

## Supporting information to the paper

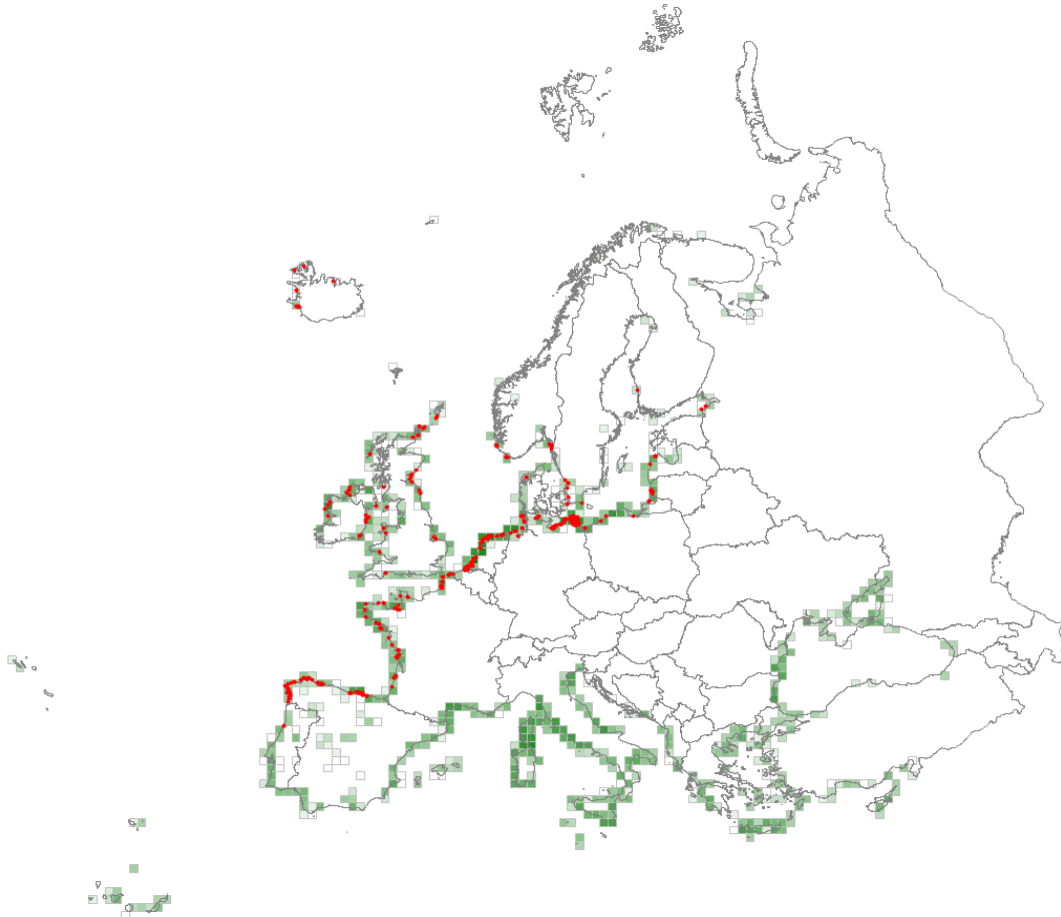
Chytrý M. *et al.*, EUNIS Habitat Classification: expert system, characteristic species combinations and distribution maps of European habitats. *Applied Vegetation Science*.

**Appendix S1.** Factsheets for the coastal, wetland, grassland, shrubland, forest and man-made habitats at hierarchical Level 3 of the revised EUNIS classification. The data are based on the classification of EVA database (version 2020-05-19) and some additional vegetation-plot datasets by the expert system EUNIS-ESy version 2020-06-08. Each factsheet contains:

- Habitat code and name
- Brief description of the habitat
- Distribution map of the habitat showing the locations of vegetation plots classified to this habitat by the EUNIS-ESy expert system (red points); green shading in the background indicates the density of plots belonging to the superior habitat group (coastal, wetland, grassland, shrubland, forest, man-made)
- Corresponding phytosociological alliances in EuroVegChecklist (Mucina et al. 2016, <https://www.synbiosys.alterra.nl/evc/>); explanation of the qualifiers:
  - < the EUNIS habitat is defined as a part of the alliance
  - > the EUNIS habitat is defined as a broader than and completely including the alliance
  - ◁ the EUNIS habitat and the alliance contain a large part that overlaps, but also parts that do not overlap
  - = the EUNIS habitat exactly matches the alliance
- Characteristic species combinations of the habitat divided into diagnostic, constant and dominant species; the values are:
  - diagnostic species: fidelity (phi coefficient multiplied by 100)
  - constant species: percentage occurrence frequency (constancy)
  - dominant species: percentage frequency of plots in which the species occurs with a cover larger than 25%

## N11 – Atlantic, Baltic and Arctic sand beach

Atlantic, Baltic and Arctic sandy beach is a linear habitat, occurring on sandy shores of the Atlantic and Arctic Oceans and the North and Baltic Seas. It is mainly an unvegetated habitat with low species diversity. Annual plants, often halophytes are the typical plant species, appearing temporarily on strandline sediments. On less dynamic beaches, as around the Baltic, perennials including some brackish and freshwater marsh plants are characteristic. Volcanic sediments can provide a distinctive character around Icelandic shores. Distinctive invertebrates characterise beaches and their driftlines, providing food for some wading birds.



### Corresponding alliances in EuroVegChecklist 2016

- <> CAK-01C Agropyro-Rumicion Nordhagen 1940 nom. ambig. rejic. propos.
- <> CAK-01A Atriplicion littoralis Nordhagen 1940
- <> CAK-02B Atriplicion nudicaulis Golub et al. 2003
- <> CAK-02A Cakilion edentulae Thannheiser 1981
- <> CAK-03A Euphorbion peplidis Tx. ex Oberd. 1952
- > CAK-01B Salsolo-Minuartion peplidis Tx. in Br.-Bl. et Tx. 1952

### Characteristic species combination

Diagnostic species (phi coefficient \* 100)

<i>Honckenya peploides</i>	35
<i>Atriplex laciniata</i>	29
<i>Salsola kali</i> aggr.	29
<i>Atriplex littoralis</i>	27

<i>Atriplex prostrata</i>	24
<i>Leymus arenarius</i>	23
<i>Atriplex calotheca</i>	19
<i>Elytrigia juncea</i>	19
<i>Atriplex glabriuscula</i>	16

Constant species (percentage frequencies)

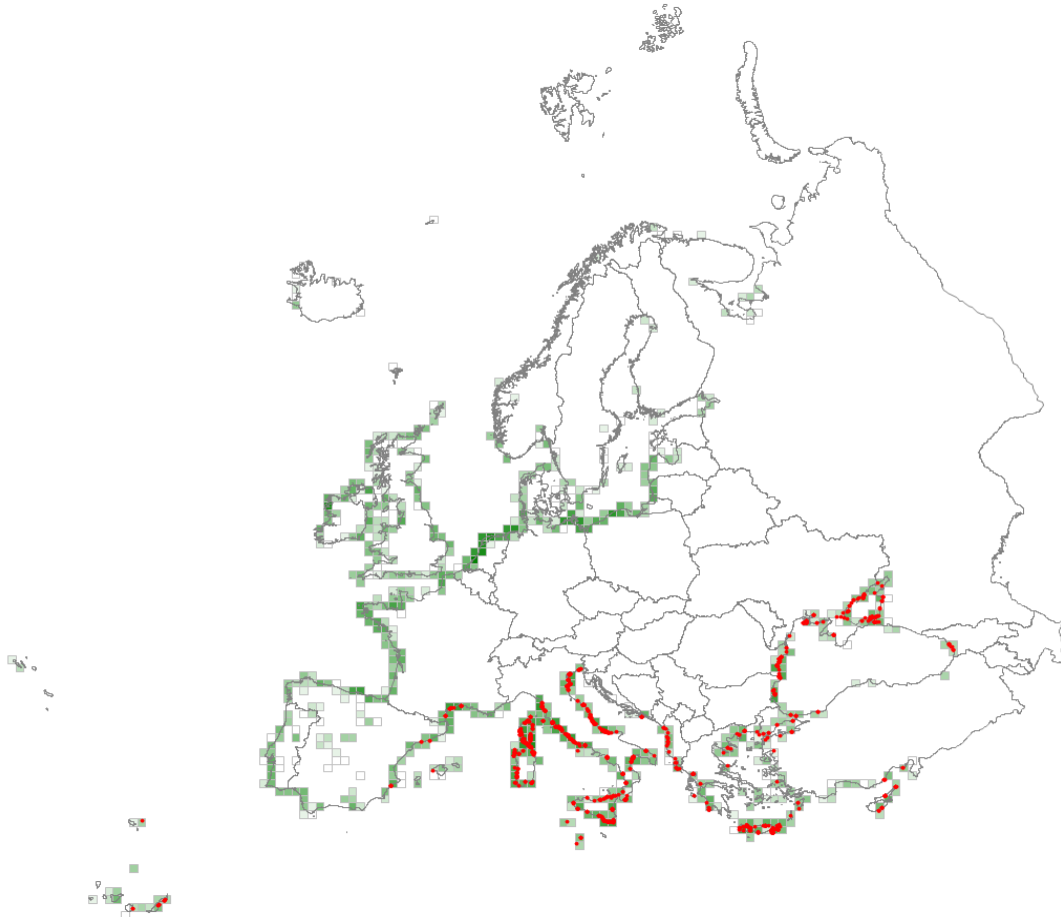
<i>Cakile maritima</i>	90
<i>Salsola kali</i> aggr.	52
<i>Atriplex prostrata</i>	43
<i>Elytrigia juncea</i>	38
<i>Honckenya peploides</i>	37
<i>Leymus arenarius</i>	22
<i>Atriplex littoralis</i>	22
<i>Tripleurospermum maritimum</i> aggr.	18
<i>Ammophila arenaria</i>	18
<i>Atriplex laciniata</i>	15
<i>Atriplex calotheca</i>	12

Dominant species (percentage frequencies of occurrences with cover > 25%)

<i>Cakile maritima</i>	20
<i>Honckenya peploides</i>	10
<i>Atriplex prostrata</i>	10
<i>Atriplex littoralis</i>	6
<i>Atriplex calotheca</i>	6

## N12 – Mediterranean and Black Sea sand beach

A largely unvegetated linear feature of sheltered coastlines around the Mediterranean and Black Seas, with fragmentary and sporadic vegetation cover developing on the accumulated sand, gravel and decaying plant material. Typically, the vegetation cover comprises scattered annual halophytes, although pioneer dune perennials can appear where sand ridges get pushed by storms beyond the normal tidal limit.



