CONVENTION ON THE CONSERVATION OF EUROPEAN WILDLIFE
AND NATURAL HABITATS

STANDING COMMITTEE

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Interpretation manual of the habitats listed in
Resolution No. 4 (1996) listing endangered natural habitats requiring specific
conservation measures

Fourth draft version 2019

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INTRODUCTION

Resolution No. 4 (1996) listing the habitat types to be protected by the Emerald network of Areas of Special Conservation Interest (ASCI’s) under the Bern 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 to the Convention on the conservation of European wildlife and natural habitats agreed in December 2010 to adopt a revised edition of Resolution No. 4 (1996) 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 revisions of Resolution No. 4 (1996), 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 relate to 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 No. 4 (1996) 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 website1 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 No. 4 (1996) habitat types and to ensure as much coherence in the interpretation of the habitat types between countries as possible.


Comments have been received from several sources, largely as a result of the first Emerald seminars held in 2011 (West Balkans), 2012 (Switzerland) and 2013 (Norway) and the ongoing Emerald pilot projects. The authors particularly thank Raymond Delarze, Elena Belonovskaya and Nikolay Sobolev for their assistance.

For some habitats the text has been revised and various errors have been corrected, particularly in the description and associated plant communities and species. The list of associated plant communities have been revised following Schaminée et al (2012). The layout has been slightly modified to ease use of the manual.

Further comments are welcome and will help to improve future editions of this manual.


After discussions at meetings of the Group of Experts on Protected Areas & Networks, the Standing Committee adopted a revised Annex I to Resolution No. 4 (1996) on 6 December 2014 (Council of Europe 2015). Most of the changes are additions and modifications to harmonise Resolution No. 4 (1996) with the list of habitats given in Annex I of the EU Habitats Directive and used for the selection of sites for the EU’s Natura 2000 network. At the same time two habitats proposed by Switzerland and one by Ukraine were also added. This third edition includes these new habitats; in some cases the changes mean an existing habitat has been replaced with a wider habitat type.

Further comments and corrections are welcome.

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Following discussions at meetings of the Group of Experts on Protected Areas & Networks, the Standing Committee adopted a revised Annex I to Resolution No. 4 (1996) on 27-30 November 2018 (Council of Europe (2018). This included four additional habitats, two proposed by Ukraine in 2018 and two proposed earlier by Switzerland. The Standing Committee also asked that two descriptions were modified to clarify that they cover habitats proposed by Ukraine.

Following the same process, in 2019, the Standing Committee adopted a revision as a consequence of Brexit negotiations, leading to an enforced harmonisation with annex I of the Habitats Directive, including 2 more additional marine habitats and a revision of the alpine and subalpine heath and scrub section.

Further comments are welcome and will help to improve future editions of this manual.
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 No. 4 (1996) are indicated with an exclamation mark (!) and highlighted in grey, e.g.

**A1.22 Mussels and fucoids on moderately exposed shores**

other habitat types are listed purely as headings, for example ‘A Marine habitats’ and ‘A1 Littoral rock and other hard substrata’ and help place the Emerald habitat types in the EUNIS classification system.

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; Mucina et al 2016). Plant communities are listed as an aid but it should be remembered that often a single plant community may occur in two or more EUNIS habitats and that there is no agreed synsystem for Europe with frequent differences of opinion.

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, especially for habitat types with a wide geographical range. The lists are largely based on the EUNIS database and in some cases species lists are only available for some subtypes.

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

The relationship between the Resolution No. 4 (1996) habitat type and those listed on Annex I of the EU Habitats Directive is indicated. Please note that in many cases the relationship between EUNIS and Annex I is complex and this information is only indicative. This is further complicated by the variation in national interpretations of the Annex I types (Evans 2010).

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


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* (A1.11), 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 (A1.112). 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*
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 lapillus* and a range of li ttorinids 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 li ttorinid 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.

**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

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### 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, Streblspio 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**


**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, Salsola daghestanica, Suaeda prostrata, Camphorosma songorica, Armeria vulgaris, Blysmus rufus, Carex marina, Carex salina, Gentianopsis detonsa, Glauk maritima, Imperata cylindrica, Limonium caspium, Scirpoides holoschoenus, Spergularia salina*

**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 maritimi)
- 1330 Atlantic salt meadows (Glauco-Puccinellietalia maritimi)
- 1410 Mediterranean salt meadows (Juncetalia maritimae)
- 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.

Mediterranean communities dominated by Posidonia oceanicae (Posidonion oceanicae) should be considered as A5.535 Posidonia beds, a subtype of !A5 Sublittoral sediment.

Plant communities
Zostera marinae

Species
Zostera sp.

EU Habitats Directive Annex I
1140 Mudflats and sandflats not covered by seawater at low tide
1160 Large shallow inlets and bays

References

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
Scirpus parvuli, Ruppion maritima

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*

**EU Habitats Directive Annex I**
Included in 1170 Reefs

### A3 Infralittoral rock and other hard substrata

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

**EU Habitats Directive Annex I**
1170 Reefs

8330 Submerged or partially submerged sea caves

### A4 Circalittoral rock and other hard substrata

Infralittoral 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 subtype 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**

1110 Sandbanks which are slightly covered by sea water all the time

1120 *Posidonia* beds (*Posidonion oceanicae*)

1170 Reefs

### A6 Deep-sea bed

**A6.1 Deep-sea rock and artificial hard substrata (but excluding A6.12 Deep sea artificial hard substrata)**

**Description**

Deep-sea benthic habitats with substrates predominantly of bedrock, immobile boulders or artificial hard substrates.

**EU Habitats Directive Annex I**

Included in
A6.6 Deep-sea bioherms

A6.61 - Communities of deep-sea corals

Description

The only community described is *Lophelia pertusa*, a cold water, reef-forming coral, which has a wide geographic distribution ranging from 55°S to 70°N, where water temperatures typically remain between 4-8°C. These reefs are generally subject to moderate current velocities (0.5 knots). The majority of records occur in the north-east Atlantic. The extent of *L. pertusa* reefs varies, with examples off Norway several km long and more than 20 m high. These reefs occur within a depth range of 200 - >2000 m on the continental slope, and in shallower waters in Norwegian fjords and Swedish west coast. In Norwegian waters, *L. pertusa* reefs occur on the shelf and shelf break off the western and northern parts on local elevations of the sea floor and on the edges of escarpments. The biological diversity of the reef community is approximately three times as high as the surrounding soft sediment (ICES, 2003), suggesting that these cold-water coral reefs may be biodiversity hotspots. Characteristic species include other hard corals, such as *Madrepora oculata* and *Solenosmilia variabilis*, the redfish *Sebastes viviparous* and the squat lobster *Munida sarsi*. *L. pertusa* reefs occur on hard substrata; this may be *Lophelia* rubble from an old colony or on glacial deposits. For this reason, *L. pertusa* reefs can be associated with iceberg plough-mark zones.

Species

*Lophelia pertusa*, *Madrepora oculata*, *Munida sarsi*, *Solenosmilia variabilis*

EU Habitats Directive Annex I

Included in

1170 Reefs

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

B1.1 Sand beach driftlines

Description
The lowest level of the supralittoral, just above the normal tide limit, where drift material accumulates and the sand may be rich in nitrogenous organic matter. Vegetation, if present at all, is very open and composed of annuals.

Plant communities
Atriplicion littoralis, Elymo littorei-Rumicion crisi, Cakilion edentulae, Atriplicion nudicaulis, Euphorbion peplidis, Cakilion euxinae, Salsolo kali-Honckenyon peploidis

Species
Atriplex spp., Cakile spp., Salsola kali, Polygonum spp

EU Habitats Directive Annex I
1210 Annual vegetation of drift lines
1640 Boreal Baltic sandy beaches with perennial vegetation

Associated Habitat types
Often found as a complex with other dune habitats such as B1.3 to B1.8 (all included in Resolution No. 4 (1996)).

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, Onono dono rosissimae-Polycarpion niveae, Agropyron juncei, Agropyro-Minuartion peploidis, Honckenyo-Elymion arenarii, Traganion moquinii, Elymion gigantei, Ammophilon arundinacea,

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 No. 4 (1996)).

**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**


**Species**


**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 No. 4 (1996)).

**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*, *Empetrian nigrì*, *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 No. 4 (1996)).

References


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-Lavanduletalia, Rosmarinetalia officinalis, Quercetalia 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-Lavanduletalia 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 No. 4 (1996)).

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
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 No. 4 (1996)).

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**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**

*Hyperico elodis*-Sparganion, *Presliion cervinae*, *Caricion davallianae*, *Caricion canescenti-fuscae*, *Potentillion anserinae*

**Species**

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

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**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**

*Plantagin-Festucion ovinae*

**EU Habitats Directive Annex I**

21A0 Machairs (* in Ireland)

**References**


**B2   Coastal shingle**

**B2.1 Shingle beach driftlines**

**Description**

The lowest level of the supralittoral, just above the normal tide limit, where drift material accumulates and the shingle may be rich in nitrogenous organic matter. Vegetation, if present at all, is very open and composed of annuals or, particularly by the Mediterranean, especially the east Mediterranean, of annuals and perennials, occupying accumulations of drift material and gravels rich in nitrogenous organic matter.

**Plant communities**

*Atriplicion littoralis, Cakilion edentulae, Elymo littorei-Rumicion crispi*

**Species**

*Cakile maritima, Salsola kali, Atriplex spp., Polygonum spp., Euphorbia peplis, Mertensia maritima*, and, particularly in Mediterranean formations, *Glaucium flavum, Matthiola sinuata, Matthiola tricuspidata, Euphorbia paralias, Eryngium maritimum*

**EU Habitats Directive Annex I**

Includes:

1210 Annual vegetation of drift lines
1610 Baltic esker islands with sandy, rocky and shingle beach vegetation and sublittoral vegetation

**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-Crambion maritimae*

**Species**

*Crambe maritima, Honkenya peploides, Lathyrus japonicus*
EU Habitats Directive Annex I

1220 Perennial vegetation of stony banks

B3  Rock cliffs, ledges and shores, including the supralittoral

B3.2  Unvegetated rock cliffs, ledges, shores and islets

| B3.24 Unvegetated Baltic rocky shores and cliffs |
| Description |
| Sea-cliffs, their faces and ledges, rocky shores and isolated seaside rocks of the Baltic Sea. |

EU Habitats Directive Annex I

Included in

1620 Boreal Baltic islets and small islands

| B3.3  Rock cliffs, ledges and shores, with angiosperms |
| Description |
| Sea-cliffs, or parts of sea-cliffs, and rocky shores colonized by disjunct assemblages of salt-tolerant crevice plants (chasmophytes) or by more or less closed salt-tolerant grasslands with associated terrestrial invertebrate and vertebrate faunal communities. |

Plant communities

_Anthyllidion barbae-jovis, Asplenion marini, Astragalion tragacanthae, Crithmion maritime, Crithmo-Daucion halophili, Crithmo-Limonion gracei, Crithmo-Staticion, Crucianellion rupestris, Dactylido hispanicae-Helichryson stoechadis, Elytrigio bessarabicae-Lactucion tataricae, Euphorbio azoricae-Festucion petraeae, Euphorbion pithyusae, Frankenio-Astydamion latifoliae, Helichryson obconico-devium, Kochio prostratae-Limonion meyeri, Launaeion cervicornis, Limonion anfracti-cancellati, |

Species

**B3.32:** Silene vulgaris ssp. maritima, Silene uniflora, Ligusticum scoticum, Armeria maritima, Odontites litoralis ssp. litoralis, Odontites litoralis ssp. fennica, Matricaria maritima, Senecio viscous

**B3.33:** Limonium spp. Silene sedoides, Frankenia hirsuta, Frankenia pulverulenta, Crithmum maritimum, Lotus cytisoides, Anthemis rigida, Bellium minutum, Catapodium marinum, Mesembryanthemum nodiflorum, Parapholis incurva, Phleum cryptoides, Phleum exaratum, Plantago weldenii, Psilurus incurvus, Sagina maritima, Sedum litoreum, Valantia muralis **B3.34:** Crithmum maritimum, Astydamia latifolia, Schizogyne sericea, Andryala glutinosa, Plantago coronopus, Tolpis fruticos, Aizoon canariense, Campylanthus salsoioides, Limonium pectinatum, Frankenia ericifolia, Reichardia ligulata, Argyranthemum frutescens, Lotus spp., Asplenium marinum.

EU Habitats Directive Annex I

Includes:

1230 Vegetated sea cliffs of the Atlantic and Baltic Coasts

1240 Vegetated sea cliffs of the Mediterranean coasts with endemic Limonium spp

1250 Vegetated sea cliffs with endemic flora of the Macaronesian coasts
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, Scorpido-Utricularion minoris, Oenanthion aquatica, Zannichellion pedicellatae, Parvopotamion, Potamion graminei, Nitellion syncarpae-tenuissimae, Sphagno-Utricularion, Ranunculion aquatilis, Hyperico elodis-Sparganion, Charion vulgaris, Potamion,

Species
Callitriche sp, Chara sp, Isoetes sp, Nitella sp, Potamogeton sp, Sparganium sp, Eleocharis quinqueflora, Eleocharis ovata

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: Stratioritetum 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: Spirodeto-Salvinietum natantis*

**Species**

*Salvinia natans*

**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**

<table>
<thead>
<tr>
<th><strong>C1.2416 Nelumbo nucifera beds</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Description</strong></td>
</tr>
<tr>
<td>Formations of <em>Nelumbo nucifera</em>, occurring in the Volga delta and from the south Caspian lowlands to the Far East, with a naturalised population in Romania.</td>
</tr>
</tbody>
</table>

**Plant communities**

*Nelumboion nuciferae*

**Species**

*Nelumbo nucifera*

**C1.24113 Transylvanian hot-spring lotus beds**

<table>
<thead>
<tr>
<th><strong>Description</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Formations of white lotus (<em>Nymphaea lotus</em>) of geothermal waters (unit C2.144) of Petea Lake, western Romania. Hungarian examples (e.g. Budapest) are introductions</td>
</tr>
</tbody>
</table>

**Species**

*Nymphaea lotus, Ceratophyllum demersum, Sparganium erectum ssp neglectum, Butomus umbellatus, Alisma plantago-aquatica, Phragmites australis*

**EU Habitats Directive Annex I**

Same as 31A0 Transylvanian hot-spring lotus beds

**References**


**C1.25 Charophyte submerged carpets in mesotrophic waterbodies**

<table>
<thead>
<tr>
<th><strong>Description</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Algal carpets dominated by Charophytes of the bottom of unpolluted, mesotrophic lakes and pools of the Palaearctic region.</td>
</tr>
</tbody>
</table>

**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

C1.32 Free-floating vegetation of eutrophic waterbodies

Description
Free-floating surface communities of more or less nutrient-rich waters.

Plant communities
Lemnion minoris, Hydrocharition morsus-ranae, Utricularion vulgaris

Species
Lemma minor, Spirodela polyrhiza, Wolffia arrhiza, Salvinia natans, Ceratophyllum submersum, Stratiotes aloides.

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

C1.33 Rooted submerged vegetation of eutrophic waterbodies

Description
Formations of water bodies constituted by submerged, rooted, perennial phanerogams with often emerging flower spikes, in particular entirely immersed pondweeds of genus Potamogeton.

Plant communities
Potamogetonion

Species
Myriophyllum spicatum, Myriophyllum verticillatum, Najas marina, Najas minor.

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

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 ololoeucos*

<table>
<thead>
<tr>
<th>C1.3413</th>
<th><em>Hottonia palustris</em> beds in shallow water</th>
</tr>
</thead>
</table>

**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

includes the following subtype separately listed in the 2010 edition:

C1.44 Charophyte submerged carpets in dystrophic waterbodies

**Description**

Lakes and pools with acidic waters of high humus content and often brown tinted (pH often 3-5).

**Plant communities**

*Nymphaeion albae, Potamogetonion, Sphagnion cuspidate, Sphagno-Utricularion.*

**Species**

**Plants**: *Utricularia* spp, *Rhynchospora alba, R. fusca, Sparganium minimum, Sphagnum* species. In the Boreal region also *Nuphar lutea, N. pumila, Carex lasiocarpa, C. rostrata, Nymphaea candida, Drepanocladium* spp., *Warnstorfa trichophylla, W. procera*.

