosa, Hippophae rhamnoides, Juniperus sp., Ophrys argolica, Phoenix theophrasti, Ruscus aculeatus, Salix repens

EU Habitats Directive Annex I
Includes:
2160 Dunes with *Hippophaë rhamnoides*
2170 Dunes with *Salix repens* ssp *argentea* (*Salicion arenariae*)
2250 Coastal dunes with *Juniperus* spp
2260 *Cisto-Lavenduletalia* dune sclerophyllous scrubs

Associated Habitat types
Often found as a complex with other dune habitats such as B1.3 to B1.8 (all included in Resolution 4).

! B1.7 Coastal dune woods

Description
Coastal dunes colonised by woodland which are directly influenced by proximity to the sea.

Plant communities
Querco-Fagetea, Quercetea ilicis, Dicrano-Pinion

Species
Betula sp, *Pinus* sp, *Quercus* sp, *Fagus sylvatica, Leucobryum glaucum, Ruscus aculeatus*

EU Habitats Directive Annex I
Includes:
2180 Wooded dunes of the Atlantic, Continental and Boreal region
2270 Wooded dunes with *Pinus pinea* and/or *Pinus pinaster*

Associated Habitat types
Often found as a complex with other dune habitats such as B1.3 to B1.8 (all included in Resolution 4).

! 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.

Plant communities
Charetum tomentosae; Elodeetum canadense; Hippuridetum vulgaris; Hottonietum palustis; Potametum pectinati

Species
Apium repens, Armeria helodes, Caropsis verticillatinundata, Colchicum corsicum, Coleanthus subtilis, Eryngium viviparum, Hamatocaulis vernicosus, Kosteletzkya pentacarpos, Ligularia sibirica, Lindernia procumbens, Liparis loeselii, Luronium natans, Marsilea quadrifolia, Petalophyllum ralfsii, Sisymbrium supinum, Spiranthes aestivalis, Thesium ebracteatum

EU Habitats Directive Annex I
2190 Humid dune slacks

Associated Habitat types
Often found as a complex with other dune habitats such as B1.3 to B1.7 (all included in Resolution 4).

! 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* .

Plant communities
Plantagini-Festucion ovinae

EU Habitats Directive Annex I
21A0 Machairs (* in Ireland)

References
Angus, I.S. & Dargie, T.C.D. 2002. The UK Machair Habitat Action Plan: progress and problems. *Botanical. Journal of Scotland* 54*:* 63–74.
Gaynor, K.. 2006. The Vegetation of Irish Machair. *Biology & Environment: Proceedings of the Royal Irish Academy* 106 (3): 311-321.

B2 Coastal shingle

! B2.3 Upper shingle beaches with open vegetation

Description
The upper beach of large shingle bars, with open pioneer communities or perennial vegetation mostly formed by *Crambe maritima , Honkenya peploides , Lathyrus japonicus* and other specialised species. Mainly in northwest Europe, from the Atlantic to the Baltic.

Plant communities
Honkenyo-Elymetea: Honkenyo-Elymetalia: Honkenyo-Crambion maritimae

Species
Crambe maritima, Honkenya peploides, Lathyrus japonicus

EU Habitats Directive Annex I
1220 Perennial vegetation of stony banks

C Inland surface waters

C1 Surface standing waters

! 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 are often sparse and open.

Plant communities
Charion fragilis, Nitellion flexilis, Nelumboion nuciferae, Scorpidio-Utricularion minoris, Oenanthion aquaticae, Zannichellion pedicellatae, Parvopotamion, Potamion graminei, Nitellion syncarpae-tenuissimae, Sphagno-Utricularion, Nymphaeion albae, Ranunculion aquatilis, Hyperico elodis-Sparganion, Ranunculion fluitantis, Charion vulgaris, Potamion,

Species
Callitriche sp. *Chara* sp, *Isoetes* sp, *Nitella* sp, *Potamogeton* sp,*Sparganium* sp

EU Habitats Directive Annex I
Includes:
2190 Humid dune slacks
3110 Oligotrophic waters containing very few minerals of sandy plains (*Littorelletalia uniflorae*)
3120 Oligothrophic waters containing very few minerals generally on sandy soils of the West Mediterranean, with *Isoetes* spp
3140 Hard oligo-mesotrophic waters with benthic vegetation of *Chara* spp

C1.2 Permanent mesotrophic lakes, ponds and pools

C1.22 Free-floating vegetation of mesotrophic waterbodies

! C1.222 Floating *Hydrocharis morsus-ranae* rafts

Description
Free-floating surface communities of Palaearctic waters rich in *Hydrocharis morsus-ranae* .

Plant communities
Hydrocharition: Hydrocharitetum morsus-ranae

Species
Hydrocharis morsus-ranae

EU Habitats Directive Annex I
included in 3150 Natural eutrophic lakes with Magnopotamion or Hydrocharition -type vegetation

! C1.223 Floating *Stratiotes aloides* rafts

Description
Free-floating communities of Palaearctic waters dominated by *Stratiotes aloides* .

Plant communities
Hydrocharition: Stratiotetum aloidis

Species
Stratiotes aloides

EU Habitats Directive Annex I
included in 3150 Natural eutrophic lakes with Magnopotamion or Hydrocharition -type vegetation

! C1.224 Floating *Utricularia australis* and *Utricularia vulgaris* colonies

Description
Free-floating communities of more or less nutrient-rich Palaearctic waters dominated by bladderworts (*Utricularia australis*, *Utricularia vulgaris*).

Plant communities
Hydrocharition: Lemno-Utricularietum vulgaris, Utricularietum australis (Utricularietum neglectae)

Species
Utricularia australis, Utricularia vulgaris

EU Habitats Directive Annex I
included in 3150: Natural eutrophic lakes with *Magnopotamion* or *Hydrocharition* -type vegetation

! C1.225 Floating *Salvinia natans* mats

Description
Free-floating communities of Central and Eastern Europe dominated by the free-floating non-indigenous fern *Salvinia natans*, often forming dense and extensive mats.

Plant communities
Hydrocharition: Spirodelo-Salvinietum natantis

Species
Salvinia natans

Corresponding class in other classifications

EU Habitats Directive Annex I
included in 3150 Natural eutrophic lakes with Magnopotamion or Hydrocharition -type vegetation

! C1.226 Floating *Aldrovanda vesiculosa* communities

Description
Rare aquatic formations of Central and Eastern Europe, dispersed from southern Brandenburg and Lake Constance east to the Ukraine, with a former outpost in eastern Lithuania, harbouring the carnivorous, free-floating Droseraceae *Aldrovanda vesiculosa* (listed on Resolution 6).

Plant communities
Aldrovandetum vesiculosae, Spirodelo-Aldrovandetum i.a.

Species
Aldrovanda vesiculosa

EU Habitats Directive Annex I
included in 3150 Natural eutrophic lakes with Magnopotamion or Hydrocharition -type vegetation

C1.24 Rooted floating vegetation of mesotrophic waterbodies

C1.241 Floating broad-leaved carpets

! *C1.2416* Nelumbo nucifera *beds*

Description

Formations of *Nelumbo nucifera*, occurring in the Volga delta and from the south Caspian lowlands to the Far East, with a naturalised population in Romania.

Plant communities

Species

Nelumbo nucifera

! C1.25 Charophyte submerged carpets in mesotrophic waterbodies

Description

Algal carpets dominated by Charophytes of the bottom of unpolluted, mesotrophic lakes and pools of the Palaearctic region.

Plant communities

Charetalia hispidae, Nitelletalia flexilis

Species

Chara sp., *Nitella* sp, *Tolypella* sp.

EU Habitats Directive Annex I

3140 Hard oligo-mesotrophic waters with benthic vegetation of *Chara spp*.

Associated Habitat types

This is similar to subtype C1.14 of !C1.1 Permanent oligotrophic lakes, ponds and pools and C1.44 Charophyte submerged carpets in dystrophic waterbodies but differing in the trophic status of the water body.

C1.3 Permanent eutrophic lakes, ponds and pools

C1.34 Rooted floating vegetation of eutrophic waterbodies

C1.341 Shallow-water floating communities

! *C1.3411* Ranunculus *communities in shallow water*

Description

Communities dominated by water crowfoots (aquatic species of *Ranunculus*) with both submerged and floating leaves, characteristic mostly of shallow Palaearctic waters with fluctuating water levels and susceptible to occasional drying.

Plant communities

Ranunculion aquatilis (Nymphaeion albae p., Ranunculion fluitantis p.); Hydrocotylo-Baldellion

Species

Ranunculus peltatus, Ranunculus aquatilis, Ranunculus baudotii, Ranunculus hederaceus, Ranunculus rionii, Ranunculus ololeucos

! *C1.3413* Hottonia palustris *beds in shallow water*

Description

Communities of shallow Palaearctic waters dominated by *Hottonia palustris* .

Plant communities

Hottonion palustris, Ranunculion aquatilis p

Species

Hottonia palustris

C1.4 Permanent dystrophic lakes, ponds and pools

! ***C1.44 Charophyte submerged carpets in dystrophic waterbodies***

Description

Algal carpets dominated by Charophytes of the bottom of unpolluted, dystrophic lakes and pools of the Palaearctic region.

Plant communities

Charion fragilis

Species

Chara sp, *Nitella* sp, *Tolypella* sp

EU Habitats Directive Annex I

3140 Hard oligo-mesotrophic waters with benthic vegetation of *Chara spp*.

Associated Habitat types

This is similar to subtype C1.14 of !C1.1 Permanent oligotrophic lakes, ponds and pools and !C1.25 Charophyte submerged carpets in mesotrophic waterbodies but differing in the trophic status of the water body.

! 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.

Plant communities

Charion canescentis, Zannichellion pedicellatae, Ranunculion aquatilis, Ruppion maritimae

Species

Lemna sp, *Wolffia* sp, *Callitriche* sp and *Ranunculus* sect. *Batrachium* sp., *Najas marina, Najas minor, Potamogeton pectinatus*

EU Habitats Directive Annex I

Includes 1150: Coastal lagoons

C1.6 Temporary lakes, ponds and pools

! *C1.66 Temporary inland saline and brackish waters*

Description

Shallow temporary saline and brackish waters, in which communities may develop which often form two layers. The main species are *Ranunculus trichophyllus , Najas minor , Najas marina* and *Ceratophyllum demersum* .

Plant communities

Charion fragilis, Nelumboion nuciferae, Potentillion anserinae, Zannichellion pedicellatae, Parvopotamion, Littorellion uniflorae, Potamion graminei, Isoëtion lacustris, Nymphaeion albae, Ranunculion aquatilis, Hyperico elodis-Sparganion, Ranunculion fluitantis

Species

Ceratophyllum demersum, Najas marina, Najas minor, Ranunculus trichophyllus

! *C1.67 Turlough and lake-bottom meadows*

Description

Terrestrial communities colonizing the bottom of waterbodies that are completely and recurrently emptied of water for part of the time, such as Irish turloughs. Habitats characteristic of each stage of the cycle may be units of C1, C3.41-C3.43, C3.51-C3.52, C3.64-C3.65 and, if appropriate, those of units D2-D5 or E2-E3.

Plant communities

Species

Plants: *Cinclidotus fontinaloides, Fontinalis antipyretica* (Bryophyta).
Animals: *Tanymastix stagnalis* (wet phase) and the beetles *Agonum lugens*, *A. livens, Badister meridionalis, Blethisa multipunctata* and *Pelophila borealis* (dry phase).

Corresponding class in other classifications

EU Habitats Directive Annex I

3180 Turloughs

References

Proctor, M. 2010. Environmental and vegetational relationships of lakes, fens and turloughs in the Burren. *Biology & Environment: Proceedings of the Royal Irish Academy* 110 (1): 17-34.

C2 Surface running waters

C2.1 Springs, spring brooks and geysers

! *C2.12 Hard water springs*

Description

Springs rich in calcium, typically due to calcareous tufa formation. Species-rich habitats with high moss cover, a high dominance of the moss *Cratoneuron commutatum* is typical.

Plant communities

Cratoneurion commutati, Lycopodo-Cratoneurion commutati

Species
Arabis soyeri, Cochlearia pyrenaica (in sites with heavy metals), *Pinguicula vulgaris, Saxifraga aizoides*. Mosses: *Catoscopium nigritum, Cratoneuron commutatum, C. commutatum* var. *falcatum*, *C. filicinum, Eucladium verticillatum, Gymnostomum recurvirostrum*. In the Boreal region also *Carex appropinquata, Epilobium davuricum, Juncus triglumis, Drepanocladus vernicosus, Philonotis calcarea, Scorpidium revolvens, S.cossoni, Cratoneuron decipiens, Bryum pseudotriquetum*

Corresponding class in other classifications

EU Habitats Directive Annex I
Subtype C2.121 Petrifying springs with tufa or travertine formations is 7220: Petrifying springs with tufa formation (*Cratoneurion*).

C3 Littoral zone of inland surface waterbodies

C3.4 Species-poor beds of low-growing water-fringing or amphibious vegetation

! ***C3.41 Euro-Siberian perennial amphibious communities***

Description
Carpets of perennial vegetation submerged for a considerable part of the year in oligotrophic or mesotrophic lakes, ponds and pools of the boreal and nemoral zones of the Palaearctic and of mountains of the southern Palaearctic.

Plant communities
Littorelletalia including the alliances *Deschampsion littoralis Eleocharition acicularis, Isoetion lacustris, Littorellion uniflorae, Lobelion dortmannae, Hyperico elodis-Sparganion*

Species
C3.411: *Littorella uniflora, Lobelia dortmanna, Sparganium angustifolium, Isoetës lacustris, I. echinospora*. **C3.413:** *Eleocharis multicaulis, Glyceria fluitans, Juncus bulbosus, Hypericum elodes, Pilularia globulifera, Deschampsia setacea, Ranunculus flammula, Littorella uniflora, Samolus valerandi*

EU Habitats Directive Annex I
included in:
3110 Oligotrophic waters containing very few minerals of sandy plains (Littorelletalia uniflorae)
3130 Oligotrophic to mesotrophic standing waters with vegetation of the Littorelletea uniflorae and/or of the Isoeto-Nanojuncetea

C3.42 Mediterraneo-Atlantic amphibious communities

! C3.421 Short Mediterranean amphibious communities

Description
Formations of Mediterranean, thermo-Atlantic and Macaronesian regions entirely or partially summer such as dry ponds, pools and ditches.

Plant communities
Isoetetalia velatae

Species

Isoetes spp., Marsilea quadrifolia, Marsilea strigosa, Pilularia globulifera, Pilularia minuta, Mentha pulegium, Lythrum hyssopifolia s.l., Trifolium filiforme, Peplis erecta, Teucrium cravense, Serapias lingua, Juncus bufonius, Juncus capitatus, Juncus pygmaeus, Juncus fasciculatus, Scirpus savii, Spiranthes aestivalis, Anagallis tenella, Cyperus flavescens, C. fuscus, C. michelianus, Fimbristylis bisumbellata, Chaetopogon fasciculatus

Corresponding class in other classifications

EU Habitats Directive Annex I
included in 3170: Mediterranean temporary ponds
References
Bagella, S., MC Caria & V. Zuccarello. 2010. Patterns of emblematic habitat types in Mediterranean temporary wetlands. *Comptes Rendus Biologies* 333 (9): 694-700

! C3.422 Tall Mediterranean amphibious communities

Description
Mediterranean and thermo-Atlantic formations of entirely or partially summer-dry ponds, pools, ditches and springs, developed on terrain covered by deep waters during long periods, composed of a mixture of small annuals and of tall perennials or annuals, in particular, of the genera *Mentha* and *Eryngium*.

Plant communities
Preslion cervinae

Species
Eryngium corniculatum, Mentha cervina, Mentha longifolia

EU Habitats Directive Annex I
included in 3170: Mediterranean temporary ponds

References
Bagella, S., MC Caria & V. Zuccarello. 2010. Patterns of emblematic habitat types in Mediterranean temporary wetlands. *Comptes Rendus Biologies* 333 (9): 694-700

C3.43 Central Eurasian amphibious communities

! C3.431 Ponto-Pannonic riverbank dwarf sedge communities

Description
Communities of nitrogen-rich muds and inundation zones of watercourses and lakes of the western central Eurasian steppe and pre-steppe zones, in particular of the Pannonic and sub-Pannonic plains and hills, dominated by sedges and rushes.

Plant communities
Elatino-Eleocharition ovatae p.: Dichostylidi-Gnaphalietum uliginosi, Cypero-Juncetum bufonii

Species
Cyperus fuscus, Cyperus flavescens, Cyperus michelianus (Dichostylis michelianus), Juncus bufonius, Echinochloa crus-galli, Filaginella uliginosa (Gnaphalium uliginosum), Elatine hungarica, Ammannia verticillata

C3.5 Periodically inundated shores with pioneer and ephemeral vegetation

C3.51 Euro-Siberian dwarf annual amphibious swards

! C3.511 Freshwater dwarf *Eleocharis* communities

Description

Rare communities colonising the fluid muds of drying ponds of nemoral, boreonemoral, boreal, and, locally, steppic regions of Europe, characterised by *Eleocharis* spp and other amphibious plants.

Plant communities

Elatino-Eleocharitenion ovatae

Species

Eleocharis ovata, Eleocharis carniolica, Carex bohemica, Lindernia procumbens, Scirpus supinus, Limosella aquatica, Cyperus fuscus, Peplis portula, Juncus tenageia, Elatine hexandra, Elatine hydropiper

EU Habitats Directive Annex I

Included in 3130 Oligotrophic to mesotrophic standing waters with vegetation of the *Littorelletea uniflorae* and/or of the *Isoeto-Nanojuncetea*

! C3.512 Dune-slack *Centaurium* swards

Description

Pioneer formations of humid calcareous sands of Atlantic and sub-Atlantic Europe, recorded from the coasts around the North Sea and from the Baltic coast of Germany, with *Centaurium* spp and other plants, characteristic of humid dune slacks and dune pool fringes, on soils with low salinity.

Plant communities

Nanocyperion

Species

Samolus valerandi, Centaurium littorale, Centaurium erythraea, Centaurium pulchellum, Gentianella amarella, Blackstonia perfoliata, Juncus bufonius

EU Habitats Directive Annex I

Included in 2190 Humid dune slacks

! *C3.5132 Swards of small* Cyperus *species*

Description

Medio-European communities dominated by *Cyperus flavescens , Cyperus fuscus* and *Cyperus michelianus*

Plant communities

Nanocyperioni i.a.

Species

Cyperus flavescens, Cyperus fuscus and Cyperus michelianus

EU Habitats Directive Annex I

Included in 3130 Oligotrophic to mesotrophic standing waters with vegetation of the *Littorelletea uniflorae* and/or of the *Isoeto-Nanojuncetea*

! *C3.5133 Wet ground dwarf herb communities*

Description

Varied communities, some very rare and threatened, of small annuals of wet ground of nemoral and boreo-nemoral regions of Palaearctic Eurasia.

Plant communities

Juncenion bufonii: Glycerio-Limoselletum, Centunculo-Anthocerotetum, Stellario uliginosae-Scirpetum setaceae, Erythraeo-Blackstonietum, Radiolenion linoidis: Ranunculo-Radioletum linoidis, Cicendietum filiformis, Hyperico-Spergularietum rubrae, Spergulario-Illecebretum verticillati, Junco-Radioletum linoidis i.a.