### Corresponding alliances in EuroVegChecklist 2016

- <> CAK-03B Cakilion euxinae Géhu et al. 1994
- <> CAK-03A Euphorbion peplidis Tx. ex Oberd. 1952

### Characteristic species combination

Diagnostic species (phi coefficient \* 100)

<i>Cakile maritima</i>	50
<i>Euphorbia peplis</i>	38
<i>Salsola kali</i> aggr.	37
<i>Polygonum maritimum</i>	27
<i>Xanthium orientale</i>	23
<i>Eryngium maritimum</i>	17

Constant species (percentage frequencies)

<i>Cakile maritima</i>	90
<i>Salsola kali</i> aggr.	67
<i>Xanthium orientale</i>	31

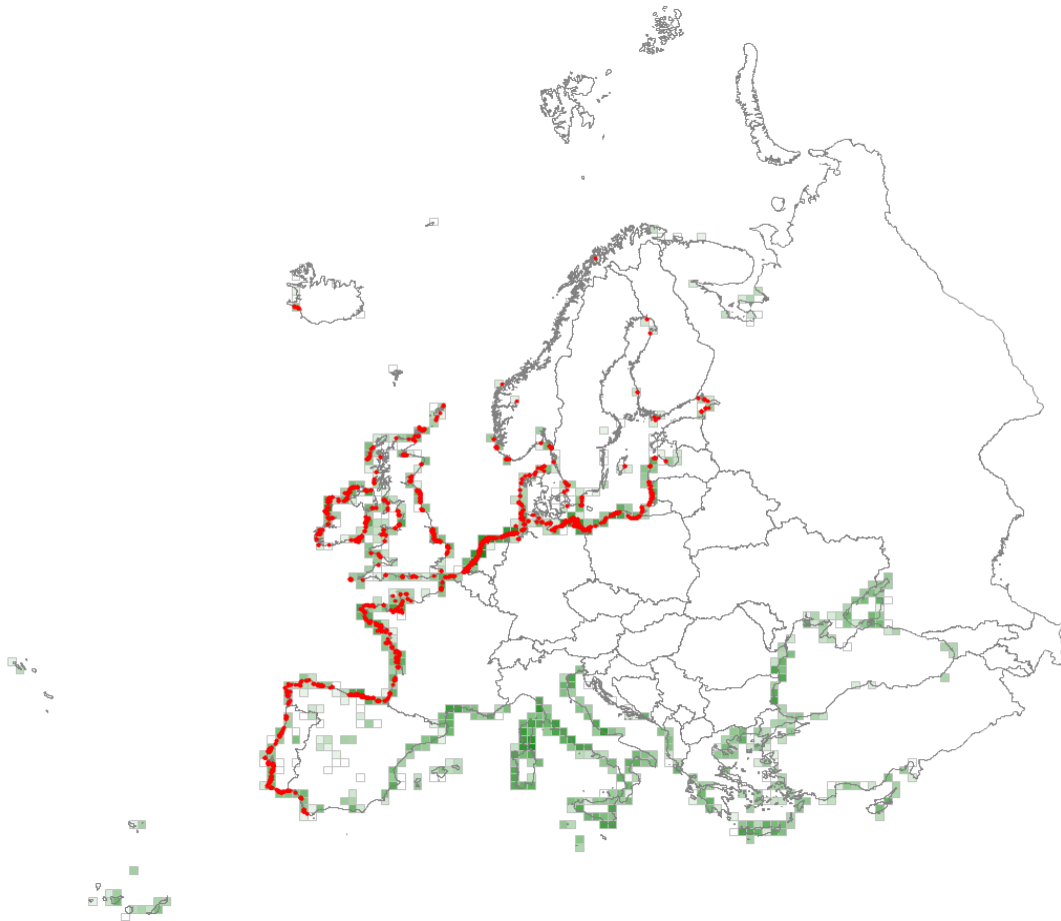
<i>Euphorbia peplis</i>	31
<i>Eryngium maritimum</i>	31
<i>Polygonum maritimum</i>	26
<i>Elytrigia juncea</i>	25
<i>Sporobolus pungens</i>	17
<i>Leymus racemosus</i>	15
<i>Medicago marina</i>	12
<i>Atriplex prostrata</i>	12
<i>Euphorbia paralias</i>	11
<i>Cyperus capitatus</i>	11
<i>Cynodon dactylon</i>	11
<i>Calystegia soldanella</i>	11

Dominant species (percentage frequencies of occurrences with cover > 25%)

<i>Cakile maritima</i>	12
<i>Salsola kali</i> aggr.	8
<i>Sporobolus pungens</i>	6

## N13 – Atlantic and Baltic shifting coastal dune

Primary, shifting (so-called 'white') dunes of dynamic coastal sands along the Atlantic, North Sea and Baltic coasts. Early pioneers upshore from the strandline catch sand blown from the beach and initiate foredune, then embryo dune, development stages. They may come and go with subsequent storms, or continue to build higher, mobile dunes that move inland, sometimes to enormous size and in distinct ridges with intervening valleys. *Ammophila arenaria* is the widespread dominant in the middle to later stages. This grass is especially well-equipped to cope with rapid upbuild and continually shifting sands. *Leymus arenarius* and *xAmmocalamagrostis baltica* play a similar role in colder regions. The latter hybrid is preferred in plantings related to coastal defence measures. The vegetation cover on the sharply-draining, nutrient-poor sand, more or less without organic matter, is typically open with few species, some indicative of the regional temperature contrasts, and some striking fungi. Specialised beetles are also characteristic.



### Corresponding alliances in EuroVegChecklist 2016

- > AMM-02A Agropyro-Honckenyon peplidis Tx. in Br.-Bl. et Tx. 1952 nom. mut. propos.
- > AMM-01C Elymion arenarii Christiansen 1927

### Characteristic species combination

Diagnostic species (phi coefficient \* 100)

<i>Ammophila arenaria</i>	35
<i>Leymus arenarius</i>	34
<i>Elytrigia juncea</i>	25
<i>xAmmocalamagrostis baltica</i>	23

<i>Honckenya peploides</i>	23
<i>Calystegia soldanella</i>	19
<i>Euphorbia paralias</i>	16

Constant species (percentage frequencies)

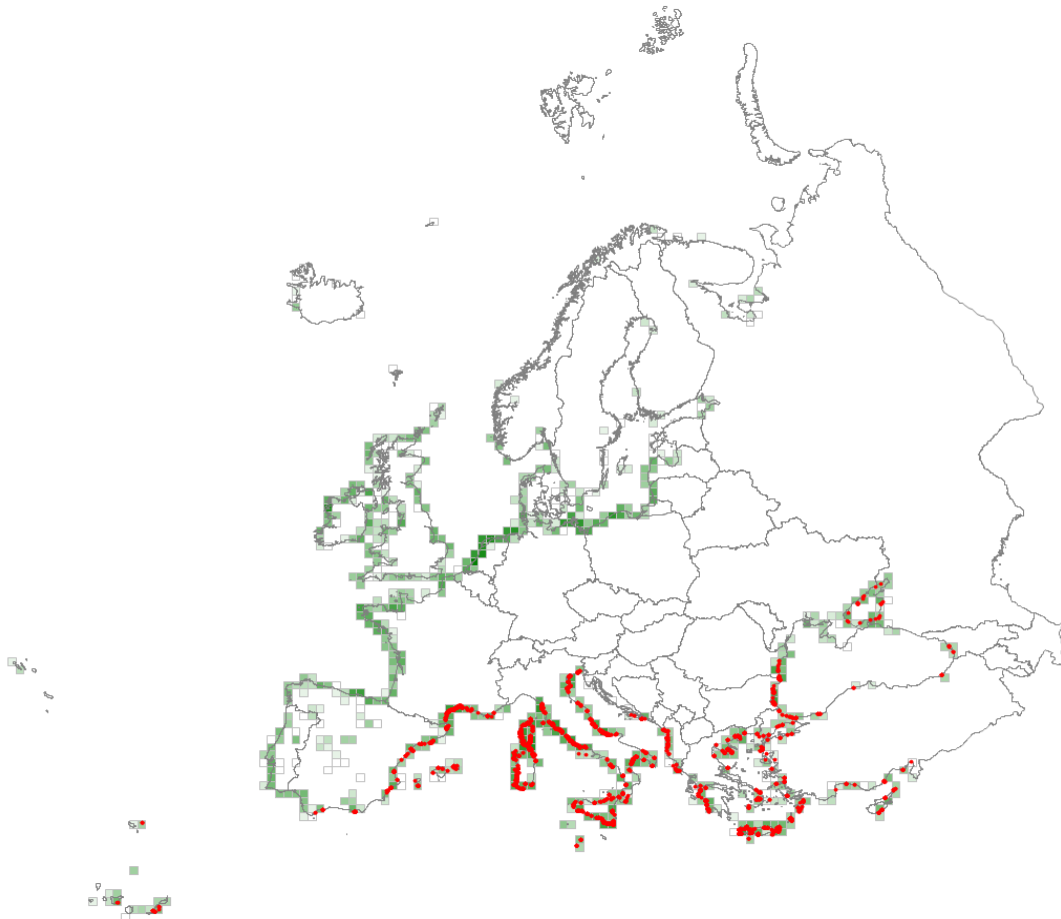
<i>Ammophila arenaria</i>	65
<i>Elytrigia juncea</i>	51
<i>Leymus arenarius</i>	33
<i>Festuca rubra</i> aggr.	31
<i>Eryngium maritimum</i>	27
<i>Honckenya peploides</i>	25
<i>Calystegia soldanella</i>	21
<i>Euphorbia paralias</i>	18
<i>Carex arenaria</i>	18
<i>Cakile maritima</i>	18
x <i>Ammocalamagrostis baltica</i>	13
<i>Sonchus arvensis</i>	13

Dominant species (percentage frequencies of occurrences with cover > 25%)

<i>Ammophila arenaria</i>	36
<i>Elytrigia juncea</i>	15
<i>Leymus arenarius</i>	9

## N14 – Mediterranean, Macaronesian and Black Sea shifting coastal dune

Primary, shifting ('white') dunes of dynamic coastal sands around the Black and Mediterranean Seas, and into the Atlantic around SW Iberia and Macaronesia. Early pioneers upshore from the strandline catch sand blown from the beach and initiate embryo dune development. These may come and go with subsequent storms, or continue to build higher mobile white dunes that move inland. Except in Macaronesia, the dominant plant in the middle to later stages is *Ammophila arenaria* (subsp. *arundinacea* in the Mediterranean), and the associated flora on the permeable, impoverished sands is limited and sparse.