**Animals**: Odonata (dragonflies and damselflies)

**EU Habitats Directive Annex I**

3160 Natural dystrophic lakes and ponds

**Associated Habitat types**

Often a component of bog landscapes such as X04 Raised bogs and D1.2 Blanket bog

### 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

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**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.

**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).

**EU Habitats Directive Annex I**

3180 Turloughs

**References**


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**C2 Surface running waters**

**C2.1 Springs, spring brooks and geysers**

**C2.111 Fennoscandian mineral-rich springs and springfens**

**Description**
Springs and springfens are characterized by continuous flow of groundwater. The water is cold, of even temperature, and rich in oxygen and minerals, due to the rapid percolation. Springs may have a basin where the water wells up and an adjacent outflow with typical vegetation. In springfens the water seeps up through the ground and the accumulated peat, enhancing the growth of specialised vegetation. Since the water originates from deeper layers, these springs often have running water during the winter even if the surrounding areas are frozen and snow-covered. The invertebrate fauna is often very specialised to this habitat and the flora rich in northern species.

**Species**


**Corresponding classes in other classifications**

Nordic Vegetation Classification 1994: 3.5.1.1 *Sphagnum - Drepanocladus* –type
3.5.1.2 *Montia fontana-Epilobiumhornemannii*-type
3.5.1.3 *Saxifraga stellaris-Philonotis fontana*-type
3.5.2.1 *Philonotis*-type
3.5.2.3 *Paludella*-type
3.4.3.2 *Filipendula ulmaria - Carex spp. - Drepanocladus spp. -Paludella squarrosa*-type

**EU Habitats Directive Annex I**

7160 Fennoscandian mineral-rich springs and springfens

**References**


**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**

*Cratoneuron commutati, Lycopodo-Cratoneuron commutati*

**Species**

*Arabis soyeri, Cochlearia pyrenaica* (in sites with heavy metals), *Pinguicula vulgaris, Saxifraga aizoides*. Mosses: *Catoscopium nigrum, 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 calcarca, Scorpidium revolvens, S.cossoni, Cratoneuron decipiens, Bryum pseudotriquetum*

**Corresponding class in other classifications**
EU Habitats Directive Annex I

Subtype C.121 Petrifying springs with tufa or travertine formations is 7220: Petrifying springs with tufa formation (Cratoneurion).

### C.2.18 Acid oligotrophic vegetation of spring brooks

**Description**

Submerged and floating aquatic plant (euhydrophyte) communities of Palaearctic streams poor in nutrients and in lime, with, in particular, *Myriophyllum alterniflorum, Potamogeton polygonifolius, Callitriche hamulata, Littorella uniflora, Juncus bulbosus, Scirpus fluviatilis* or acidophilous mosses and algae. In Iceland, *Montia fontana, Potamogeton filiformis, Ranunculus trichophyllus (Ranunculus confervoides, Ranunculus aquatilis var. diffusus)* and *Fontinalis antipyretica* characterize the community in clear, slowly flowing waters.

**Plant communities**

*Cardamino-Montion*

**Corresponding class in other classifications**

Milieux naturels de Suisse 2008: 1.3.3 Végétation des sources acides

EU Habitats Directive Annex I

Part of

3260 Water courses of plain to montane levels with *Ranunculion fluviatilis* and *Callitricho-Batrachion* vegetation

### C.2.19 Lime rich oligotrophic vegetation of spring brooks

**Description**

Submerged and floating aquatic plant (euhydrophyte) communities of Palaearctic streams poor in nutrients but rich in lime, characterized in particular by *Potamogeton coloratus* and *Chara hispida* or by tufa-forming mosses and algae.

**Plant communities**

*Ranunculion fluviatilis, Cratoneurion commutati*

**Corresponding class in other classifications**

Milieux naturels de Suisse 2008: 1.3.2 Végétation des sources alcalines

EU Habitats Directive Annex I

Part of

3260 Water courses of plain to montane levels with *Ranunculion fluviatilis* and *Callitricho-Batrachion* vegetation

### C.2.1A Mesotrophic vegetation of spring brooks

**Description**

Submerged and floating aquatic plant (euhydrophyte) communities of Palaearctic streams moderately rich in nutrients.

**Species**
Berula erecta (Sium erectum), Mentha aquatica f. submersa, Potamogeton perfoliatus, Potamogeton natans, Groenlandia densa, Ranunculus peltatus, Ranunculus penicillatus, Ranunculus trichophyllus, Ranunculus fluitans, Ranunculus aquatilis, Callitriche trunca, Callitriche stagnalis, Nymphaea alba, Myriophyllum spicatum

**Corresponding class in other classifications**

Milieux naturels de Suisse 2008: 1.3 Sources et suintements

**EU Habitats Directive Annex I**

Part of

3260 Water courses of plain to montane levels with *Ranunculus fluitans* and *Callitrichio-Batrachion* vegetation

<table>
<thead>
<tr>
<th><strong>C2.1B  Eutrophic vegetation of spring brooks</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Description</strong></td>
</tr>
<tr>
<td><strong>Species</strong></td>
</tr>
</tbody>
</table>

**Corresponding class in other classifications**

Milieux naturels de Suisse 2008: 1.3 Sources et suintements

**EU Habitats Directive Annex I**

Part of

3260 Water courses of plain to montane levels with *Ranunculus fluitans* and *Callitrichio-Batrachion* vegetation

<table>
<thead>
<tr>
<th><strong>C2.25 Acid oligotrophic vegetation of fast flowing streams</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Description</strong></td>
</tr>
</tbody>
</table>

**Plant communities**

*Batrachion fluitantis*

**Corresponding class in other classifications**

Milieux naturels de Suisse 2008: 1.2 Eaux courantes

**EU Habitats Directive Annex I**

Part of
3260 Water courses of plain to montane levels with *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation

### C2.26 Lime rich oligotrophic vegetation of fast flowing streams

**Description**

Submerged and floating aquatic plant (euhydrophyte) communities of Palaearctic streams poor in nutrients but rich in lime, characterized in particular by *Potamogeton coloratus* and *Chara hispida* or by tufa-forming mosses and algae.

**Plant communities**

*Batrachion fluitantis* (syn *Ranunculion fluitantis*, *Callitricho-Batrachion*)

**Corresponding class in other classifications**

Milieux naturels de Suisse 2008: 1.2 Eaux courantes

**EU Habitats Directive Annex I**

Included in

3260 Water courses of plain to montane levels with *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation

### C2.27 Mesotrophic vegetation of fast flowing streams

**Description**

Submerged and floating aquatic plant (euhydrophyte) communities of Palaearctic streams moderately rich in nutrients.

**Plant communities**

*Batrachion fluitantis* (syn *Ranunculion fluitantis*, *Callitricho-Batrachion*)

**Species**


**Corresponding class in other classifications**

Milieux naturels de Suisse 2008: 1.2 Eaux courantes

**EU Habitats Directive Annex I**

Included in

3260 Water courses of plain to montane levels with *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation

### C2.28 Eutrophic vegetation of fast flowing streams

**Description**

Submerged and floating aquatic plant (euhydrophyte) communities of Palaearctic streams rich in nutrients.

**Plant communities**

*Batrachion fluitantis* (syn *Ranunculion fluitantis*, *Callitricho-Batrachion*)
Species

- *Ranunculus fluitans*, *Ranunculus circinatus*, *Zannichellia palustris f. fluvialilis*, *Potamogeton nodosus*, *Potamogeton lucens*, *Potamogeton pectinatus*, *Potamogeton crispus*, *Sparganium emersum*, *Sagittaria sagittifolia*, *Callitriche obtusangula*, *Nuphar lutea* and the moss *Fontinalis antipyretica*

**Corresponding class in other classifications**

- Milieux naturels de Suisse 2008: 1.2 Eaux courantes

**EU Habitats Directive Annex I**

Included in

3260 Water courses of plain to montane levels with *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation

**C2.33 Mesotrophic vegetation of slow-flowing streams**

**Description**

Submerged and floating aquatic plant (euhydrophyte) communities of Palaearctic streams moderately rich in nutrients.

**Plant communities**

- *Batrachion fluitantis* (syn *Ranunculion fluitantis*, *Callitricho-Batrachion*), *Nymphaeion albae*, *Potamogetonion*

**Species**


**Corresponding class in other classifications**

- Milieux naturels de Suisse 2008: 1.2.1.1 Grands cours d'eau de plaine

**EU Habitats Directive Annex I**

Included in

3260 Water courses of plain to montane levels with *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation

**C2.34 Eutrophic vegetation of slow-flowing streams**

**Description**

Submerged and floating aquatic plant communities (euhydrophyte) of Palaearctic streams rich in nutrients.

**Plant communities**

- *Batrachion fluitantis* (syn *Ranunculion fluitantis*, *Callitricho-Batrachion*), *Nymphaeion albae*, *Potamogetonion*

**Species**
**C3 Littoral zone of inland surface waterbodies**

**C3.2 Water fringing reedbeds and tall helophytes other than canes**

**Description**

Water-fringing stands of tall vegetation by lakes (including brackish lakes), rivers and brooks, usually species-poor and often dominated by one species. Includes stands of *Carex* spp., *Cladium mariscus*, *Equisetum fluviatile*, *Glyceria maxima*, *Hippuris vulgaris*, *Phragmites australis*, *Sagittaria sagittifolia*, *Schoenoplectus* spp., *Sparganium* spp. and *Typha* spp. Excludes terrestrialized reed and sedge beds which are not at the water's edge (D5.1, D5.2).

**Plant communities**

*Deschampsion argenteae*, *Magno-Caricion gracilis*, *Magno-Caricion elatae*, *Eleocharito palustris-Sagittarion sagittifolii*, *Typhion laxmannii*, *Phalaridion arundinaceae*, *Scirpion maritimi*, *Carici-Rumicion hydrolapathi*, *Phragmition communis*

**Corresponding class in other classifications**

Milieux naturels de Suisse 2008: 2.1.2.1: Roselière lacustre

2.1.2.2: Roselière terrestre

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

**Description**

Includes isoetids of the shores of oligotrophic lakes, *Nasturtium aquaticum* by streams, mediterranean dwarf *Scirpus* swards, and other species-poor but dissimilar types of vegetation.

**Plant communities**

*Deschampsion litoralis*, *Littorellion uniflorae*, *Lobelion dortmannae*, *Rorippion islandicae*, *Subularion aquaticae*

**Corresponding class in other classifications**

Milieux naturels de Suisse 2008: 2.1 Rivages avec végétation

**EU Habitats Directive Annex I**

included in:

1150 Coastal lagoons

3110 Oligotrophic waters containing very few minerals of sandy plains (*Littorelletalia uniflorae*)
Oligothrophic waters containing very few minerals generally on sandy soils of the West Mediterranean, with *Isoetes* spp.

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

Mediterranean temporary ponds

**C3.5 Periodically inundated shores with pioneer and ephemeral vegetation**

<table>
<thead>
<tr>
<th><strong>C3.51 Euro-Siberian dwarf annual amphibious swards</strong></th>
<th>(but excluding C3.5131 Toad-rush swards)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Description</strong></td>
<td></td>
</tr>
<tr>
<td>Dwarf oligo-mesotrophic annual communities of recently emerged muds and sands of the nemoral, boreonemoral and boreal regions. Terrestrial forms of amphibious species and annual species are frequent. A dynamic habitat and several aspects can occur during the vegetation cycle. If the substrate is sufficiently wet, and also in advanced successional stages, the moss layer is abundant. Typical species are <em>Juncus bufonius</em>, <em>Cyperus fuscus</em>, <em>Cyperus flavescens</em> and other species from vegetation of class <em>Isoeto-Nanojuncetea</em>.</td>
<td></td>
</tr>
<tr>
<td><strong>Communities dominated by Juncus bufonius</strong> (C3.5131 Toad-rush swards) are not included.</td>
<td></td>
</tr>
<tr>
<td><strong>Plant communities</strong></td>
<td></td>
</tr>
<tr>
<td><em>Elatino macropodae-Damasonion alismatis, Eleocharition soloniensis, Nanocyperion, Radiolion linoidis, Verbenion supinae</em></td>
<td></td>
</tr>
<tr>
<td><strong>Species</strong></td>
<td></td>
</tr>
<tr>
<td><strong>C3.511: Eleocharis ovata, Eleocharis carniolica, Carex bohemica, Lindernia procumbens, Scirpus supinus, Limosella aquatica, Cyperus fuscus, Peplis portula, Juncus tenageia, Elatine hexandra, Elatine hydropiper, and Coleanthus subtilis</strong></td>
<td><strong>C3.512: Samolus valerandi, Centaurium littorale, Centaurium erythraea, Centaurium pulchellum, Gentianella amarella, Blackstonia perfoliata, Juncus bufonius</strong></td>
</tr>
<tr>
<td><strong>C3.513: Juncus bufonius, Scirpus setaceus, Cyperus flavescens, Centunculus minimus, Spergularia segetalis, Centaurium pulchellum, Blackstonia perfoliata, Samolus valerandi, Cicendia filiformis, Radiola linoides and Illecebrum verticillatum</strong></td>
<td></td>
</tr>
</tbody>
</table>

**Corresponding class in other classifications**

Milieux naturels de Suisse 2008: 2.5.1 Végétation de petites annuelles éphémères

**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**

Calamagrostion neglectae, Calamagrostion pseudophragmitis, Epilobion fleischeri, Euphorbion rigidae, Festucion duriotaganae, Glaucion flavi, Muerbeckiello huetii-Epilobion dodonaei, Scrophularion sciophila

**Species**

Myricaria germanica, Glaucium flavum, Oenothera biennis, Salix elaeagnos, Elymus fibrosus, Elymus transbaicalensis, Elymus kronokensis ssp. subalpinus, Cotoneaster cinnabarinus, Papaver lapponicum

**Corresponding class in other classifications**

Milieux naturels de Suisse 2008: 3.2.1.1 Alluvions avec végétation pionnière herbacée

**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

Ericion tetralicis, Oxyccoo-Ericion tetralicis

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 daceae-Plantaginetum gentianoidis, Carici nigrae-Sphagnetum balkanicum, Carici echinatae-Sphagnetum, Junco-Caricetum fuscae, Sphagno-Caricetum rostratae, Carici-Sphagnetum droseretosum

Species
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 No. 4 (1996):

**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**

*Caricion canescenti-fuscae, Sphagno-Caricion canescents, Caricion lasiocarpace, Rhynchosporion albae*

**Species**


**Corresponding class in other classifications**

Milieux naturels de Suisse 2008: 2.2.4 Carixaie de transition

**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.

**Plant communities**

*Oxyocooco microcarpi-Empetrion hermaphroditae*

**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.

**Plant communities**

Oxycocco microcarpi-Empetrion hermaphroditii, Sphagnion medii

**Species**

*Plants:* Chamaedaphne calyculata, Empetrum nigrum (s.lato), Betula nana, Thricophorum cespitosum, Eriophorum vaginatum, E. russeolum, Carex rostrata, C. lasiocarpa, C. rotundata, C. chordorrhiza, 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, Warnstorffia exannulata (Drepanoclados exannulatus), Limprichtia revolvens (Drepanoclados revolvens), Drepanoclados (s.lato) spp., Scorpidium scorpioides.


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.

**Plant communities**

Oxycocco microcarpi-Empetrion hermaphroditii

**Species**


EU Habitats Directive Annex I

Not present in EU28
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


Corresponding class in other classifications

Milieux naturels de Suisse 2008: 2.2.3 Parvocariçaie neutro-basophile

EU Habitats Directive Annex I

7230: Alkaline fens

References


D4.2 Basic mountain flushes and streamsides, with a rich arctic-montane flora

Description

Rare Alpine, peri-Alpine, northern British and periartctic 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

**Corresponding class in other classifications**

Milieux naturels de Suisse 2008: 2.2.5 Groupement pionnier des bords de torrents alpins

**EU Habitats Directive Annex I**

7240: Alpine pioneer formations of the Caricion bicoloris-atrofuscae

**References**


**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**

*Magno-Caricion elatae, Magno-Caricion gracilis, Carici-Rumicion hydrolapathi, Scrophulario umbrosae-Caricion paniculatae, Caricion broterianae, Caricion microcarpae, Deschampsion argenteae*

**Species**

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

**Corresponding class in other classifications**

Milieux naturels de Suisse 2008: 2.2.1.1 Magnocariçaie

2.2.1.2 Formation à marisque

**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 maritima, 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

| D6.23 Interior Iberian salt pan meadows |

**Description**

Salt meadows peculiar to the lowest, wettest parts of interior Iberian depressions, dominated by Puccinellia fasciculata or Aeluropus littoralis in the very lowest areas, or, slightly higher, by Juncus gerardi. The higher, drier ground that surrounds them is occupied either by other salt meadow communities that are less differentiated from the coastal communities (units A2.522 and A2.532) or by salt scrubs (unit F6.83).