Species

Juncus bufonius, Scirpus setaceus, Centunculus minimus, Spergularia segetalis, Blackstonia perfoliata, Cicendia filiformis, Radiola linoides and Illecebrum verticillatum

EU Habitats Directive Annex I

Included in 3130 Oligotrophic to mesotrophic standing waters with vegetation of the *Littorelletea uniflorae* and/or of the *Isoeto-Nanojuncetea*

! ***C3.55 Sparsely vegetated river gravel banks***

Description

Vascular plant communities occupying gravel deposits of rivers, including pioneer vegetation and subsequent stages in the colonization sequence. Early-stage communities of Alpine, boreal and Mediterranean watercourses are specialised, those of nemoral lowlands and hills are related to other formations, in particular those of unit E3..

Plant communities

Epilobietalia fleischeri, Glaucion flavi

Species

Myricaria germanica, Glaucium flavum, Oenothera biennis, Salix elaeagnos

EU Habitats Directive Annex I

Partially covered by
3220 Alpine rivers and the herbaceous vegetation along their banks
3230 Alpine rivers and their ligneous vegetation with *Myricaria germanica*
3240 Alpine rivers and their ligneous vegetation with *Salix elaeagnos*
3250 Constantly flowing Mediterranean rivers with *Glaucium flavum*

Associated Habitat types

Can occur in a mosaic with !C3.62 Unvegetated river gravel banks

C3.6 Unvegetated or sparsely vegetated shores with soft or mobile sediments

! ***C3.62 Unvegetated river gravel banks***

Description

Unvegetated deposit beds of streams formed of pebbles, gravels, boulders or a mixture of gravels and finer sediments, occupying the edges of the stream, forming islands in the channel or supporting the arms and rivulets constituting the stream, together with their associated animal communities. Corresponding habitats with pioneer or ephemeral vascular vegetation are included in unit C3.55 and their succession leads to willow woodland (G1.11).

Associated Habitat types
Can occur in a mosaic with !C3.55 Sparsely vegetated river gravel banks

D Mires, bogs and fens

D1 Raised and blanket bogs

! 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 but *Sphagnum* mosses 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).

Plant communities
Scheuchzerietalia palustris p, *Erico-Ledetalia* p

Species
Sphagnum papillosum, S. tenellum, S. compactum, S. magellanicum, S. rubellum, S. fuscum, Narthecium ossifragum, Molinia caerulea, Scirpus cespitosus, Schoenus nigricans, Eriophorum angustifolium, Eriophorum vaginatum, Calluna vulgaris

EU Habitats Directive Annex I
7130 Blanket bogs (* if active bog)

D2 Valley mires, poor fens and transition mires

D2.2 Poor fens and soft-water spring mires

D2.22 Carex nigra, Carex canescens, Carex echinata *fens*

! D2.226 Peri-Danubian black-white-star sedge fens

Description

Acidic fens, with an herbaceous sward formed by *Carex* spp and sometimes *Juncus effusus , Juncus acutiflorus* or *Nardus stricta* of the mountains and hills forming the basin of the middle and lower Danube basin, and of adjacent regions, in particular of the Carpathians, the Dinarides, the mountains of the southeastern Balkan peninsula and the Moravian hills.

Plant communities
Carici dacicae-Plantaginetum gentianoidis, Carici nigrae-Sphagnetum balkanicum, Carici echinatae-Sphagnetum, Junco-Caricetum fuscae, Sphagno-Caricetum rostratae, Carici-Sphagnetum droseretosum

Species
Carex echinata, Carex canescens, Carex dacica (Carex nigra ssp. dacica), Carex rostrata, Juncus effusus, Juncus acutiflorus, Nardus stricta, **D2.2262:** *Carex nigra, Carex echinata, Eriophorum angustifolium, Agrostis canina, Molinia caerulea, Nardus stricta, Drosera rotundifolia*. **D2.2263:** *Carex nigra, C. echinata, Eriophorum latifolium, E. angustifolium, E. vaginatum, Carex panicea, C. pallescens, Dactylorhiza cordigera, Pinguicula vulgaris, Primula farinosa ssp. exigua, Alchemilla bulgarica, Cirsium heterotrichum, Soldanella hungarica, Gymnadenia frivaldii, Juncus spp., Sphagnum spp.* **D2.2265:** *Carex nigra, Carex stellulata, Deschampsia cespitosa, Pinguicula vulgaris, Drosera rotundifolia, Sphagnum rubellum, Soldanella alpina, Dactylorhiza cordigera, Leucorchis albida*

! **D2.3 Transition mires and quaking bogs**

includes the following subtype separately listed in the 1998 edition of Resolution 4:
D2.3H Wet, open, acid peat and sand, with Rhynchospora alba and Drosera

Description
Incompletely terrestrialized wetlands occupied by peat-forming vegetation with acid groundwater or (for vegetation rafts) acid underlying pool or lake water. Included in this habitat type are rafts of *Sphagnum* and *Eriophorum* sp (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.

Plant communities
Scheuchzerietalia palustris: Caricion lasiocarpae, Rhynchosporion albae p.

Species
Plants: *Eriophorum gracile*, *Carex chordorrhiza*, *C. lasiocarpa*, *C. diandra*, *C. rostrata*, *C. limosa*, *Scheuchzeria palustris*, *Hammarbya paludosa*, *Liparis loeselii*, *Rhynchospora alba, R. fusca*, *Menyanthes trifoliata*, *Epilobium palustre*, *Pedicularis palustris, Sphagnum* sp. (*S. papillosum*, *S. angustifolium*, *S. subsecundun*, *S. fimbriatum*, *S. riparium*, *S. cuspidatum)*, *Calliergon giganteum*, *Drepanocladus revolvens*, *Scorpidium scorpioides*, *Campylium stellatum*, *Aneura pinguis*

EU Habitats Directive Annex I
Includes:
7140 Transition mires and quaking bogs
7150 Depressions on peat substrates of the *Rhynchosporion*

D3 Aapa, palsa and polygon mires

! **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.

Species
Eriophorum russeolum, Carex rotundata, C. saxatilis, Empetrum nigrum ssp. *hermaphroditum, Ledum palustre, Betula nana, Vaccinium microcarpum*; Mosses- *Dicranum elongatum*; Lichens: *Ochrolechia* spp., *Cladonia* spp., *Cladina* spp.

EU Habitats Directive Annex I
7320 Palsa mires

! **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.

Species
Plants: *Chamaedaphne calyculata, Empetrum nigrum* (s.lato), *Betula nana, Thricophorum cespitosum, Eriophorum vaginatum, E. russeolum, Carex rostrata, C. lasiocarpa, C. rotundata, C. chordorriza, C. livida, Scheuchzeria palustris, Molinia caerulea, Rubus chamaemorus, Saxifraga hirculus, Dactylorhiza incarnata*; Mosses- *Sphagnum papillosum, S. jensenii, S. lindbergii, S. majus, S. aongstroemii, S. subsecundum, S. subfulvum, S. pulchrum, Warnstorfia exannulata (Drepanocladus exannulatus), Limprichtia revolvens (Drepanocladus revolvens), Drepanocladus* (s.lato) spp., *Scorpidium scorpioides.*
Animals: Butterflies - *Pyrgus centaureae, Erebia disa*; Moths: *Syngrapha diasema, Apamea maillardi, Nola karelica, Hypoxyxtis pluviaria*.

EU Habitats Directive Annex I
7310 Aapa mires

! **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.

Species
Salix pulchra, S. reptans, Betula nana, Ledum decumbens, Vaccinium vitis-idaea, Rubus chamaemorus, Dryas punctata, Carex chordorrhiza, C. rariflora, C. rotundata, C. stans, Arctagrostis latifolia, Arctophila fulva, Dupontia fischeri, Aulacomnium palustre, A. turgidum, Homalothecium nitens, Polytrichum strictum, Hylocomium splendens, Sphagnum fimbriatum, S. girgensohnii, S. lenense, S. nemoreum, S. balticum, S. majus

EU Habitats Directive Annex I
Not present in EU27

D4 Base-rich fens and calcareous spring mires

! 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 or tall herbs (e.g.). 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.

Plant communities
Caricion davallianae

Species
Campylium stellatum, *Drepanocladus intermedius*, *D. revolvens*, *Cratoneuron commutatum*, *Acrocladium cuspidatum*, *Ctenidium molluscum*, *Fissidens adianthoides*, *Bryum pseudotriquetrum, Schoenus nigricans*, *S. ferrugineus*, *Eriophorum latifolium*, *Carex davalliana*, *C. flava*, *C. lepidocarpa*, *C. hostiana*, *C. panicea*, *Juncus subnodulosus*, *Scirpus cespitosus*, *Eleocharis quinqueflora*, very rich herbaceous flora including *Tofieldia calyculata*, *Dactylorhiza incarnata*, *D. traunsteineri*, *D. traunsteinerioides*, *D. russowii*, *D. majalis* ssp.*brevifolia*, *D. cruenta*, *Eupatorium cannabinum*, *Liparis loeselii*, *Herminium monorchis*, *Epipactis palustris*, *Pinguicula vulgaris*, *Pedicularis sceptrum-carolinum*, *Primula farinosa*, *Swertia perennis*

EU Habitats Directive Annex I
7230: Alkaline fens

! 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. They host many species with a boreoarctic or glacial relict distribution, many of which are redlisted several countries.

Plant communities
Caricion bicolori-atrofuscae

Species
Carex bicolor, C. microglochin, C. maritima, C. atrofusca, C. vaginata, Kobresia simpliciuscula, Scirpus pumilus, Juncus arcticus, J. alpinoarticulatus, J. castaneus, J. triglumis, Typha minima, T. lugdunensis, T.

shuttleworthii, Tofieldia pusilla, often accompanied by Carex davalliana, C. dioica, C. capillaris, C. panicea, C. nigra, Blysmus compressus, Eleocharis quinqueflora, Scirpus cespitosus, Primula farinosa, Equisetum variegatum, Drepanocladus intermedius, Campylium stellatum

EU Habitats Directive Annex I
7240: Alpine pioneer formations of the *Caricion bicoloris-atrofuscae*

D5 Sedge and reedbeds, normally without free-standing water

! **D5.2 Beds of large sedges normally without free-standing water**

Description
Terrestrialized stands of tall species of *Carex, Cladium* and *Cyperus*, stands are 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).

Plant communities
Magnocaricion elatae, Armerion maritimae, Caricion davallianae, Filipendulion, Calthion palustris, Molinio-Holoschoenion, Phragmition communis, Caricion broterianae, Carici-Rumicion hydrolapathi.

Species
Angelica palustris, Carex acuta, Carex acutiformis, Carex appropinquata, Carex elata, Carex lasiocarpa, Carex paniculata, Cladium mariscus Cyperus papyrus, Schoenus nigricans, Kostelezkia pentacarpos

EU Habitats Directive Annex I
7210: Calcareous fens with *Cladium mariscus* and species of the *Caricion davallianae*

D6 Inland saline and brackish marshes and reedbeds

! **D6.1 Inland saltmarshes**
includes the following subtypes separately listed in or split units from the 1998 version:
D6.15 Interior Iberian Microcnemum and Salicornia swards
D6.16 Interior central European and Anatolian Salicornia , Microcnemum , Suaeda and Salsola swards

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).

Plant communities
Scorzonero-Juncion gerardii, Armerion maritimae, Potentillion anserinae, Puccinellio-Spergularion salinae, Puccinellion limosae, Puccinellion maritimae, Halo-Trichophorion pumili, Salicornion patulae, Thero-Salicornion

Species
Apium repens, Kosteletzkya pentacarpos, Primula nutans, Salicornia sp, Sisymbrium supinum

EU Habitats Directive Annex I
1340 Inland salt meadows

E Grasslands and lands dominated by forbs, mosses or lichens

E1 Dry grasslands

E1.1 Inland sand and rock with open vegetation

E1.11 Euro-Siberian rock debris swards

! E1.112 *Sempervivum* or *Jovibarba* communities on rock debris

Description
Open lowland and hill rock debris swards of suboceanic climates of Western Europe and western and northern Central Europe harbouring often rare and local lowland forms of *Sempervivum* spp. or *Jovibarba* spp.

Plant communities
Alysso alyssoidis-Sedion albi: Sempervivetum soboliferi, Sedo sexangularis-Sempervivetum tectorum, i.a.

Species
Sempervivum tectorum, S. funckii var. aqualiense, Jovibarba sobolifera

EU Habitats Directive Annex I
included in 6110: Rupicolous calcareous or basophilic grasslands of the *Alysso-Sedion albi*

! 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.

Plant communities
Brachypodietalia phoenicoidis, Brometalia erecti, Festucetalia vaginatae, Festucetalia valesiacae, Helictotricho-Stipetalia, Koelerio-Phleetalia phleoidis, Scorzonero-Chrysopogonetalia, Seslerietalia rigidae, Stipo pulcherrimae-Festucetalia pallentis

Species
Artemisia laciniata, Artemisia oelandica, Artemisia pancicii, Astragalus centralpinus, Biscutella neustriaca, Cypripedium calceolus, Dianthus arenarius ssp. arenarius, Dracocephalum austriacum, Euphrasia marchesettii, Gentianella anglica, Jurinea cyanoides, Lilium pomponium, Pulsatilla patens, Pulsatilla vulgaris ssp. gotlandica, Senecio jacobaea ssp. gotlandicus, Stipa bavarica, Stipa styriaca, Thesium ebracteatum

EU Habitats Directive Annex I
6190 Rupicolous pannonic grasslands (*Stipo-Festucetalia pallentis*)

6210 Semi-natural dry grasslands and scrubland facies on calcareous substrates (*Festuco-Brometalia*) (* important orchid sites)
6240 Sub-Pannonic steppic grasslands
6250 Pannonic loess steppic grasslands
6260 Pannonic sand steppes
6280 Nordic alvar and precambrian calcareous flatrocks
62C0 Ponto-Sarmatic steppes

! **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 e.g. vegetation of the class Thero-Brachypodietea.

Plant communities
Diantho humilis-Velezion rigidae, Cymbopogoni-Brachypodion ramosi, Plantagini-Catapodion marini, Moricandio-Lygeion sparti, Dauco-Catananchion luteae, Sedo-Ctenopsion gypsophilae, Trachynion distachyae, Thero-Brachypodion, Armerion girardii, Omphalodion commutatae, Stipion retortae

Species
Brachypodium distachyum, B. retusum, B. fasciculatus, B. madritensis, B. rubens, B. alopecuros, Aegilops neglecta, A. geniculata, A. triuncialis, Avena sterilis, A. barbata, Lagurus ovatus, Cynosurus echinatus, Stipa capensis, Hyparrhenia hirta, Andropogon distachyos, Cynodon dactylon, Dactylis hispanica, Urginea maritima, Asphodelus microcarpus, Lloydia graeca, Anacamptis pyramidalis

EU Habitats Directive Annex I
6220 Pseudo-steppe with grasses and annuals of the Thero-Brachypodietea

E1.7 Closed non-Mediterranean dry acid and neutral grassland

! ***E1.71*** **Nardus stricta *swards***

Description
Mesophile and xerophile *Nardus stricta* dominated or -rich grasslands of Atlantic or sub-Atlantic lowland, collinar and montane regions of northern Europe, middle Europe and western Iberia. Other important species: *Festuca rubra, Agrostis capillaris, Agrostis pyrenaica, Avenula versicolor, Campanula alpine* and *Avenella flexuosa*.

Plant communities
Violion caninae

Species
Nardus stricta, Festuca rubra, Agrostis capillaris, Avenella flexuosa, Avenula versicolor, Polygala vulgaris, **E1.711** *Galium saxatile, Potentilla erecta* **E1.712** *Arnica montana, Campanula rotundifolia, Carex panicea, Thymus pulegioides,* **E1.713** *Danthonia decumbens, Calluna vulgaris, Sieglingia decumbens,* **E1.714** *Carex pallescens, Gymnadenia conopsea, Orchis mascula, Dactylorhiza majalis, Platanthera bifolia, Phyteuma nigrum, Lychnis flos-cuculi, Anemone nemorosa*

Corresponding class in other classifications

Classification	Code	Name	Relation type
Palaearctic Habitat Classification 2001	35.11	Mat grass swards	same
CORINE Biotopes Classification 1991	35.11	Mat-grass swards	same
Nordic Vegetation Classification 1994	5.1.3.3	Mat grass heath type	n/a
Milieux Naturels de Suisse 1998	5.4.1.1	Lande subatlantique sèche	wider

EU Habitats Directive Annex I
6230 *Species-rich Nardus grasslands, on silicious substrates in mountain areas (and submountain areas in Continental Europe)

E1.8 Closed Mediterranean dry acid and neutral grassland

! ***E1.83*** ***Mediterraneo-montane* Nardus stricta *swards***

Description
Perennial grasslands on acid soils of the supra-Mediterranean zone, dominated by grasses such as *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.

Plant communities
Helianthemion guttati, Vulpio-Lotion,Potentillo ternatae-Nardion, Corynephoro-Malcolmion patulae, Festucion elegantis, Campanulo herminii-Nardion strictae, Potentillion calabri

Species
Arnica montana, Colchicum corsicum, Festuca elegans, Gentiana lutea, Nardus stricta

! 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. Vegetation of the order *Violetalia calaminariae* .
Plant communities
Armerion halleri, Plantagini-Festucion ovinae, Thlaspion calaminariae, Thlaspion rotundifolii

Species
Armeria arenaria, Armeria bottendorfensis, Armeria halleri, Armeria maritima, Dianthus sylvestris, Festuca ophioliticola ssp. *calaminaria, Festuca valesiaca, Galium anisophyllon, Minuartia verna var. hercynica, Poa alpina, Silene vulgaris* ssp. *humilis, Thlaspi alpestre* ssp. *calaminare, Thlaspi caerulescens, Viola calaminaria, Viola dubyana*

EU Habitats Directive Annex I
6130 Calaminarian grasslands of the Violetalia calaminariae

E2 Mesic grasslands

E2.2 Low and medium altitude hay meadows

! ***E2.25 Continental meadows***

Description

Lowland and collinar mesophile grasslands of the Pannonic basin, the Transylvanian basin, the lower Danubian plain, the Thracian plain and their fringing foothills, Eastern Europe and of southern Siberia.

Plant communities

Alopecurion pratensis, Arrhenatherion, Glycyrrhizion echinatae Glycyrrhizion glabrae

Species

Agrostis capillaris, Arrhenatherum elatius, Alopecurus pratensis, Alopecurus rendlei, Festuca pratensis, Poa pratensis, Merendera sobolifera, Galium rubioides

EU Habitats Directive Annex I

included in 6510 Lowland hay meadows (*Alopecurus pratensis, Sanguisorba officinalis*)

E3 Seasonally wet and wet grasslands

! **E3.1 Mediterranean tall humid grassland**

includes the following subtypes separately listed in or split units from the 1998 version:
E3.111 Serapias grassland

Description

Mediterranean humid grasslands of tall grasses and rushes widespread throughout the 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.