### Corresponding alliances in EuroVegChecklist 2016

- > AMM-01A *Ammophilion* Br.-Bl. 1921
- > AMM-01B *Elymion gigantei* Morariu 1957

### Characteristic species combination

Diagnostic species (phi coefficient \* 100)

<i>Echinophora spinosa</i>	38
<i>Medicago marina</i>	37
<i>Eryngium maritimum</i>	37
<i>Elytrigia juncea</i>	37
<i>Euphorbia paralias</i>	33
<i>Cyperus capitatus</i>	30
<i>Cutandia maritima</i>	26
<i>Achillea maritima</i>	25



<i>Sporobolus pungens</i>	25
<i>Calystegia soldanella</i>	24
<i>Pancratium maritimum</i>	24
<i>Ammophila arenaria</i>	22
<i>Cakile maritima</i>	19
<i>Anthemis maritima</i>	16

Constant species (percentage frequencies)

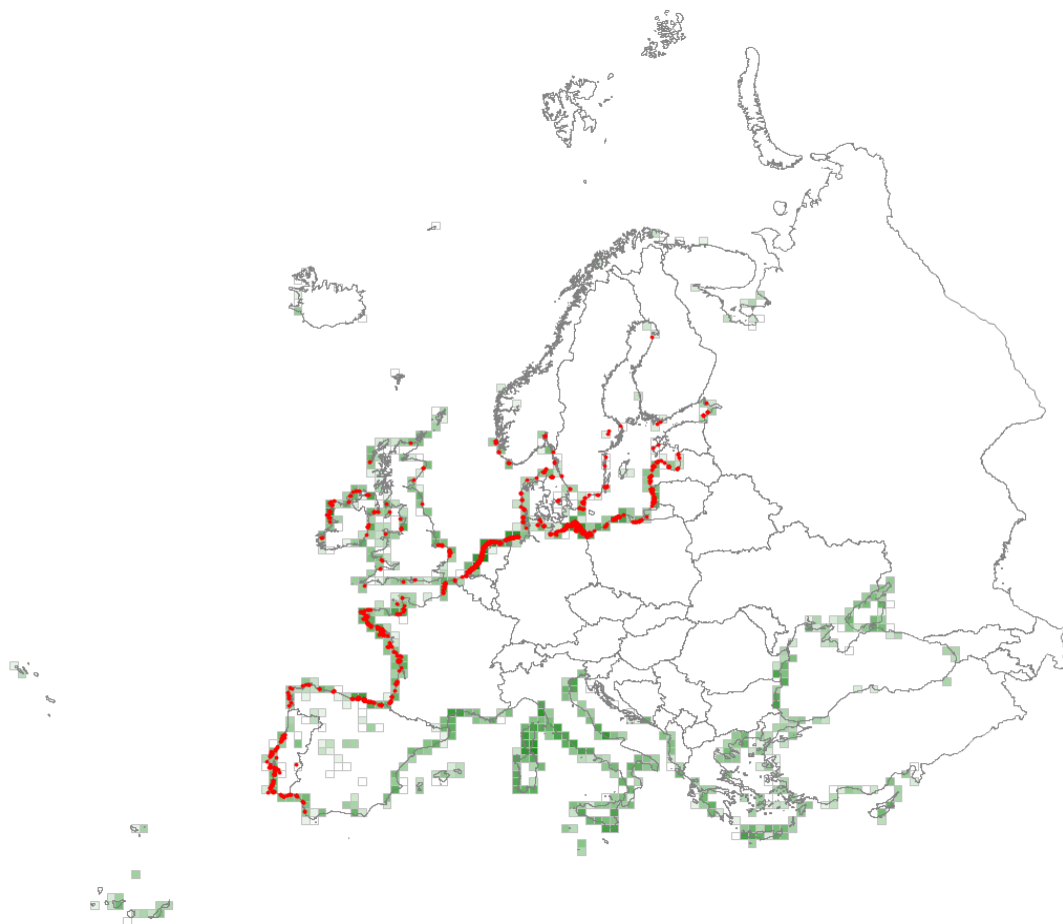
<i>Elytrigia juncea</i>	72
<i>Eryngium maritimum</i>	65
<i>Medicago marina</i>	43
<i>Ammophila arenaria</i>	41
<i>Euphorbia paralias</i>	38
<i>Cakile maritima</i>	36
<i>Pancratium maritimum</i>	33
<i>Echinophora spinosa</i>	32
<i>Cyperus capitatus</i>	31
<i>Sporobolus pungens</i>	29
<i>Calystegia soldanella</i>	26
<i>Achillea maritima</i>	23
<i>Cutandia maritima</i>	18
<i>Polygonum maritimum</i>	14
<i>Salsola kali</i> aggr.	12
<i>Euphorbia pepelis</i>	12
<i>Anthemis maritima</i>	11

Dominant species (percentage frequencies of occurrences with cover > 25%)

<i>Ammophila arenaria</i>	24
<i>Elytrigia juncea</i>	19
<i>Achillea maritima</i>	5

## N15 – Atlantic and Baltic coastal dune grassland (grey dune)

Grasslands that develop on the stabilised sands of older (grey) dunes along the Atlantic (southern to middle Portugal), North Sea and Baltic coasts. The sandy substrate, thinly enriched with accumulating humus, is well-drained and can dry out during summer. Typically with a more or less complete cover of (relatively low) grasses, herbs, bryophytes and lichens, sometimes with low shrubs, they comprise one of the most species-rich habitats on the temperate European coast. The flora can vary with the regional climate, with the character of the substrate, from acid to highly calcareous, and with the local dune topography. Individual dune systems can vary from narrow strips to enormous stretches, though most are not a dynamic stage in succession, but maintained in a more or less stable fixed state. They were often grazed or mown in the past, and missing dune fixation prevented the development of dense, tall grasslands as well as scrub and woodland. The habitat is threatened in most countries by the abandonment of traditional farming, by eutrophication through nitrogen deposition, overuse and urbanisation, often related to tourism.



### Corresponding alliances in EuroVegChecklist 2016

- <> TUB-02B *Alkanno-Maresion nanae* Rivas Goday in Rivas Goday et Rivas-Mart. 1963  
corr. Díez Garretas et al. 2001
- <> TUB-03A *Anthyllido hamosae-Malcolmion lacerae* Rivas Goday 1958
- <> COR-01A *Corynephorion canescentis* Klika 1931
- > CRU-01B *Euphorbio portlandicae-Helichryson stoechadis* Sissingh 1974
- <> CRU-02B *Helichryson picardii* (Rivas-Mart., M. Costa et Izco in Rivas-Mart. et al. 1990)  
Rivas-Mart. et al. 1999
- > CRU-01A *Koelerion arenariae* Tx. 1937 corr. Gutermann et Mucina 1993
- <> COR-01B *Koelerion glaucae* Volk 1931
- <> TUB-02A *Linarion pedunculatae* Díez Garretas et al. in Izco et al. 1988

## Characteristic species combination

### Diagnostic species (phi coefficient \* 100)

<i>Carex arenaria</i>	26
<i>Malcolmia littorea</i>	24
<i>Corynephorus canescens</i>	23
<i>Phleum arenarium</i>	23
<i>Festuca polesica</i>	22
<i>Euphorbia portlandica</i>	21
<i>Armeria welwitschii</i>	21
<i>Galium arenarium</i>	20
<i>Ammophila arenaria</i>	20
<i>Iberis procumbens</i>	18
<i>Verbascum litigiosum</i>	18
<i>Anchusa calcarea</i>	16
<i>Thymus carnosus</i>	16
<i>Linaria caesia</i>	15
<i>Reichardia gaditana</i>	15