**Plant communities**

Lygeo-Lepidion cardaminis, Lygeo sparti-Limonion furfuracei, Limonion catalaunico-vicosoi, Meliloto dentati-Bolboschoenion maritime,

**EU Habitats Directive Annex I**

Included in

1410 Mediterranean salt meadows (Juncetalia maritimi)
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

includes the following subtype separately listed in or split units from the 2010 version:

E1.112 Sempervium or Jovibarba communities on rock debris

Description

Open lowland and hill rock debris swards of suboceanic, temperate, boreal or sub-Mediterranean, climates of Western Europe and of Central Europe, east, sporadically, to the Baltic countries and the Black Sea, formed mostly by annuals and succulents or semisucculents on decomposed rock surfaces of edges, ledges or knolls, with calcareous or siliceous soils frequently disturbed by erosion or rabbits. Vegetation communities are of Alysso-Sedion albi and Seslerio-Festucion pallentis. These swards comprise a great variety of distinct and often very local, isolated communities harbouring many characteristic species like Erophila verna, Jovibarba globifera ssp. glabrescens, Poa bulbosa, Sedum acre, Sedum album, Sedum sexangulare, among which are numerous rare forms including both relict and evolutionarily recent taxa. Together with more developed grassland communities of unit E1.29, sometimes E1.21-E1.25, E1.27, or E1.281, very species poor communities of units H3.19 or H3.2B, and lacunar shrub formations of unit F3.1, they constitute the vascular vegetation of middle European inland cliffs and rock outcroppings of unit H3 (namely H3.1B, H3.1C and H3.2E).

Plant communities

Alysso alyssoidis-Sedion albi, Sedo-Scleranthion biennis, Hyperico perforati-Scleranthion perennis, Sedion anglici, Sedo albi-Veronica dillenii

Species

Alyssum alyssoides, Arabis recta, Cerastium spp., Hormungia petraea, Jovibarba spp., Poa badensis, Saxifraga tridactylites, Sedum spp., Sempervium spp., Teucrium botrys

Corresponding class in other classifications

Milieux naturels de Suisse 2008: 4.1.1 Végétation des dalles calcaires de basse altitude
Nordic Vegetation Classification 1994: 5.2.1.1b Dry meadow type on bedrocks, northern variant

5.1.5.1 Bedrock alvar type

5.2.1.1a Dry meadow type on bedrocks, poor variant

5.2.1.1 Dry meadow type on bedrocks

EU Habitats Directive Annex I

6110: Rupicolous calcareous or basophilic grasslands of the Alysso-Sedion albi

E1.12 Euro-Siberian pioneer calcareous sand swards

Description

Open grasslands of strongly to slightly calcareous inland sands of Western Europe and of middle, western and northern Central Europe, locally to Slovakia, the Baltic States and Belarus, sometimes interspersed with annual formations with Cerastium semidecandrum, Vicia lathyroides, Silene conica, Phleum arenarium, Petrorhagia prolifera, Arenaria serpyllifolia, Sedum acre. Dunal equivalent formations are found in unit H5.
Plant communities

*Koelerion glaucae, Sileno conicae-Cerastion semidecandri, Sedo-Cerastion*

Species

*Helichrysum arenarium, Silene otites, Silene chlorantha, Dianthus deltoides, Dianthus arenarius, Bromus tectorum, Cynodon dactylon, Gypsophila fastigiata ssp. arenaria, Astragalus arenarius, Androsace septentrionalis, Onosma arenaria, Jurinea cyanoides, Koeleria glauca, Koeleria macrantha, Festuca psammophila, Festuca polesia*, Festuca duvalii, *Poa bulbosa, Colchicum arenarium, Stipa borystenhica ssp. germanica*

**Corresponding class in other classifications**

Milieux naturels de Suisse 2008: 4.1.1 Végétation des dalles calcaires de basse altitude

Nordic Vegetation Classification 1994: 5.1.4.1 *Koeleria glauca* type

EU Habitats Directive Annex I

Same as

6120 Xeric sand calcareous grasslands

### E1.13 Continental dry rocky steppic grasslands and dwarf scrub on chalk outcrops

**Description**

Communities of chamaephytes on cretaceous outcrops in the steppe and southern forest-steppe zones in the Don and (probably) Volga basins. A mix of the species of continental steppes is typical. The community is usually open, and plant cover varies from 30-70% with several threatened plant species.

**Plant communities**

*Artemisio hololeucae-Hyssopion cretacei, Euphorbio cretophilae-Thymion cretacei*

**Species**

*Androsace koso-poljanskii, Artemisia hololeuca, Thymus cretaceus, Helianthemum cretophilum, Jurinea brachycephala, Gypsophila oligosperma, Asperula tephrocarpa, Euphorbia cretophila, Helianthemum creteceum, Hyssopus cretaceus Astragalus tanaiticus, Daphne Sophia, Erysimum ucrainicum, Genista tanaitaica, Hedysarum creteceum, Hedysarum ucrainicum, Onobrychis vassilczenkoi, Pinus creteceae, Scrophularia creteceae, Silene creteceae*

**EU Habitats Directive Annex I**

Does not occur in the EU

**References**


### 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 valesiaca*, *Helictotricho-Stipetalia*, *Koelerio-Phleetalia phleoidis*, *Scorzonero-Chrysopogonetalia*, *Seslerietalia rigidae*, *Stipo pulcherrimae-Festucetalia pallentis*

Species

*Artemisia lacinia*, *Artemisia oelandica*, *Artemisia pancicii*, *Astragalus centralpinus*, *Biscutella neustriaca*, *Cypripedium calceolus*, *Dianthus arenarius ssp. arenarius*, *Dracocephalum austriacum*, *Euphrasia marchesetia*, *Geniana anglica*, *Jurinea cyanoides*, *Lilium pomponium*, *Pulsatilla patens*, *Pulsatilla vulgaris ssp. gotlandica*, *Senecio jacobaea ssp. gotlandicus*, *Stipa bavarica*, *Stipa styriaca*, *Theesium ebracteatum*, *Allium savranicum*, *Althaea officinalis*, *Arisaema triphyllum*, *Asphodelus microcarpus*, *Bellevalia sarmatica*, *Bulbocodium versicolor*, *Crambe grandiflora*, *Diplotaxis cretacea*, *Paeonia tenuifolia*, *Tulipa schrenkii*, *Cotoneastrum alaunicus*, *Papaver bracteatum*, *Potentilla eversmanniana*, *Rosa donetzica"

**Corresponding class in other classifications**

Milieux naturels de Suisse 2008: 4.2 Pelouses sèches thermophiles

**EU Habitats Directive Annex I**

6190 Rupicoliouls 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

<table>
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<tr>
<th>E1.3 Mediterranean xeric grassland</th>
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**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*, *Moricando-Lygeion sparti*, *Dauco-Catananchion luteae*, *Sedo-Ctenopsion gypsophilae*, *Trachynion distachyae*, *Thero-Brachypodion*, *Armerion girardi*, *Omphalodion commutatae*, *Stipion retortae*

**Species**

*Brachypodium distachyum*, *B. retusum*, *B. fasciculatus*, *B. madritensis*, *B. rubens*, *B. alopecurus*, *Aegilops neglecta*, *A. geniculata*, *A. triuncialis*, *Avena sterilis*, *Lagurus ovatus*, *Cynosurus echinatus*, *Stipa capensis*, *Hyparrhenia hirta*, *Andropogon distichos*, *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
**E1.55 Eastern sub-Mediterranean dry grassland**

**Description**

Open, xeric grasslands on carbonate rocks or flysch of the sub-Mediterranean zones of Trieste, Istria, the Balkan peninsula and of the *Ostryo-Carpinion* zone of Greece, where they coexist with steppic grasslands of the *Festucetalia valesiaceae* (unit E1.21), developing in areas of lesser continentality than the latter, and incorporating a greater Mediterranean element than they do; like the steppic grasslands, however, they are often dominated by *Carex humilis* or *Festuca rupicola*. Maintained by extensive mowing or grazing, they are invaded by tall herbs after abandonment.

**Plant communities**

*Chrysopogono-Saturejion subspicatae, Scorzonerion villosae*

**Species**


**EU Habitats Directive Annex I**

62A0 Eastern sub-mediterranean dry grasslands (*Scorzoneratalia villosae*)

**References**

Terzi, Massimo. (2014) Numerical Analysis of the Order *Scorzoneratalia villosae* Phytocoenologia. 44(3-4), 3-4

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**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*.

Does not include subalpine and alpine *Nardus stricta* communities (*Nardion strictae*) which are included in E4.3 Acid alpine and subalpine grassland.

**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, Siegingia 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**

Nordic Vegetation Classification 1994: 5.1.3.3 Mat grass heath type

Milieux naturels de Suisse 2008: 5.4.1 Lande subatlantique acidophile
EU Habitats Directive Annex I

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

### E1.722 Boreo-arctic Agrostis-Festuca grasslands

**Description**

Grasslands of subarctic affinities of the northern boreal and middle boreal zones of northern Scandinavia and northwestern Russia, of the alpine and arcto-alpine zones of the Caledonian chains of Scandinavia and of lowlands and hills of Iceland, composed of Festuca spp., Agrostis capillaris, with Anthoxanthum odoratum, other grass species, often with Polygonum viviparum and other herbs.

**Plant communities**

*Potentillo-Polygonion vivipara*

**Corresponding class in other classifications**

Nordic Vegetation Classification 1994: 5.1.3.2 Common Bent heath type

- 5.2.1.2 Sheep's Fescue dry meadow type
- 5.2.1.3a Dry meadow type rich in herbs, poor Red Fescue variant
- 5.2.2.2 Common Bent meadow type
- 5.2.2.5 Northern Sheep's Fescue meadow type
- 5.2.2.6 Northern Red Fescue meadow type

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Included in

6270 Fennoscandian lowland species-rich dry to mesic grasslands

### 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*

### E1.9 Open non-Mediterranean dry acid and neutral grassland, including inland dune grassland

**Description**

Open grassland, often with therophytes, of the nemoral, boreonemoral and submediterranean zones, developed on raw non-calcareous soils, especially on inland dunes and fixed sands.
Plant communities

Armerion elongatae, Armerion junceae, Armerio-Potentillion, Corynephorion canescents, Diantho-Pinusii-Jasionion heldreichii, Hyperico perforati-Scleranthion perennis, Koelerion glaucae Sedo-Cerastion arvensis, Sedo albi-Veronicion dillenii, Sedion pyrenaici, Sedo-Scleranthion, Scabioso-Trifolion dalmatici, Sileno conicae-Cerastion semidecandri, Thero-Airion

Species


E1.92: Agrostis capillaris, Agrostis vinealis, Agrostis delicatula, Agrostis durieui, Agrostis castellana, Poa angustifolia, Anthoxanthum odoratum, Festuca filiformis, Corynephorus canescens, Calamagrostis epigejos, Carex arenaria E1.93: Corynephorus canescens, sometimes by Leymus arenarius or Carex arenaria E1.94: Corynephorus canescens, Carex arenaria, Spergula morisonii, Teesdalia nudicaulis and carpets of fruticose lichens (Cladonia, Cetraria) E1.99: Corynephorus canescens, Festuca vaginata, Koeleria glauca, Thymus serpyllum and Ceratodon purpureus

EU Habitats Directive Annex I

Includes

2330 Inland dunes with open Corynephorus and Agrostis grasslands
2340 Pannonic inland dunes

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, Thlaspi rotundifolii

Species

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

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6130 Calaminarian grasslands of the Violetalia calaminariae
E2  Mesic grasslands

E2.1 Permanent mesotrophic pastures and aftermath-grazed meadows

E2.15 Macaronesian mesic grassland

Description
Secondary grasslands of the highest levels of the Atlantic islands.

Plant communities
Festucion francoi

Species
Holcus rigidus, Festuca jubata, Deschampsia foliosa, Ranunculus cortusifolius, Rumex azorica, Cardamine caldeirarum, Dryopteris azorica, D. crispifolia, Euphrasia grandiflora, Lactuca watsoniana, Senecio malvifolius, Tolpis azorica, Bellis azorica, Sanicula azorica, Ammi spp.

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6180 Macaronesian mesophile grasslands

E2.2 Low and medium altitude hay meadows

Includes the following subtypes separately listed in the 1998 version
E2.25 Continental meadows

Description
Mesotrophic hay meadows of low altitudes of Europe, fertilised and well-drained. They are most characteristic of the nemoral and boreonemoral zones of Europe, but extend to the Cordillera Central, the Apennines and the supra-Mediterranean zone of the Balkan peninsula and Greece.

Plant communities
Arrhenatherion elatioris, Brachypodio-Centaureion nemoralis, Calthion palustris, Conioselinion tatarici, Cynosurion cristati, Deschampsion cespitosae, Glycyrrhizion echinatae, Glycyrrhizion glabrae, Glycyrrhizion korshinskyi, Molinion caeruleae, Ranunculo neapolitani-Arrhenatherion elatioris, Rumicion thyrsiflori

Species
Arrhenatherum elatius, Alchemilla xanthochlora, Alopecurus pratensis, Anthriscus sylvestris, Arrhenatherum elatius, Bromus erectus, Campanula patula, Crepis biennis, Crepis biennis, Dactylis glomerata, Daucus carota, Equisetum arvense, Festuca rubra, Galium album, Geranium pratense, Heracleum sphondylium, Knautia arvensis, Leucanthemum vulgare, Medicago sativa, Pastinaca sativa, Picris hieracioides, Pimpinella major, Sanguisorba officinalis, Trifolium dubium, Trisetum flavescens

Corresponding class in other classifications
Milieux naturels de Suisse 2008: 4.5.1 Prairie de fauche de basse altitude

EU Habitats Directive Annex I
Includes
6270 Fennoscandian lowland species-rich dry to mesic grasslands
6510 Lowland hay meadows (Alopecurus pratensis, Sanguisorba officinalis)
E2.3 Mountain hay meadows

Description

Often species-rich mesotrophic to eutrophic hay meadows of the montane and subalpine levels of higher mountains of the nemoral and southern boreal zones.

Plant communities

Calthion palustris, Pancicion serbicae, Phyteum-Trisetion flavescentis, Polygonion krascheninnikovii, Triseto flavescentis-Polygonion bistortae, Violion cornutae

Species


Corresponding class in other classifications

Milieux naturels de Suisse 2008: 4.5.2 Prairie de fauche de montagne

EU Habitats Directive Annex I

Includes

6520 Mountain hay meadows

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 Seraplas 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, Sieglingion decumbentis

Species


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6420: Mediterranean tall humid grasslands of the Molinio-Holoschoenion
E3.3 Sub-mediterranean humid meadows

Description

Humid meadows rich in clover (Trifolium spp.) of sub- and supramediterranean regions remote from Atlantic influence, in particular, of the Balkan peninsula, of the Apennines and of Mediterranean Anatolia, mostly developed above the lowlands but below the montane level.