Plant communities

Molinio-Holoschoenion

Species

Scirpus holoschoenus (*Holoschoenus vulgaris*), *Agrostis stolonifera*, *A. reuteri*, *Galium debile*, *Molinia caerulea*, *Briza minor*, *Melica cupanii*, *Cyperus longus*, *Linum tenue*, *Trifolium resupinatum*, *Schoenus nigricans*, *Peucedanum hispanicum*, *Carex mairii*, *Juncus maritimus*, *J. acutus*, *Asteriscus aquaticus*, *Hypericum tomentosum*, *H. tetrapterum*, *Inula viscosa*, *Oenanthe pimpinelloides*, *O. 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*, *C. pyrenaicum*, *Senecio doria*, *Dorycnium rectum*, *Erica terminalis*, *Euphorbia pubescens*, *Lysimachia ephemerum*

Corresponding class in other classifications

EU Habitats Directive Annex I

6420: Mediterranean tall humid grasslands of the *Molinio-Holoschoenion*

! **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, rushes or *Scirpus sylvaticus*.

Plant communities
Calthion palustris, Deschampsion cespitosae, Juncion acutiflori, Cnidion venosi; Agropyro-Rumicion, Molinion caeruleae, Arrhenatherion, Cynosurion cristati, Alopecurion pratensis, , Filipendulion.

Species
E3.41: *Caltha palustris, Cirsium palustre, C. rivulare, C. oleraceum, Carduus personata, Telekia speciosa, Epilobium parviflorum, Mentha aquatica, Scirpus sylvaticus, Stachys palustris, Bromus racemosus, Crepis paludosa, Fritillaria meleagris, Geum rivale, Polygonum bistorta, Senecio aquaticus, Trollius europaeus, Lotus uliginosus, Trifolium dubium, Equisetum palustre, E. telmateia, Myosotis palustris, Oenanthe silaifolia, Gratiola officinalis, Inula salicina, Succisella inflexa, Dactylorhiza majalis, Alopecurus pratensis, Festuca gigantea, Juncus effusus, Juncus filiformis*. **E3.42:** *Juncus acutiflorus*. **E3.43**: *Deschampsia cespitosa; Cnidium dubium, Viola persicifolia, Allium angulosum, Iris sibirica, Oenanthe lachenalii, Oenanthe silaifolia, Gratiola officinalis, Juncus atratus, Leucojum aestivum, Carex praecox var. suzae, Lythrum virgatum*. **E3.44:** *Juncus effusus, J. conglomeratus, J. inflexus, J. compressus, J. tenuis, Carex hirta, Festuca arundinacea, Alopecurus geniculatus, Rumex crispus, Mentha longifolia, M. pulegium, Potentilla anserina, P. reptans, Ranunculus repens*. **E3.46:** *Cirsium canum, Alopecurus pratensis, Festuca pratensis, Deschampsia cespitosa, Polygonum bistorta, Angelica sylvestris, Scirpus sylvaticus, Caltha palustris, Valeriana simplicifolia, Pedicularis limnogena, Ligularia sibirica, Telekia speciosa*

EU Habitats Directive Annex I
subtype E3.43 = 6440: Alluvial meadows of river valleys of the *Cnidion dubii*

! **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* .

Plant communities
Molinion caeruleae, Juncion squarrosi, Junco-Molinion, Juncion acutiflori

Species
Artemisia laciniata, Carex acuta, Juncus squarrosus, Ligularia sibirica, Molinia caerulea, Nardus stricta, Scirpus cespitosus, Thesium ebracteatum
E3.51*:, Succisa pratensis, Allium angulosum, A. suaveolens, Betonica officinalis, Cirsium dissectum, C. tuberosum, Dianthus superbus, Trollius europaeus, Galium boreale, Gentiana asclepiadea, G. pneumonanthe, Gladiolus palustris, Silaum silaus, Selinum carvifolia, Inula salicina, Iris sibirica, Laserpitium prutenicum, Lathyrus pannonicus, Tetragonolobus maritimus, Serratula tinctoria, Dactylorhiza maculata*. **E3.52***:, Festuca ovina, Gentiana pneumonanthe, Pedicularis sylvatica,* and sometimes *Sphagnum* spp.

EU Habitats Directive Annex I
subtype E3.51 = 6410: *Molinia* meadows on calcareous, peaty or clayey-silt-laden soils (*Molinion caeruleae*)

E5 Woodland fringes and clearings and tall forb stands

E5.4 Moist or wet tall-herb and fern fringes and meadows

E5.41 Screens or veils of perennial tall herbs lining watercourses

E5.411 Watercourse veils (other than of *Filipendula*)

! *E5.4111* Angelica archangelica *fluvial communities*

Description

Communities of *Angelica archangelica*. ssp. *litoralis* of large northern rivers, presently rare and threatened.

Plant communities

Soncho-Angelicetum litoralis

Species

Angelica archangelica ssp. *litoralis*

Corresponding class in other classifications

EU Habitats Directive Annex I

Included in 6430 Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels

! *E5.4112* Angelica heterocarpa *fluvial communities*

Description

Angelica heterocarpa formations of tidal estuaries of the Loire, the Charente and the Gironde; the species is a rare and very narrow endemic of southwestern France.

Plant communities

Species

Angelica heterocarpa

EU Habitats Directive Annex I

Included in 6430 Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels

References

Bensettiti, F., Gaudillat, V., Malengrau, D. & Quéré, E. 2002. Cahiers d'habitats Natura 2000. Connaissance et gestion des habitats et des espèces d'intérêt communautaire. Tome 6. Espèces végétales. La Documentation française. 271 pp. http://inpn.mnhn.fr/docs/cahab/fiches/1607.pdf

! *E5.4113* Althaea officinalis *screens*

Description

Althaea officinalis formations of river banks and marsh edges, particularly on somewhat saline soils.

Plant communities

Species
Althaea officinalis

EU Habitats Directive Annex I
Included in 6430 Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels

! E5.414 Continental river bank tall-herb communities dominated by *Filipendul*a

Description
River bank and freshwater humid depression tall herb communities dominated by *Filipendula ulmaria* of the continental steppe zones.

Plant communities

Species
Filipendula ulmaria

EU Habitats Directive Annex I
6430 Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels

! E5.415 Eastern nemoral riverbanks with tall herb communities

Description
Tall herb communities of river banks in the eastern nemoral region of Europe (Note – this habitat type has not yet been formally incorporated into the EUNIS classification)

Plant communities
Calamagrostetea langsdorffii p.

EU Habitats Directive Annex I
6430 Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels

Associated Habitat types
Similar vegetation may also occur in E5.424 Eastern nemoral Tall-herb communities of humid meadows.

E5.42 Tall-herb communities of humid meadows

! E5.423 Continental tall-herb communities of humid meadows

Description
River bank and freshwater humid depression tall herb communities of the continental steppe zones.

Plant communities
Lythro-Euphorbion, Veronico longifoliae-Lysimachion vulgaris

Species
Filipendula ulmaria, Lythrum salicaria

EU Habitats Directive Annex I
6430 Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels

! E5.424 Eastern nemoral Tall-herb communities of humid meadows

Description

Tall herb communities of humid meadows in the eastern nemoral region of Europe (Note – this habitat type has not yet been formally incorporated into the EUNIS classification)

EU Habitats Directive Annex I

6430 Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels

Associated Habitat types

Similar vegetation may also occur in E5.415Eastern nemoral riverbanks with tall herb communities

E6 Inland salt steppes

! 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.

Plant communities

Limonion gmelinii, Frankenion pulverulentae, Hordeion marini, Puccinellio-Spergularion salinae, Lygeo-Lepidion cardaminis, Romulion, Lygeo sparti-Limonion furfuracei, Thero-Salicornion,

Species

Halopeplis amplexicaulis, Hymenolobus procumbens, Limonium spp.*, Lygeum spartum, Microcnemion coralloides, Salicornia patula, Senecio auricula, Sphenopus divaricatus.*

EU Habitats Directive Annex I

1510 Mediterranean salt steppes (*Limonietalia*)

! E6.2 Continental inland salt steppes

includes the following subtype separately listed in or split unit from the 1998 version:

E6.23 Central Eurasian solonchak grassland with *Crypsis*

Description

Salt steppes and their associated salt-tolerant herbaceous communities outside the Mediterranean basin. In Europe they are found in the substeppe and steppe zones eastwards from the Hungarian Plain.

Plant communities

Scorzonero-Juncion gerardii, Armerion maritimae, Festuco-Limonion gmelinii, Glycyrrhizion echinatae, Potentillion anserinae, Beckmannion eruciformis, Peucedano officinalis-Asterion sedifolii, Limonion gmelinii, Juncion maritimi, Cypero-Spergularion salinae, Puccinellion peisonis, Festucion pseudovinae, Puccinellio-Spergularion salinae, Salicornion herbaceae, Puccinellion limosae, Thero-Salicornion, Malvion neglectae, Scorzonero-Juncetalia gerardii, Glycyrrhizetalia glabrae, Festuco-Limonietalia, Puccinellietalia, Lepidietalia latifolii, Crypsidetalia aculeatae, Agropyro-Artemision coerulescentis

Species
Festuca pseudovina, Achillea collina, A. setacea, Trifolium strictum, T. retusum, Camphorosma annua. **E6.21:** *Achillea asplenifolia, Trifolium subterraneum, T. pallidum, Lotus tenuis, Centaurea pannonica, Scilla autumnalis, Artemisia santonicum, A. maritima, Limonium gmelinii, Sedum caespitosum, Taraxacum bessarabicum Puccinellia distans, Aster tripolium ssp. pannonicus,* and the endemic *Plantago schwarzenbergiana.* **E6.22:** *Camphorosma monspeliaca, Goniolimon tataricum, Petrosimonia triandra, Zingeria pisidica Trifolium resupinatum, Trifolium michelianum, Medicago arabica, Halimione pedunculata, Iris halophile.* **E6.231:** *Cyperus pannonicus (Acorellus pannonicus).* **E6.232:** *(Frankenia pulverulenta, Suaeda confusa, Salsola acutifolia, Parapholis incurva, Hordeum marinum, Cressa cretica).*

EU Habitats Directive Annex I
E6.21 = 1530 Pannonic salt steppes and salt marshes

E7 Sparsely wooded grasslands

! **E7.3 Dehesa**

Description
A characteristic landscape of the southwest 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* .

Species
Quercus suber, Q. rotundifolia, Q. pyrenaica, Q. faginea
Aquila adalberti, Grus grus, Lynx pardinus

EU Habitats Directive Annex I
6310: Dehesas with evergreen *Quercus* spp

F Heathland, scrub and tundra

F2 Arctic, alpine and subalpine scrub

F2.2 Evergreen alpine and subalpine heath and scrub

F2.22 Alpide acidocline* Rhododendron *heaths

! F2.224 Carpathian *Rhododendron kotschyi* heaths

Description
Heaths of the subalpine and lower alpine levels (1700-2000 m) of the eastern and southern Carpathian Mountains, common and widespread, but occupying small areas, dominated by *Rhododendron myrtifolium* (syn *R kotschyi*), *Vaccinium gaultherioides* and *Vaccinium vitis-idaea* .

Plant communities
Rhododendro myrtifolii-Vaccinietum

Species
Rhododendron myrtifolium (R. kotschyi) - dominate, Vaccinium gaultherioides, V. vitis-idaea, Soldanella hungarica ssp. *major, Potentilla aurea* ssp. *chrysocraspeda, Melampyrum saxosum, Campanula abietina, Campanula serrata*

EU Habitats Directive Annex I
included in 4060 Alpine and Boreal heaths

! F2.225 Balkan *Rhododendron kotschyi* heaths

Description
Rhododendron myrtifolium (syn *R kotschyi*) dominated heaths of the subalpine belt of the Balkan Range and the Rila mountains.

Plant communities
Rhododendro-Vaccinion p

Species
Rhododendron myrtifolium

EU Habitats Directive Annex I
included in 4060 Alpine and Boreal heaths

! ***F2.26*** **Bruckenthalia *heaths***

Description
Formations of *Bruckenthalia spiculifolia*, often accompanied by *Juniperus nana*, *Vaccinium myrtillus* and herbaceous alpine grassland species, occupying damp, non-calcareous substrates of high mountains of the Balkan peninsula and northern Anatolia.

Plant communities
Bruckenthalion spiculifoliae

Species
Bruckenthalia spiculifolia, Juniperus nana, Vaccinium myrtillus

EU Habitats Directive Annex I
included in 4060 Alpine and Boreal heaths

F3 Temperate and mediterranean-montane scrub

F3.2 Submediterranean deciduous thickets and brushes

F3.24 ***Subcontinental and continental deciduous thickets***

! F3.241 Central European subcontinental thickets

Description

Deciduous thickets of the Pannonic basin and neighbouring regions, with northwestern irradiations in Central Europe, within and around the range of occurrence of white cinquefoil oak woods (**G1.7A11**), of western tartar maple steppe oak woods (**G1.7A12**) and of Pannonian white oak woods (unit **G1.7374**).

Plant communities
Prunetalia: Prunion fruticosae; Orno-Cotinetalia: Orno-Cotinion p.

Species
Prunus fruticosa. **F3.2412***: Amygdalus nana, Spiraea media, Prunus spinosa, Rhamnus catharticus, Rosa gallica, R. pimpinellifolia, R. spinosissima, Peucedanum alsaticum, Asparagus officinalis, Agropyron intermedium, Vinca herbacea.* **F3.2413***: Cotinus coggygria, Amelanchier ovalis, Cotoneaster tomentosus, C. matrensis, Pyrus nivalis, Prunus mahaleb, Spiraea media, Sorbus graeca, Fraxinus ornus.*

EU Habitats Directive Annex I
40A0 *Subcontinental peri-Pannonic scrub

F4 Temperate shrub heathland

! 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.

Plant communities
Daboecion cantabricae, Ericion tetralicis, Genistion micrantho-anglicae, Oxycocco-Ericion tetralicis, Ulici-Ericion ciliaris, Ulicion minoris

Species
Calluna vulgaris, Erica tetralix, Erica ciliaris, Erica scoparia, Genista anglica, Molinia caerulea, Scirpus cespitosus, Sphagnum compactum, Sphagnum molle, Sphagnum tenellum, Ulex gallii, Ulex minor

EU Habitats Directive Annex I
4010 Northern Atlantic wet heaths with *Erica tetralix*
4020 *Temperate Atlantic wet heaths with *Erica ciliaris* and *Erica tetralix* [a priority subtype of 4010]

References
Gorissen, I. 2004. *Dwarf shrub heaths of Europe - from Atlantic to Caucasus and Ural.* Verlag Ingmar Gorissen, Siegburg.

! 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.

Plant communities
Calluno-Festucion tenuifoliae, Daboecion cantabricae, Dactylido maritimae-Ulicion maritimi, Ericion cinereae, Ericion umbellatae, Genistion micrantho-anglicae, Genistion pilosae, Genisto-Vaccinion,

Koelerio-Phleion phleoidis, Loiseleurio-Vaccinion, Loiseleurio-Diapension, Violion caninae, Ulicion minoris, Ulici-Ericion ciliaris

Species
Vaccinium spp*., Calluna vulgaris; Arctostaphylos uva-ursi, Bruckenthalia speculifolia, Cistus salvifolius, C incanus, Empetrum nigrum, E. hermaphroditum, Erica cinerea E. mackaiana, E. vagans, E. aragonensis, E. andevalensis, E umbellata, Genista anglica, G. germanica, G. pilosa, G. tinctoria, Genistella sagittalis, Ulex maritimus, U. gallii, Pleurozium schreberi, Hylocomium splendens.,*

EU Habitats Directive Annex I
4030 European dry heaths

References
Gorissen, I. 2004. *Dwarf shrub heaths of Europe - from Atlantic to Caucasus and Ural.* Verlag Ingmar Gorissen, Siegburg.

! **F4.3 Macaronesian heaths**

Description
Heaths of the Canary Islands, Azores and Madeira.

Plant communities
Myrico fayae-Ericion arboreae

Species
Adenocarpus foliolosus, Calluna vulgaris, Chamaecytisus proliferus ssp. *proliferus, Cistus chinamadensis, Cletura arborea, Daboecia azorica, Erica arborea, E. maderensis, E. platycodon, E. scoparia* ssp. *azorica, Ilex canariensis, Juniperus brevifolia, Laurus azorica, Luzula purpureo-splendens, Lysimachia azorica, Myrica faya, Pteridium aquilinum, Teline canarienis, T. splendens, T. stenopetala, Thymus caespititius, Vaccinium cilindraceum*
EU Habitats Directive Annex I
4050 Endemic macaronesian heaths

F5 Maquis, arborescent matorral and thermo-Mediterranean brushes

F5.5 Thermo-Mediterranean scrub

! F5.52 *Euphorbia dendroides* formations

Description
Stands of *Euphorbia dendroides*, a tertiary relict of Macaronesian origin; they occur as a facies of the thermo-Mediterranean scrub of the Balearics, Corsica, Sardinia, Sicily, Islas Eolie, Egadi, Pelagi, Pantelleria, Crete, and, very locally, of those of the coasts of northern Catalonia, southeastern France, peninsular Italy and its islands, central Greece, notably on slopes facing the gulf of Corinth, the Peloponnese, the Aegean archipelagoes, Albania and enclaves of the Mediterranean periphery of Anatolia and the Levant. Particularly extensive and robust stands occur in Sicily, Sardinia and Crete where they may extend to relatively high altitudes. Very local formations in Mediterranean North Africa occupy the steep rocky slopes of some coastal capes and isolated inland sites, in Cyrenaica, northern Tunisia (Ichkeul), and in a narrow coastal strip in northern Algeria.

Plant communities

Species
Euphorbia dendroides

Corresponding class in other classifications

EU Habitats Directive Annex I
included in 5330 Thermo-Mediterranean and pre-desert scrub

! F5.54 *Chamaerops humilis* brush

Description
Chamaerops humilis dominated scrub in coastal regions of the Mediterranean.

Plant communities
Pistacio lentisci-Rhamnetalia alaterni p

Species
Chamaerops humilis

EU Habitats Directive Annex I
included in 5330 Thermo-Mediterranean and pre-desert scrub

! F5.55 Mediterranean pre-desert scrub

Description
Shrub formations constituting, with the halo-nitrophilous scrubs (unit F6.824) and the localized gypsum scrubs (unit F6.73), much of the natural and semi-natural vegetation of the arid zone of southeastern Spain (Almeria, Murcia, Alicante), a highly distinctive region of unique climatological, biological and landscape character within Europe, extremely rich in African and endemic species. Several of the most remarkable formations remain in only a few undisturbed localities and are gravely at risk. Similar formations occur in the upper arid (Mediterranean arid) zone of North Africa. Outposts of these communities also exist in Sicily, the Egadi islands, the Pelagie islands, the Maltese Islands and Pantelleria.

Plant communities
Anthyllido terniflorae-Salsolion papillosae, Thymo moroderi-Sideritidion leucanthae

Species
Ziziphus lotus, Maytenus senegalensis var. *europaeus, Periploca laevigata* ssp. *angustifolia, Salsola webbii, Sideretis foetens, Ulex argentatus* ssp. *erinaceus, Genista umbellata*

EU Habitats Directive Annex I
included in 5330 Thermo-Mediterranean and pre-desert scrub

! F5.56 Thermo-Mediterranean broom fields (retamares)

Description

Mediterranean formations dominated by retamas (*Lygos* spp.) or by large, non-spiny thermo-mediterranean brooms of the genera *Cytisus* and *Genista* , limited to the Iberian peninsula, the Balearics, mediterranean North Africa, the Cilento coast of Campania and Sicily and its associated islands.