### Constant species (percentage frequencies)

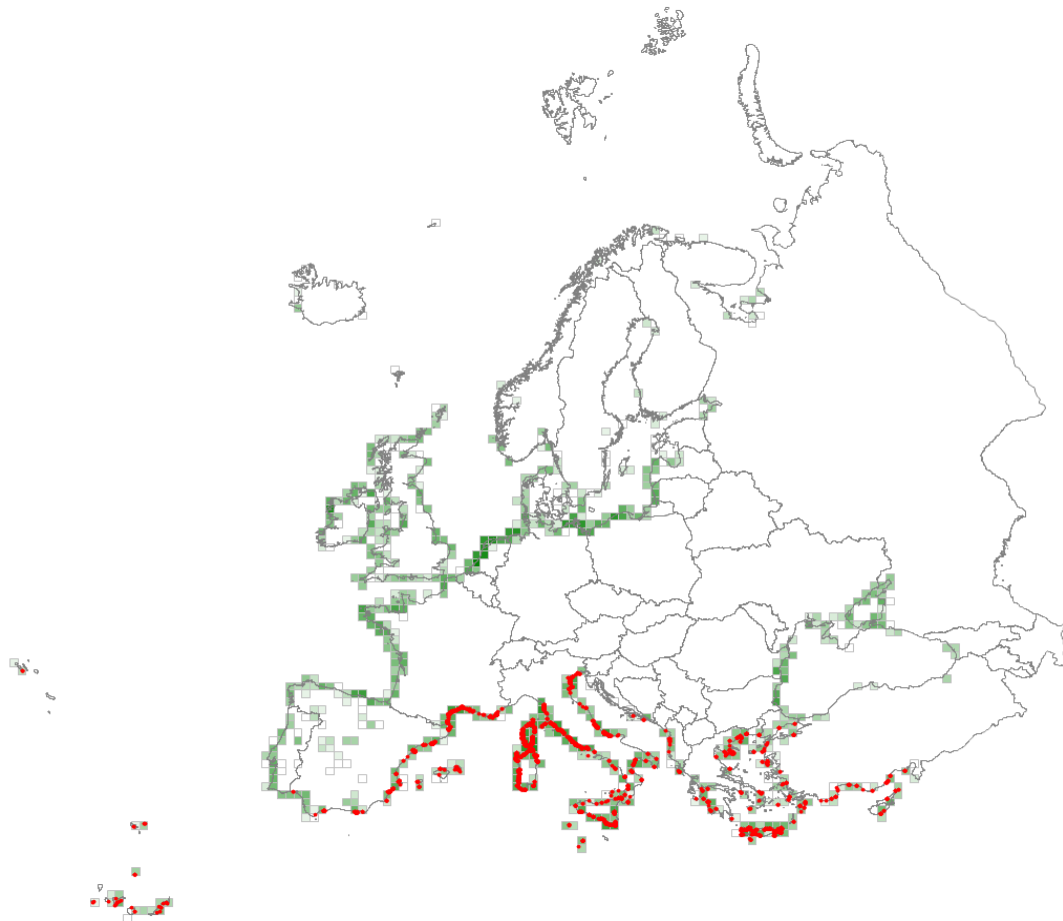
<i>Carex arenaria</i>	55
<i>Corynephorus canescens</i>	39
<i>Ammophila arenaria</i>	37
<i>Festuca rubra</i> aggr.	33
<i>Sedum acre</i>	22
<i>Jasione montana</i>	21
<i>Hieracium umbellatum</i>	21
<i>Artemisia campestris</i>	20
<i>Hypochaeris radicata</i>	19
<i>Syntrichia ruralis</i> aggr.	17
<i>Rumex acetosella</i>	17
<i>Hypnum cupressiforme</i> aggr.	16
<i>Galium verum</i>	16
<i>Calamagrostis epigejos</i>	16
<i>Phleum arenarium</i>	15
<i>Ceratodon purpureus</i>	15
<i>Leontodon saxatilis</i>	14
<i>Cetraria aculeata</i>	14
<i>Cerastium semidecandrum</i>	14
<i>Plantago lanceolata</i>	13
<i>Euphorbia portlandica</i>	13
<i>Poa pratensis</i> aggr.	12
<i>Eryngium maritimum</i>	12
<i>Crucianella maritima</i>	12
<i>Aira praecox</i>	12
<i>Cladonia furcata</i>	11

### Dominant species (percentage frequencies of occurrences with cover > 25%)

<i>Syntrichia ruralis</i> aggr.	11
<i>Carex arenaria</i>	9
<i>Corynephorus canescens</i>	8
<i>Calamagrostis epigejos</i>	7

## N16 – Mediterranean and Macaronesian coastal dune grassland (grey dune)

Stable (grey) dunes of fixed sands along the Mediterranean and Macaronesian coasts, and of the thermo-Atlantic coasts of Portugal, southwestern Spain and North Africa inland from wind erosion and salt deposition. They have a more or less complete cover of graminoids and herbs, often with a contingent of colourful spring annuals capitalising on early rains. The flora varies according to regional climate and dune topography. They may represent a temporary phase, giving way to evergreen sclerophyll scrub and woodland, or may form more permanent grassland at sites not suitable for shrubland. Through much of the Mediterranean, the habitat has been destroyed, contaminated by the invasion of non-native species or is much influenced by tourism, urbanisation, infrastructure development, arable cultivation, nitrogen deposition and afforestation.



### Corresponding alliances in EuroVegChecklist 2016

- <> TUB-02B *Alkanno-Maresion nanae* Rivas Goday in Rivas Goday et Rivas-Mart. 1963 corr. Díez Garretas et al. 2001
- > CRU-02A *Crucianellion maritimae* Rivas Goday et Rivas-Mart. 1958
- > CRU-01C *Diantho catalaunici-Scrophularion humifusae* Baudière et Simonneau 1974
- > MOQ-01C *Euphobio paraliae-Lotion glauci* Jardim et al. 2003
- <> CRU-02B *Helichryson picardii* (Rivas-Mart., M. Costa et Izco in Rivas-Mart. et al. 1990) Rivas-Mart. et al. 1999
- <> CHE-01K *Laguro ovati-Vulpion fasciculatae* Géhu et Biondi 1994
- <> TUB-02A *Linarion pedunculatae* Díez Garretas et al. in Izco et al. 1988
- > TUB-02E *Maresion nanae* Géhu et al. 1987
- > TUB-02F *Medicagini-Triplachnion nitentis* Mayer 1995
- > TUB-02G *Ononidion tournefortii* Géhu et al. 1996
- > TUB-02C *Psammo-Vulpion* Pignatti 1953

- > CRU-01D Syntrichio-Lomeliosion argenteae Biondi, Sburlino et Theurillat in Sburlino et al. 2014
- > TUB-02D Vulpio-Lotion Horvatić 1963

### Characteristic species combination

#### Diagnostic species (phi coefficient \* 100)

<i>Vulpia fasciculata</i>	31
<i>Medicago marina</i>	30
<i>Pseudorlaya pumila</i>	23
<i>Medicago littoralis</i>	23
<i>Cyperus capitatus</i>	23
<i>Malcolmia ramosissima</i>	23
<i>Pancratium maritimum</i>	22
<i>Erodium laciniatum</i>	20
<i>Silene niceensis</i>	20
<i>Lagurus ovatus</i>	20
<i>Elytrigia juncea</i>	20
<i>Crucianella maritima</i>	19
<i>Euphorbia terracina</i>	19
<i>Silene colorata</i>	19
<i>Cutandia maritima</i>	18
<i>Eryngium maritimum</i>	18
<i>Centaurea spinosa</i>	18
<i>Ononis variegata</i>	16
<i>Echinophora spinosa</i>	16
<i>Lotus cytisoides</i>	16
<i>Lotus creticus</i>	16
<i>Echium humile</i>	15
<i>Centaurea sphaerocephala</i>	15

#### Constant species (percentage frequencies)

<i>Elytrigia juncea</i>	39
<i>Medicago marina</i>	34
<i>Eryngium maritimum</i>	32
<i>Pancratium maritimum</i>	30
<i>Lagurus ovatus</i>	29
<i>Vulpia fasciculata</i>	25
<i>Medicago littoralis</i>	24
<i>Cyperus capitatus</i>	23
<i>Lotus cytisoides</i>	20
<i>Silene colorata</i>	18
<i>Ammophila arenaria</i>	18
<i>Sporobolus pungens</i>	16
<i>Crucianella maritima</i>	16
<i>Cakile maritima</i>	16
<i>Euphorbia terracina</i>	15
<i>Pseudorlaya pumila</i>	14
<i>Helichrysum stoechas</i>	14
<i>Echinophora spinosa</i>	14
<i>Euphorbia paralias</i>	13
<i>Cutandia maritima</i>	13
<i>Silene niceensis</i>	12
<i>Calystegia soldanella</i>	12
<i>Achillea maritima</i>	12
<i>Sonchus bulbosus</i>	11
<i>Reichardia picroides</i>	11
<i>Ononis natrix</i>	11

*Lotus creticus*

11

Dominant species (percentage frequencies of occurrences with cover > 25%)

*Crucianella maritima*

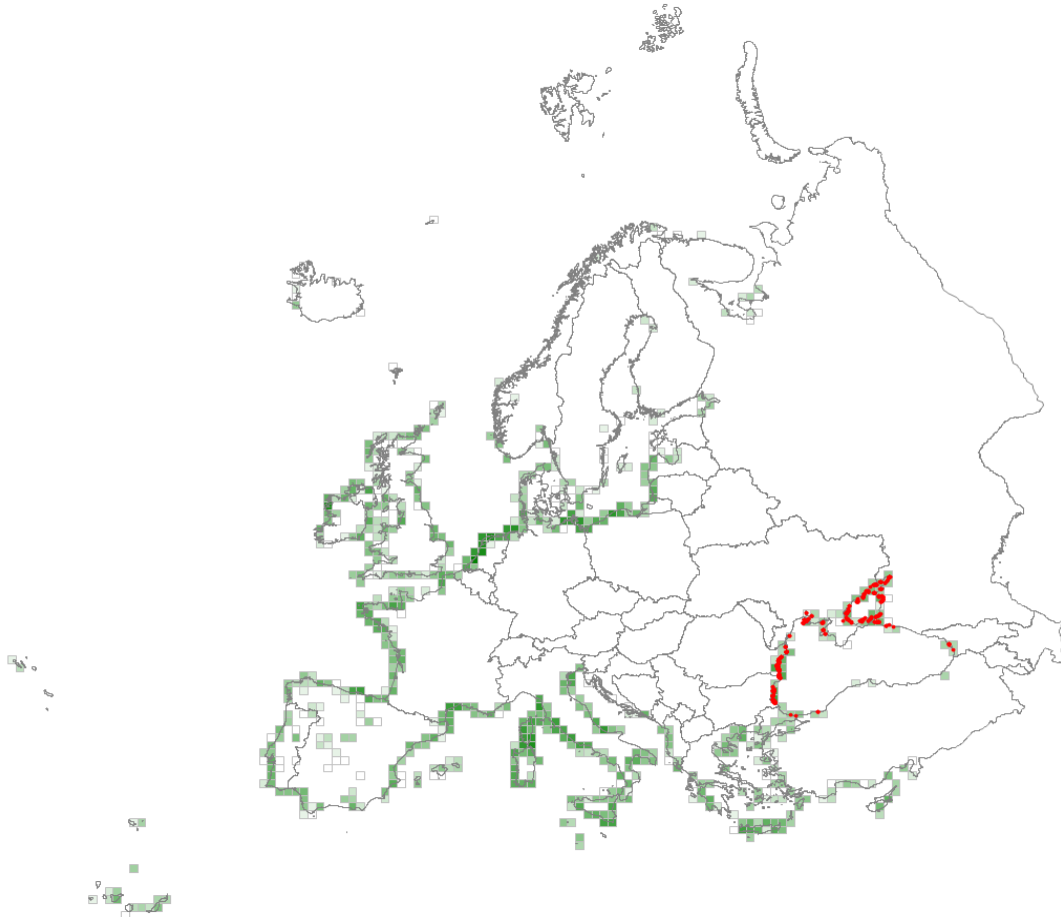
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*Centaurea spinosa*