Plant communities

Molinio-Hordeion secalini, Ranunculion velutini, Trifolion resupinati, Trifolion pallidi

Species

**E3.31**: Alopecurus pratensis, Alopecurus rendlei (Alopecurus utriculatus), Festuca pratensis (Festuca elatior) or Poa trivialis ssp. sylvicola (Poa sylvicola), and by numerous Trifolium spp., Medicago hispida ssp. apiculata, Lotus corniculatus var. hirsutus, Hordeum murinum, Ranunculus marginatus, Ranunculus velutinus, Cirsium canum var. macedonicum, Oenanthe stenoloba, Moenchia mantica, Lychnis flos-cuculi ssp. subintegra, Teucrium scordioides, Podospermum canum, Narcissus poeticus, Leucojum aestivum

**E3.32**: Ranunculus velutinus, Bromus racemosus, Hordeum secalinum, Trifolium dubium, Trifolium resupinatum, Trifolium micranthum, Trifolium patens, Trifolium fragiferum, Trifolium pratense, Trifolium repens, Carex distans, Deschampsia cespitosa, Gaudinia fragilis, Ophioglossum vulgatum, Centaurea jacea, Holcus lanatus, Alopecurus rendlei (Alopecurus utriculatus), Orchis laxiflora, Colchicum lusitanum

**E3.34**: Deschampsia cespitosa, Alopecurus pratensis or Poa trivialis ssp. sylvicola, with Trifolium pallidum, Trifolium patens, Trifolium fragiferum, Trifolium cinctum, Ranunculus stevenii, Lathyrus nissolia, Medicago arabica, Clematis integrifolia.

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Includes 6540 Sub-Mediterranean grasslands of the Molinio-Hordeion secalini

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

Glycyrrhizion glabrae, Calthion palustris, Deschampsion cespitosa, Juncion acutiflori, Cnidion venosi; Agropyro-Rumicion, Molinia caeruleae, Arrhenatherion, Alopecurion pratensis, Filipendulion.

Species


**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

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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*


**Corresponding class in other classifications**

Milieux naturels de Suisse 2008: 2.3.1 prairie à molinie

**EU Habitats Directive Annex I**

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

**E4 Alpine and subalpine grasslands**

**E4.1 Vegetated snow-patch**

**E4.11 Boreo-alpine acidocline snow-patch grassland and herb habitats**

Description

Snow patches of the Alps, the Pyrenees, the Carpathians (e.g. alliances *Salicion herbaceae* and *Festucion picturatae*), the Dinarides, the Rhodope Mountains (Rila) and the Pelagonides, occupying areas free from snow for less than two months, with the herbs e.g. *Luzula alpinopilosa, Salix herbacea, Ligusticum mutellina*; mosses *Polytrichum sexangulare, Polytrichum juniperinum, Pohlia commutata, Kiaeria falcata* (*Dicranum falcatum*), the liverwort *Anthelia juratzkana* or sometimes lichens. Also snow-patch communities of arctic and boreal mountains of Fennoscandia, the Scottish Highlands, Iceland, Greenland and other islands of the Norwegian and Greenland seas, formed of mats of mosses and lichens.

**Plant communities**

*Salicion herbaceae, Salici herbaceae-Caricion lachenalii, Festucion picturatae, Ranunculion crenati, Hyalopoion ponticae, Cassiopo-Salicion herbaceae*

**Species**

**4.111**: *Polytrichum sexangulare, Polytrichum juniperinum, Pohlia commutata, Kiaeria falcata* (*Dicranum falcatum*), the liverwort *Anthelia juratzkana 4.112*: *Carex foetida, Alopecurus gerardii, Omalotheca supina* (*Gnaphalium supinum*) (including *Omalotheca supina var. pusilla*), *Lepidium stylatum, Alchemilla pentaphyllea, Mucizonia sedoides, (Umbilicus sedoides, Sedum candollei), Sedum
alpestre, Cardamine alpina, Carex pyrenaica 4.113: Luzula alpinopilosa ssp. obscura (Luzula spadicea) Poa granitica, Ranunculus montanus, Oligotrichum hercynicum E4.114: Nardus stricta, Omalotheca supina (Gnaphalium supinum), Plantago atrata, Salix herbacea, Polytrichum gracile, Polytrichum norvegicum, Luzula desvauxii E4.116: Deschampsia cespitosa

Corresponding class in other classifications

Milieux naturels de Suisse 2008: 4.4.2 Combe à neige acide

Nordic Vegetation Classification 1994: 1.2.1.4 Wavy Hairgrass - Sweet Vernal grass type
1.2.3.1 Meadow Buttercup - Sweet Vernal grass variant
1.2.3.2 Starry Saxifrage - Mountain Sorrel type
1.2.5.1 Alpine Lady fern type
1.3.1.1 Mossy Mountain heather – Dwarf willow type
1.3.1.2 Rufine Sedge - Arctic Hare's-foot Sedge type
1.3.1.3 Curved Woodrush-Glacier Buttercup type

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Included in 6150 Siliceous alpine and boreal grasslands

E4.12 Boreo-alpine calcicline snow-patch grassland and herb habitats

Description

Herbaceous snow-patch swards of the Alpids, characteristic of calcareous soils under snow for long periods, with Arabis caerulea, Carex atrata, Ranunculus alpestris, Saxifraga androsacea and other calciphile snowfield, snowbed and snow-patch communities of boreal and arcto-alpine mountains formed by small herbs, grasses or mosses. Dwarf, underground-stemmed willows may also be present but not dominant (c.f. unit F2.12).

Plant communities

Arabidion caeruleae, Ranunculo-Oxyrion didynae

Species


Corresponding class in other classifications

Milieux naturels de Suisse 2008: 4.4.1 Combe à neige calcaire
Nordic Vegetation Classification 1994: 1.2.4.1 Low herb type

1.2.4.3 Meadow Buttercup - Alpine Meadow grass type
1.2.4.4 Purple Saxifrage - Mountain Sorrel type
1.3.2.1a Distichium capillaceum-variant
1.3.2.2 Snow Buttercup type
1.3.2.3 Snow grass type
1.3.3.1 Arctic Woodrush type

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Included in 6170 Alpine and subalpine calcareous grasslands

### E4.3 Acid alpine and subalpine grassland

**Description**

Alpine and subalpine grasslands developed over crystalline rocks and other lime-deficient substrates or on decalcified soils of mountains. On boreal mountains, *Carex bigelowii* and *Juncus tridicus* often dominate. The acid alpine grasslands of central Europe are more mixed, with *Armeria alpina*, *Armeria alliacea* (*Armeria montana*), *Euphrasia minima*, *Gentiana alpina*, *Geum montanum*, *Juncus tridicus*, *Lychnis alpina*, *Pedicularis pyrenaica*, *Phyteuma hemisphaericum*, *Pulsatilla alpina ssp. sulphurea*, *Ranunculus pyreneaue*, *Sempervivum montanum*, *Botrychium lunaria*.

**Plant communities**


**Species**

lutea, Gentiana punctata, Viola rhodopeia E4.3B: Minuartia recurva and Scleranthus neglectus, Armeria rumelica, Poa violacea, Cardamine paniculii, Luzula campestris, Juncus trifidus, Anthemis carpatica, Jasione orbiculata, Rumex acetosella, Plantago carinata, Campanula scheuchzeri

**Corresponding class in other classifications**

Milieux naturels de Suisse 2008: 4.3.5 Pâturage maigre acide
4.3.6 Pelouse rocheuse acide
4.3.7 Pelouse acide de l'étage alpin supérieur

**EU Habitats Directive Annex I**

Includes

6140 Siliceous Pyrenean *Festuca eskia* grasslands
6150 Siliceous alpine and boreal grasslands
6160 Oro-Iberian *Festuca indigesta* grasslands
6170 Alpine and subalpine calcareous grasslands
6230 Species-rich *Nardus* grasslands, on silicious substrates in mountain areas (and submountain areas in Continental Europe)
62D0 Oro-Moesian acidophilous grasslands

**E4.4 Calcareous alpine and subalpine grassland**

**Description**

Alpine and subalpine grasslands of base-rich soils of the high mountains of the nemoral, submediterranean and supramediterranean zones.

**Plant communities**

*Agrostion alpinae, Anthyllido-Seslerion klasterskyi, Armerion cantabricae*

*Avenion sempervirentis, Caricion austroalpinae, Caricion ferrugineae, Caricion firmae, Dryadion integrifolii, Festucion burnatii, Festucion pungentis, Festucion scopariae, Festucion versicoloris, Festucion xanthinae, Festuco saxatilis-Seslerion bielzii, Festuco-Knaution longifolii, Kobresio-Dryadion, Kobresion capilliformis, Laserpitio nestleri-Ranunculion thorae, Minuartio-Poion ligulatae, Ononidion cristatae, Ononidion striatae, Oxytropidion dinaricae, Oxytropido-Elynnion myosuroidis, Primulion intricatae, Seslerio juncifoliae-Caricion firmae, Seslerio-Asterion alpine, Seslerio-Festucion xanthinae, Seslerion apenninae, Seslerion coeruleae, Seslerion nitidae, Seslerion tatrae, Seslerion tenuifoliae*

**Species**

*Dryas octopetala, Gentiana nivalis, Gentiana campestris, Alchemilla hoppeana, Alchemilla conjuncta, Alchemilla flabellata, Anthyllis vulneraria, Astragalus alpinus, Aster alpinus, Draba aizoides, Globularia nudicaulis, Helianthemum nummularium ssp. grandiflorum, Helianthemum oelandicum ssp. alpestre, Pulsatilla alpina ssp. alpina, Phyteuma orbiculare, Astartia major and Polygala alpestris, Kobresia myosuroides (Elyna myosuroides), Oxytropis spp, Carex spp*

**Corresponding class in other classifications**

Milieux naturels de Suisse 2008: 4.3.2 Pelouse calcaire sèche à laîche ferme
4.3.4 Gazon des crêtes ventées
4.3.1 Pelouse calcaire sèche à seslerie
4.3.3 Pelouse calcaire fraîche

EU Habitats Directive Annex I

6170 Alpine and subalpine calcareous grasslands

E5 Woodland fringes and clearings and tall forb stands

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

includes the following subtypes separately listed in the 2010 version:

E5.4111 Angelica archangelica fluvial communities
E5.4112 Angelica heterocarpa fluvial communities
E5.4113 Althaea officinalis screens
E5.414 Continental river bank tall-herb communities dominated by Filipendula
E5.415 Eastern nemoral riverbanks with tall herb communities
E5.423 Continental tall-herb communities of humid meadows
E5.424 Eastern nemoral Tall-herb communities of humid meadows
E5.424 Eastern nemoral Tall-herb communities of humid meadows

Description

Tall-herb and fern vegetation of the nemoral and boreal zones, including stands of tall herbs on hills and mountains below the montane level. Tall herbs are often dominant along watercourses, in wet meadows and in shade at the edge of woodlands.

Plant communities


Species

E5.41: Filipendula ulmaria, Aegopodium podagraria, Chaerophyllum hirsutum, Urtica dioica, Mentha longifolia, Angelica sylvestris, Caltha palustris, Crepis paludosa, Epilobium hirsutum, Geranium palustre
E5.42: Filipendula ulmaria is dominant here, Crepis paludosa, Iris sibirica, Lythrum salicaria, Geranium palustre
E5.43: Galium aparine, Glechoma hederacea, Geum urbanum, Aegopodium podagraria, Silene dioica, Carduus crispus, Chaerophyllum hirsutum, Lamium album, Alliaria petiolata, Lapsana communis, Geranium robertianum, Viola alba, Viola odorata
E5.54: Paspalum paspalodes, Paspalum vaginatum, Polypogon viridis (Agrostis semiverticillata), Cyperus fuscus, Catabrosa aquatic

Corresponding class in other classifications

Milieux naturels de Suisse 2008: 5.1.3 Ourlet hygrophile de plaine narrower
2.3.3 Mégaphorbiée marécageuse
5.1.4 Ourlet hygrophile d'altitude

EU Habitats Directive Annex I

3280 Constantly flowing Mediterranean rivers with Paspalo-Agrostidion species and hanging curtains of Salix and Populus alba
6430 Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels
E5.5 Subalpine moist or wet tall-herb and fern stands

Description
Luxuriant tall herb formations of deep, humid soils in the montane to alpine, but mostly subalpine, levels of the higher mountains.

Plant communities

Adenostylium alliariae, Cirsion appendiculati, Cirsium flavispinae, Delphinion elati, Doronicion corsici, Dryopterido-Athyrium distentifolii, Mulgedion alpine Polemonio acutiflori-Veratriion lobeliani Rumicion alpine, Triseto sibiricae-Aconition septentrionalis

Species

Cicerbita alpina, Cicerbita alpina plumieri, Cirsium helenioides, Cirsium spinosissimum, Cirsium flavispinum, Geranium sylvaticum, Polygonatum verticillatum, Ranunculus platanifolius, Aconitum vulparia, Aconitum napellus, Aconitum nevadense, Adenostyles alliariae, Senecio elodes, Veratrum album, Trollius europaeus, Peucedanum ostruthium, Doronicum austriacum, Pedicularis foliosa, Eryngium alpinum, Leuzea rhapontica (Centaurea rhapontica), Valeriana pyrenaica, Tozza alpine

Corresponding class in other classifications

Milieux naturels de Suisse 2008: 5.2.3 Mégaphorbiaie de montagne mésophile à graminées
5.2.4 Mégaphorbiaie de montagne hygrophile à Adenostyles alliariae

Nordic Vegetation Classification 1994: 1.2.4.5 Wood Crane's-bill type
1.2.5.1b Athyrium - Dryopteris type
1.2.6.1 Blue Sowthistle - Wood Crane's-bill type
1.2.6.2 Garden Angelica - Wood Crane's-bill
1.2.6.3 Globeflower type

EU Habitats Directive Annex I

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

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 pulvurulenta, Hordeion marini, Puccinelloio-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
**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 sedifoli, Limonion gmelinii, Juncion maritimi, Cypero-Spergularion salinae, Puccinellion poisonis, Festucion pseudovinae, Puccinellio-Spergularion salinae, Salicornion herbaceae, Puccinellion limosae, Thero-Salicornion, Malvion neglectae, Scorzono-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.*

**E6.23:** *(Frankenia pulvulenta, 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**

**Plants:** *Quercus suber, Q. rotundifolia, Q. pyrenaica, Q. faginea*

**Animals:** *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

The 2014 version of Resolution No. 4 (1996) separately listed:
- F2.22 - Alpide acidocline *Rhododendron* heaths
- F2.26 - *Bruckenthalia* heaths

Description

Small, dwarf or prostrate shrub formations of the alpine and subalpine zones of mountains, dominated by ericaceous species, *Dryas octopetala*, dwarf junipers, brooms or greenweeds; *Dryas* heaths of the British Isles.

Includes the following subtypes:
- F2.21 - Alpide dwarf ericoid wind heaths
- F2.22 - Alpide acidocline *Rhododendron* heaths
- F2.23 - Southern Palaearctic mountain dwarf *Juniperus* scrub
- F2.24 - Alpigenic high mountain *Empetrum* - *Vaccinium* heaths
- F2.25 - Boreo-alpine and arctic heaths
- F2.26 - *Bruckenthalia* heaths
- F2.27 - Alpide *Arctostaphylos uva-ursi* and *Arctostaphylos alpinus* heaths
- F2.28 - Alpide *Rhododendron hirsutum* - *Erica* heaths
- F2.29 - *Dryas octopetala* mats
- F2.2A - Alpide high mountain dwarf *Vaccinium* heaths
- F2.2B - Alpide high mountain *Genista* and *Chamaecytisus* heaths

Plant communities


Corresponding class in other classifications

- Milieux naturels de Suisse 2008: 5.4.3 Lande subalpine calcicole
- 5.4.4 Lande subalpine xérophile sur sol acide
- 5.4.6 Lande alpine ventée
- 5.4.5 Lande subalpine méso-hygrophile sur sol acide

EU Habitats Directive Annex I

4060 Alpine and Boreal heaths
F2.3 Subalpine deciduous scrub

**F2.32 Subalpine and oroboreal Salix brush**

**Description**

Willow-dominated communities of higher Eurasian mountains and of the boreal zone, mostly characteristic of the subalpine zone of the higher ranges of the Alpine system and its satellites, where many constitute facies of subalpine shrub and tall herb communities, of the slopes of lesser ranges in the boreal zone, including the Scandinavian mountains, of Iceland and of the northern British Isles (cf. unit E5.5). Species composition is very variable and endemic species are highly represented here.

**Plant communities**

*Salicion helveticae, Salicion pentandrae, Salicion silesiacae*

**Species**

*Salix lapponum, Salix lanata, Salix arbuscula, Salix myrsinites, Salix glauca, Salix helvetica, Salix bicolor*

**Corresponding class in other classifications**

Milieux naturels de Suisse 2008: 5.3.8 Saulaie buissonnante subalpine

**EU Habitats Directive Annex I**

Includes 4060 Sub-Arctic Salix spp scrub

F2.33 Subalpine mixed brushes

**F2.336 Rhodope Potentilla fruticosa thickets**

**Description**

Closed formations dominated by *Potentilla fruticosa* of the 1550 metre level in the *Picea abies* and *Pinus sylvestris* belt of the west Rhodope mountains of Bulgaria.