Plant communities
Adenocarpion decorticantis, Genistion floridae, Genistion polygaliphyllae, Pruno-Rubion radulae, Retamion sphaerocarpae, Ulici europaei-Cytision striate

Species
Lygos sphaerocarpa, L. monosperma, L. raetam ssp. *gussonei, Genista cinerea* ssp. *speciosa, G. valentina, G. spartioides* ssp. *retamoides, G. s.* ssp. *pseudoretamoides, G. haenseleri, G. ramosissima, G. ephedroides, G. dorycnifolia, Cytisus aeolicus*

EU Habitats Directive Annex I
included in 5330 Thermo-Mediterranean and pre-desert scrub

! F5.5B Cabo de Sao Vicente brushes

Description
Low brush and garrigue formations of the dolomitic tableland, karsts, sands and terra-rosas of the vicinity of Cape San Vicente (Portugal), with dwarf *Juniperus phoenicea* ssp. *lycia* , *Cistus palhinhae* , *Ulex argenteus* ssp. *erinaceus* , rich in endemic species.

Plant communities
Junipero-Cistetum palhinhae, Asparago-Rhamnetum oleoidis juniperetosum lyciae i.a.

Species
Biscutela vicentina,Cistus palhinhae, Genista hirsuta ssp. *algarbiensis, G. triacanthus, Juniperus turbinata, Juniperus phoenicea* ssp. *lycia, Serratula monardii* var. *algarbiensis, Sideritis arborescens* ssp. *lusitanica, Teucrium vincentinum, Ulex erinaceus* (*Ulex argenteus* ssp. *erinaceus*)

EU Habitats Directive Annex I
5140 *Cistus palhinhae* formations on maritime wet heaths

F6 Garrigue

! 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 .

Plant communities
Thymo-Teucrienion verticillati, Lepidion subulati, Thymo-Teucrion verticillati

Species

Centaurea hyssopifolia, Centaurea sp., Frankenia sp., Gypsophila hispanica, Gypsophila struthium, Helianthemum sp., Helianthemum squamatum, Herniaria fruticosa, Jurinea sp., Lepidium subulatum, Ononis tridentate, Reseda stricta, Santolina sp., Teucrium libanitis, Teucrium sp., Teucrium turredanum, Thymus sp.

EU Habitats Directive Annex I
1520 Iberian gypsum vegetation (*Gypsophiletalia*)

! F6.8 Xero-halophile scrubs

Description
Salt-tolerant shrub formations of dry ground in areas of low-precipitation in the mediterranean region, in particular, the Iberian peninsula and Sicily, and of the Macaronesian Islands.

Plant communities
Chenoleion tomentosae, Oleo cerasiformis-Rhamnetea crenulatae, Oleo-Rhamnetalia crenulatae, Forsskaoleo angustifoliae-Rumicetalia lunariae, Helichryso stoechadis-Santolinetalia squarrosae, Polycarpaeo niveae-Traganetea moquini, Salsolo vermiculatae-Peganetalia harmalae, Cisto monspeliensis-Micromerietalia hyssopifoliae

Species
F6.81: *Chenoleoides tomentosa* **F6.82:** *Peganum harmala, Artemisia herba-alba, Lycium intricatum, Capparis ovata, Salsola vermiculata, Salsola genistoides, Salsola verticillata, Suaeda pruinosa, Atriplex halimus, Atriplex glauca, Camphorosma monspeliaca, Anabasis articulata, Haloxylon articulatum* **F6.83:** *Arthrocnemum glaucum, Arthrocnemum perenne, Suaeda pruinosa, Suaeda fruticosa* var. *brevifolia,*

EU Habitats Directive Annex I
includes 1430 Halo-nitrophilous scrubs (*Pegano-Salsoletea*)

! 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.

Plant communities
Anthyllion hermanniae, Crithmo-Staticion, Dorycnio-Coridothymion capitati, Hypericion balearici, Launaeion cervicornis, Micromerion julianae, Rosmarinion officinalis Verbascion spinosi
Species
Anthyllis hermanniae, Armeria soleirolii, Astragalus massiliensis, Centaurea balearica, Centaurea horrida, Limonium insulare, Limonium lanceolatum, Limonium multiflorum, Limonium pseudolaetum, Limonium strictissimum, Sarcopoterium spinosum, Silene holzmannii, Silene velutina,

EU Habitats Directive Annex I
Includes
5410 West Mediterranean clifftop phryganas (Astragalo-Plantaginetum subulatae)
5420 Sarcopoterium spinosum phryganas
5430 Endemic phryganas of the Euphorbio-Verbascion

F9 Riverine and fen scrubs

! **F9.1 Riverine scrub**

Description

Scrub of broad-leaved willows, e.g. *Salix aurita* , *Salix cinerea* , *Salix pentandra* , beside rivers. Also scrub of *Alnus* spp. and narrow-leaved willows, e.g. *Salix elaeagnos* , 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* <hich are considered as a forest habitat (G1.1).

Plant communities

Salicion incanae, Salicion albae, Salicion triandrae, Tamaricion parviflorae, Salicion triandro-neotrichae, Salicion eleagno-daphnoidis, Salicion salviifoliae, Salicetalia purpureae

Species

Salix aurita, *Salix cinerea* , *Salix pentandra, Salix elaeagnos, Frangula alnus*, *Hippophae rhamnoides*, *Myricaria germanica*

Corresponding class in other classifications

Nordic Vegetation Classification 1994 2.2.5.1 Willow thicket of wet herb type
Milieux Naturels de Suisse 1998 5.3.6 Saulaie buissonnante alluviale

EU Habitats Directive Annex I

Includes
3230 Alpine rivers and their ligneous vegetation with *Myricaria germanica*
3240 Alpine rivers and their ligneous vegetation with *Salix elaeagnos* p

! **F9.3 Southern riparian galleries and thickets (Excluding F9.35: Riperian stands of invasive shrubs)**

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.

Plant communities

Arbuto unedonis-Laurion nobilis, Nerion oleandri, Salicion cinereae, Securinegion buxifoliae, Tamaricion africanae, Tamaricion boveano-canariensis

Species

F9.311: *Nerium oleander, Vitex agnus-castus, Tamarix spp., Dittrichia viscosa, Saccharum ravennae, Arundo donax, Rubus ulmifolius.* **F9.3133:** *Tamarix parviflora, T. tetrandra, T. dalmatica, T. smyrnensis, T.hampeana, T. hohenackeri* **F9.32:** *Securinega tinctoria, Bryonia cretica, Tamus communis, Clematis campaniflora*, **F9.33:** *Prunus lusitanica, Viburnum tinus.* **F9.34:** *Salix atrocinerea, Salix salvifolia, Myrica gale*

EU Habitats Directive Annex I

subtypes F9.31 to F9.34 = 92D0 Southern riparian galleries and thickets (*Nerio-Tamaricetea* and *Securinegion tinctoriae*)

G Woodland, forest and other wooded land

G1 Broadleaved deciduous woodland

G1.1 Riparian and gallery woodland, with dominant *Alnus, Betula, Populus* or *Salix*

! *G1.11 Riverine* Salix *woodland*

Description

Bush or arborescent formations dominated by willow (*Salix* spp), lining flowing water and submitted to periodic flooding, developed on recently deposited alluvion. Willow brushes are particularly characteristic of rivers originating in major mountain ranges. Shrubby willow formations also constitute an element of lowland and hill riverine successions in all major biomes, often making the belt closest to the water course. Taller arborescent willow formations often constitute the next belt landwards in riverine successions of lowland western nemoral, eastern nemoral and warm-temperate humid forest regions, and a large part of the less diverse riverine systems of the steppic, mediterranean and cold desert zones. May be affected by the invasive alien species such as *Solidago canadensi , Aster novi-belgi , Aster novi-angli* and *Impatiens glandulifera* .

Plant communities

Salicetea purpureae, Salicion albae, Salicion canariensis

Species

Aster novi-belgii, Impatiens glandulifera, Lycopus europaeus, Lysimachia vulgaris, Phalaroides arundinacea, Populus alba, Populus canescens, Populus nigra, Salix sp., Urtica dioica

Corresponding class in other classifications

Milieux Naturels de Suisse 1998 6.1.2 Saulaie blanche

EU Habitats Directive Annex I

Includes tree dominated forms of
3240 Alpine rivers and their ligneous vegetation with *Salix elaeagnos* p

Associated Habitat types

European forest types ***6.12.1 Riparian forest***

! *G1.12 Boreo-alpine riparian galleries*

Description

Riverside, lakeside and seaside alder, birch or pine galleries and cordons of the boreal, boreonemoral and boreosteppic zones, of the high mountains of the nemoral zone and of their piedmont influence region, dominated by *Alnus incana* along the montane and submontane rivers of the Alps, the Carpathians, the northern Apennines, the Dinarides, the Balkan Range, the Rhodopides and neighbouring regions, by *Alnus incana* or *Alnus glutinosa* in boreal Fennoscandia and northeastern Europe, by *Betula pendula* or *Pinus sylvestris* in western Siberia. Nitrophilous and hygrophilous species dominate the herb layer.

Plant communities

Alnion incanae, Roso majalis-Betulion pendulae,

Species

Alnus incana, Aegopodium podagraria , Chaerophyllum hirsutum , Petasites hybridus , Crepis paludosa, Caltha palustris ssp. laeta **G1.123:** *Betula pubescens, Prunus padus, Valeriana sambucifolia, Anemone nemorosa, Geranium sylvaticum, Geum rivale, Matteuccia struthiopteris, Paris quadrifolia, Silene dioica*

(Melandrium rubrum), Equisetum pratense. **G1.124:** *Lycopus europaeus, Filipendula ulmaria, Lysimachia vulgaris, Equisetum arvense*. **G1.127:** *Alnus subcordata, Alnus barbata*

Corresponding class in other classifications
European forest types 6.12.1 Riparian forest

EU Habitats Directive Annex I
included in 9030 Natural forests of primary succession stages of land upheaval coast
91E0 Alluvial forests with Alnus glutinosa and Fraxinus excelsior (*Alno-Padion, Alnion incanae, Salicion albae*)

Associated Habitat types
Can occur as a band between larger rivers and floodplain forests such as G1.221, G1.223, G1.223 and G1.224

! ***G1.13 Southern* Alnus *and* Betula *galleries***

Description
Riparian formations of *Alnus glutinosa* , locally of *Alnus cordata* or *Betula* spp. of the Mediterranean basin and of western Iberia, often with *Fraxinus angustifolia* and *Osmunda regalis* .

Plant communities
Osmundo-Alnion, Populetalia albae

Species
Alnus cordata, Alnus glutinosa, Betula spp, *Frangula alnus, Quercus canariensis, Myrica gale, Salix atrocinerea, Scilla ramburei, Salix pedicellata, Rhododendron ponticum* ssp. *baeticum, Diplazium caudatum, Galium broterianum, Osmunda regalis*

Corresponding class in other classifications
European forest types 6.12.3 Mediterranean and Macaronesian riparian forest

EU Habitats Directive Annex I
subtypes G1.132 and G1.134 = 92B0 Riparian formations on intermittent Mediterranean water courses with *Rhododendron ponticum, Salix* and others

G1.2 Mixed riparian floodplain and gallery woodland

! ***G1.21 Riverine* Fraxinus - Alnus *woodland, wet at high but not at low water***

Description
Riparian forests of *Fraxinus excelsior* and *Alnus glutinosa* , sometimes *Alnus incana* , of middle European and northern Iberian lowland or hill watercourses, on soils periodically inundated by the annual rise of the river level, but otherwise well-drained and aerated during low-water; they differ from riparian alder woods within units G1.41 and G1.52 by the strong representation in the dominated layers of forest species not able to grow in permanently waterlogged soils.

Plant communities
Alnion glutinosae, Alnion incanae, Carpinion betuli, Fraxinion angustifoliae

Species

Fraxinus excelsior, Alnus glutinosa, A. incana. **G1.211:** *Carex remota, Carex pendula, Carex strigosa, Equisetum telmateia, Rumex sanguineus, Lysimachia nemorum, Cardamine amara, Chrysosplenium oppositifolium, Chrysosplenium alternifolium, Impatiens noli-tangere, Ribes rubrum*. **G1.212:** *Ribes rubrum, R. uva-crispa, Stellaria nemorum, Impatiens noli-tangere, Aconitum vulparia, Allium ursinum, Geum rivale, Athyrium filix-femina, Dryopteris carthusiana, Matteuccia struthiopteris, Ranunculus platanifolius, Urtica dioica, Ranunculus ficaria, Primula elatior, Lamium galeobdolon, Filipendula ulmaria, Luzula sylvatica. Chaerophyllum hirsutum, Crepis paludosa, Aegopodium podagraria, Astrantia major, Aruncus sylvestris, Carex remota, C. brizoides, Equisetum maximum*

Corresponding class in other classifications
European forest types 6.12.2 Fluvial forest

EU Habitats Directive Annex I
included in 91E0 Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion, Alnion incanae, Salicion albae*)

Associated Habitat types
Can occur as a band between larger rivers and floodplain forests such as G1.221, G1.223, G1.223 and G1.224

G1.22 Mixed Quercus - Ulmus - Fraxinus woodland of great rivers

! G1.221 Great medio-European fluvial forests

Description
Fully developed, very tall, multi-layered, highly diverse riparian forests of oaks, ashes, elms, limes, maples, alders, poplars, cherries, apple, willows of the middle and lower courses of large central European river systems, in particular, the Rhine, the Danube, the Emst, the Elbe, the Saale, the Weser, the Oder, the Loire, the Rhone-Saone systems. Their highly complex structure is formed of eight strata with some 50 species of trees and shrubs. The upper arborescent stratum includes *Quercus robur , Fraxinus excelsior , Ulmus minor Ulmus laevis , Ulmus glabra , Populus alba , Populus tremula , Populus canescens , Populus nigra , Acer pseudoplatanus , Acer platanoides , Salix alba , Alnus glutinosa* and *Prunus avium* , the lower arborescent stratum *Malus sylvestris , Tilia cordata* , with *Alnus incana , Prunus padus* and *Crataegus monogyna* forming the sub-arborescent shrub layer . There are very varied high and low shrub layers and numerous lianas including *Clematis vitalba , Tamus communis , Humulus lupulus , Hedera helix* and *Vitis vinifera* ssp. *sylvestris* . These forests are the most diverse, structurally, floristically and faunistically, of all European ecosystems, and closest in that respect to tropical communities and to the warm temperate forests of the Pleistocene, the great fluvial forests of Europe are reduced to a few highly vulnerable examples, located mainly within the Rhine, Danube and Elbe systems.

Plant communities
Ulmenion minoris

Species
The upper arborescent stratum includes *Quercus robur, Fraxinus excelsior, Ulmus minor, Ulmus laevis, Ulmus glabra, Populus alba, Populus tremula, Populus canescens, Populus nigra, Acer pseudoplatanus, Acer platanoides, Salix alba, Alnus glutinosa, Prunus avium*, the lower arborescent stratum *Malus sylvestris, Tilia cordata, the sub-arborescent shrub layer Alnus incana, Prunus padus and Crataegus monogyna, Clematis vitalba, Tamus communis, Humulus lupulus, Hedera helix, Vitis vinifera ssp. sylvestris*

Corresponding class in other classifications

European forest types 6.12.2 Fluvial forest

EU Habitats Directive Annex I
included in 91F0 Riparian mixed forests of *Quercus robur, Ulmus laevis* and *Ulmus minor*, *Fraxinus excelsior* or *Fraxinus angustifolia*, along the great rivers (*Ulmenion minoris*)

References
Schnitzler A. (2007) *Les forêts alluviales d'Europe. Biodiversité. Ecologie, biogéographie et valeur intrinsèque*. Tec et Doc Lavoisier, Paris

! G1.223 Southeast European *Fraxinus - Quercus - Alnus* forests

Description
Mixed riverine forests of Ponto-Pannonic and sub-Mediterranean regions of southeastern Europe, usually dominated by *Quercus robur* and/or *Fraxinus angustifolia* , accompanied by a wide range of other tree species.

Plant communities
Ulmenion.

Species
Ulmus minor, Ulmus laevis, Carpinus betulus, Acer campestre, Alnus glutinosa, Fraxinus excelsior, Salix alba, Populus alba. **G1.2233:** *Quercus robur, Fraxinus angustifolia ssp. pannonica, Acer tataricum, Cornus sanguinea, Crataegus monogyna, Corylus avellana, Carex acutiformis, C. elata, C. riparia, Urtica dioica, U. kioviensis, Veratrum album, Polygonatum latifolium, Symphytum officinale*. **G1.2234:** *Cornus sanguinea, Viburnum opulus, Frangula alnus, Crataegus monogyna, Rubus caesius, Lysimachia nummularia, Glechoma hederacea, Convallaria majalis.*

Corresponding class in other classifications
European forest types 6.12.2 Fluvial forest

EU Habitats Directive Annex I
included into 91F0: Riparian mixed forests of Quercus robur, Ulmus laevis and Ulmus minor, Fraxinus excelsior or Fraxinus angustifolia, along the great rivers (Ulmenion minoris)

! G1.224 Po *Quercus - Fraxinus - Alnus* forests

Description
Relict forests of the alluvial plain of the Po and its main tributaries, remnants of the greatest fluviatile system of Europe. They are formed by meso-hygrophile, mesotrophic, multi-layered, oak-ash-hornbeam-dominated communities, with ashes, willows and, mostly, alders, in the wettest areas, lianas are abundant and the herb layer is very diverse.

Plant communities
Polygonato multiflorae-Quercetum roboris i.a.

Species
Canopy - *Quercus robur, Q. cerris, Fraxinus excelsior, F. ornus, Carpinus betulus, Ulmus minor, Populus alba, P. nigra, Acer campestre, A. pseudoplatanus, Prunus padus, P. avium, Alnus glutinosa, Salix alba, Corylus avellana, Sorbus torminalis, S. domestica,* **Shrub layer** - *Ruscus aculeatus, Cornus mas, C.*

sanguinea, Pyracantha coccinea, Rubus fruticosus, R. ulmifolius, R. caesius, Ribes uva-crispa, Sambucus nigra , Daphne mezereum , Viburnum lantana , Mespilus germanica , Lonicera xylosteum , Ligustrum vulgare , Prunus spinosa , Rosa canina , Euonymus europaeus , Rhamnus catharticus **Lianes-**, *Hedera helix, Tamus communis, Rubia peregrina, Bryonia cretica;* **Herb layer** - *Equisetum hyemale, Symphytum officinale, Polygonatum multiflorum, Pulmonaria officinalis, Lathyrus vernus, Mercurialis perennis, Mespilus germanica Primula acaulis, Euphorbia dulcis, Melittis melissophyllum, Erythronium dens-canis, Leucojum vernum, Brachypodium sylvaticum.*

Corresponding class in other classifications
European forest types 6.12.2 Fluvial forest

EU Habitats Directive Annex I
included in 91F0 Riparian mixed forests of *Quercus robur, Ulmus laevis* and *Ulmus minor*, *Fraxinus excelsior* or *Fraxinus angustifolia*, along the great rivers (*Ulmenion minoris*)

References
Schnitzler A. (2007) *Les forêts alluviales d'Europe. Biodiversité. Ecologie, biogéographie et valeur intrinsèque*. Tec et Doc Lavoisier, Paris

G1.3 Mediterranean riparian woodland

! ***G1.36 Ponto-Sarmatic mixed Populus riverine forests***

Description
Mixed riverine forests of the floodplains of rivers of the Pontic and Sarmatic steppes, wooded steppes and southern nemoral forests of southern Eastern Europe, in particular, of the lower Danube, the lower Prut, the lower Dniestr, the lower Dniepr basin, the lower and middle Don and Donetz system, the lower Volga basin, the Kouma and Terek basins, dominated by or rich in *Populus alba , P nigra* and *P canescens* . They extend west to the sub-Carpathian Getic region; poplar galleries described from the Pannonic margin of Moravia and the Bohemian basin occupy a similar ecological position and are included here.