6

## N17 – Black Sea coastal dune grassland (grey dune)

Dune grassland on stabilised or semi-stabilised coastal sands around the Black Sea, mostly on the western and north-western stretches and now only very locally. The dunes are best developed on broader flatter shores, and the ridges can vary in height from just a few metres to over 50 m, with moist depressions between. The flora is variable with a shift from the Mediterranean to Pontic regions moving northwards, with many regional endemic plant species among its grasses and herbs. Perennials predominate, but there can be striking contingents of annuals on more mobile stretches of sand on the ridges. Mosses and lichens can be extensive on north-facing, less sunny slopes.



### Corresponding alliances in EuroVegChecklist 2016

- > CRU-03C Cynodonto-Teucrion polii Korzhenevskii et Kliukin 1990
- > CRU-03B Scabiosion ucranicae Sanda et al. 1980
- > CRU-03A Sileno thymifoliae-Jurineion kilaeae Géhu et Uslu ex Mucina in Mucina et al. 2016

### Characteristic species combination

Diagnostic species (phi coefficient \* 100)

<i>Centaurea odessana</i>	50
<i>Leymus racemosus</i>	41
<i>Carex colchica</i>	38
<i>Secale sylvestre</i>	32
<i>Linaria genistifolia</i>	32
<i>Crambe maritima</i>	31

<i>Alyssum hirsutum</i>	27
<i>Jurinea kilaea</i>	27
<i>Seseli tortuosum</i>	24
<i>Agropyron cimmericum</i>	23
<i>Silene subconica</i>	22
<i>Odontarrhena borzaeana</i>	22
<i>Lepidotrichum uechtrizianum</i>	22
<i>Artemisia arenaria</i>	22
<i>Silene euxina</i>	20
<i>Festuca beckeri</i>	20
<i>Centaurea arenaria</i> aggr.	19
<i>Euphorbia seguieriana</i>	19
<i>Silene thymifolia</i>	18
<i>Plantago arenaria</i>	17
<i>Astragalus varius</i>	17
<i>Ephedra distachya</i>	16
<i>Syntrichia ruralis</i> aggr.	16
<i>Stachys maritima</i>	16
<i>Eryngium maritimum</i>	15

Constant species (percentage frequencies)

<i>Leymus racemosus</i>	46
<i>Carex colchica</i>	37
<i>Linaria genistifolia</i>	33
<i>Euphorbia seguieriana</i>	33
<i>Crambe maritima</i>	31
<i>Centaurea odessana</i>	29
<i>Eryngium maritimum</i>	28
<i>Secale sylvestre</i>	26
<i>Seseli tortuosum</i>	25
<i>Anisantha tectorum</i>	23
<i>Teucrium polium</i> aggr.	22
<i>Syntrichia ruralis</i> aggr.	22
<i>Medicago falcata</i>	22
<i>Artemisia campestris</i>	20
<i>Artemisia arenaria</i>	20
<i>Alyssum hirsutum</i>	19
<i>Eryngium campestre</i>	18
<i>Festuca beckeri</i>	17
<i>Lactuca tatarica</i>	16
<i>Chondrilla juncea</i>	16
<i>Galium humifusum</i>	16
<i>Ephedra distachya</i>	16
<i>Cynodon dactylon</i>	16
<i>Poa bulbosa</i>	15
<i>Cynanchum acutum</i>	15
<i>Centaurea arenaria</i> aggr.	15
<i>Artemisia santonicum</i>	15
<i>Plantago lanceolata</i>	14
<i>Astragalus onobrychis</i>	14
<i>Alyssum turkestanicum</i>	13
<i>Silene subconica</i>	12
<i>Senecio leucanthemifolius</i>	12
<i>Plantago arenaria</i>	12
<i>Cichorium intybus</i>	12
<i>Centaurea diffusa</i>	12
<i>Astragalus varius</i>	12
<i>Xanthium orientale</i>	11
<i>Securigera varia</i>	11



*Gypsophila perfoliata*

11

Dominant species (percentage frequencies of occurrences with cover > 25%)

*Carex colchica*

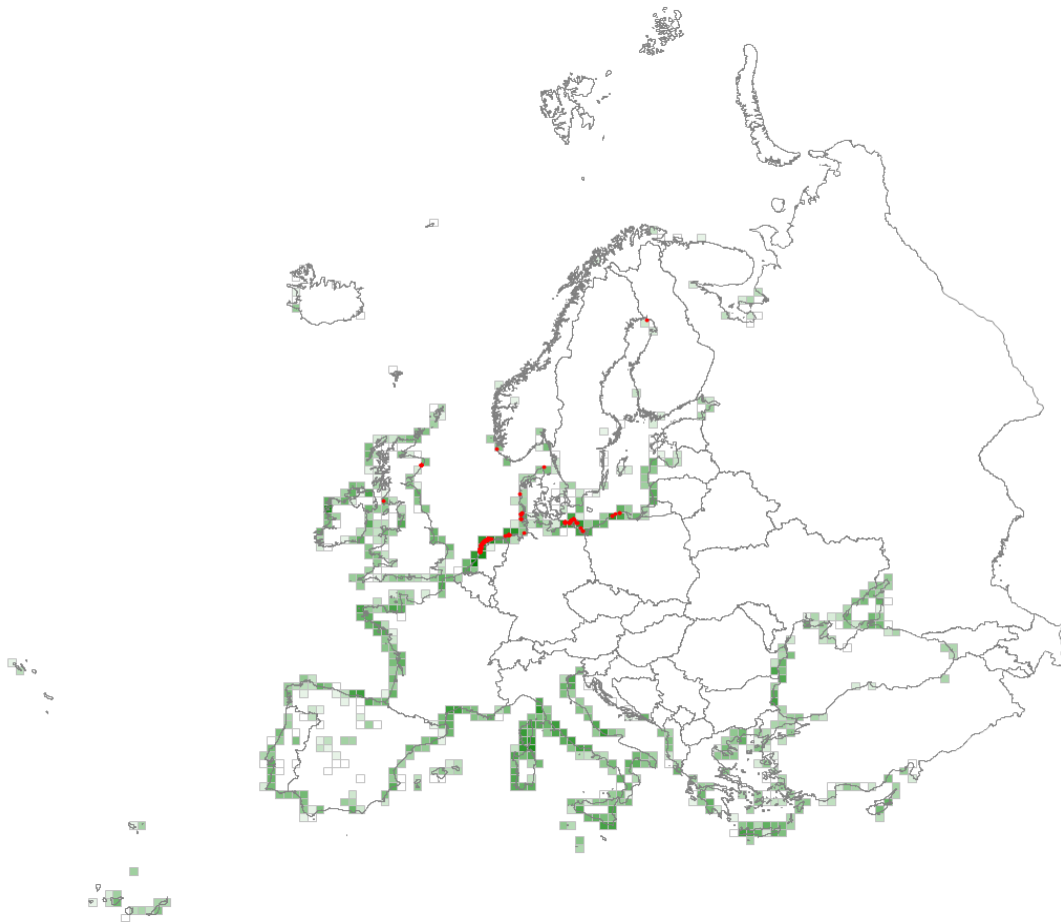
6

*Leymus racemosus*

5

## N18 – Atlantic and Baltic coastal *Empetrum* heath

Heath on stable, decalcified dune sands along the cooler north Atlantic and Baltic coasts of Europe, dominated by *Empetrum nigrum*, with or without *Calluna vulgaris*, or occurring in dune slacks where *Erica tetralix* may also be abundant or even replace *Empetrum* with the same suite of associates. Persistent where wind-exposure or light grazing prevent succession to scrub or woodland. Dry *Empetrum* heaths are probably threatened by increased temperature and less precipitation during spring and summer.