**Plant communities**

*Pruno tenellae-Syringion*

**Species**


**EU Habitats Directive Annex I**

40B0 Rhodope Potentilla fruticosa thickets

**References**


F2.4 Conifer scrub close to the tree limit

**F2.41 Inner Alpine Pinus mugo scrub**

**Description**
Pinus mugo scrub of the dry eastern inner Alps, of local occurrence throughout the area, accompanied by Rhododendron hirsutum, or, on siliceous ground, Rhododendron ferrugineum and Vaccinium myrtillus.

**Plant communities**

Pinion mugo, Pino mugo-Ericion

**Species**

Pinus mugo, Rhododendron hirsutum, Rhododendron ferrugineum, Vaccinium myrtillus, Erica herbacea, Arctostaphylos uva-ursi, Arctostaphylos alpinus, Rhodothamnus chamaecistus

**Corresponding class in other classifications**

Milieux naturels de Suisse 2008: 5.4.3 Lande subalpine calcicole

**EU Habitats Directive Annex I**

4070 Bushes with Pinus mugo and Rhododendron hirsutum (Mugo-Rhododendretum hirsuti)

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**F2.42 Outer Alpine Pinus mugo scrub**

**Description**

Main range Pinus mugo scrub of well-drained, mostly calcareous, soils of the northern and southeastern outer Alps, usually with Rhododendron hirsutum, Arctostaphylos uva-ursi, Arctostaphylos alpinus, Sorbus chamaemespilus, Lonicera caerulea, Lonicera alpigena, Calamagrostis varia, sometimes with Erica herbacea or Rhodothamnus chamaecistus and, in acidophilous variants, known in particular from the Karawanken, Vaccinium myrtillus, Vaccinium vitis-idaea, Rhododendron ferrugineum, Empetrum hermaphroditum.

**Plant communities**

Pinion mugo, Pino mugo-Ericion

**Species**

**Corresponding class in other classifications**

Milieux naturels de Suisse 2008: 5.4.3 Lande subalpine calcicole

**EU Habitats Directive Annex I**

4070 Bushes with Pinus mugo and Rhododendron hirsutum (Mugo-Rhododendretum hirsuti)

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**F2.43 Southwestern Pinus mugo scrub**

**Description**

Very local Pinus mugo scrub of the southwestern Alps (Moyen-Valais, Haute-Roya, Ligurian Alps), with Juniperus nana, Arctostaphylos uva-ursi, Daphne striata, Erica herbacea, Carex firma and, in some stations, Rhododendron hirsutum; cold-block Pinus mugo formations of the Swiss Jura.

**Plant communities**

Pino mugo-Ericion

**Species**

**Corresponding class in other classifications**

Milieux naturels de Suisse 2008: 5.4.3 Lande subalpine calcicole

**EU Habitats Directive Annex I**
F2.44 Apennine Pinus mugo scrub

Description
Rare and local Apennine formations of the Parmian Apennines, the Abruzzi and the Campanian Apennines

Plant communities
Rhododendro-Vaccinion

Species
Pinus mugo

EU Habitats Directive Annex I
4070 Bushes with Pinus mugo and Rhododendron hirsutum (Mugo-Rhododendretum hirsuti)

F2.45 Hercynian Pinus mugo scrub

Description
Pinus mugo scrub of the Sudeten, the Erzgebirge, the Bayerischerwald and the Böhmerwald.

Plant communities
Ledo-Pinion, Pinion mugo

Species
Pinus mugo, Vaccinium myrtillus, Salix silesiaca s.l., Trientalis europaea, Homogyne alpine

EU Habitats Directive Annex I
4070 Bushes with Pinus mugo and Rhododendron hirsutum (Mugo-Rhododendretum hirsuti)

F3 Temperate and mediterranean-montane scrub

F3.1 Temperate thickets and scrub

F3.12 Buxus sempervirens thickets

Description
Buxus sempervirens-dominated variants of units F3.11, F3.22, F3.23 or F3.24 with for example Juniperus oxycedrus or Pteridium aquilinum.

Plant communities
Berberidion vulgaris

Species
Buxus sempervirens, Prunus spinosa, Prunus mahaleb, Cornus mas, Crataegus spp., Berberis vulgaris, Ligustrum vulgare, Viburnum lantana, Amelanchier ovalis, Geranium sanguineum, Dictamnus albus

Corresponding class in other classifications
Milieux naturels de Suisse 2008: 5.3.2 Buissons xérothermophiles sur sol neutre à alcalin

EU Habitats Directive Annex I
5110 Stable xerothermophilous formations with *Buxus sempervirens* on rock slopes (*Berberidion* pp)

**Associated habitat types**

Succession phase of calcareous grasslands toward mixed deciduous forests, for example with *Quercus pubescens* or continental pine forests with *Pinus sylvestris*. On very superficial soils where natural succession towards forest can not take place these formations are stable. These communities are associated with calcareous grasslands, mixed oak or *Quercus pubescens* groves, beech groves rich in orchid species or with *Pinus nigra* and *Pinus leucodermis* (e.g. in Greece).

### F3.16 Juniperus communis scrub

**Description**

Temperate and mediterranean-montane communities dominated by *Juniperus communis*, mostly *Juniperus*-dominated variants of units F3.11, F3.13, F3.22-F3.24. *Calluna vulgaris, Crataegus* spp., *Pinus sylvestris, Quercus petraea, Bromus erectus* and *Festuca rupicola* are also present.

**Plant communities**

*Vaccinio-Juniperion communis*

**Species**

*Juniperus communis, Crataegus* spp., *Rosa* spp., *Prunus spinosa*.

**Corresponding class in other classifications**

- Milieux Naturels de Suisse 2008: 5.4.1 Lande subatlantique acidophile
- Nordic Vegetation Classification 1994: 5.1.1.5e Juniper-heather heath-variant

**EU Habitats Directive Annex I**

5130 Juniperus communis formations on heaths or calcareous grasslands

**Associated habitat types**

Most often found as a succession from mesophilous or xerophilous calcareous and nutrient poor grasslands, such as *Festuco-Brometea* and *Elyno-Sesleretea*, or more rarely, heathlands of the *Calluno vulgaris-Ulicetea minoris*

### F3.2 Submediterranean deciduous thickets and brushes

#### F3.21 Montane Cytisus purgans fields

**Description**

*Cytisus (Genista) purgans*-dominated formations of higher levels (upper montane, subalpine, oro-mediterranean) of southwestern European and North African mountains, often associated with dwarf juniper scrubs (unit F2.23) or hedgehog-heaths (unit F7.4), and physiognomically reminiscent of the latter.

**Plant communities**

*Cytision multiflori* (syn *Genistion polygaliphyllae*)

**Species**

*Cytisus (Genista) purgans*

**EU Habitats Directive Annex I**

5120 Mountain *Cytisus purgans* formations
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
Prunion fruticosae, Orno-Cotinion p.

Species

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

F3.245 Eastern Mediterranean deciduous thickets

Description
Deciduous thickets of Cyprus and of the Mediterranean or sub-Mediterranean zones of Asia Minor and the Levant, within the regions of occurrence of eastern white oak woods (unit G1.73), hop-hornbeam mixed oak woods (unit G1.74), Balkano-Anatolian thermophilous oak forests (unit G1.76), Macedonian-oak woodland (unit G1.78) and Mediterranean valonia oak woodland (unit G1.79).

Plant communities
Genisto-Ceratonietum

Species
Crataegus azarolus var. aronia

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

F3.247 Ponto-Sarmatic deciduous thickets

Description
Deciduous thickets of the wooded steppe zone of the Pontic and Sarmatic regions and of adjacent areas, including the Thracian steppe zone, within and around the zone of occurrence of easternmost white cinquefoil oak woods (unit G1.7A14), of tartar maple steppe oak woods (unit G1.7A122) and of sub-Euxinian steppe woods (unit G1.7A13).

Species
Prunus spinosa, Crataegus monogyna, Caragana frutex, Spiraea crenifolia (Spiraea crenata), Prunus tenella (Amygdalus nana), Jasminum fruticans, Paliurus spina-christi, Rhamnus catarhica, Asparagus verticillatus, Asphodeline lutea, Bromus inermis, Dianthus nardiformis, Kochia prostrata, Medicago minima, Genista sessilifolia, Moehringia grisebachii, Moehringia jankae, Orlaya grandiflora, Ornithogalum amphibulum, Paeonia tenuifolia, Salvia ringens, Thymus zygiodies, Veronica jacquini.
Corresponding class in other classifications

Habitatele din România: R3132 Tufărişuri ponto-sarmatice de Caragana frutex

EU Habitats Directive Annex I

40C0 Ponto-Sarmatic deciduous thickets

References


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 cinereae, Ericion umbellatae, Stauracanthion boivinii, Ulicion minoris, Genistio pilosae-Vaccinion, Ericion arboreae

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


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-Phléion phleoidis, Loiseleurio-Vaccinion, Loiseleurio-Diapension, 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.

**Corresponding class in other classifications**

Milieux naturels de Suisse 2008: included in 5.4.1 Lande subatlantique acidophile

**EU Habitats Directive Annex I**

4030 European dry heaths

**References**


### F4.3 Macaronesian heaths

**Description**

Heaths of the Canary Islands, Azores and Madeira.

**Plant communities**

*Myrico fayae-Ericion arboreae, Daboecion azoricae*

**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 canariensis, T. splendens, T. stenopetala, Thymus caespititus, Vaccinium cilindraceum

**EU Habitats Directive Annex I**

4050 Endemic macaronesian heaths

### F5 Maquis, arborescent matorral and thermo-Mediterranean brushes

#### F5.1 Arborescent matorral

### F5.13 Juniper matorral

**Description**

Mediterranean and sub-mediterranean evergreen sclerophyllous brush and scrub organized around arborescent junipers of different species.

**Plant communities**

*Juniperion turbinatae*

**Species**

Juniperus oxycedrus, Juniperus phoenicea, Juniperus lyca, Juniperus excelsa, Juniperus foetidissima, Juniperus communis, Juniperus drupacea, Juniperus thurifera

**EU Habitats Directive Annex I**

5210 Arborescent matorral with *Juniperus* spp
F5.17 Arid zone matorral

F5.171 Iberian arid zone *Ziziphus* matorral

**Description**

Pre-desert brush of *Periploca laevigata*, *Lycium intricatum*, *Asparagus stipularis*, *Asparagus albus*, *Withania frutescens* with tall *Ziziphus lotus*, confined to the arid Iberian Southeast under a xerophytic thermo-Mediterranean bio-climate; corresponds to the mature phase or climax of climatophile and edapho-xero-psammophile vegetation series (*Periplocion angustifoliae*: *Ziziphetum loti*, *Zizipho-Maytenetum europaei*, *Mayteno-Periplocetum*).

**Plant communities**

*Mayteno-Periplocetum angustifoliae*, *Ziziphetum loti*, *Gymnosporio europaei-Ziziphetum loti*

**Species**


**EU Habitats Directive Annex I**

5220 Arborescent matorral with *Zyziphus*

**Associated habitat types**

Similar formations with lower *Ziziphus lotus* bushes are listed in unit F5.551.

**References**


F5.18 *Laurus nobilis* matorral

**Description**

Humid arborescent matorral with tall laurel (*Laurus nobilis*) developed locally in Sardinia, Sicily, the Maltese Islands, Campania, in particular.

**Species**

*Arbutus unedo*, *Ceratonia siliqua*, *Fraxinus ornus*, *Laurus nobilis*, *Olea europaea var. sylvestris*, *Phillyrea latifolia*, *Quercus ilex*, *Rubia peregrina ssp. longifolia*, *Smilax aspera var. altissima*, *Viburnum tinus*.

**EU Habitats Directive Annex I**

5230 Arborescent matorral with *Laurus nobilis*

**Associated habitat types**

Similar formations without tall *Laurus nobilis* are F5.516

F5.5 Thermo-Mediterranean scrub

F5.51 Thermo-Mediterranean brushes, thickets and heath-garrigues

F5.516 *Laurus* thickets

**Description**
Laurus nobilis thickets of humid or fresh stations of thermo-mediterranean regions, low-growing facies of unit F5.18, noted in particular in Sardinia, Sicily, the Maltese Islands, Campania and Crete.

Species
Laurus nobilis

EU Habitats Directive Annex I
5310 Laurus nobilis thickets

**F5.517 Coastal Helichrysum garrigues**

Description
Low formations of Helichrysum (Helichrysum italicum ssp. microphyllum, Helichrysum italicum ssp. italicum) with spurge (Euphorbia pithyusa, i.a.), Pistacia lentiscus, Camphorosma monspeliaca, Artemisia densiflora or Thymelaea passerina, Thymelaea hirsuta, Thymelaea tartonraira of the immediate vicinity of sea cliffs, forming the transition between cliff vegetations or clifftop phryganas and thermo-Mediterranean scrub; they are particularly characteristic of the large Mediterranean islands.

Plant communities
Euphorbion pithyusae

Species
Helichrysum italicum ssp. microphyllum, Helichrysum italicum ssp. italicum, Euphorbia pithyusa, Pistacia lentiscus, Camphorosma monspeliaca, Artemisia densiflora, Thymelaea passerina, Thymelaea hirsuta, Thymelaea tartonraira.

EU Habitats Directive Annex I
5320 Low formations of Euphorbia close to cliffs

**F5.51G Tall spiny broom brush**

Description
Scrub dominated by tall, spiny species of Genista.

Plant communities
Sarcopoterio spinosi-Genistion fasselatae

Species
Genista fasselata

EU Habitats Directive Annex I
Included in
5330 Thermo-Mediterranean and pre-desert 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**

*Oleo-Ceratonion siliquae* p

**Species**

*Euphorbia dendroides*

**EU Habitats Directive Annex I**

included in 5330 Thermo-Mediterranean and pre-desert scrub

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**F5.53 Ampelodesmos mauritanica -dominated garrigues**

**Description**

Garrigues invaded and dominated by the high tussocks of *Ampelodesmos mauritanica*; typically thermo-Mediterranean, they also occur extensively in the meso-Mediterranean zone. They are most prevalent on the Tyrrenian coast of central and southern Italy, in Sicily, in the Mediterranean zone and the less arid parts of the Saharo-Mediterranean transition zone of North Africa.

**Species**

*Ampelodesmos mauritanica*

**EU Habitats Directive Annex I**

Included in

5330 Thermo-Mediterranean and pre-desert scrub

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**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

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**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

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**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**


**EU Habitats Directive Annex I**

- included in 5330 Thermo-Mediterranean and pre-desert scrub

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**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**


**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-Ramicetalia lunariae, Helichryso stoechadis-Santoloneta 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: Arthrocnennum glaucum, Arthrocnennum 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, Launacion 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, Iris timofeevi, Corydalis tarkiensis, Himantoglossum formosum*

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 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* which 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 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 2008: 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: Riparian 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.

Stands dominated by invasive species (e.g. *Reynoutria japonica*) are not included in this habitat type.
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. tetandra, 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 salviifolia, 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

The following comment from the Interpretation Manual of European Union Habitats (European Commission 2013) may be helpful in selecting suitable sites for the Emerald Network:

“(Sub)natural woodland vegetation comprising native species forming forests of tall trees, with typical undergrowth, and meeting the following criteria: rare or residual, and / or hosting species of Community interest.

For forest habitat types the following additional criteria were accepted by the Scientific Working Group (21-22 June 1993):

- forests of native species;
- forests with a high degree of naturalness;
- forests of tall trees and high forest;
- presence of old and dead trees;
- forests with a substantial area;
- forests having benefited from continuous sustainable management over a significant period.”