Plant communities
Salici-Populetum, Populetum nigro-albae, Fraxino pallisae-angustifoliae-Quercetum roboris, Ulmeto-Fraxinetum pallisae p., Fraxino-Populetum

Species
G1.361: *Populus alba, Populus nigra, Populus canescens*. **G1.362:** *Quercus robur, Quercus pedunculiflora, Fraxinus angustifolia, Fraxinus pallisiae, Populus alba, Populus tremula and Populus canescens*

Corresponding class in other classifications
European forest types 6.12.3 Mediterranean and Macaronesian riparian forest

EU Habitats Directive Annex I
included in 92A0 *Salix alba* and *Populus alba* galleries

! ***G1.37 Irano-Anatolian mixed riverine forests***

Description

Riverine forests of the Irano-Anatolian plateau of Turkey, Iran and Afghanistan, of the Koura basin of Transcaucasia and of the Hyrcanian lowlands, of the Hindu-Kuch and western Himalayas, with species of *Populus* together with *Juglans regia* and *Platanus orientalis* .

Plant communities

Species
Populus nigra, Populus caspica, Populus alba, Populus euphratica, Populus pruinosa, Populus transcaucasica, Juglans regia, Platanus orientalis

EU Habitats Directive Annex I
Not present in the European Union

! ***G1.38*** **Platanus orientalis *woods***

Description
Forests, usually riparian, of *Platanus orientalis* in southeast Europe.

Plant communities
Platanion orientalis

Species
Salix alba, *S. elaeagnos*, *S. purpurea*, *Alnus glutinosa*, *Cercis siliquastrum*, *Celtis australis*, *Populus alba, P. nigra*, *Juglans regia*, *Fraxinus ornus*, *Alnus glutinosa*, *Ruscus aculeatus*, *Vitex agnus-castus*, *Nerium oleander*, *Rubus* spp., *Rosa sempervirens*, *Hedera helix*, *Clematis vitalba*, *Vitis vinifera* ssp. *sylvestris*, *Anemone blanda*, *Aristolochia rotunda*, *Symphytum bulbosum*, *Hypericum hircinum*, *Calamintha grandiflora*, *Melissa officinalis*, *Helleborus cyclophyllus*, *Cyclamen hederifolium*, *C. repandum*, *C. creticum*, *Galanthus nivalis* ssp. *reginae-olgae*, *Dracunculus vulgaris*, *Arum italicum*, *Biarum tenuifolium*, *Pteridium aquilinum*

Corresponding class in other classifications
European forest types 6.12.3 Mediterranean and Macaronesian riparian forest

EU Habitats Directive Annex I
Included in 92C0 *Platanus orientalis* and *Liquidambar orientalis* woods (*Platanion orientalis*)

! ***G1.39*** **Liquidambar orientalis *woods***

Description
Riverine forests dominated by the Tertiary relict *Liquidambar orientalis* , with a very limited range in southern Asia Minor and Rhodes.

Plant communities
Platanion orientalis

Species
Liquidambar orientalis, Adiantum capillus-veneris

Corresponding class in other classifications
European forest types 6.12.3 Mediterranean and Macaronesian riparian forest

EU Habitats Directive Annex I
Included in 92C0 *Platanus orientalis* and *Liquidambar orientalis* woods (*Platanion orientalis*)

G1.4 Broadleaved swamp woodland not on acid peat

G1.41 Alnus swamp woods not on acid peat

G1.411 Meso-eutrophic swamp alder woods

! *G1.4115 Eastern Carpathian* Alnus glutinosa *swamp woods*

Description
Meso-eutrophic *Alnus glutinosa* swamp woods of marshy intramontane depressions and floodplains, at the 500-800 m level of foothills of the eastern Carpathian system, in particular, the Harghita and Baraolt mountains.

Plant communities
Carici elongatae-Alnetum glutinosae p.

Species
Alnus glutinosa, Calla palustris, Calamagrostis canescens, Carex caespitosa, C elongata, Dryopteris carthusiana, Ligularia sibirica, Thelypteris palustris

Corresponding class in other classifications
European forest types 6.11.2 Alder swamp forest
Habitatele din Romania R4403 Păduri danubian- panonice de anin negru (*Alnus glutinosa*) cu *Iris pseudacorus*

! G1.414 Steppe swamp *Alnus glutinosa* woods

Description
Alnus glutinosa mire woods of the steppic regions of Eurasia, west to the Pannonic basin.

Plant communities
Alnion glutinosae: Thelypteridi-Alnetum, Dryopteridi-Alnetum, Fraxino pannonicae-Alnetum

Species
Alnus glutinosa, Fraxinus pannonicus

Corresponding class in other classifications
European forest types 6.11.2 Alder swamp forest

! *G1.44 Wet-ground woodland of the Black and Caspian Seas*

Description
The most hygrophilous communities of the mixed mesic Euxino-Hyrcanian forests (units G1.A71, G1.A74). They may include, *Fraxinus angustifolia* galleries, as well as dense *Alnus barbata* forest stands occupying areas of black damp or swampy soils on coastal alluvial plains, with *Fraxinus angustifolia* and an understorey of *Rubus hirtus , Smilax excelsa* and other climbers and shrubs, notably of the Rosaceae.

Plant communities
Alnetea hyrcanica p., *Alnetea glutinosae euxina* p.

Species
Alnus barbata, *Fraxinus angustifolia, Smilax excels, Rubus hirtus*

Corresponding class in other classifications
European forest types 6.11.2 Alder swamp forest

G1.5 Broadleaved swamp woodland on acid peat

! ***G1.51*** **Sphagnum Betula *woods***

Description
Forests of *Betula pubescens* or *Betula carpatica* on peaty, humid and very acid soils, colonizing bogs of reduced peat building activity and acid fens of the boreal, sub-boreal and nemoral zones, very locally of the wooded steppe and steppe zones, with *Molinia caerulea , Vaccinium spp., Empetrum nigrum , Trientalis europaea , Eriophorum vaginatum* and many sphagna and other bryophytes.

Plant communities
Betulion pubescentis

Species
Betula carpatica, Betula pubescens, Empetrum nigrum, Eriophorum vaginatum, Molinia caerulea, Sphagnum fallax, Sphagnum magellanicum, Trientalis europaea, Vaccinium sp.

Corresponding class in other classifications
European forest types 6.11.3 Birch swamp forest

EU Habitats Directive Annex I
9080 Fennoscandian deciduous swamp woods
91D0 Bog woodland

! G1.6 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 and oro-Mediterranean formations are mixed beech-fir or beech-fir-spruce forests, which are listed under G4.6 in EUNIS but included here.

Plant communities
Aremonio-Fagenion, Cephalanthero-Fagion, Erythronio-Carpinion, Doronico orientalis-Fagion moesiaci, Fagion sylvaticae, Geranio nodosi-Fagion, Geranio striati-Fagion, Ilici-Fagion, Lonicero alpigenae-Fagion, Luzulo-Fagion, Rhododendro pontici-Fagion orientalis, Scillo lilio-hyacinthi-Fagion, Symphyto cordati-Fagion, Vaccinio-Fagion orientalis

Species
Fagus sylvatica, Abies alba. **G1.61:** *Luzula luzuloides, Polytrichum formosum, Deschampsia flexuosa, Calamagrostis villosa, Vaccinium myrtillus, Pteridium aquilinum.* **G1.62:** *Ilex aquifolium.* **G1.63:** *Anemone*

nemorosa, Carex pilosa, Galium odoratum, Lamium galeobdolon, Melica uniflora, Picea abies. **G1.64:** *Scilla lilio-hyacinthus, Lathraea clandestina, Athyrium filix-femina, Gymnocarpium dryopteris, Asplenium scolopendrium, Dryopteris spp., Polystichum spp., Melica uniflora, Galium odoratum, Helleborus viridis ssp. occidentalis, Lathyrus occidentalis, Paris quadrifolia, Euphorbia hyberna.* **G1.65:** *Acer pseudoplatanus* **G1.66:** *Cephalanthera spp., Carex digitata, C. flacca, C. montana, C. alba, Sesleria albicans, Brachypodium pinnatum), Neottia nidus-avis, Epipactis leptochila, E. microphylla) and thermophile species, transgressive of the Quercetalia pubescenti-petraeae. The bush-layer includes several calcicolous species (Ligustrum vulgare, Berberis vulgaris) and Buxus sempervirens.* **G1.69:** *Fagus moesiaca.* **G1.6D:** *Symphytum cordatum, Cardamine glanduligera (Dentaria glandulosa), Hepatica transsilvanica, Pulmonaria rubra, Leucanthemum waldsteinii, Silene heuffelii, Ranunculus carpaticus, Euphorbia carniolica, Aconitum moldavicum, Saxifraga rotundifolia ssp. heuffelii, Primula elatior ssp. leucophylla, Hieracium rotundatum, Galium kitaibelianum, Moehringia pendula, Festuca drymeja.* **G1.6F:** *Fagus taurica var. dobrogica, Tilia tomentosa, T. cordata, Fraxinus ornus, F. angustifolia, F. pallisiae, Carpinus betulus, Populus tremula, Ulmus glabra, Potentilla micrantha, Scutellaria altissima*

Corresponding class in other classifications
European forest types 6.6 Beech forest (all subtypes)
Milieux Naturels de Suisse 1998 6.2 Hêtraies

EU Habitats Directive Annex I
Includes:
G1.61 = 9110 *Luzulo-Fagetum* beech forests
G1.62 = 9120 Atlantic acidophilous beech forests with *Ilex* and sometimes also *Taxus* in the shrublayer (*Quercion robori-petraeae* or *Ilici-Fagenion*)
G1.63 = 9130 Asperulo-Fagetum beech forests
G1.65 = 9140 Medio-European subalpine beech woods with *Acer* and *Rumex arifolius*
G1.66 = 9150 Medio-European limestone beech forests of the *Cephalanthero-Fagion*
G1. 681, G1.685 and G1.686 = 9210 Apeninne beech forests with *Taxus* and *Ilex*
G1.186 and G1.687 = 9220 Apennine beech forests with *Abies alba* and beech forests with *Abies nebrodensis*

References
Dzwonko, Z. & Loster, S. (2000). Syntaxonomy and phyto-geographical differentiation of the Fagus woods in the Southwest Balkan Peninsula. *J. Veg. Sci.* 11*:* 667–678.
Tzonev, R., Dimitrov, M., Chytrý, M., Roussakova, V, Di-mova, D., Gussev, C, Pavlov, D., Vulchev, V, Vitkova, A., Gogoushev, G., Nikolov, I., Borisova, D. & Ganeva, A. (2006). Beech forest communities in Bulgaria. *Phytocoenologia* 36*:* 247–279.
Willner, W. (2002). Syntaxonomische Revision der südmittel-europäischen Buchenwälder. *Phytocoenologia* 32*:* 337–453.

! **G1.7 Thermophilous deciduous woodland (excluding G1.7D *Castanea sativa* woodland)**
includes the following subtypes separately listed in or split units from the 1998 version:
G1.7B *Quercus pyrenaica* woodland
G1.7C Mixed thermophilous 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* and *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.

Plant communities

Aceri granatensis-Quercion fagineae, Aceri tatarici-Quercion, Genisto germanicae-Quercion, Junipero excelsae-Quercion pubescentis, Quercion broteroi, Quercion ilicis, Quercion pyrenaicae, Quercion pubescenti-sessiliflorae, Querco rotundifoliae-Oleion sylvestris

Species

G1.73: *Ostrya carpinifolia, Carpinus orientalis, C. betulus, Fraxinus ornus, Quercus pubescens, Quercus virgiliana*. **G1.74:** *Quercus cerris, Q. petraea, Ostrya carpinifolia, Carpinus orientalis, C. betulus, Fraxinus ornus.* **G1.7C2:** *Carpinus orientalis, Fraxinus ornus, Cotinus coggygria, Oryzopsis holciformis, Oxytropis virescens, Stachys leucoglossa, Paeonia peregrina, Salvia ringens, Cornus mas, Quercus pubescens*. **G1.7C3:** *Acer granatense, Acer monspessulanum, Quercus faginea, Quercus pyrenaica, Sorbus aria, Sorbus torminalis, Taxus baccata, Daphne laureola, Paeonia officinalis* ssp. *humilis*. **G1.7C4:** *Tilia tomentosa, T. platyphyllos, Fraxinus excelsior, Brachypodium pinnatum, Galium erectum, Cruciata glabra, Digitalis grandiflora, Erysimum odoratum, Sisymbrium strictissimum, Aconitum anthora, Hesperis vrabelyiana, Carduus collinus, Waldsteinia geoides, Melica altissima, Carex brevicollis*. **G1.7C6:** *Fraxinus angustifolia, F. ornus, Cornus sanguinea, Tilia platyphyllos, T. tomentosa, Ulmus minor, Carpinus orientalis*. **G1.7C7:** *Juniperus communis, Ligustrum vulgare, Rhamnus catharticus, Crataegus monogyna, Prunus spinosa, Prunus mahaleb, Rubus caesius, Euonymus verrucosus, Berberis vulgaris*. **G1.7C8:** *Tilia* spp., *Fraxinus* spp., *Quercus* spp., *Carpinus* spp., *Ostrya carpinifolia, Acer* spp., *Sorbus* spp., *Populus* spp., *Celtis australis*

Corresponding class in other classifications

European forest types 6.8 Thermophilous deciduous forest (except 6.8.7 Chestnut forest)
Milieux Naturels de Suisse 1998 6.3.4 Chênaie buissonnante
6.3.5 Ostryaie buissonnante du sud des Alpes

EU Habitats Directive Annex I

Includes:
91AA Eastern white oak woods
91B0 Thermophilous *Fraxinus angustifolia* woods
91H0 Pannonian woods with *Quercus pubescens*
91I0 Euro-Siberian steppic woods with *Quercus* spp
91M0 Pannonian-Balkanic turkey oak –sessile oak forests
91N0 Pannonic inland sand dune thicket (*Junipero-Populetum albae*)
91Z0 Moesian silver lime woods
9230 Galicio-Portuguese oak woods with *Quercus robur* and *Quercus pyrenaica*
9240 *Quercus faginea* and *Quercus canariensis* Iberian woods
9250 *Quercus trojana* woods
9310 Aegean *Quercus brachyphylla* woods
9350 *Quercus macrolepis* forests

! **G1.8 Acidophilous *Quercus*-dominated woodland**

Description

Forests of *Quercus robur* or *Quercus petraea* on acid soils.

Plant communities

Genisto germanicae-Quercion, Quercion petraeae, Quercion roboris, Quercion pyrenaicae

Species

Quercus robur, *Quercus petraea, Deschampsia flexuosa, Vaccinium myrtillus, Pteridium aquilinum, Lonicera periclymenum , Holcus mollis, Maianthemum bifolium, Convallaria majalis, Hieracium sabaudum, Hypericum pulchrum, Luzula pilosa, Polytrichum formosum, Leucobryum glaucum*

Corresponding class in other classifications
European forest types 6.4 Acidophilous oak and oak-birch forest
Milieux Naturels de Suisse 1998 6.3.6 Chênaie acidophile

EU Habitats Directive Annex I
Subtypes:
G1.81 & G1.84 = 9190 Old acidophilous oak woods with *Quercus robur* on sandy plains
G1.83 = 91A0 Old sessile oak woods with *Ilex* and *Blechnum* in the British Isles

G1.A Meso- and eutrophic *Quercus* , *Carpinus* , *Fraxinus* , *Acer* , *Tilia* , *Ulmus* and related woodland

! *G1.A1* Quercus - Fraxinus - Carpinus betulus *woodland on eutrophic and mesotrophic soils*

Description
Atlantic, medio-European and eastern European forests dominated by *Quercus robur* or *Quercus petraea*, on eutrophic or mesotrophic soils, with usually ample and species-rich herb and bush layers. *Carpinus betulus* is generally present. They occur under climates too dry or on soils too wet or too dry for beech or as a result of forest management favouring oaks.

Plant communities
Carpinion betuli

Species
Carpinus betulus, Quercus robur, Q. petraea. **G1.A16:** *Quercus cerris, Sorbus torminalis, S. domestica, Acer campestre, Ligustrum vulgare, Cornus mas, Ulmus minor, Rhamnus catharticus, Viola mirabilis, V. alba, V. suavis, Primula veris, Polygonatum latifolium, P. multiflorum, P. odoratum, Pulmonaria mollis ssp. mollis, P. murinii, Chamaecytisus supinus, Convallaria majalis, Carex montana, C. umbrosa, C. curvata, C. michelii, Festuca heterophylla, Melica uniflora, Poa nemoralis.* **G1.A1A:** *Acer tataricum, Cyclamen purpurascens, Epimedium alpinum, Erythronium dens-canis, Helleborus dumetorum ssp. atrorubens, Knautia drymeia.* **G1.A1B:** *Carex brizoides, Anemone nemorosa, Corydalis solida, Galanthus nivalis, Gagea spathacea, G. lutea, Gladiolus imbricatus, Cyclamen purpurascens, Crocus neapolitanus, Erythronium dens-canis, Helleborus dumetorum, Adoxa moschatellina, Anemone ranunculoides, Ranunculus ficaria, Scilla vindobonensis, Leucojum vernum.* **G1.A1C:** *Tilia tomentosa, Pyrus eleagrifolia, P. malus, Acer stevenii, Lonicera caprifolium, Cotinus coggygria, Stellaria holostea, Carex pilosa, Galium schultesii, Festuca heterophylla, Ranunculus auricomus, Lathyrus hallersteinii, Melampyrum bihariense, Aposeris foetida, Helleborus odorus*

Corresponding class in other classifications
European forest types 6.5 Mesophytic deciduous forest (except 6.5.8 Ravine and slope forest).

EU Habitats Directive Annex I
Subtypes:
G1.A14 = 9160 Sub-Atlantic and medio-European oak or oak-hornbeam forests of the *Carpinion betuli*
G1.A161 = 9170 *Galio-Carpinetum* oak-hornbeam forests
G1.A1B, G1.A166, G1.A167 = 91G0 Pannonic woods with *Quercus petraea* and *Carpinus betulus*

! *G1.A4* *Ravine and slope woodland*

Description

Cool, moist forests with a varied tree layer, especially species of *Acer*, *Tilia* and *Fraxinus* of variable dominance, most often on steep slopes. They are of considerable biohistorical and biogeographical importance, as examples of the mixed forests of the Atlantic period, preserved in stations inaccessible to beech domination.