### Corresponding alliances in EuroVegChecklist 2016

<> ULI-02A *Empetrum nigrum* Schubert ex Westhoff et Den Held 1969

### Characteristic species combination

Diagnostic species (phi coefficient \* 100)

<i>Hieracium umbellatum</i>	38
<i>Carex arenaria</i>	36
<i>Empetrum nigrum</i> aggr.	34
<i>Salix repens</i>	26
<i>Hypnum cupressiforme</i> aggr.	22
<i>Ammophila arenaria</i>	21
<i>Dicranum scoparium</i>	20
<i>Cladonia fimbriata</i>	19
<i>Cladonia portentosa</i>	18
<i>Festuca filiformis</i>	17

Constant species (percentage frequencies)

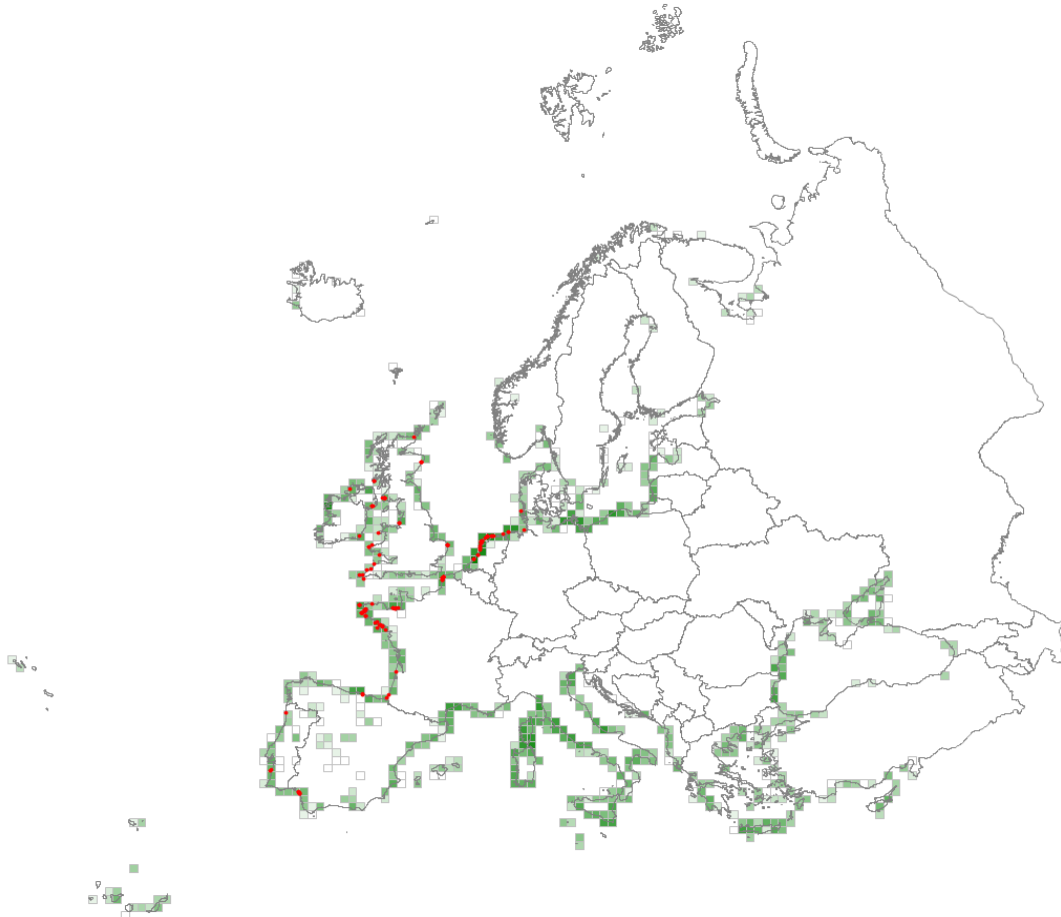
<i>Empetrum nigrum</i> aggr.	100
<i>Carex arenaria</i>	77
<i>Hypnum cupressiforme</i> aggr.	67
<i>Hieracium umbellatum</i>	63
<i>Dicranum scoparium</i>	63
<i>Calluna vulgaris</i>	48
<i>Salix repens</i>	44
<i>Ammophila arenaria</i>	38
<i>Pleurozium schreberi</i>	31
<i>Calamagrostis epigejos</i>	27
<i>Polypodium vulgare</i>	25
<i>Cladonia portentosa</i>	25
<i>Cladonia arbuscula</i> aggr.	25
<i>Lotus corniculatus</i>	23
<i>Festuca rubra</i> aggr.	23
<i>Luzula campestris</i> aggr.	21
<i>Pseudoscleropodium purum</i>	19
<i>Festuca filiformis</i>	19
<i>Avenella flexuosa</i>	19
<i>Viola canina</i>	17
<i>Lophocolea bidentata</i>	17
<i>Cladonia fimbriata</i>	17
<i>Anthoxanthum odoratum</i> aggr.	17
<i>Jasione montana</i>	15
<i>Erica tetralix</i>	15
<i>Potentilla erecta</i>	13
<i>Galium verum</i>	13
<i>Corynephorus canescens</i>	13
<i>Cladonia pyxidata</i> aggr.	13
<i>Agrostis capillaris</i>	13
<i>Pilosella officinarum</i>	12
<i>Hypochaeris radicata</i>	12
<i>Danthonia decumbens</i>	12
<i>Cladonia gracilis</i>	12

Dominant species (percentage frequencies of occurrences with cover > 25%)

<i>Empetrum nigrum</i> aggr.	87
<i>Calluna vulgaris</i>	33
<i>Hypnum cupressiforme</i> aggr.	12
<i>Pleurozium schreberi</i>	6
<i>Dicranum scoparium</i>	6
<i>Cladonia arbuscula</i> aggr.	6

## N19 – Atlantic coastal *Calluna* and *Ulex* heath

Heath on stable, decalcified, sharply-draining dune sands along the warmer, more humid Atlantic coast of Europe, dominated by *Calluna vulgaris*, *Erica* spp., *Ulex* spp. or other low spiny legumes, often with a strong contingent of grasses and sedges. Persistent where wind-exposure or light grazing prevent succession to scrub or woodland.



### Corresponding alliances in EuroVegChecklist 2016

- <> ULI-02B Calluno-Genistion pilosae P. Duvigneaud 1945
- <> ULI-02A Empetrium nigri Schubert ex Westhoff et Den Held 1969
- <> ULI-01A Ericion cinereae Böcher 1940
- <> ULI-01D Ericion umbellatae Br.-Bl. in Br.-Bl. et al. 1952
- <> ULI-01B Ulicion Malcuit 1929

### Characteristic species combination

Diagnostic species (phi coefficient \* 100)

<i>Erica cinerea</i>	35
<i>Calluna vulgaris</i>	21
<i>Scilla verna</i>	20
<i>Carex arenaria</i>	20
<i>Ulex europaeus</i>	19
<i>Danthonia decumbens</i>	16

Constant species (percentage frequencies)

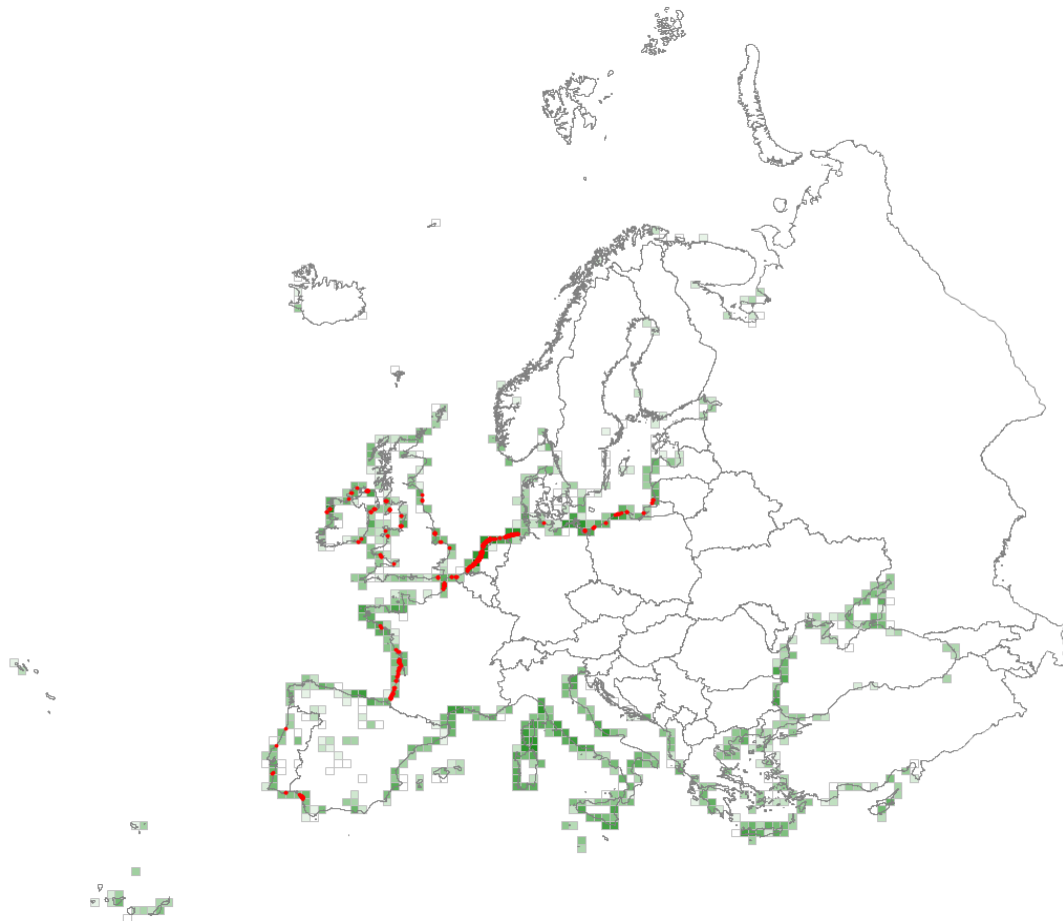
<i>Calluna vulgaris</i>	85
<i>Erica cinerea</i>	52
<i>Carex arenaria</i>	42
<i>Agrostis capillaris</i>	37
<i>Potentilla erecta</i>	36
<i>Hypnum cupressiforme</i> aggr.	36
<i>Festuca ovina</i>	33
<i>Danthonia decumbens</i>	31
<i>Lotus corniculatus</i>	30
<i>Hypochaeris radicata</i>	30
<i>Anthoxanthum odoratum</i> aggr.	26
<i>Ulex europaeus</i>	25
<i>Dicranum scoparium</i>	23
<i>Viola riviniana</i>	22
<i>Pilosella officinarum</i>	22
<i>Holcus lanatus</i>	22
<i>Leontodon saxatilis</i>	21
<i>Plantago lanceolata</i>	20
<i>Dactylis glomerata</i>	20
<i>Jasione montana</i>	17
<i>Pseudoscleropodium purum</i>	16
<i>Festuca filiformis</i>	16
<i>Daucus carota</i>	16
<i>Cladonia portentosa</i>	16
<i>Viola canina</i>	15
<i>Thymus praecox</i>	15
<i>Scilla verna</i>	15
<i>Pleurozium schreberi</i>	15
<i>Festuca rubra</i> aggr.	15
<i>Thymus serpyllum</i>	14
<i>Salix repens</i>	14
<i>Empetrum nigrum</i> aggr.	14
<i>Carex caryophylla</i>	12
<i>Ammophila arenaria</i>	12
<i>Stachys officinalis</i>	11
<i>Luzula campestris</i> aggr.	11

Dominant species (percentage frequencies of occurrences with cover > 25%)

<i>Calluna vulgaris</i>	59
<i>Erica cinerea</i>	33
<i>Ulex europaeus</i>	14
<i>Hypnum cupressiforme</i> aggr.	7
<i>Ulex minor</i>	6
<i>Erica vagans</i>	6

## N1A – Atlantic and Baltic coastal dune scrub

Scrub dominated by a wide diversity of low to tall shrubs on stabilised dry dune sands and in dune slacks along the Atlantic and Baltic coasts. The composition varies according to regional climate and soil conditions. Fen vegetation with low *Salix repens* or grasslands with *Rosa spinosissima* are not included.