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 canadensis, Aster novi-belgii, 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 2008: 6.1.2 Saulaie blanche

EU Habitats Directive Annex I

3240 Alpine rivers and their ligneous vegetation with Salix elaeagnos (tree dominated stands)

91E0 Alluvial forests with Alnus glutinosa and Fraxinus excelsior (Alno-Padion, Alnion incanae, Salicion albae)

92A0 Salix alba and Populus alba galleries
Associated Habitat types

European forest types: 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 boreo-Steppic 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**


**Corresponding class in other classifications**

European forest types: 12.1 Riparian forest

Milieux naturels de Suisse 2008: 6.1.3 Aulnaie alluviale

### 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: 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**

*Achnion incanae*, *Carpinion betuli*, *Fraxinion excelsioris*

**Species**


**Corresponding class in other classifications**

European forest types: 12.2 Fluvial forest

Milieux naturels de Suisse 2008: 6.1.4 Frênaie humide

**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**

Includes the following subtypes separately listed in the 1998 version:

G1.221 Great medio-European fluvial forests

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

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

**Description**
Diverse riparian forests of the middle courses of great rivers, inundated only by large floods. Hardwood trees with dominant *Fraxinus, Ulmus* or *Quercus* spp. with a very typical spring herb aspect. Often with several layers in the canopy and with lianes.

**Plant communities**

*Alnion incanae, Carpinion betuli*

**Species**

**G1.221**: *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, Malus sylvestris, Tilia cordata, Alnus incana, Prunus padus* and *Crataegus monogyna*. *Clematis vitalba, Tamus communis, Humulus lupulus, Hedera helix and Vitis vinifera ssp. Sylvestris*

**G1.223**: *Quercus robur* and/or *Fraxinus angustifolia*, with varying admixtures of *Ulmus minor, Ulmus laevis, Carpinus betulus, Alnus glutinosa, Fraxinus excelsior, Salix alba, Populus alba*

**G1.224**: *Quercus robur, Quercus cerris, Fraxinus excelsior, Fraxinus ornus, Carpinus betulus, Ulmus minor, Populus alba, Populus nigra, Acer campestre, Acer pseudoplatanus, Prunus padus, Prunus avium, Alnus glutinosa, Salix alba, Corylus avellana, Sorbus torminalis, Sorbus domestica, Ruscus aculeatus, Cornus mas, Cornus sanguinea, Crataegus laevigata, Crataegus monogyna, Pyracantha coccinea, Rubus fruticosus, Rubus ulmifolius, Rubus caesius, Ribes uva-crispa, Sambucus nigra, Daphne mezereum, Viburnum lantana, Mespilus germanica, Lonicera xylosteum, Ligustrum vulgare, Prunus spinosa, Rosa canina, Euonymus europaeus, Rhamnus catharticus; Hedera helix, Tamus communis, Rubia peregrina, Bryonia cretica; Equisetum hyemale, Symphytum officinale, Polygonatum multiflorum, Pulmonaria officinalis, Lathyrus vernus, Mercurialis perennis, Primula acaulis, Asarum europaeum, Euphorbia dulcis, Melittis melissophyllum, Erythronium dens-canis, Leucojum vernum, Brachypodium sylvaticum, Carex pilosa*

**G1.225**: *Quercus robur, Tilia cordata, Ulmus laevis, Ulmus effusa, Alnus cordata*

**Corresponding class in other classifications**

European forest types: 12.2 Fluvial forest

Milieux naturels de Suisse 2008: 6.1.4 Frênaie humide

**EU Habitats Directive Annex I**

91F0 Riparian mixed forests of *Quercus robur, Ulmus laevis and Ulmus minor, Fraxinus excelsior* or *Fraxinus angustifolia*, along the great rivers (*Ulmenion minoris*)

**References**


**G1.3 Mediterranean riparian woodland**

Includes the following subtypes separately listed in the 2010 version:

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

G1.37 Irano-Anatolian mixed riverine forests

G1.38 *Platanus orientalis* woods

G1.39 *Liquidambar orientalis* woods

**Description**
Alluvial forests and gallery woods of the Mediterranean region. Dominance may be of a single species, of few species or mixed with many species including *Fraxinus*, *Liquidambar*, *Platanus*, *Populus*, *Salix*, *Ulmus*. Excludes Mediterranean *Salix* woods (G1.1) and shrubby riparian vegetation (F9.3).

**Plant communities**

*Lauro nobilis-Fraxinion angustifoliae, Osmundo-Alnion glutinosae, Platanion orientalis, Populion albae, Rhododendro pontici-Prunion lusitanicae*

**Corresponding class in other classifications**

European forest types: 12.3 Mediterranean and Macaronesian riparian forest

**EU Habitats Directive Annex I**

92A0 *Salix alba* and *Populus alba* galleries

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**

**Description**

Marshy *Alnus glutinosa*-dominated woods and scrubs, usually with shrubby willows in the undergrowth or with other shrubs, e.g. *Frangula alnus*.

**Plant communities**

*Alnion glutinosae*

**Corresponding class in other classifications**

National Vegetation Classification (UK) W5: *Alnus glutinosa-Carex paniculata* woodland

Milieux Naturels de Suisse 2008: 6.1.1: Aulnaie noire

**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: 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. In European Russia these forests may also host *Salix lapponicum*, *Salix myrtilloides* and *Scheuchzeria palustris*

**Plant communities**

*Betulion pubescentis*

**Species**

*Betula carpatica*, *Betula pubescens*, *Empetrum nigrum*, *Eriophorum vaginatum*, *Molinia caerulea*, *Sphagnum fallax*, *Sphagnum magellanicum*, *Trientalis europaea*, *Vaccinium sp.* *Salix lapponicum*, *Salix myrtilloides*, *Scheuchzeria palustris*

**Corresponding class in other classifications**

European forest types: 11.3 Birch swamp forest

Milieux naturels de Suisse 2008: 6.5.1 Betulion

**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**


**Species**

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, Caucasus: Rhododendron ponticum, Vaccinium arctostaphylos, Acer laetum, Ruscus colchicus, Galanthus bortkewitschianus, Cephalanthera damasonium, Colchicum umbrosum, Taxus baccata

**Corresponding class in other classifications**

European forest types: 6 Beech forest (all subtypes)

Milieux Naturels de Suisse 2008: 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**


**G1.7 Thermophilous deciduous woodland**

(excluding G1.7D *Castanea sativa* woodland)

Includes the following subtypes

G1.71: Western *Quercus pubescens* woods and related communities

G1.72: Cyrno-Sardinian *Quercus pubescens* woods

G1.73: Eastern *Quercus pubescens* woods

G1.74: Italo-Illlyrian *Ostrya carpinifolia* sub-thermophilous *Quercus* woods

G1.75: Southeastern sub-thermophilous *Quercus* woods

G1.76: Balkano-Anatolian thermophilous *Quercus* forests

G1.77: Afro-Iberian thermophilous *Quercus* forests

G1.78: *Quercus trojana* woodland

G1.79: Mediterranean *Quercus macrolepis* woodland

G1.7A: Steppe *Quercus* woods

G1.7B: *Quercus pyrenaica* woodland

G1.7C: Mixed thermophilous woodland
The 1998 version of Resolution No. 4 (1996) separately listed:

- 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. In the Crimean peninsula and the Krasnodar region the habitat can be dominated by *Pistacia mutica*.

**Plant communities**

- *Quercion petraeae*, *Quercion pubescenti-petraeae*, *Aceri tatarici-Quercion*, *Lathyro pisiformis-Quercion roboris*, *Aceri granatensis-Quercion fagineae*, *Fraxino ornii-Ostryion*, *Syringo-Carpinion orientalis*, *Elytrigio nodosae-Quercion*, *Physospermo-Quercion*, *Crataego laevigatae-Quercion cerridis*, *Pino calabricae-Quercion*, *Quercion confertae*, *Quercion petraeo-cerridis*, *Melitto albidae-Quercion*, *Quercion macrolepidis*

**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 vrabelyi*, *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: 8 Thermophilous deciduous forest (all subtypes except 8.7 Chestnut forest)  
Milieux Naturels de Suisse 2008: 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 Pannonian 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: 4 Acidophilous oak and oak-birch forest (all subtypes)

Milieux Naturels de Suisse 2008: 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

**G1.9 Non-riverine woodland with Betula, Populus tremula or Sorbus aucuparia**

**G1.91 Betula woodland not on marshy terrain**

**G1.917 Oro boreal Betula woods and thickets**

**Description**

Timberline birch woods and thickets dominating the subalpine belt of the mountains of the boreal taiga zone or the transition zone between taiga and tundra or polar deserts in the Atlantic or Pacific influenced extreme western and extreme eastern regions of the northern Palaearctic, formed by Betula pubescens ssp. czerepanovii (Betula pubescens ssp. tortuosa, Betula kusmisscheffii) or Betula ermani.

**Plant communities**

Betulion tortuosae
Species

> Cladonia spp., Dicranum spp., Empetrum hermaphroditum, Hylocomium splendens, Linnea borealis, Pleurozium schreberi, Stereocaulon paschale, Tridentalis europaea, Vaccinium myrtillus; Aconitum lycoctonum, Cicerbita alpina, Cornus suecica, Geranium sylvaticum, Gymnocarpium dryopteris, Hierochloë odorata, Melica nutans, Rubus saxatilis, Trollius europaeus

Corresponding class in other classifications

European forest types: 3.4 Mountainous birch forest
Nordic Vegetation Classification 1994: 2.2.1.1 Mountain birch forest of lichen - dwarf shrub type
  2.2.1.2 Mountain Birch forest of dwarf shrub - grass type
  2.2.1.3 Mountain Birch forest of low herb type
  2.2.1.4 Mountain birch forest of tall herb type

EU Habitats Directive Annex I

9040 Nordic subalpine/subarctic forests with Betula pubescens ssp czerepanovii

G1.918 Eurasian boreal Betula woods

Description

Birch woods of the taiga belt, of the wooded tundra belt, and of the taiga-nemoral forest transition zone of Eurasia, formed by Betula pendula, Betula pubescens s.l. or Betula platyphylla.

Plant communities

Trollio europaei-Pinion sylvestris, Veronico teucrii-Pinion sylvestris

Corresponding class in other classifications

European forest types: 13.3 Birch forest
Nordic Vegetation Classification 1994: 2.2.1.5 Birch forest of dwarf shrub-grass type
  2.2.1.7 Birch forest of herb type

EU Habitats Directive Annex I

Included in

9010 Western Taiga
9030 Natural forests of primary succession stages of landupheaval coast

G1.92 Populus tremula woodland

G1.925 Boreal Populus tremula woods

Description

> Populus tremula stands of the taiga zone and of the transition zone between taiga and nemoral woods of Fennoscandia and the northern Sarmatic region.

Corresponding class in other classifications

European forest types: 13.4 Aspen forest
Nordic Vegetation Classification 1994: 2.2.1.8 Aspen forest

EU Habitats Directive Annex I
Included in 9010 Western Taiga

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


Corresponding class in other classifications

European forest types: 5 Mesophytic deciduous forest (all subtypes except except 5.8 Ravine and slope forest).

Milieux naturels de Suisse 2008: 6.3.3 Carpinion

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.A1C = 91Y0 Dacian oak & hornbeam forests

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 pseudoplatanis*

**Species**


**Corresponding class in other classifications**

**European forest types:** 5.8 Ravine and slope forest

Milieux Naturels de Suisse 2008: 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

<table>
<thead>
<tr>
<th>G1.A7</th>
<th>Mixed deciduous woodland of the Black and Caspian Seas</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Description</strong></td>
<td>Mixed summer-green broad-leaved forests limited mainly to the mountains bordering the Black Sea and the Caspian Sea.</td>
</tr>
<tr>
<td><strong>Plant communities</strong></td>
<td>Astrantio-Carpinion caucasicae, Carpinion orientalis, Crataego-Carpinion caucasicae, Junipero excelsae-Quercion pubescentis, Quercetalia pubescenti-petraeae</td>
</tr>
<tr>
<td><strong>Species</strong></td>
<td>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</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>G1.B</th>
<th>Non-riverine Alnus woodland</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>G1.B3 Boreal and boreonemoral Alnus woods</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Description</strong></td>
<td>Non-riparian, non-marshy formations of the boreal zone of the Palaearctic region dominated by <em>Alnus glutinosa</em> or <em>Alnus incana</em>.</td>
</tr>
<tr>
<td><strong>Plant communities</strong></td>
<td>Alnion incanae</td>
</tr>
</tbody>
</table>

**Corresponding class in other classifications**
European forest types: 13.1 Alder forest

Nordic Vegetation Classification 1994: 2.2.4.1 Grey alder forest

2.2.4.2 Alder shore forest

**EU Habitats Directive Annex I**

9010 Western Taïga

9030 Natural forests of primary succession stages of land upheaval coast

| 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. Woodlands dominated by exotic lauriphyllous trees and shrubs as in Ticino, Switzerland² are also excluded.

**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, Ilex aquifolium, 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, Quercus pubescens, Acer monspessulanum, Frangula rupestris, Hedera helix*

**Corresponding class in other classifications**

European forest types: 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

G3.13  Acidophilous Abies alba forests

### G3.134 Holy Cross fir forests

**Description**

Upland fir, or fir-dominated fir-spruce or fir-pine-oak forests developed on mesotrophic acid soils of Little-Poland, in particular, of the Holy Cross mountains and of sub-Carpathic hills, with an undergrowth rich in ferns, bryophytes and lowland forest species shared with the deciduous forests of the Tilio-Carpinetum.

**Plant communities**

*Abietetum polonicum*

**Species**

*Abies alba, Fagus sylvatica, Quercus robur, Quercus sessilis, Pinus sylvestris, Betula verrucosa, Populus tremula, Picea excelsa, Alnus glutinosa, Sambucus racemosa, Rubus idaeus, Dryopteris austriaca, Athyrium filix-femina, Phegopteris dryopteris, Phegopteris polypodioides, Lycopodium annotinum, Hylocomium splendens, Polytrichum formosum, Maianthemum bifolium, Rubus hirsutus, Galeobdolon luteum, Oxalis acetosella, Luzula pilosa.*

**Corresponding class in other classifications**

European forest types: 3.2 Subalpine and mountainous spruce and mountainous mixed spruce-silver fir forest

**EU Habitats Directive Annex I**

Same as 91P0 Holy Cross fir forest (*Abietetum polonicum*)

### 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 hypopitits, Orthilia secunda, Cirsium erisithales, Oxalis acetosella, Veronica urticifolia, Daphne mezereum.*

**Corresponding class in other classifications**

European forest types: 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 G1.6 *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#

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### 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: 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

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### 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, Abieti nordmannianae-Fagenion orientalis*

**Species**

*Abies nordmanniana, Abies borisii-regis, Buxus sempervirens, Vaccinium arctostaphylos, Rhododendron ponticum, Actaea spicata, Ruscus colchicus, Acer laetum*

**Corresponding class in other classifications**

European forest types: 10.6 Mediterranean and Anatolian fir forest

**EU Habitats Directive Annex I**

9270 Hellenic beech forests with *Abies borisii-regis*

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### 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

*Paenonio 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: 10.6 Mediterranean and Anatolian fir forest

**EU Habitats Directive Annex I**

9520 *Abies pinsapo* forests

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### 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.*


**Corresponding class in other classifications**

European forest types: 3.2 Subalpine and montane spruce and montane mixed spruce-silver fir forest

Milieux naturels de Suisse 2008: included in 6.6.2 Pessière

**EU Habitats Directive Annex I**

included in 9410 Acidophilous *Picea* forests of the montane to alpine levels (*Vaccinio-Piceetea*)

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### 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**

**Corresponding class in other classifications**

European forest types: 3.2 Subalpine and montane spruce and montane mixed spruce-silver fir forest

Milieux naturels de Suisse 2008: included in 6.6.2 Pessière

**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: 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

Includes the following subtypes separately listed in the the 2010 version:

- **G3.1E1** Southeastern Moesian *Picea abies* forests
- **G3.1E3** Montenegrine *Picea abies* forests
- **G3.1E4** Pelagonide *Picea abies* forests
- **G3.1E5** Balkan Range *Picea abies* forests

**Description**

Outlying *Picea abies* formations of the Apennines, the southern Dinarides, the Balkan Range and the Rhodope Mountains, at the southern limit of the range of the species and mostly south of its continuous range. *Pinus sylvestris* may be present, and undergrowth species may include *Vaccinium myrtillus, Urtica dioica, Rubus idaeus, Bruckenthalia spiculifolia, Poa nemoralis, Daphne oleoides, Calamagrostis arundinacea* and *Fragaria vesca*.