Plant communities
Tilio platyphylli-Acerion pseudoplatani

Species
Acer pseudoplatanus, Actaea spicata, Fraxinus excelsior, Helleborus viridis, Lunaria rediviva, Taxus baccata, Ulmus glabra, Carpinus betulus, Corylus avellana, Quercus sp., *Sesleria varia, Tilia cordata, T. platyphyllos*. **G1.A41:** *Acer platanoides, Fagus sylvatica, Quercus robur. Actaea spicata, Galeobdolon montanum*. **G1.A42:** *Polygonatum verticillatum, Galium odoratum, Ranunculus platanifolius, Centaurea montana, Poa chaixii, Pulmonaria montana, Circaea alpina, Sambucus racemosa, Mercurialis perennis, Dryopteris filix-mas*. **G1.A43:** *Aegopodium podagraria, Cirsium oleraceum, Filipendula ulmaria, Carex pendula, C. sylvatica, Equisetum telmateia, Matteuccia struthiopteris, Cardamine trifolia, Paris quadrifolia, Stachys sylvatica.* ***G1.A45:*** *Tilia cordata, T. platyphyllos, Acer platanoides, Fraxinus excelsior, Ulmus glabra, Fagus sylvatica, Euonymus latifolius, Asperula taurina, Cyclamen purpurascens*.

Corresponding class in other classifications
European forest types 6.5.8 Ravine and slope forest
Milieux Naturels de Suisse 1998 6.3.1 Erablaie de ravin méso-hygrophile
6.3.2 Tiliaie thermophile sur éboulis ou lapiez

EU Habitats Directive Annex I
9180: *Tilio-Acerion* forests of slopes, screes and ravines

! ***G1.A7 Mixed deciduous woodland of the Black and Caspian Seas***

Description
Mixed summer-green broad-leaved forests limited mainly to the mountains bordering the Black Sea and the Caspian Sea.

Plant communities
Astrantio-Carpinion caucasicae, Carpinion orientalis, Crataego-Carpinion caucasicae, Junipero excelsae-Quercion pubescentis, Quercetalia pubescenti-petraeae

Species
Carpinus betulus, C. orientalis, Quercus dshorochensis, Q. syspirensis, Q. anatolica, Q. iberica, Q. macranthera, Acer cappadocium, Fagus orientalis, Abies bornmuelleriana, Prunus avium, Pyrus caucasica, Corylus avellana, Euonymus europaeus, Euonymus verrucosus

! **G2 Broadleaved evergreen woodland**
(excluding G2.8 Highly artificial broadleaved evergreen forestry plantations and G2.9 Evergreen orchards and groves)

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. EUNIS includes plantations and orchards under G2 but they are not included in this habitat type for Emerald.

Plant communities
Cistion laurifolii, Quercion pubescenti-sessiliflorae, Aceri granatensis-Quercion fagineae, Oleo-Ceratonion siliquae, Quercion ilicis, Querco rotundifoliae-Oleion sylvestris, Arbuto andrachnae-Quercion cocciferae, Quercion broteroi, Lathyrion veneti, Quercion pyrenaicae, Paeonio broteroi-Abietion pinsapo, Quercetalia ilicis

Species
Pistacia terebinthus, Fraxinus ornus, Coronilla emerus, Ostrya carpinifolia, Carpinus orientalis, Laurus nobilis, Viburnum tinus, Rhamnus alaternus, Rosa sempervirens, Lonicera etrusca, Clematis flammula, Rubia peregrina, Smilax aspera, Vitis vinifera ssp. sylvestris, Cyclamen purpurascens, Prunus mahaleb, Myrtus communis, Juniperus phoenicea, Fraxinus ornus, Quercus pubescens, Acer monspessulanum, Frangula rupestris, Hedera helix

Corresponding class in other classifications
European forest types 6.9 Broadleaved evergreen forest (all subtypes)

EU Habitats Directive Annex I
Subtypes:
G2.1 includes 9330 Quercus suber *forests*
9340 Quercus ilex and Quercus rotundifolia forests
9390 Scrub and low forest vegetation with Quercus alnifolia
93A0 Woodlands with Quercus infectoria (Anagyro foetidae-Quercetum infectoriae)
G2.3 = 9360 Macaronesian laurel forests (Laurus, Ocotea)
G2.4 = 9320 Olea and Ceratonia forests
G2.5 = 9370 Palm groves of Phoenix
G2.6 = 9380: Forests of Ilex aquifolium

G3 Coniferous woodland

G3.1 *Abies* and *Picea* woodland

! ***G3.15 Southern Apennine* Abies alba *forests***

Description
Relict *Abies alba* woods associated with the beech forests of the *Geranio versicolori-Fagion* of the Lucano-Calabrian Apennines (Pollino, Sila, Aspromonte).

Plant communities
Cardamino kitaibelii-Fagenion sylvaticae.

Species
Abies alba, Abies alba subsp. apennina, Juniperus hemisphaerica, Monotropa hypopitis, Orthilia secunda, Cirsium erisithales, Oxalis acetosella, Veronica urticifolia, Daphne mezereum.

Corresponding class in other classifications
European forest types 6.10.6 Mediterranean and Anatolian fir forest

EU Habitats Directive Annex I
9510 Southern Apennine *Abies alba* forests

Associated Habitat types
Stands where *Fagus sylvatica* is also present are treated under 61.6 *Fagus* woodland

References
Spampinato G & E Biondi (not dated) 9510*: Foreste sud-appenniniche di *Abies alba* in Habitat Italia http://vnr.unipg.it/habitat/cerca.do?formato=stampa&idSegnalazione=85#

! ***G3.16*** ***Moesian* Abies alba *forests***

Description
Forests of *Abies alba* or of *Abies alba* mixed with *Fagus sylvatica , Picea abies , Pinus sylvestris* or *Pinus nigra* of the Rhodopides, the Balkan Range, the Moeso-Macedonian mountains and the Pelagonids, within the geographical range of the alliance *Fagion moesiacum*.

Plant communities
Fagion sylvaticae, *Fagion moesiacum p.*

Species
Abies alba, Picea abies, Pinus sylvestris, P. nigra.

Corresponding class in other classifications
European forest types 6.10.6 Mediterranean and Anatolian fir forest

EU Habitats Directive Annex I
91BA Moesian silver fir forests

Associated Habitat types
Stands where *Fagus sylvatica* is co-dominant are treated under 61.6 *Fagus* woodland

! ***G3.17*** ***Balkano-Pontic* Abies *forests***

Description
Forests of *Abies nordmanniana , Abies borisii-regi , Abies bornmuelleriana* of the southern Balkans peninsula, the Pontic range and the Caucasus, often mixed with beech, or adjacent to beech forests.

Plant communities
Fagion sylvaticae, Rhododendro pontici-Fagion orientalis

Species
Abies nordmanniana, Abies borisii-regis, Buxus sempervirens

Corresponding class in other classifications
European forest types 6.10.6 Mediterranean and Anatolian fir forest

EU Habitats Directive Annex I
9270 Hellenic beech forests with *Abies borisii-regis*

! ***G3.19*** **Abies pinsapo *forests***

Description

Fir or fir-cedar forests dominated by relict species of *Abies* , including forests of *Abies pinsapo* , *Abies marocana* , *Abies numidica* , *Abies cilicica* or *Abies nebrodensis* , distributed along the coasts of the Mediterranean basin, well outside the range of beech.

Plant communities
Paeonio coriaceae-Abietetum pinsapi, Bunio macucae-Abietetum pinsapi

Species
Abies pinsapo, A. marocana, A. numidica, A. cilicica, A. nebrodensis

Corresponding class in other classifications
European forest types 6.10.6 Mediterranean and Anatolian fir forest

EU Habitats Directive Annex I
9520: *Abies pinsapo* forests

! ***G3.1B Alpine and Carpathian subalpine* Picea *forests***

Description
Spruce (*Picea abies*) forests of the lower subalpine level, and of anomalous stations in the montane level, of the outer, intermediate and inner Alps; in the latter, they are often adjacent to montane spruce forests of unit G3.1C. Also Spruce forests of the lower subalpine level of the Carpathians. The spruces, often stunted or columnar, are accompanied by an undergrowth of decidedly subalpine affinities.

Plant communities
Piceion excelsae

Species
Picea abies, Vaccinium spp. **G3.1B1:** *Oxalis acetosella, Vaccinium vitis-idaea, Vaccinium myrtillus, Calamagrostis villosa and the moss Hylocomium splendens*. **G3.1B2:** *Adenostyles spp., Chaerophyllum hirsutum, Peucedanum ostruthium, Ranunculus aconitifolius, Aconitum vulparia, Aconitum paniculatum, Stellaria nemorum, Geranium sylvaticum, Cicerbita alpina*. **G3.1B3:** *Listera cordata, Sphagnum acutifolium, S. quinquefarium, S. girgensohnii*. **G3.1B6:** *Pinus mugo, Pinus cembra, Rhododendron myrtifolium, Vaccinium myrtillus, Vaccinium vitis-idaea, Homogyne alpina, Soldanella hungarica ssp. major, Calamagrostis villosa. East Carpathians: Bruckenthalia spiculifolia, Campanula abietina, Campanula serrata, Hieracium rotundatum, Sphagnum palustre, S. wulfianum, S. squarrosum, Bazzania trilobata, Leucanthemum waldsteinii*.

Corresponding class in other classifications
European forest types 6.3.2 Subalpine and montane spruce and montane mixed spruce-silver fir forest
EU Habitats Directive Annex I
included in 9410 Acidophilous *Picea* forests of the montane to alpine levels (*Vaccinio-Piceetea*)

! ***G3.1C Inner range montane* Picea *forests***

Description
Picea abies forests of the montane level of the inner Alps, characteristic of regions climatically unfavourable to both beech and fir. Also analogous *Picea abies* forests of the montane and collinar levels of the inner basin of the Slovakian Carpathians subjected to a climate of high continentality.

Plant communities
Piceion excelsae

Species
Picea abies. **G3.1C2:** *Calamagrostis varia, Carex flacca, Sesleria caerulea, Hieracium trifidum, Aster bellidiastrum.* **G3.1C3:** *Oxalis acetosella, Galium rotundifolium, Galium odoratum, Anemone nemorosa, Doronicum austriacum, Petasites albus, Primula elatior, Fragaria vesca, Cardamine trifolia, Carex montana and Melica nutans.* **G3.1C5:** *Sphagnum spp., Equisetum sylvaticum, Listera cordata, Dryopteris dilatata*

Corresponding class in other classifications
European forest types 6.3.2 Subalpine and montane spruce and montane mixed spruce-silver fir forest

EU Habitats Directive Annex I
included in 9410 Acidophilous *Picea* forests of the montane to alpine levels (*Vaccinio-Piceetea*)

! ***G3.1D*** ***Hercynian subalpine* Picea *forests***

Description
Subalpine Spruce (*Picea abies*) forests of high ranges of the central and eastern sections of the Hercynian arc, from the Harz to the Bohemian Quadrangle.

Plant communities
Soldanello montanae-Piceetum, Calamagrostio villosae-Piceetum, Plagiothecio-Piceetum hercynicum

Species
Picea abies, Abies alba, Sorbus aucuparia, Vaccinium myrtillus, Homogyne alpina, Soldanella montana, Calamagrostis villosa

Corresponding class in other classifications
European forest types 6.3.2 Subalpine and montane spruce and montane mixed spruce-silver fir forest

EU Habitats Directive Annex I
included in 9410 Acidophilous *Picea* forests of the montane to alpine levels (*Vaccinio-Piceetea*)

G3.1E ***Southern European* Picea abies *forests***

! G3.1E1 Southeastern Moesian *Picea abies* forests

Description
Spruce (*Picea abies*) forests of the Rhodopide Vitosha, Rila, Pirin and Rhodope ranges and of the Moeso-Macedonian mountains.

Plant communities
"Abieti-Piceetum scardicum", "Piceetum subalpinum scardicum", i.a.

Species
Picea abies

Corresponding class in other classifications
European forest types 6.3.2 Subalpine and montane spruce and montane mixed spruce-silver fir forest

! G3.1E3 Montenegrine *Picea abies* forests

Description

Isolated subalpine and high montane *Picea abies* forests of the Ljubisnja range of Montenegro, developed on both siliceous and calcareous substrates, at altitudes comprised between 1150 and 1850 m on adrets and between 1100 and 1900 m on ubacs. They are species-rich on limestones with a cortège of medio-European affinities, except for the presence of *Laserpitium marginatum* .

Plant communities

Piceion excelsae

Species

Picea abies

Corresponding class in other classifications

European forest types 6.3.2 Subalpine and montane spruce and montane mixed spruce-silver fir forest

EU Habitats Directive Annex I

Not present in the European Union

! G3.1E4 Pelagonide *Picea abies* forests

Description

Very local subalpine *Picea abies* forests of the Pelagonides, particularly of the southern Sar Planina of the F.Y.R. of Macedonia, with smaller stands farther south in the F.Y.R. of Macedonia, and in Albania.

Plant communities

Piceion excelsae

Species

Picea abies

Corresponding class in other classifications

European forest types 6.3.2 Subalpine and montane spruce and montane mixed spruce-silver fir forest

EU Habitats Directive Annex I

Not present in the European Union

! G3.1E5 Balkan Range *Picea abies* forests

Description

Rare and local *Picea abies* forests of the western and central Balkan Range.

Plant communities

Piceion excelsae

Species

Picea abies

Corresponding class in other classifications
European forest types 6.3.2 Subalpine and montane spruce and montane mixed spruce-silver fir forest

EU Habitats Directive Annex I

! ***G3.1G*** **Picea omorika *forests***

Description
Picea omorika -dominated forests of the Drina basin of central Serbia, also in Bosnia and Hercegovina. *Picea abies* and *Abies alba* are usually also present while the herb layer is relatively species-poorwhile bryophytes can be widespread.

Plant communities
Piceion excelsae

Species
Picea omorika, Salix caprea , Pinus nigra Rosa pendulina Valeriana montana , Vaccinium myrtillus , Luzula sylvatica , Hieracium transsilvanicum , Gentiana asclepiadea , Erica carnea , Calamagrostis varia , Veronica chamaedrys , Lathyrus vernus , Euphorbia amygdaloides Bryophytes - *Dicranum scoparium , Ctenidium molluscum , Eurhynchium striatum , Hylocomium splendens , Rhytidiadelphus triquetrus*

Corresponding class in other classifications
European forest types 6.3.2 Subalpine and montane spruce and montane mixed spruce-silver fir forest

EU Habitats Directive Annex I
Not present in the European Union

! ***G3.1H*** **Picea orientalis *forests***

Description
Picea orientalis -dominated forests of the Caucasus and of the eastern Pontic Range.

Plant communities
Geranio iberici-Pinion orientalis

Species
Picea orientalis

Corresponding class in other classifications
European forest types 6.3.2 Subalpine and montane spruce and montane mixed spruce-silver fir forest

EU Habitats Directive Annex I
Not present in the European Union

References
Ketenoglu, O et al (2010) Synopsis of syntaxonomy of Turkish forests. *Journal of Environmental Biology* 31 (1) 71-80.

G3.2 Alpine *Larix - Pinus cembra* woodland

! ***G3.21*** ***Eastern Alpine siliceous* Larix *and* Pinus cembra *forests***

Description

Subalpine forests of *Larix decidua* and/or*Pinus cembra of* the eastern and central Alps, mostly of the inner ranges, usually on siliceous substrates, with an often species-poor undergrowth.

Plant communities

Piceion excelsae, Rhododendro-Vaccinion

Species

Larix decidua, Pinus cembra, Rhododendron ferrugineum, Vaccinium myrtillus, Calamagrostis villosa, Luzula albida

Corresponding class in other classifications

European forest types 6.3.1 Subalpine larch-arolla pine and dwarf pine forest
Milieux Naturels de Suisse 1998 6.6.3 Forêt de mélèzes et d'aroles

EU Habitats Directive Annex I

Included in 9420 Alpine *Larix decidua* and/or *Pinus cembra* forests

! ***G3.22*** ***Eastern Alpine calcicolous* Larix *and* Pinus cembra *forests***

Description

Subalpine and montane forests of *Larix decidua, Picea abies* and *Pinus cembra* of the eastern and central Alps on calcareous substrates. The undergrowth is usually species-rich.

Plant communities

Piceion excelsae, Rhododendro-Vaccinion

Species

Larix decidua, Picea abies, Pinus cembra, Pinus mugo, Erica herbacea, Rhododendron hirsutum, Polygala chamaebuxus

Corresponding class in other classifications

European forest types 6.3.1 Subalpine larch-arolla pine and dwarf pine forest
Milieux Naturels de Suisse 1998 6.6.3 Forêt de mélèzes et d'aroles

EU Habitats Directive Annex I

Included in 9420 Alpine *Larix decidua* and/or *Pinus cembra* forests

! ***G3.25*** ***Carpathian* Larix *and* Pinus cembra *forests***

Description

Uncommon *Larix decidua* or *Pinus cembra* formations of the Carpathians, occurring as a single dominant, together as codominants, or mixed with spruce (*Picea abies*).

Plant communities

Pino cembrae-Piceetum, Erico-Pinion sylvestris

Species

Larix decidua, Pinus cembra, Picea abies, Rhododendron myrtifolium, Bruckenthalia spiculifolia, Melampyrum saxosum, Soldanella hungarica ssp. major, Campanula abietina

Corresponding class in other classifications
European forest types 6.3.1 Subalpine larch-arolla pine and dwarf pine forest
Habitate din România
R4201 Rarişti sud-est carpatice de molid (*Picea abies*) şi zâmbru *(Pinus cembra)* cu *Bruckenthalia spiculifolia*
R4202 Rarişti sud-est carpatice de molid (*Picea abies*) şi zâmbru (*Pinus cembra*) cu *Rhododendron myrtifolium*
R4204 Păduri şi rarişti de larice (*Larix decidua*) cu *Saxifraga cuneifolia*

EU Habitats Directive Annex I
Included in 9420 Alpine *Larix decidua* and/or *Pinus cembra* forests

! ***G3.26*** **Larix polonica *forests***

Description
Larix decidua ssp. *polonica* -dominated facies of the white cinquefoil oak woods (units G1.7A111 & G1.7A114) of Poland and the western Ukraine.

Plant communities
Piceion excelsae.

Species
Larix decidua ssp. *polonica*

Corresponding class in other classifications
European forest types 6.3.1 Subalpine larch-arolla pine and dwarf pine forest

Associated Habitat types
G1.7A111, G1.7A114

G3.3 *Pinus uncinata* woodland

! ***G3.31*** **Pinus uncinata *forests with* Rhododendron ferrugineum**

Description
Pinus uncinata forests of the western outer Alps, the Jura and north facing slopes (‘ubac’) of the Pyrenees developed on siliceous or decalcified soils of the subalpine level with a predominately ericaceous undergrowh usually dominated by *Rhododendron ferrugineum*.

Plant communities
Rhododendro-Vaccinion p.

Species
Pinus uncinata, Rhododendron ferrugineum, Vaccinium myrtillus, V. uliginosum, Calluna vulgaris, Homogyne alpina, Deschampsia flexuosa, Lycopodium annotinum

Corresponding class in other classifications
European forest types 6.3.1 Subalpine larch-arolla pine and dwarf pine forest

EU Habitats Directive Annex I
included in 9430 Subalpine and montane *Pinus uncinata* forests (* if on gypsum or limestone)

! ***G3.32 Xerocline* Pinus uncinata *forests***

Description
Pinus uncinata forests of the inner Alps, of the western outer Alps and the Jura, and of south facing slopes ('adret') of the Pyrenees, accompanied by shrubby undergrowth in which *Rhododendron ferrugineum* is absent or rare.