### Corresponding alliances in EuroVegChecklist 2016

- <> RHA-01A Berberidion vulgaris Br.-Bl. ex Tx. 1952 nom. conserv. propos.
- <> LAV-02A Coremation albi Rothmaler 1943
- <> ARE-01C Holoschoeno australis-Salicion arenariae Neto et al. 2004
- > ARE-01B Ligustro-Hippophaeion Géhu et Géhu-Franck 1983
- <> RHA-03A Pruno spinosae-Rubion ulmifolii O. de Bolòs 1954
- > ARE-01A Salicion arenariae Tx. ex Passarge in Scamoni 1963
- <> RHA-01D Urtico-Crataegion Passarge et G. Hofmann 1968

### Characteristic species combination

Diagnostic species (phi coefficient \* 100)

<i>Hippophae rhamnoides</i>	40
<i>Carex arenaria</i>	17

Constant species (percentage frequencies)

<i>Hippophae rhamnoides</i>	37
<i>Carex arenaria</i>	37
<i>Festuca rubra</i> aggr.	32

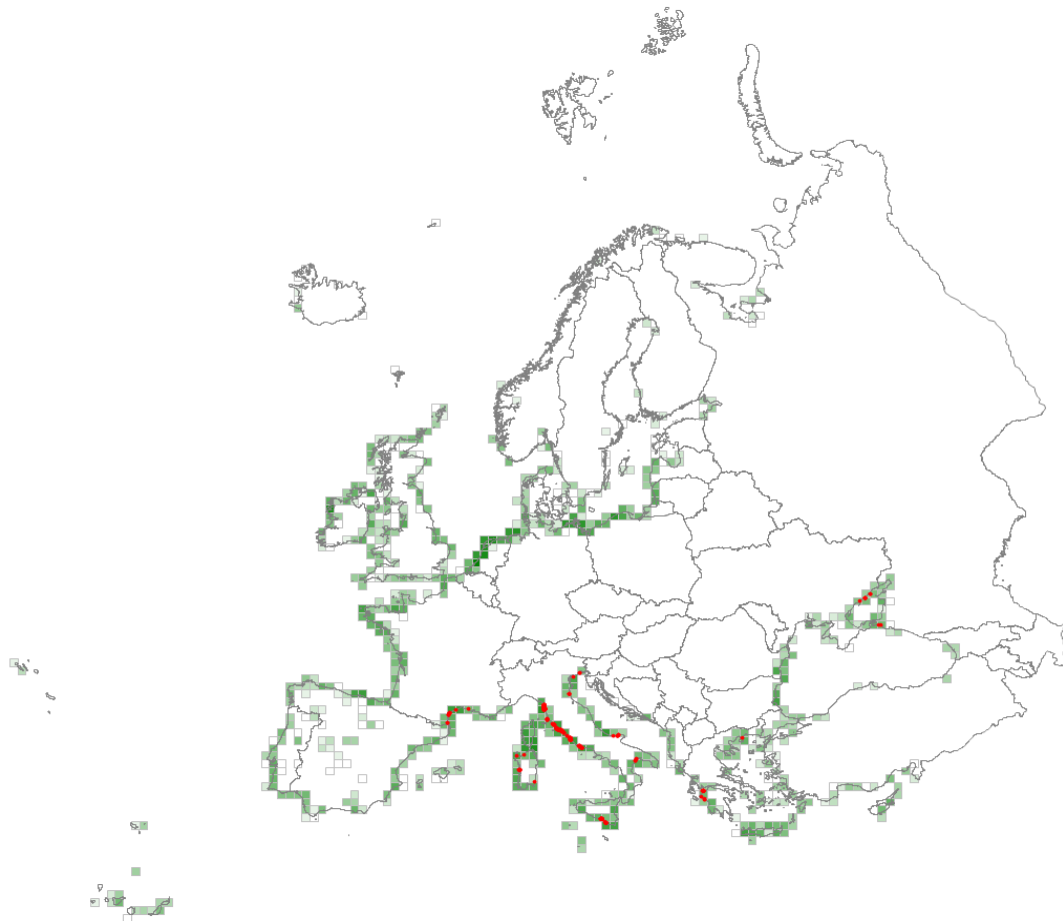
<i>Rubus caesius</i>	28
<i>Poa pratensis</i> aggr.	25
<i>Calamagrostis epigejos</i>	24
<i>Ammophila arenaria</i>	22
<i>Salix repens</i>	20
<i>Jacobaea vulgaris</i>	20
<i>Holcus lanatus</i>	20
<i>Urtica dioica</i>	16
<i>Pseudoscleropodium purum</i>	16
<i>Hypnum cupressiforme</i> aggr.	16
<i>Ligustrum vulgare</i>	15
<i>Galium verum</i>	15
<i>Galium mollugo</i> aggr.	14
<i>Solanum dulcamara</i>	13
<i>Sambucus nigra</i>	13
<i>Rubus fruticosus</i> aggr.	13
<i>Rosa spinosissima</i>	13
<i>Lotus corniculatus</i>	13
<i>Cistus salviifolius</i>	13
<i>Cirsium arvense</i>	13
<i>Luzula campestris</i> aggr.	12
<i>Galium aparine</i>	12
<i>Dicranum scoparium</i>	12
<i>Crataegus monogyna</i>	12
<i>Rubia peregrina</i>	11
<i>Brachythecium rutabulum</i>	11

Dominant species (percentage frequencies of occurrences with cover > 25%)

<i>Hippophae rhamnoides</i>	27
<i>Rubus caesius</i>	10
<i>Salix repens</i>	9
<i>Rosa spinosissima</i>	9
<i>Ligustrum vulgare</i>	8
<i>Rubus fruticosus</i> aggr.	7
<i>Festuca rubra</i> aggr.	7
<i>Erica scoparia</i>	5

## N1B – Mediterranean and Black Sea coastal dune scrub

Scrub dominated by a wide diversity of low to tall shrubs on stabilised dry dune sands along the Mediterranean and Black Sea coasts, often grading to dune grassland or woodland, the associated herb flora showing elements from these neighbouring vegetation types or mosaics.



### Corresponding alliances in EuroVegChecklist 2016

- > QUI-04I Asparago orientalis-Juniperion macrocarpae (Díez Garretas et Asensi 2014)  
Mucina in Mucina et al. 2016
- <> RHA-01A Berberidion vulgaris Br.-Bl. ex Tx. 1952 nom. conserv. propos.
- <> QUI-04L Cerantonio-Pistacion lentisci Zohary et Orshan 1959
- <> LAV-02A Coremation albi Rothmaler 1943
- > CRU-02C Helichryso barrelieri-Centaureion spinosae Mucina et Dimopoulos in Mucina et al. 2016
- <> ARE-01C Holoschoeno australis-Salicion arenariae Neto et al. 2004
- > QUI-04B Juniperion turbinatae Rivas-Mart. 1975 corr. 1987
- <> QUI-04H Oleo-Cerantonion siliquae Br.-Bl. ex Guinochet et Drouineau 1944
- <> RHA-03A Pruno spinosae-Rubion ulmifolii O. de Bolòs 1954
- > ARE-01D Pyracantho coccineae-Hippophaeion fluviatilis de Foucault et Julve 2001
- <> LAV-01D Quercion fruticosae Rothmaler 1954

### Characteristic species combination

Diagnostic species (phi coefficient \* 100)

*Juniperus oxycedrus* aggr.



<i>Smilax aspera</i>	20
<i>Phillyrea angustifolia</i>	18
<i>Lonicera implexa</i>	17

Constant species (percentage frequencies)