**Plant communities**

*Piceion excelsae*

**Corresponding class in other classifications**
European forest types: 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*)

<table>
<thead>
<tr>
<th>G3.1F Enclave <em>Picea abies</em> forests</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Description</strong></td>
</tr>
<tr>
<td>Spontaneous <em>Picea abies</em> formations occupying outlying altitudinal or edaphic enclaves within the range of more predominant vegetation types, in particular the montane levels of the outer Alps, the Carpathians, the Dinarides, the Jura, the Hercynian ranges, the subalpine levels of the Jura, the western Hercynian ranges and the Dinarides.</td>
</tr>
<tr>
<td><strong>Plant communities</strong></td>
</tr>
<tr>
<td><em>Chrysanthemo rotundifolii-Piceion, Piceion excelsae</em></td>
</tr>
<tr>
<td><strong>Species</strong></td>
</tr>
<tr>
<td><em>Picea abies</em>, <em>Bazzania trilobata</em>, <em>Vaccinium myrtillus</em>, <em>Listera cordata</em>, <em>Lycopodium annotinum</em></td>
</tr>
<tr>
<td><strong>Corresponding class in other classifications</strong></td>
</tr>
<tr>
<td>European forest types: 3.2 Subalpine and montane spruce and montane mixed spruce-silver fir forest</td>
</tr>
</tbody>
</table>

Milieux naturels de Suisse 2008: included in 6.6.1 Pessière-sapinière

**EU Habitats Directive Annex I**

included in 9410 Acidophilous *Picea* forests of the montane to alpine levels (*Vaccinio-Piceetea*)

<table>
<thead>
<tr>
<th>G3.1G <em>Picea omorika</em> forests</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Description</strong></td>
</tr>
<tr>
<td><em>Picea omorika</em> dominated forests of the Drina basin of central Serbia, also in Bosnia and Hercegovina. <em>Picea abies</em> and <em>Abies alba</em> are usually also present while the herb layer is relatively species-poorwhile bryophytes can be widespread.</td>
</tr>
<tr>
<td><strong>Plant communities</strong></td>
</tr>
<tr>
<td><em>Piceion excelsae</em></td>
</tr>
<tr>
<td><strong>Species</strong></td>
</tr>
<tr>
<td><em>Picea omorika</em>, <em>Salix caprea</em>, <em>Pinus nigra</em>, <em>Rosa pendulina</em>, <em>Valeriana montana</em>, <em>Vaccinium myrtillus</em>, <em>Luzula sylvatica</em>, <em>Hieracium transsilvanicum</em>, <em>Gentiana asclepiadea</em>, <em>Erica carnea</em>, <em>Calamagrostis varia</em>, <em>Veronica chamaedrys</em>, <em>Lathyrus vernus</em>, <em>Euphorbia amygdaloides</em> Bryophytes - <em>Dicranum scoparium</em>, <em>Ctenidium molluscum</em>, <em>Eurhynchium striatum</em>, <em>Hylocomium splendens</em>, <em>Rhytidiadelphus triquetrus</em></td>
</tr>
<tr>
<td><strong>Corresponding class in other classifications</strong></td>
</tr>
<tr>
<td>European forest types: 3.2 Subalpine and montane spruce and montane mixed spruce-silver fir forest</td>
</tr>
</tbody>
</table>

**EU Habitats Directive Annex I**

Not present in the European Union

<table>
<thead>
<tr>
<th>G3.1H <em>Picea orientalis</em> forests</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Description</strong></td>
</tr>
<tr>
<td><em>Picea orientalis</em> dominated forests of the Caucasus and of the eastern Pontic Range.</td>
</tr>
</tbody>
</table>
Plant communities

Geranio iberici-Pinion orientalis

Species

Picea orientalis

Corresponding class in other classifications

European forest types: 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


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: 3.1 Subalpine larch-arolla pine and dwarf pine forest

Milieux Naturels de Suisse 2008: 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: 3.1 Subalpine larch-arolla pine and dwarf pine forest
Milieux Naturels de Suisse 2008: 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: 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: 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 undergrowth 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: 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**

*Seslerio caeruleae-Pinion uncinatae*

**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: 3.1 Subalpine larch-arolla pine and dwarf pine forest

Milieux naturels de Suisse 2008: 6.6.5 Pinède de montagne

**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**


**Corresponding class in other classifications**

European forest types: 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*, *Astragalus zingeri*, *Potentilla volgarica*, *Sempervivum ruthenicum*, *Chamaeacytis wulfii*

**Corresponding class in other classifications**

Biotopes of the Czech Republic 2001: L8.2 Lesostepní bory

European forest types: 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 dometorum, 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: 2.2 Nemoral scots pine forest

<table>
<thead>
<tr>
<th>G3.4234</th>
<th>Pannonic steppe <em>Pinus sylvestris</em> woods</th>
</tr>
</thead>
</table>

**Description**

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

**Plant communities**

*Festuco vaginatae-Pinion*

**Species**

*Pinus sylvestris, Festuca vaginata*

**European forest types**

2.2 Nemoral scots pine forest

<table>
<thead>
<tr>
<th>G3.43</th>
<th>Inner-Alpine <em>Ononis</em> steppe forests</th>
</tr>
</thead>
</table>

**Description**

Xerophile, often calcicolous, open *Pinus sylvestris* or *Pinus sylvestris* and *Pinus uncinata* forests of the montane level of inner Alpine valleys submitted to extreme continental climate (upper Durance, Ubaye, upper Tiné, Val di Susa, Maurienne, Val d'Aoste, Alto Adige (Val Venosta), Upper Engadine, Vintschgau, Virgental), rich in leguminous plants.

**Plant communities**

*Ononido rotundifoliae-Pinion sylvestris*

**Species**

*Pinus sylvestris, Pinus uncinata, Juniperus communis, Juniperus sabina, Berberis vulgaris, Amelanchier ovalis, Ononis rotundifolia, Ononis cenisia, Astragalus austriacus, Astragalus purpureus, Coronilla minima, Onobrychis saxatilis*

**Corresponding class in other classifications**

Milieux Naturels de Suisse 2010: 6.4.3 Pinède continentale xérophile

European forest types: 3.3 Alpine Scots pine & black pine forest

**References**

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

Includes the following subtypes separately listed in the 2010 version

G3.442 Carpathian relict calcicolous *Pinus sylvestris* forests

**Description**

Mesophile, mostly calcicolous, *Pinus sylvestris* forests of the intermediate Alps, the inner Alps, the northern and southeastern outer Alps, with outposts in northern peri-Alpine areas, in the Jura and in the Carpathians, generally characterised by the presence of *Erica herbacea*.

**Plant communities**

_Erico-Fraxinion orni, Erica carnea-Pinion, Pulsatillo slavicae-Pinion_

**Species**


**Corresponding class in other classifications**

Milieux Naturels de Suisse 2008: 6.4.1 Pínède subatlantique des pentes marneuses

6.4.2 Pínède subcontinentale basophile

European forest types: 3.3 Alpine Scots pine and black pine forest

**EU Habitats Directive Annex I**

Includes 91Q0 Western Carpathian calcicolous *Pinus sylvestris* forests

**References**


**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 lucidum_, _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: 3.3 Alpine scots pine and black pine forest

**EU Habitats Directive Annex I**

91Q0 Western Carpathian calcicolous *Pinus sylvestris* forests

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**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

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**G3.4G *Pinus sylvestris* forest on chalk in the steppe zone**

**Description**

Forests with *Pinus sylvestris* var. *cretacea* of the alliance *Libanotido intermediae-Pinion sylvestris* on the chalk outcrops of the Steppic zone

**EU Habitats Directive Annex I**

Not present in the European Union

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**G3.5 *Pinus nigra* woodland (but excluding G3.57 *Pinus nigra* reforestation)**

Includes the following subtypes separately listed in the 2010 version

- G3.51 Alpino-Apennine *Pinus nigra* forests
- G3.52 Western Balkanic *Pinus nigra* forests
- G3.53 *Pinus salzmannii* forests
- G3.54 Corsican *Pinus laricio* forests
- G3.55 Calabrian *Pinus laricio* forests
G3.56 *Pinus pallasiana* and *Pinus banatica* forests

**Description**

Forests dominated by pines of the *Pinus nigra* group.

**Plant communities**

Abietion cephalonicae, Berberido aetnensis-Pinion laricionis, Berberido creticae-Juniperion foetidissimae, Chamaeyctiso hirsuti-Pinion pallasianae, Erico carneaе-Pinion, Erico-Fraxinion orni, Fraxino orni-Pinion nigrae, Junipero sabinae-Pinion sylvestris, Pinion pallasianae, Querco-Cedrion libani

**Species**


**Corresponding class in other classifications**

European forest types: 10.2 Mediterranean and Anatolian black pine forest

**EU Habitats Directive Annex I**

9530 (Sub-) Mediterranean pine forests with endemic black pines

**References**

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


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. Accompanying 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**


**Corresponding class in other classifications**

European forest types: 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)

Includes the following subtypes separately listed in the 2010 version

G3.711 Charente Pinus pinaster ssp. atlantica - Quercus ilex forests
G3.712 Aquitanian Pinus pinaster ssp. atlantica - Quercus suber forests
G3.714 Iberian Pinus pinaster ssp. atlantica forests
G3.72 Pinus pinaster ssp. pinaster (Pinus mesogeensis) forests
G3.73 Pinus pinea forests
G3.741 Iberian Pinus halepensis forests
G3.742 Balearic Pinus halepensis forests
G3.743 Provenço-Ligurian Pinus halepensis forests
G3.744 Corsican Pinus halepensis woods
G3.745 Sardinian Pinus halepensis woods
G3.746 Sicilian Pinus halepensis woods
G3.7471 Gargano Pinus halepensis forests
G3.7472 Metapontine Pinus halepensis forests
G3.7473 Umbrian Pinus halepensis forests
G3.748 Hellenic Pinus halepensis forests
G3.749 Illyrian Pinus halepensis forests
G3.74A East Mediterranean Pinus halepensis forests
G3.75 Pinus brutia forests

Description

Mediterranean and thermo-Atlantic forests of thermophilous pines, mostly appearing as successional stages or plagioclimax replacements of Mediterranean evergreen broadleaved woodland G2.1 or G2.4. Long-established plantations of these pines, within their natural area of occurrence, and with an undergrowth basically similar to that of G2.1 and G2.4, are included.

Plant communities

Alkanno baeoticae-Pinion halepensis, Pinion pineae

Species

**G3.71:** Arbutus unedo, Calluna vulgaris, Cistus salviifolius, Cytisus scoparius, Daphne gnidium, Erica scoparia, Frangula alnus, Hedera helix, Ilex aquifolium, Pinus pinaster ssp. atlantica, Pteridium aquilinum, Quercus ilex, Quercus pubescens, Quercus robur, Rubia peregrine, Ruscus aculeatus, Ulex europaeus, **G3.72:** Arbutus unedo, Calicotome spinosa, Erica arborea, Genista corsica, Lavandula stoechas, Pinus pinaster, Pistacia lentiscus, Quercus faginea, Quercus ilex, Quercus pyrenaica, Quercus rotundifolia, Quercus suber, Rosmarinus officinalis, Rubia peregrina, Teucrium marum. **G3.73:** Pinus pinea, Arbutus unedo, Calicotome spinosa, Calicotome villosa, Chamaerops humilis, Cistus albidus, Cistus creticus, Cistus crispus, Cistus laurifolius, Cistus monspeliensis, Cistus salviolius, Cistus salviolius, Corema album, Corynephorus canescens, Crataegus monogyna, Cytisus scoparius, Cytisus scoparius, Erica arborea, Erica scoparia, Halimium halimifolium, Halimium rosmarinifolium, Helichrysum serotinum, Juniperus communis, Juniperus oxycedrus, Juniperus oxycedrus, Juniperus
phoenicea, Juniperus thurifera, Lavandula latifolia, Lavandula pedunculata, Pinus pinaster, Pistacia palaestina, Pistacia terebinthus, Retama sphaerocarpa, Rhamnus oleoides, Salvia officinalis, Ulex australis

**Corresponding class in other classifications**

European forest types: 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

*Pinus nigra* woodlands are G3.6

**References**


### 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**


**Corresponding class in other classifications**

European forest types: 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 silicuae*, *Quercion ilicis*, *Mayteno-Juniperion canariensis*, *Juniperion thuriferae*, *Periplocion angustifoliae*, *Juniperion excelsae*, *Fagion sylvaticae*, *Junipero excelsae-Quercion pubescentis*, *Quercetea pubescentis*
Species


Corresponding class in other classifications

Includes European forest types

10.7 Juniper forest
10.8 Cypress forest
10.9 Cedar forest
10.10 Tetaclinis articulate stands
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 Tetaclinis articulate forests
9580 Mediterranean Taxus baccata woods
9590 Cedrus brevifolia forests (Cedrosetum brevifoliae)

G3.A Picea taiga woodland

Description

Boreal spruce or spruce-pine forests of Fennoscandia, northeastern Poland, the Baltic States, Belarus and European Russia, with G3.B constituting the westernmost section of the continuous Eurasian northern taiga belt. In the boreo-nemoral zone, deciduous trees such as Quercus robur, Tilia cordata, Acer platanoides, Ulmus laevis, Populus tremula may accompany the conifers.

Plant communities

Aconito septentrionalis-Piceion obovatae, Empetro-Piceion obovatae, Piceion excelsae

Species


**Corresponding class in other classifications**

European forest types: 1.1 Spruce and spruce-birch boreal forest

Nordic Vegetation Classification 1994: 2.1.2.1 Spruce forest of bilberry type

2.1.2.2 Spruce forest of low fern type
2.1.2.4 Spruce forest of low herb type
2.1.2.5 Spruce forest of fern type
2.1.2.6 Spruce forest of tall herb type

**EU Habitats Directive Annex I**

9010 Western Taiga
9050 Fennoscandian herb-rich forests with Picea abies

### G3.B Pinus taiga woodland

**Description**

Boreal pine forests of Fennoscandia, northeastern Poland, the Baltic States, Belarus and European Russia, with G3.A constituting the westernmost section of the continuous Eurasian northern taiga belt.

**Plant communities**

*Cladonio stellaris-Pinion sylvestris, Dicrano-Pinion*

**Species**


**Corresponding class in other classifications**

European forest types: 1.2 Pine and pine-birch boreal forest

Nordic Vegetation Classification 1994: 2.1.1.1 Pine forest of lichen type

2.1.1.2 Pine forest of heather - crowberry type
2.1.1.4 Pine forest of cowberry type
2.1.1.5 Pine forest, Leguminous plants—Stone bramble-type
2.1.1.6 Pine forest on calcareous ground

**EU Habitats Directive Annex I**

9010 Western Taïga

**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: 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**

*Eriophorum vaginatum, Vaccinium oxycoccos, Vaccinium uliginosum*

**Corresponding class in other classifications**

European forest types: 11.1 Conifer dominated or mixed mire forests

Milieux naturels de Suisse 2008: 6.5.2 Pinède sur tourbe

6.5.3 Pessière sur tourbe

**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.

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 Resolution 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

H1.4 Lava tubes is included in 8320 Fields of lava and natural excavations

H2 Scree

H2.1 Cold siliceous scree

Description

Noncalcereous scree of the mountains and uplands of the boreal zone, developed on siliceous substrates including basic to ultrabasic igneous or metamorphic substrates. Included are the scree of northern Europe including Iceland.

Plant communities

*Allosuro-Athyrion alpestris, Antitrichio-Rhodiolion roseae, Ranunculo-Oxyrion didynae*

Corresponding class in other classifications

Nordic Vegetation Classification 1994: 7.1.4.1 Rock Speedwell type

7.1.4.2 Rock Speedwell type rich in bushes

7.1.4.3b Alpine Lady's Mantle-Thymus arcticus variant

7.1.4.3a Alpine Mouse-ear-Viviparous fescue variant

7.1.4.4 Bog Bilberry type

7.1.4.5 Thrift-Moss Campion type
EU Habitats Directive Annex I

8110 Siliceous scree of the montane to snow levels (*Androsacetalia alpinae* and *Galeopsietalia ladani*)

### H2.2 Cold limestone screes

**Description**

Unstable, gravelly, humus-poor, highly calcareous screes of the subalpine, low alpine and middle alpine levels of boreal and arctic mountains. Often with endemic species or species of restricted range.