Plant communities
Erico-Pinion sylvestris, Juniperion nanae, Pino sylvestris-Juniperion sabinae

Species
Pinus uncinata, Juniperus nana, J. hemisphaerica, Arctostaphylos uva-ursi, A. alpinus, Erica herbacea, Rhododendron hirsutum, Cotoneaster integerrimus, Daphne striata, Dryas octopetala, Polygala chamaebuxus

Corresponding class in other classifications
European forest types 6.3.1 Subalpine larch-arolla pine and dwarf pine forest

EU Habitats Directive Annex I
included in 9430 Subalpine and montane Pinus uncinata forests (* if on gypsum or limestone)

G3.4 *Pinus sylvestris* woodland south of the taiga

! ***G3.41 Caledonian forest***

Description
Relict, indigenous Scots pine forests of endemic *Pinus sylvestris* var. *scotica*, limited to the central and northeastern Grampians of Scotland. They are mostly open and have a ground layer usually rich in ericaceous species and mosses, in particular, *Hylocomium splendens*.

Plant communities
Dicrano-Pinion

Species
Pinus sylvestris, Sorbus aucuparia, Betula pubescens, B. pendula, Juniperus communis, Ilex aquifolium, Populus tremula, Calluna vulgaris, Corallorhiza trifida, Deschampsia flexuosa, Goodyera repens, Linnaea borealis, Listera cordata, Moneses uniflora, Orthilia secunda, Pyrola minor, Trientalis europaea. Bryophytes - *Hylocomium splendens, Pleurozium schreberi*.

Corresponding class in other classifications
European forest types 6.2.2 Nemoral scots pine forest
National Vegetation Classification (UK) W18 *Pinus sylvestris - Hylocomium splendens* woodland

EU Habitats Directive Annex I
91C0 Caledonian forest

References

G3.42 ***Middle European* Pinus sylvestris *forests***

G3.423 Western Eurasian steppe pine forests

! *G3.4232* *Sarmatic steppe* Pinus sylvestris *forests*

Description

Xerophilous *Pinus sylvestris* woods of the wooded steppe belt of the Sarmatic region of western Eurasia and of areas with extreme continental local climates of northeastern Central Europe and Eastern Europe, extending from northeastern and eastern Brandenburg and Mecklenburg-Vorpommern, north-central and eastern Poland in the west, through Podolia and the southern Russian plateaux, to Bashkiria.

Plant communities

Cytiso ruthenici-Pinion sylvestris

Species

Pinus sylvestris, Vaccinium myrtillus, Pyrola minor, Orthilia minor, Chimaphilla umbellata, Ophrys insectifera, Coronilla vaginalis, Globularia punctata, Brachypodium pinnatum

Corresponding class in other classifications

Biotopes of the Czech Republic 2001 L8.2 Lesostepní bory
European forest types 6.2.2 Nemoral scots pine forest

EU Habitats Directive Annex I

91U0 Sarmatic steppe pine forest (*Cytiso-Pinetalia*)

! *G3.4233* *Carpathian steppe* Pinus sylvestris *woods*

Description

Local xerophile *Pinus sylvestris* steppe woods of sub-Pannonic low Carpathian spurs of southwestern and southeastern Slovakia and of the Slovakian inner Carpathian basins.

Plant communities

Cytiso ruthenici-Pinion p.

Species

Cornus mas, Brachypodium pinnatum, Melica nutans, Luzula luzuloides, Hypochoeris maculata, Buglossoides purpurocaerulea, Lathyrus niger, Vicia dumetorum, Melittis melissophyllum, Digitalis grandiflora, Viola collina, Achillea distans, Euphorbia epithymoides, Orchis purpurea

Corresponding class in other classifications

Biotopes of Slovakia 2114300 Dubové subxerotermofilné a borovicové xerofilné lesy
European forest types 6.2.2 Nemoral scots pine forest

! *G3.4234* *Pannonic steppe* Pinus sylvestris *woods*

Description

Pinus sylvestris sand steppe woods of the western Pannonic plain and its satellite basins, in particular, the Zahorie (Marchfeld) and the little Alf"ld.

Plant communities

Festuco vaginatae-Pinion

Species
Pinus sylvestris, Festuca vaginata

Corresponding class in other classifications
European forest types 6.2.2 Nemoral scots pine forest

G3.44 ***Spring heath* Pinus sylvestris *forests***

! G3.442 Carpathian relict calcicolous *Pinus sylvestris* forests

Description
Isolated, calcicolous *Pinus sylvestris* forests of the western Carpathians, related to the spring heath Scots pine forests of the Alpine area, limited to a few small enclaves in the Strazov mountains, the Velka Fatra, the Pienini (Pinus sylvestris - Calamagrostis varia community, Pinus sylvestris - Carex alba community), the Slovakian inner-Carpathian basins and the Slovakian Erzgebirge. *Erica herbacea* and *Polygala chamaebuxus* are absent; the undergrowth includes a number of species of continental distribution and xerothermic affinities, including some western Carpathian endemics.

Plant communities
Pulsatillo slavicae-Pinion: Carici humilis-Pinetum

Species
Pinus sylvestris, Linum flavum, Carex humilis, Carex alba, Calamagrostis varia, Pulsatilla slavica, Thymus carpathicus, Primula auricula ssp. hungarica, Globularia aphyllanthes, Campanula carpatica, Festuca tatrae

Corresponding class in other classifications
European forest types 6.3.3 Alpine scots pine and black pine forest

! *G3.4C* ***Southeastern European* Pinus sylvestris *forests***

Description
Pinus sylvestris forests of the eastern Carpathians and of the mountains of the Balkan peninsula, south to northern Greece, formed by the largely isolated, disjunct, southeastern forms of *Pinus sylvestris* (*Pinus sylvestris* var. *rhodopaea* , *Pinus sylvestris* var. *illyrica* , *Pinus sylvestris* var. *romanica*), and often limited to azonal edaphic enclaves.

Plant communities
Fraxino orni-Ericion, Fraxino orni-Pinion nigrae

Species
Pinus sylvestris var. rhodopaea, Pinus sylvestris var. illyrica, Pinus sylvestris var. romanica. **G3.4C5:** *Erica herbacea (Erica carnea), Galium lucidum, Aquilegia vulgaris.* **G3.4C6:** *Abies alba, Fagus sylvatica, Picea abies, Populus tremula, Betula pendula, Juniperus communis, Cotoneaster nebrodensis, Vaccinium myrtillus, Arctostaphylos uva-ursi, Galium licidum, Luzula sylvatica, Brachypodium pinnatum.* **G3.4C7:** *Picea abies, Abies alba, Betula pendula, undergrowth dominated by Leucobryum glaucum.* **G3.4C8:** *Sesleria rigida, Helianthemum nummularium ssp. obscurum, Thymus comosus, Asperula capitata, Dianthus spiculifolius, Arctostaphylos uva-ursi, Sorbus aria, Cotoneaster integerrimus.* **G3.4C9:** *Vaccinium*

myrtillus, Vaccinium vitis-idaea, Luzula luzuloides, Oxalis acetosella, Deschampsia flexuosa and Dicranum scoparium. **G3.4CA:** *Daphne blagayana, Iris ruthenica, Bruckenthalia spiculifolia, Anthemis carpatica*
Corresponding class in other classifications
European forest types 6.3.3 Alpine scots pine and black pine forest

! ***G3.4E*** ***Ponto-Caucasian*** **Pinus sylvestris** ***forests***

Description
Pine forests dominated by the *Pinus sylvestris* group, mostly included in *Pinus sylvestris* ssp. *hamata* or its intermediates with *Pinus sylvestris* ssp. *sylvestris* , also forests with *Pinus kochiana* , *Pinus hamata* or *Pinus armena* , of the Pontic Range, its satellites and inner Anatolian outposts, of the mountains of the Crimea and of the Caucasus.

Plant communities
Pinion kochianae

Species
Pinus sylvestris ssp. hamata, P. kochiana, P. hamata, P. armena

EU Habitats Directive Annex I
Not present in the European Union

G3.5 ***Pinus nigra*** **woodland**

! ***G3.51*** ***Alpino-Apennine*** **Pinus nigra** ***forests***

Description
Pinus nigra sensu stricta forests of the eastern Italian, Austrian and Slovenian Alps, the Apennines and the Adriatic coasts of northern Italy occuring on steep, dry, sunny rocky slopes.

Plant communities
Fraxino orni-Pinion nigrae, Erico-Pinion sylvestris

Species
Pinus nigra. **G3.511:** *Cyclamen purpurascens, Aquilegia einseleana*. **G3.513:** *Amelanchier ovalis, Cotoneaster spp., Berberis vulgaris, Erica herbacea, Daphne cneorum, Polygala chamaebuxus, Melampyrum angustissimum, Epipactis atrorubens, Cyclamen purpurascens, Carex humilis, Euphorbia saxatilis, Sesleria albicans, Calamagrostis varia*

Corresponding class in other classifications
European forest types 6.10.2 Mediterranean and Anatolian black pine forest

EU Habitats Directive Annex I
included in 9530 (Sub-) Mediterranean pine forests with endemic black pines

! ***G3.52*** ***Western Balkanic*** **Pinus nigra** ***forests***

Description
Light, open forests of *Pinus nigra* ssp. *nigra* or *Pinus dalmatica* of the Dinarides, the Pelagonides and the Dalmatian coastal areas. The tree and shrub layer are not dense, therefore the herb layer is quite rich,

dominated by *Potentilla opaca , Euphorbia glabriflora , Erica carnea* and *Sesleria rigida*, forming compact "meadows" in the forest.

Plant communities
Fraxino orni-Pinion nigrae

Species
G3.521: *Pinus nigra* ssp. *nigra.* **G3.5212:** *Daphne blagayana, Rosa pendulina, Erica herbacea, Galium lucidum, Laserpitium krapfii, Vicia villosa, Symphytum tuberosum, Erythronium dens-canis, Pteridium aquilinium, Asplenium cuneifolium* ssp. *serpentini, Campanula servicaria, Crocus veluchensis, Stachys scardica, Helleborus multifidus* ssp. *serbicus*. **G3.5214:** *Erica herbacea, Galium lucidum, Genista januensis, Aquilegia vulgaris, Buphthalmum salicifolium, Teucrium chamaedrys, Carex humilis, Anthericum ramosum, Cyclamen purpurascens, Polygala chamaebuxus, Hepatica nobilis, Geranium sanguineum, Helleborus niger* ssp. *macranthus, Epipactis atrorubens, Carex alba*

Corresponding class in other classifications
European forest types 6.10.2 Mediterranean and Anatolian black pine forest

EU Habitats Directive Annex I
included in 9530 (Sub-) Mediterranean pine forests with endemic black pines

! ***G3.53*** **Pinus salzmannii *forests***

Description
Pinus salzmannii (*Pinus nigra* ssp. *salzmannii* , *Pinus nigra* ssp. *clusiana* , *Pinus nigra* ssp. *mauretanica*) forests of Spain, southern France and North Africa.

Plant communities
Juniperion thuriferae

Species
Pinus salzmannii (*Pinus nigra* ssp. *salzmannii, Pinus nigra* ssp. *clusiana, Pinus nigra* ssp. *mauretanica*)

Corresponding class in other classifications
European forest types 6.10.2 Mediterranean and Anatolian black pine forest

EU Habitats Directive Annex I
included in 9530 (Sub-) Mediterranean pine forests with endemic black pines

! ***G3.54*** ***Corsican* Pinus laricio *forests***

Description
Pinus laricio forests of the mountains of Corsica. The Corsican nuthatch (*Sitta whiteheadi*) is endemic to these forests.

Plant communities
Galio-Pinetum luzuletosum, Galio-Pinetum anthyllidetosum, Galio-Pinetum ericetosum

Species

Pinus laricio, Ilex aquifolium, Daphne laureola, Erica arborea, E. scoparia Pteridium aquilinum, Allium pendulinum, Helleborus lividus ssp. corsicus, Galium odoratum, Epiphytic lichens - *Cetraria glauca, Hypogymnia bitteriana,* Birds - *Sitta whiteheadi*

Corresponding class in other classifications
European forest types 6.10.2 Mediterranean and Anatolian black pine forest

EU Habitats Directive Annex I
included in 9530 (Sub-) Mediterranean pine forests with endemic black pines

! ***G3.55*** ***Calabrian* Pinus laricio *forests***

Description
Pinus laricio var. *calabrica* forests of the Sila, the Aspromonte and Etna in southern Italy.

Plant communities
Hypochaerido-Pinetum calabricae

Species
Pinus laricio

Corresponding class in other classifications
European forest types 6.10.2 Mediterranean and Anatolian black pine forest

EU Habitats Directive Annex I
included in 9530 (Sub-) Mediterranean pine forests with endemic black pines

Associated Habitat types

References
Spampinato G (not dated) 9530* Pinete (sub)mediterranee di pini neri endemici in Habitat Italia http://vnr.unipg.it/habitat/cerca.do?formato=stampa&idSegnalazione=86

! ***G3.56*** **Pinus pallasiana *and* Pinus banatica *forests***

Description
Montane forests of *Pinus pallasiana* , or *Pinus banatica* (*Pinus nigra* var. *banatica*) of the southern Carpathians, the Balkan peninsula, Cyprus, Anatolia and Crimea.

Plant communities
Abietion cephalonicae

Species
Pinus pallasiana, Pinus banatica. **G3.5618:** *Quercus dalechampii, Ostrya carpinifolia (southern Rhodopes), Abies alba, Pinus sylvestris.* **G3.562:** *Genista radiata, Fraxinus ornus, Cotinus coggygria, Biscutella laevigata, Ceterach officinarum, Festuca xanthina, Seseli rigidum, Campanula kladniana, Centaurea rhenana and Campanula divergens.*

Corresponding class in other classifications
European forest types 6.10.2 Mediterranean and Anatolian black pine forest

EU Habitats Directive Annex I
included in 9530 (Sub-) Mediterranean pine forests with endemic black pines

References
Papastergiadou, E. *et al*. (1997). Syntaxonomic Typology of Greek Habitats. *Folia Geobotanica & Phytotaxonomica* 32 (3): 335-341..

! **G3.6 Subalpine mediterranean *Pinus* woodland**

Description
Balkan endemic forests of *Pinus heldreichii* or *Pinus peuce*, restricted to the southern Balkans, Northern Greece and Southern Italy. Accompaning species are *Picea abies, Pinus sylvestris, Pinus mugo* with understory including *Juniperus sibirica, Vaccinium myrtillus, Calamagrostis arundinacea, Brachypodium pinnatum, Luzula luzuloides, Luzula sylvatica, Geranium macrorhizum*

Plant communities
Pinion peucis, Pinion heldreichii

Species
G3.61: *Pinus heldreichii, Pinus leucodermis, Brachypodium pinnatum, Festuca penzesii, Calamagrostis arundinacea, Orthilia secunda*. **G3.62:** *Pinus peuce, Vaccinium myrillus, Luzula sylvatica, Calamagrostis arundinacea, Pinus mugo*

Corresponding class in other classifications
European forest types 6.10.5 Alti-Mediterranean pine forest

EU Habitats Directive Annex I
95A0 High oro-Mediterranean pine forests

G3.7 Lowland to montane mediterranean *Pinus* woodland (excluding *Pinus nigra*)

G3.71 ***Maritime* Pinus pinaster *ssp.* atlantica *forests***

! G3.711 Charente *Pinus pinaster* ssp. *atlantica* - *Quercus ilex* forests

Description
Pinus pinaster ssp. *atlantica* forests with a subcanopy of *Quercus ilex* , *Arbutus unedo* and sometimes *Quercus pubescens* or *Quercus robur* and an undergrowth of *Rubia peregrina , Cistus salvifolius , Daphne gnidium* . The more acid stands have *Ulex europaeus , Cytisus scoparius* and *Erica scoparia* while calcareous stands have *Hedera helix* and *Ruscus aculeatus* . These forests occur on the mostly calcareous inner dunes of the coasts of Vendé, Charente-maritime and northern Gironde, including the islands of Noirmoutier, Yeu, Ré, and Oléron, in western France.

Plant communities
Junipero intermediae-Pinion catalaunicae, *Pino pinastri-Quercetum ilicis*

Species
Pinus pinaster ssp. *atlantica, Arbutus unedo, Quercus ilex, Q. pubescens, Q. robur, Rubia peregrina, Cistus salvifolius, Daphne gnidium*. Acidic stands- *Ulex europaeus, Cytisus scoparius, Erica scoparia*. Calcareous stands- *Hedera helix, Ruscus aculeatus*

Corresponding class in other classifications
European forest types 6.10.1 Thermophilous pine forest

EU Habitats Directive Annex I
included in 9540 Mediterranean pine forests with endemic Mesogean pines

! G3.712 Aquitanian *Pinus pinaster* ssp. *atlantica* - *Quercus suber* forests

Description
Pinus pinaster ssp. *atlantica* forests with a subcanopy of *Quercus suber* , *Arbutus unedo* and sometimes *Quercus robur* developed on acidocline inner dunes of the warmer, more humid coasts of the Marensin, between the Eyre and the Adour river mouths in southwest France.

Plant communities
Pino pinastri-Quercetum suberis

Species
Pinus pinaster ssp*. Atlantica, Erica cinerea, Pteridium aquilinum, Frangula alnus, Rubia peregrina.* In the more open stands- *Cistus salvifolius, Cytisus scoparius, Erica scoparia, Calluna vulgaris.* In more closed stands- *Hedera helix, Ruscus aculeatus, Ilex aquifolium*

Corresponding class in other classifications
European forest types 6.10.1 Thermophilous pine forest
EU Habitats Directive Annex I
included in 9540 Mediterranean pine forests with endemic Mesogean pines

! G3.714 Iberian *Pinus pinaster* ssp. *atlantica* forests

Description
Pinus pinaster ssp. *atlantica* forests of Galicia, Portugal and neighbouring areas.

Species
Pinus pinaster ssp. atlantica

Corresponding class in other classifications
European forest types 6.10.1 Thermophilous pine forest

EU Habitats Directive Annex I
included in 9540 Mediterranean pine forests with endemic Mesogean pines

! G3.72 *Pinus pinaster* ssp. *pinaster* (*Pinus mesogeensis*) forests

Description
Forests of *Pinus pinaster* ssp. *pinaster* (syn. *Pinus mesogeensis*) of the western Mediterranean, mostly in siliceous meso-Mediterranean, upper meso-Mediterranean and supra-Mediterranean regions of Spain, Portugal, Corsica, southeastern France, northwestern Italy, Sardinia and Pantelleria not on coastal dunes.

Plant communities

Junipero intermediae-Pinion catalaunicae

Species
Pinus pinaster. **G3.725:** *Arbutus unedo*, *Quercus ilex*, *Rosmarinus officinalis*, *Erica arborea*, *Genista corsica*, *Lavandula stoechas*, *Rubia peregrina*, *Calicotome spinosa*, *Pistacia lentiscus*, *Teucrium marum*

Corresponding class in other classifications
European forest types 6.10.1 Thermophilous pine forest

EU Habitats Directive Annex I
included in 9540 Mediterranean pine forests with endemic Mesogean pines

Associated Habitat types
Similar forests on coastal dunes are habitat type B1.71

! G3.73 *Pinus pinea* forests

Description
Mediterranean forests and old naturalised plantations of *Pinus pinea* not on coastal dunes. Ancient introductions in many areas often makes the distinction between spontaneous forests and long-established formations of anthropogenic origin difficult. These are thus included, while stands resulting from recent plantations are not.