**Plant communities**

*Arenarion norvegicae, Salici reticulatae-Poion alpinae*

**Species**


**Corresponding class in other classifications**

Nordic Vegetation Classification 1994: 7.1.4.3 Arctic Sandwort type

EU Habitats Directive Annex I

8120 Calcareous and calcshist screes of the montane to alpine levels (*Thlaspietea rotundifolii*)

### H2.3 Temperate-montane acid siliceous screes

**Description**

Siliceous screes of high altitudes and cool sites in mountain ranges of the nemoral zone, including the Alps, Pyrenees and Caucasus.

**Plant communities**

*Androsacion alpinae, Chaerophyllion humilis, Dryopteridion oreadis, Scrophulario minimae-Symphylomion graveolens, Senecionion leucophylli*

**Species**

**H2.31:** *Androsace alpina, Achillea nana, Oxyria digyna, Geum reptans, Saxifraga bryoides, Ranunculus glacialis, Linaria alpina, Oreochloa disticha, Silene acaulis** **H2.32:** *Epilobium collinum, Galeopsis segetum, Acetosella vulgaris, Dalanum ladanum, Petasites albus, Tussilago farfara, Senecio viscosus, Anarrhinum bellidifolium, Cryptogramma crispa** **H2.33:** *Saxifraga bryoides, Saxifraga adscendens, Saxifraga oppositifolia, Oxyria digyna, Androsace hedraeantha Poa cenisia, Cryptogramma crispa, Vaccinium spp., Polygonum alpinum, Pleuropteropyrum undulatum, Lerchenfeldia flexuosa, Senecio rupestris.*

**Corresponding class in other classifications**

Milieux Naturels de Suisse 2008: 3.3.2.2Eboulis siliceux d'altitude

3.3.2.3Eboulis siliceux thermophiles

EU Habitats Directive Annex I

8110 Siliceous scree of the montane to snow levels (*Androsacetalia alpinae* and *Galeopsietalia ladani*)

8150 Medio-European upland siliceous screes
**H2.4 Temperate-montane calcareous and ultra-basic screes**

**Description**
Calcereous and calcshist screes of high altitudes and cool sites in mountain ranges of the nemoral zone, including the Alps, Pyrenees and Caucasus. Usually sparse vegetation cover, unstable, on steep slopes.

**Plant communities**

Androsacion ciliatae, Arabidion alpinae, Bunion alpine, Drabion hoppeanae, Festucion dimorphae, Iberidion spathulatae, Iberido apertae-Linarion propinqua, Papaverion tatrici, Papavero-Thymion pulcherrimi, Petasion paradoxi, Platycapno saxicolae-Iberidion granatensis, Saxifragion praeterrmissae, Saxifragion prenjae, Thlaspion rotundifolii, Thlaspion stylosi, Veronica-Papaverion degentii

**Species**

H2.41: Draba hoppeana, Campanula cenisia, Saxifraga biflora, Herniaria alpina, Trisetum spicatum
H2.42: Thlaspi rotundifolium, Papaver rhaeticum, Papaver sendleri, Viola cenisia, Linaria alpina, Arabis alpina
H2.43: Petasites paradoxus, Valeriana montana, Gypsophila repens, Hieracium spp
H2.44: Cerastium latifolium, Cerastium tatrae, Arabis alpina, Hutchinsia alpina, Sedum atratum, Cystopteris montana
H2.45: Morina persica, Sideritis scardica.

**Corresponding class in other classifications**

Milieux Naturels de Suisse 2008: 3.3.1.2 Eboulis calcaire d'altitude (roche dure)
3.3.1.3 Eboulis de calcschistes d'altitude
3.3.1.4 Eboulis calcaire humide

EU Habitats Directive Annex I

8120 Calcareous and calcshist screes of the montane to alpine levels (Thlaspietea rotundifolii)

**H2.5 Acid siliceous screes of warm exposures**

**Description**
Siliceous screes of warm exposures in mountain ranges of the nemoral zone, including the Alps, Pyrenees and Caucasus, and of Mediterranean mountains, hills and lowlands and, locally, of warm, sunny middle European upland or lowland sites.

**Plant communities**

Dryopteridion oreadis, Gymnogrammo-Scrophularion, Galeopsis, Galeopsis pyrenaicae, Holcioni caespilose, Linario saxatilis-Senecionion carpetani, Sesamoidion suffruticosae

**Species**

H2.51: Senecio leucophyllus, Taraxacum pyrenaicum, Galeopsis pyrenaica, Xatardia scabra, Armeria alpina
H2.54: Linaria saxatilis, Linaria alpina, Digitalis purpurea var. carpetana, Senecio pyrenaicus ssp. carpetanus, Rumex suffruticosus, Santolina oblongifolia, Conopodium bunioides, Reseda gredensis
H2.58: Achnatherum calamagrostis, Melica ciliata.

**Corresponding class in other classifications**

Milieux Naturels de Suisse 2008: 3.3.2.3 Eboulis siliceux thermophiles

EU Habitats Directive Annex I

8130 Western Mediterranean and thermophilous scree
H2.6 Calcareous and ultra-basic screes of warm exposures

Includes the following subtype separately listed in the 2010 version

H2.6.13 Paris Basin screes

Description

Calcareous and calcshist screes of warm exposures in mountain ranges of the nemoral zone, including the Alps, Pyrenees and Caucasus, and of Mediterranean mountains, hills and lowlands and, locally, of warm, sunny middle European upland or lowland sites.

Plant communities


Species

H2.62: Arenaria provincialis (Gouffeia arenarioides), Ptychotis heterophylla, Linaria supina, Centranthus ruber, Centranthus lecoqii, Crucianella latifolia H2.68: Drypis spinosa, Ranunculus brevifolius, Senecio thapsoides, Aethionema saxatile, Geranium robertianum ssp. purpureum, Centranthus calcitrapa, Mercurialis annua, Theligonum cynocrambe and Thlaspi perfoliatum H2.6A: Alyssum troodi, Hedysarum cyprium, Salvia veneris H2.6C: Dianthus petraeus, Corydalis ochroleuca, Peltaria alliacea, Drypis spinosa ssp. jacquiniana, Malcolmia serbica, Galium corrudifolium, Teucrium chamaedrys, Geranium robertianum H2.6D: Achnatherum calamagrostis, harbouring the endemics Halacsyia sendtneri, Scrophularia tristis, Alyssum markgrafii, Linaria rubioides, Stachys chrysophaea, Cotinus coggygria H2.6E: Achnatherum calamagrostis H2.6G: Achnatherum calamagrostis, Parietaria officinalis, Lamium garganicum ssp. laevigatum, Galium album ssp. album, Vincetoxicum hirundinaria

Corresponding class in other classifications

Milieux Naturels de Suisse 2008: 3.3.1.5 Eboulis calcaire thermophile

EU Habitats Directive Annex I

8130 Western Mediterranean and thermophilous scree
8140 Eastern Mediterranean screes
8160 Medio-European calcareous scree of hill and montane levels

H3 Inland cliffs, rock pavements and outcrops

H3.1 Acid siliceous inland cliffs

Description

Dry non-calcareous inland cliffs. Specific plant associations colonize montane and Mediterranean cliffs. Most of the subdivisions refer to them. Northern lowland cliffs usually support fragments of other less specialized communities.

Plant communities

Androsacion vandelli, Asarinion procumbentis, Asplenion septentrionalis, Cheilanthon hispanicae, Gymnogammo-Scrophularion, Gypsophilion tenuifoliae, Hieracion carpetani, Hypno-Polypodion vulgaris, Linariion capraeae, Pohlio crudae-Asplenion septentrionalis, Polygonion icarici, Polypodion serrati, Potentillion crassinerviae, Saxifragion continentalis, Saxifragion cotyledonis, Saxifragion cymbosae, Saxifragion nevadensis, Saxifragion pedemontanae, Sesamoidion suffraticosae, Silenion lerchenfeldianae, Thalictrum foetidi-Asplenion
Species

**H3.11:** Acetosella vulgaris, Aurinia saxatilis, Polypodium vulgare, Woodsia ilvensis, Primula minima, Ranunculus alpestris, Saxifraga bryoides, Silene acaulis **H3.13:** Saxifraga pedemontana **H3.14:** Potentilla crassinervia, Armeria leucocephala, Silene requienii, Saxifraga pedemontana ssp. cervicornis, Amelanchier ovalis ssp. rhannoides, Festuca sardoa, Phyteuma serratum, Helechrysum frigidum, Aquilegia bernardii, Leucanthemum corsicum, Scabiosa corsica, Draba dubia, Asplenium viride, Draba loiseleurii, Eriogonum paoli **H3.16:** Asarina procumbens (Antirrhinum asarina), Sedum hirsutum, Centaurea pectinata, Sempervivum arvernense, Dianthus graniticus, Saxifraga clusii, Saxifraga hypnoides **H3.17:** Cheilanthes tinaei **H3.18:** Cheilanthes spp, Asplenium spp, Polypodium spp, Dianthus spp

Corresponding class in other classifications

Nordic Vegetation Classification 1994: 7.1.1.1 Forked Spleenwort-Maidenhair Spleenwort type

7.1.1.2 Catchfly-Heather-type

7.1.1.3 Oblong Woodsia-Red German Catchfly-type

Milieux Naturels de Suisse 2008: 3.4.2 Paroi de roche siliceuse, serpentine

EU Habitats Directive Annex I

8220 Siliceous rocky slopes with chasmophytic vegetation

**H3.2 Basic and ultra-basic inland cliffs**

Description

Dry, calcareous inland cliffs. Specific plant associations colonize montane and Mediterranean cliffs and most of the subdivisions refer to these. Northern lowland cliffs usually support fragments of other less specialized communities.

Plant communities


Species

**H3.21:** Asplenium petrarchae, Phagnalon sordidum, Sarcocapnos enneaphylla, Biscutella frutescens, Hieracium stelligerum, Lavatera maritima, Campanula macrorhiza, Melica minuta, Melica bauhinii, Scabiosa saxatilis, Teucrium buxifolium, Rhamnus lycioides ssp. borgiae Brassica balearica, Helichrysum rupestre var. cambessedesii, Brassica insularis, Ruta graveolens, Stachys glutinosa, Dianthus rupestris, Iberis sempervirens, Lithodora rosmarinifolia, Antirrhinum siculum, Brassica rupestris, Brassica incana,

Corresponding class in other classifications

Milieux Naturels de Suisse 2008: 3.4.1 Paroi de roche calcaire
Nordic Vegetation Classification 1994: 7.1.2.1 Green Spleenwort type

7.1.3.1 Rock vegetation on serpentine, Green Spleenwort type
7.1.3.2 Rock vegetation on serpentine, Dwarf shrub type
7.1.3.3 Rock vegetation on serpentine, Asplenium adulterinum type

EU Habitats Directive Annex I

8210 Calcareous rocky slopes with chasmophytic vegetation

H3.511 Limestone pavements

Description

More or less level surfaces of calcareous rock of lowlands, hills and mountains of non-desert regions of the Palaearctic, including karstic pavements, lapis, with their clints (fissures) and grikes (blocks).

EU Habitats Directive Annex I

8240 Limestone pavements
References


H4 Snow or ice-dominated habitats

H4.2 Ice caps and true glaciers

Description
Permanent and near-permanent ice. Includes ice sheets, ice caps, cirque glaciers, valley glaciers, and small ice masses (glacierets) that are either permanent or persist for a few years.

Corresponding class in other classifications
Milieux Naturels de Suisse 2008: 3.1.1 Glaciers

EU Habitats Directive Annex I
8340 Permanent glaciers

H4.3 Rock glaciers and unvegetated ice-dominated moraines

Description
Mixtures of ice and rocks in which the rocks ride on top of the ice (rock glaciers), or form ridges or mounds of morainic material containing buried ice (ice-core moraines), or are in the process of losing the ice to become glacial moraines. Excludes unvegetated glacial moraines where ice is no longer dominant (H5.2).

Corresponding class in other classifications
Milieux Naturels de Suisse 2008: 3.1.2 Glacier rocheux

EU Habitats Directive Annex I
8340 Permanent glaciers

H6 Recent volcanic features

Description
Hard rock surfaces, rock jumbles, loose material deposits, soils, water bodies resulting from recent or present volcanic activity, unvegetated, occupied by lichens or mosses, or colonized by specialised, relatively sparse herb- or shrub-dominated communities. Includes a wide variety of active and non-active features including steam vents (fumaroles), vapour and hot sulphurous gas vents (solfatares), paint pots, porridge pots and mud volcanoes, as well as cold carbon dioxide, methane and nitrogen vents (mofettes), that emit directly into the open atmosphere, barren lava flows, fields of volcanic ash and summits of dormant volcanoes.

EU Habitats Directive Annex I
8320 Fields of lava and natural excavations

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 (Ruppientea)); 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

References


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

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### 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**


**Animals:** *Dragonflies- Leucorrhinia dubia, Aeshna subartica, A. caerulea, A. juncea, Somatochlera 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.*

**Corresponding class in other classifications**

Milieux naturels de Suisse 2008: 2.4.1 Tourbière à sphaignes

**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.

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### X09 Pasture woods (with a tree layer overlying pasture)

**Description**

Pasture woods are the products of historic land management systems, and represent a vegetation structure rather than being a particular plant community. Typically this structure consists of large, open-grown or high forest trees (often pollards) at various densities, in a matrix of grazed grassland, heathland and/or woodland florae. This habitat is most common in southern Britain, but scattered examples occur throughout the UK. Outgrown wood-pasture and mature high forest remnants occur in northern and central Europe, but the number and continuity of ancient (veteran) trees with their associated distinctive saproxyllic (wood-eating) fauna and epiphytic flora are more abundant in Britain than elsewhere. Component habitat
types include beech and yew woodland (G1.6 and G3.97), heathland (F4) and dry acid grassland (E1.7). A range of native species usually predominates amongst the old trees but there may be non-native species which have been planted or regenerated naturally.

**EU Habitats Directive Annex I**

Includes

6530 Fennoscandian wooded meadows

9070 Fennoscandian wooded pastures

**References**


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**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.

**Species**

*Fritillaria ruthenica, Bulbocodium versicolor, Delphinium puniceum, Pulsatilla pratensis, Stipa zalesski, Stipa pulcherrima, Adonis wolgensis*

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**X29 Salt lake islands**

**Description**

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

**Species**

*Saussurea salsa, Ruppia drepanensis, Marsilea strigosa, Ceratophyllum tanaiticum*

**EU Habitats Directive Annex I**

Not present in the European Union

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**X35 Inland Sand Dunes**

**Description**
Sand bodies of eolian origin, possessing constructional relief and separated from the coast and its dune cords by nondonal 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)

**Species**

*Pulsatilla patens, Dianthus arenarius ssp. arenarius, Ligularia sibirica, Serratula lycopifolia, Chamaedaphne calyculata, Cinna laitifolia, Inula helenium, Helichrysum arenarium, Serratula coronata, Adenophora lilifolia, Hypericum hirsutum, Dracocephalum ruyschiana, Origanum vulgare, Lilium martagon, Gladiolus tenuis, Hierochloë odorata, Polemonium caeruleum, Chimaphila umbellata*

**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**

| X36 Depressions (pody) of the Steppe zone |

**Description**

Pody are a heterogeneous group of closed depressions of the Steppic region, predominantly on the left bank of the Lower Dnipro and along the Lower Volga and Lower Don, some of them are relics of the ancient hollows of the former Dnipro valley, others are formed as a result of subsidence processes or deflationary phenomena. Characterised by Gleysols ("gleysolod") with iron-manganese nodules, formed as a result of prolonged flooding. Characterised by a wide spectrum of vegetation including free-floating, coastal, ephemeral, meadow, meadow-steppe communities from the *Isoëto-Nanojuncetalia, Nanocyperetalia, Myosuro-Beckmannion eruciformis, Eleocharition soloniensis, Molino-Arrhenatheretalia, Molinietalia, Lythro virgati-Elytrigion pseudocaesiae, Festuco-Brometea, Festucetalia valesiaceae and Festucion valesiaceae*.

**EU Habitats Directive Annex I**

Not present in EU28