Plant communities
Cisto-Lavanduletea, Quercion ilicis

Species
Pinus pinea

Corresponding class in other classifications
European forest types 6.10.1 Thermophilous pine forest

EU Habitats Directive Annex I
included into 9540: Mediterranean pine forests with endemic Mesogean pines

Associated Habitat types
Pinus pinea on coastal dunes are included in habitat type B1.71

G3.74 *Pinus halepensis* forests

! G3.741 Iberian *Pinus halepensis* forests

Description
Pinus halepensis forests of Spain, considered native for at least two-thirds of their considerable expanse; they are mostly restricted to eastern regions on the Mediterranean slope of the Catalonian mountains, the Maestrazgo, the pre-Baetic ranges of the upper Guadalquivir basin, the southern Andalusian mountains; they penetrate farther inland in the Ebro basin and around the headwaters of the Tagus and Guadalquivir systems. They appear to extend north along the coast of the French Golfe du Lion to the region of Agde.

Species

Pinus halepensis

Corresponding class in other classifications
European forest types 6.10.1 Thermophilous pine forest

EU Habitats Directive Annex I
included in 9540 Mediterranean pine forests with endemic Mesogean pines

! G3.742 Balearic *Pinus halepensis* forests

Description
Pinus halepensis formations of the Balearic islands, present and probably native on all the major islands.

Species
Pinus halepensis

Corresponding class in other classifications
European forest types 6.10.1 Thermophilous pine forest

EU Habitats Directive Annex I
included in 9540 Mediterranean pine forests with endemic Mesogean pines

! G3.743 Provenço-Ligurian *Pinus halepensis* forests

Description
Mostly lower meso-Mediterranean *Pinus halepensis* forests of Provence and of the lower slopes and coastlines of the Maritime and Ligurian Alps, extensive and undoubtedly native.

Species
Pinus halepensis

Corresponding class in other classifications
European forest types 6.10.1 Thermophilous pine forest

EU Habitats Directive Annex I
included in 9540 Mediterranean pine forests with endemic Mesogean pines

! G3.744 Corsican *Pinus halepensis* woods

Description
Rare and local *Pinus halepensis* woods of the Corsican coasts, some, at least, possibly natural.

Plant communities
Pistacio-Juniperetum macrocarpae

Species
Pinus halepensis

Corresponding class in other classifications

European forest types 6.10.1 Thermophilous pine forest

EU Habitats Directive Annex I
included in 9540 Mediterranean pine forests with endemic Mesogean pines

References
Gamisans, J (1991) La Végétation de la Corse. EdisudAix en Provence.

! G3.745 Sardinian *Pinus halepensis* woods

Description
Pinus halepensis formations of Sardinia, where certainly native woods occur on Isola di San Pietro and the Sulcis coast of Iglesiente.

Species
Pinus halepensis

Corresponding class in other classifications
European forest types 6.10.1 Thermophilous pine forest

EU Habitats Directive Annex I
included in 9540 Mediterranean pine forests with endemic Mesogean pines

! G3.746 Sicilian *Pinus halepensis* woods

Description
Pinus halepensis formations of Sicily and peripheral islands.

Species
Pinus halepensis

Corresponding class in other classifications
European forest types 6.10.1 Thermophilous pine forest

EU Habitats Directive Annex I
included in 9540 Mediterranean pine forests with endemic Mesogean pines

G3.747 Italic *Pinus halepensis* forests

! *G3.7471* *Gargano* Pinus halepensis *forests*

Description
Pinus halepensis forests of monte Gargano and the Tremiti islands (south-east Italy).

Species
Pinus halepensis

Corresponding class in other classifications
European forest types 6.10.1 Thermophilous pine forest

EU Habitats Directive Annex I

included in 9540 Mediterranean pine forests with endemic Mesogean pines

! *G3.7472* *Metapontine* Pinus halepensis *forests*

Description
Pinus halepensis forests of the Gulf of Taranto area, in particular of the Metapontine littoral (Southern Italy).

Species
Pinus halepensis

Corresponding class in other classifications
European forest types 6.10.1 Thermophilous pine forest

EU Habitats Directive Annex I
included in 9540 Mediterranean pine forests with endemic Mesogean pines

! *G3.7473* *Umbrian* Pinus halepensis *forests*

Description
Pinus halepensis forests of southern Umbria, in the Narni and Spoleto-Terni areas.

Species
Pinus halepensis

Corresponding class in other classifications
European forest types 6.10.1 Thermophilous pine forest

EU Habitats Directive Annex I
included in 9540 Mediterranean pine forests with endemic Mesogean pines

! G3.748 Hellenic *Pinus halepensis* forests

Description
Pinus halepensis formations of Greece, where the species is relatively widespread, particularly in Attica, Thessaly, the coasts of the Peloponnese and of central continental Greece, the Ionian islands, Chalcidici, the northern Sporades, Euboea and Skiros.

Species
Pinus halepensis

Corresponding class in other classifications
European forest types 6.10.1 Thermophilous pine forest

EU Habitats Directive Annex I
included in 9540 Mediterranean pine forests with endemic Mesogean pines

! G3.749 Illyrian *Pinus halepensis* forests

Description

Pinus halepensis forests and woods of the southern and central part of the meso-Mediterranean Orno-Quercetum illicis zone of the Balkan peninsula, extending in a narrow coastal and archipelagic band from the Gulf of Sarandë to northern Dalmatia.

Species
Pinus halepensis

Corresponding class in other classifications
European forest types 6.10.1 Thermophilous pine forest

EU Habitats Directive Annex I
included in 9540 Mediterranean pine forests with endemic Mesogean pines

! G3.74A East Mediterranean *Pinus halepensis* forests

Description

Forests of *Pinus halepensis* of the Mediterranean coastal regions of the Middle East. Extensive and varied in the southern part of the region, they are represented further north by isolated outposts in the coastal region of Syria and in south central Anatolia, where *Pinus halepensis* occurs in the thermo-Mediterranean zone of the Cilician plain, apparently mixed with *Pinus brutia* .

Species
Pinus halepensis

Corresponding class in other classifications
European forest types 6.10.1 Thermophilous pine forest
EU Habitats Directive Annex I
included in 9540 Mediterranean pine forests with endemic Mesogean pines

! ***G3.75*** **Pinus brutia *forests***

Description

Pinus brutia forests of Crete, the eastern Aegean islands, extreme southeastern continental Europe, Anatolia, Cyprus and the eastern Mediterranean coastal regions not on coastal dunes. Eastern vicariants of Aleppo pine forests (unit G3.74), they comprise, however, taller, more luxuriant, and often extensive, formations. Disjunct formations of this pine or of related species, described from Crimea and the Caucasian region (*Pinus pityusa , Pinus stankewiczii , Pinus eldarica*) are also included here.

Species
Pinus brutia

Corresponding class in other classifications
European forest types 6.10.1 Thermophilous pine forest

EU Habitats Directive Annex I
included in 9540 Mediterranean pine forests with endemic Mesogean pines

Associated Habitat types
Pinus brutia on coastal dunes are included in habitat type B1.71

! **G3.8 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. These forests, of which well-preserved examples have become rare, are the only habitat of Blue Chaffinch (*Fringilla teydea*), Tenerife Great Spotted Woodpecker (*Dendrocopos major canariensis*) and Gran Canaria Great Spotted Woodpecker (*Dendrocopos major thanneri*).

Plant communities

Cisto-Pinion canariensis

Species

Pinus canariensis, Chamaecytisus proliferus, *Adenocarpus foliolosus*, *Cistus symphytifolius*, *Lotus campylocladus*, *L. hillebrandii, L. spartioides*, *Daphne gnidium*, *Juniperus cedrus*, *Micromeria* spp.

Corresponding class in other classifications

European forest types 6.10.3 Canarian pine forest

EU Habitats Directive Annex I

9550: Canary Island endemic pine forests

! **G3.9 Coniferous woodland dominated by Cupressaceae or Taxaceae**

includes the following subtypes separately listed in or split unit from the 1998 version: G3.9C Cedrus woodland

Description

Woods dominated by *Cupressus sempervirens, Juniperus* spp. or *Taxus baccata* of the nemoral and Mediterranean mountains and hills.

Plant communities

Juniperion brevifoliae, Acero sempervirenti-Cupression sempervirentis, Oleo-Ceratonion siliquae, Quercion ilicis, Mayteno-Juniperion canariensis, Juniperion thuriferae, Periplocion angustifoliae, Juniperion excelsae, Fagion sylvaticae, Junipero excelsae-Quercion pubescentis, Quercetea pubescentis

Species

Abies nebrodensis, Anagyris latifolia, Arceuthobium azoricum, Argyranthemum lidii, Argyranthemum winteri, Astragalus maritimus, Bupleurum handiense, Centaurea attica ssp. megarensis, Cephalanthera cucullata, Cheirolophus duranii, Cheirolophus junonianus, Convolvulus lopez-socasi, Cupressus sempervirens, Cupressus sp., *Cypripedium calceolus, Cytisus aeolicus, Dendriopoterium pulidoi, Dorycnium spectabile, Dracaena draco, Erica scoparia ssp. azorica, Euphorbia lambii, Euphorbia stygiana, Frangula azorica, Fritillaria conica, Fritillaria obliqua, Galanthus nivalis, Jankaea heldreichii, Juniperus sp., Limonium arborescens, Limonium dendroides, Limonium sventenii, Ophrys argolica, Phoenix theophrasti, Picconia azorica, Prunus lusitanica ssp. azorica, Rumex azoricus, Ruscus aculeatus, Sideritis cystosiphon, Sideritis infernalis, Sideritis marmoreal, Sideroxylon marmulano, Solanum lidii, Taxus baccata, Teline salsoloides, Tetraclinis articulate, Zelkova abelicea*

Corresponding class in other classifications

Includes European forest types
6.10.7 Juniper forest
6.10.8 Cypress forest
6.10.9 Cedar forest
6.10.10 *Tetraclinis articulata* stands
6.10.11 Mediterranean yew stands

EU Habitats Directive Annex I
Includes
91J0 *Taxus baccata* woods of the British Isles
9290 *Cupressus* forests (*Acero-Cupression*)
9560 Endemic forests with *Juniperus* spp
9570 *Tetraclinis articulata* forests
9580 Mediterranean *Taxus baccata* woods
9590 *Cedrus brevifolia* forests (*Cedrosetum brevifoliae*)

! **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 of northern Europe.

Species
Betula pubescens, Picea sp.*, Pinus* sp. *Sphagnum* spp

Corresponding class in other classifications
European forest types 6.11.1 Conifer dominated or mixed mire forests

EU Habitats Directive Annex I
91D0: Bog woodland

! **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.

Plant communities
Sphagnion medii, Salicion cinereae, Piceion excelsae, Dicrano-Pinion, Sphagno-Betuletalia, Betulion pubescentis

Species

Corresponding class in other classifications
European forest types 6.11.1 Conifer dominated or mixed mire forests

EU Habitats Directive Annex I
91D0 Bog woodland

H Inland unvegetated or sparsely vegetated habitats

! 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 species poor, 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.

Plant communities

Species

Plants: bryophytes only (e.g. *Schistostega pennata*) and algal carpets at the entry of caves.

Animals: Very specialised and highly endemic cavernicolous fauna. It includes underground relic forms of a fauna which has been diversified outside. This fauna is mainly composed of invertebrates which exclusively live in caves and underground waters. The cavernicolous terrestrial invertebrates are mainly coleoptera, belonging to the *Bathysciinae* and *Trechinae* families in particular, which are carnivorous and have a very limited distribution. Cavernicolous aquatic invertebrates constitute a highly endemic fauna, dominated by crustaceans (*Isopoda*, *Amphipoda*, *Syncarida*, *Copepoda*) and include many living fossils. Aquatic molluscs, belonging to the *Hydrobiidae* family are also found. With regard to vertebrates, caves constitute hibernation sites for most European bat species, among which many are threatened and listed on Resulution 6. Caves also shelter some very rare amphibious species like *Proteus anguinus* and several species of the *Speleomantes* genus

EU Habitats Directive Annex I

8310 Caves not open to the public

H2 Screens

H2.6 Calcareous and ultra-basic screes of warm exposures

H2.61 Peri-Alpine thermophilous screes

! H2.613 Paris Basin screes

Description

Calcareous screes of the Paris basin and its periphery, with many rare or endemic plants including *Viola hispida* (listed on Resolution 6).

Plant communities

Leontodontion hyoseroidis

Species

Leontodon hyoseroides, Sisymbrium supinum, Linaria supina, Galeopsis angustifolia, Viola hispida), Galium timeroyi ssp. fleurotii, Iberis violetii, Iberis durandii, Biscutella neustriaca

EU Habitats Directive Annex I

Included in 8160 Medio-European calcareous scree of hill and montane levels

Associated Habitat types

References

X Habitat complexes

! X01 Estuaries

Description

Downstream part of a river valley, subject to the tide and extending from the limit of brackish waters. River estuaries are coastal inlets where there is generally a substantial freshwater influence. The mixing of freshwater and sea water and the reduced current flows in the shelter of the estuary lead to deposition of fine sediments, often forming extensive intertidal sand and mud flats. In addition to herbs, they can also be colonised by shrubs creating thickets (e.g. *Tamarix* spp.). Where the tidal currents are faster than flood tides, most sediments deposit to form a delta at the mouth of the estuary. Baltic river mouths, considered here to be an estuary subtype, have brackish water and no tide, with helophytic wetland vegetation and luxurious aquatic vegetation in shallow water areas. Littoral and sublittoral habitat types typical of estuaries are included in A2 and A5, although many other habitat types including tidal rivers may occur in estuaries. Includes Transitional waters as defined by the European Union's Water Framework Directive.

Species

Plants: Benthic algal communities, *Zostera* beds e.g. *Zostera noltii* (*Zosteretea*) or vegetation of brackish water: *Ruppia maritima* (= *R. rostellata* (*Ruppietea*)); *Spartina maritima* (*Spartinetea*); *Sarcocornia perennis* (*Arthrocnemetea*). Both species of fresh water and brackish water can be found in Baltic river mouths (*Carex* spp., *Myriophyllum* spp., *Phragmites australis*, *Potamogeton* spp., *Scirpus* spp.).
Animals: Invertebrate benthic communities; important feeding areas for many birds.

EU Habitats Directive Annex I
1130 Estuaries

! X02 Saline coastal lagoons

Description

Lagoons are expanses of shallow coastal salt water, of varying salinity and water volume, wholly or partially separated from the sea by sand banks or shingle, or, less frequently, by rocks. Salinity may vary from brackish water to hypersalinity depending on rainfall, evaporation and through the addition of fresh seawater from storms, temporary flooding of the sea in winter or tidal exchange. With or without vegetation of seagrasses or charophytes. Habitat types typical of lagoons are included in A5, although many other habitat types may also occur in lagoons.

EU Habitats Directive Annex I
1150 Coastal lagoons

! X03 Brackish coastal lagoons

Description

Lagoons are expanses of shallow coastal salt water, of varying salinity and water volume, wholly or partially separated from the sea by sand banks or shingle, or, less frequently, by rocks. Fully saline coastal lagoons are classified as X02.

Flads and gloes, considered a Baltic variety of lagoons, are small, usually shallow, more or less delimited water bodies still connected to the sea or cut off from the sea very recently by land upheaval. Characterised by well-developed reedbeds and luxuriant submerged vegetation and having several morphological and botanical development stages in the process whereby sea becomes land.

Mediterranean lagoons may host the Ruppietum community with halophytic vegetation, while at sites with a fresh water supply, plant communities of Juncetum and Phragmitetum can develop. Sarcocornia perennis and Arthrocnemum macrostachyum may occur here.

EU Habitats Directive Annex I
1150 Coastal lagoons

! X04 Raised bog complexes

Description

Raised bogs are highly oligotrophic, strongly acidic, domed peatlands, whose peat is composed mainly of sphagnum remains and whose surface derives moisture and nutrients only from rainfall.

Plant communities
Erico-Sphagnetalia magellanici, Scheuchzerietalia palustris p., Utricularietalia intermedio-minoris p., *Caricetalia fuscae* p

Species
Plants: Erico-Sphagnetalia magellanici- *Andromeda polifolia, Carex pauciflora, Cladonia* spp., *Drosera rotundifolia, Eriophorum vaginatum, Odontoschisma sphagni, Sphagnum magellanicum, S. imbricatum, S. fuscum, Vaccinium oxycoccos;* in the Boreal region also *Betula nana*, *Chamaedaphne calyculata, Calluna vulgaris, Ledum palustre* and *Sphagnum angustifolium.* Scheuchzerietalia palustris *p*., Utricularietalia intermedio-minoris *p*., Caricetalia fuscae *p.- Carex fusca, C. limosa, Drosera anglica, D. intermedia, Eriophorum gracile, Rhynchospora alba, R. fusca, Scheuchzeria palustris, Utricularia intermedia, U. minor, U. ochroleuca*; in the Boreal region also *Sphagnum balticum* and *S. majus*.
Animals: Dragonflies- *Leucorrhinia dubia, Aeshna subartica, A. caerulea, A. juncea, Somatochlora arctica, S. alpestris*; Butterflies- *Colias palaeno, Boloria aquilonaris, Coenonympha tullia, Vacciniina optilete, Hypenodes turfosalis, Eugraphe subrosea*; Spiders- *Pardosa sphagnicola, Glyphesis cottonae;* Ants- *Formica transkaucassia;* Cricket/Grasshopper- *Metrioptera brachyptera, Stethophyma grossum*.

EU Habitats Directive Annex I
7110 *Active raised bogs
7120 Degraded raised bogs still capable of natural regeneration

Associated Habitat types
Raised bog complexes may include elements of the main mire surface (D1.1) comprising a complex of low hummocks, small pools and their associated vegetation, together with larger pools (C1.46), a marginal lagg (C1.47), pre-woods (G5.64) and other associated habitat types.

! X18 Wooded steppe

Description

The transition zone between forests and the middle Eurasian, Irano-Anatolian or Saharo-Mediterranean steppes, occurring in a vast swath extending from Pannonia to the Far East, south of and inland from the boreal and nemoral forest belts, in regions of reduced summer humidity, as well as in areas adjacent to, or under the influence of the Mediterranean and warm-temperate humid zones, represented by a macromosaic of steppe and connected, contiguous, disjunct or widely spaced woodland stands, the latter usually with a very developed grassy understorey, or by a scattering of trees within a steppe environment. The forest elements are often located on porous or slightly raised ground, valley sides or slopes, the grasslands occupying less well drained soils and lower places. Component habitat types include those of E1.2 in combination with G1.7.

! X29 Salt lake islands

Description

Permanently or usually emergent features of inland saline lakes and of permanent or temporary saline lakes or ponds.

Plant communities

Species

Corresponding class in other classifications

EU Habitats Directive Annex I

Not present in the European Union

Associated Habitat types

References

! X35 Inland Sand Dunes

Description

Sand bodies of eolian origin, possessing constructional relief and separated from the coast and its dune cordons by nondunal habitats, developed within the boreal, nemoral, steppic, warm-temperate humid, mediterranean or subdesert steppe zones. The vegetation is a mosaic of grasslands, heaths and open areas which differs markedly from coastal sand dune communities. Desert sands are excluded. (Habitat type not yet incorporated into the EUNIS habitats classification)

EU Habitats Directive Annex I

Includes

2310 Dry sand heaths with *Calluna* and *Genista*

2320 Dry sand heaths with *Calluna* and *Empetrum nigrum*

2330 Inland dunes with open *Corynephorus* and *Agrostis grasslands*

2340*Pannonic inland dunes