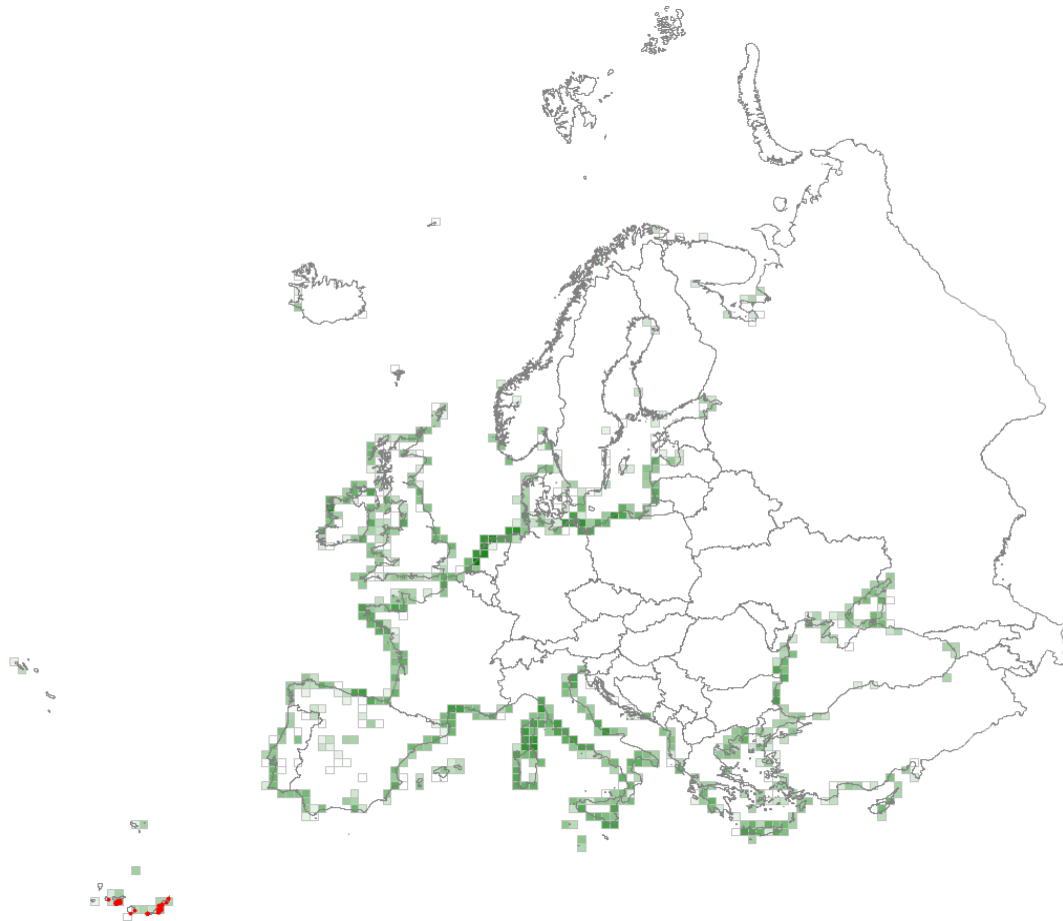
<i>Smilax aspera</i>	51
<i>Juniperus oxycedrus</i> aggr.	46
<i>Rubia peregrina</i>	43
<i>Asparagus acutifolius</i>	38
<i>Pistacia lentiscus</i>	36
<i>Phillyrea angustifolia</i>	29
<i>Lonicera implexa</i>	25
<i>Rhamnus alaternus</i>	17
<i>Prasium majus</i>	17
<i>Phillyrea latifolia</i>	17
<i>Helichrysum stoechas</i>	16
<i>Cistus creticus</i>	16
<i>Lagurus ovatus</i>	14
<i>Quercus ilex</i>	13
<i>Daphne gnidium</i>	13

Dominant species (percentage frequencies of occurrences with cover > 25%)

<i>Juniperus oxycedrus</i> aggr.	35
<i>Smilax aspera</i>	14
<i>Pistacia lentiscus</i>	10
<i>Phillyrea angustifolia</i>	10
<i>Tamarix hampeana</i>	6
<i>Suaeda vera</i>	6

## N1C – Macaronesian coastal dune scrub

Often sparse scrub on coastal dune sands in the arid mediterranean climate in parts of the Canary archipelago.



### Corresponding alliances in EuroVegChecklist 2016

- > MOQ-01B Polycarpaeo niveae-Euphorbion paraliae Rivas-Mart. et Wildpret in Rivas-Mart. et al. 2002
- > MOQ-01A Traganion moquinii Sunding 1972

### Characteristic species combination

Diagnostic species (phi coefficient \* 100)

<i>Tetraena fontanesii</i>	75
<i>Traganum moquinii</i>	59
<i>Polycarpaea nivea</i>	47
<i>Heliotropium crispum</i>	42
<i>Frankenia laevis</i>	37
<i>Atriplex glauca</i>	36
<i>Launaea arborescens</i>	31
<i>Reichardia crystallina</i>	28
<i>Lotus sessilifolius</i>	25
<i>Suaeda vermiculata</i>	24
<i>Launaea nudicaulis</i>	22
<i>Pulicaria burchardii</i>	20
<i>Polygonum balansae</i>	20

<i>Citrullus colocynthis</i>	20
<i>Ononis tournefortii</i>	20
<i>Suaeda vera</i>	19
<i>Helianthemum canariense</i>	19
<i>Ononis serrata</i>	18
<i>Limonium pectinatum</i>	17
<i>Euphorbia paralias</i>	17
<i>Salsola vermiculata</i>	17
<i>Schizogyne sericea</i>	16

Constant species (percentage frequencies)

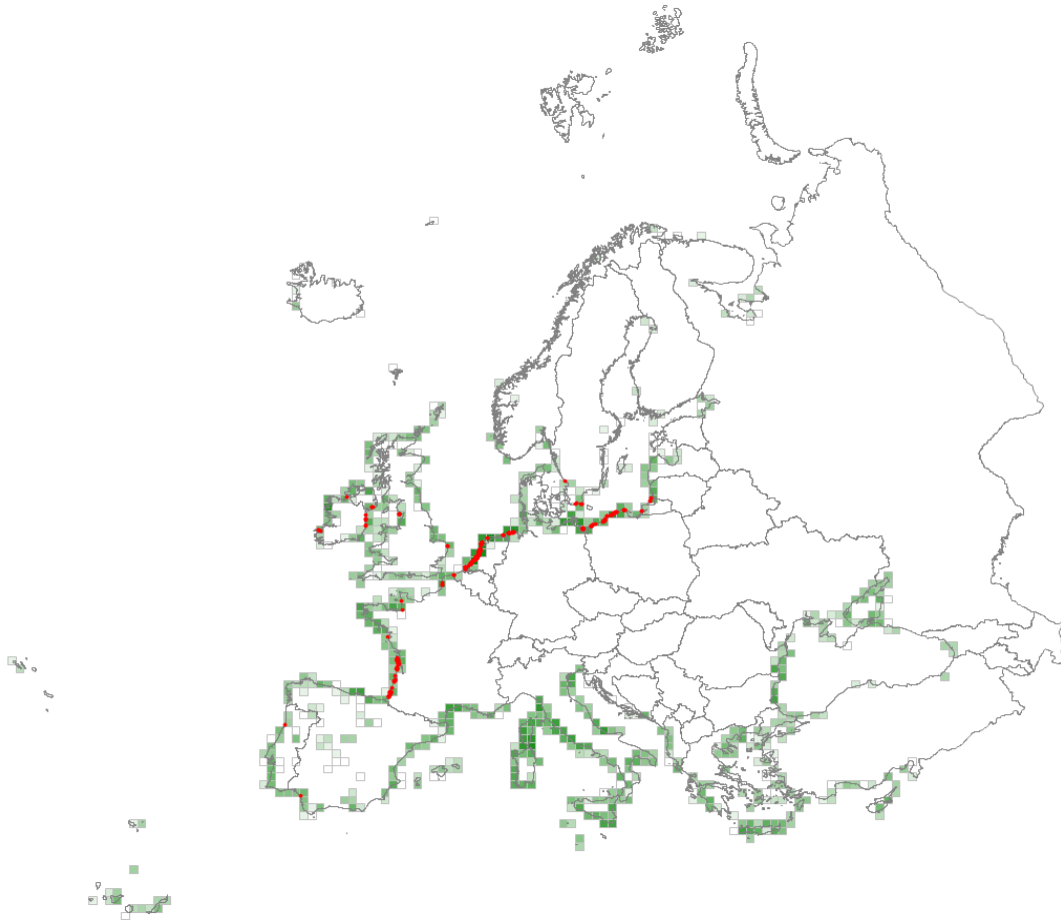
<i>Tetraena fontanesii</i>	80
<i>Frankenia laevis</i>	44
<i>Launaea arborescens</i>	40
<i>Traganum moquinii</i>	36
<i>Polycarpaea nivea</i>	36
<i>Atriplex glauca</i>	28
<i>Suaeda vera</i>	24
<i>Heliotropium crispum</i>	24
<i>Euphorbia paralias</i>	20
<i>Schizogyne sericea</i>	16
<i>Salsola vermiculata</i>	16
<i>Reichardia crystallina</i>	16
<i>Lotus sessilifolius</i>	16
<i>Limonium pectinatum</i>	16
<i>Suaeda vermiculata</i>	12
<i>Helianthemum canariense</i>	12
<i>Euphorbia balsamifera</i>	12

Dominant species (percentage frequencies of occurrences with cover > 25%)

<i>Tetraena fontanesii</i>	40
<i>Traganum moquinii</i>	24
<i>Polycarpaea nivea</i>	12
<i>Frankenia laevis</i>	8
<i>Euphorbia paralias</i>	8

## N1D – Atlantic and Baltic broad-leaved coastal dune forest

A forest type with a wide range of variation, comprising a diversity of relatively open to closed forests on Atlantic and Baltic coastal dunes. It develops where more stable coastal sands are invaded by broadleaved trees typical of the local soil and climatic conditions. It includes forests in dry and wet conditions, on calcareous and acidic sands and along the climatic gradient from southern Norway and the Baltics towards central Portugal. Many of these forests are indistinguishable in their floristic composition from inland examples of the same general type.



### Corresponding alliances in EuroVegChecklist 2016

- <> ALN-01A Alnion glutinosae Malcuit 1929
- <> POP-02A Alnion incanae Pawłowski et al. 1928
- <> FAG-03A Carpinion betuli Issler 1931
- <> QUE-02B Lonicero periclymeni-Betulion pubescentis Géhu 2006
- <> QUE-01B Quercion roboris Malcuit 1929

### Characteristic species combination

Diagnostic species (phi coefficient \* 100)

<i>Lonicera periclymenum</i>	17
<i>Quercus robur</i>	17
<i>Carex arenaria</i>	15
<i>Prunus serotina</i>	15

Constant species (percentage frequencies)

<i>Quercus robur</i>	50
<i>Lonicera periclymenum</i>	40
<i>Crataegus monogyna</i>	35
<i>Sorbus aucuparia</i>	34
<i>Rubus fruticosus</i> aggr.	33
<i>Carex arenaria</i>	33
<i>Urtica dioica</i>	31
<i>Geum urbanum</i>	30
<i>Hedera helix</i> aggr.	28
<i>Galium aparine</i>	25
<i>Rubus caesius</i>	23
<i>Pseudoscleropodium purum</i>	23
<i>Pinus pinaster</i>	22
<i>Geranium robertianum</i>	22
<i>Dryopteris dilatata</i>	21
<i>Acer pseudoplatanus</i>	21
<i>Kindbergia praelonga</i>	19
<i>Holcus lanatus</i>	19
<i>Ligustrum vulgare</i>	18
<i>Calamagrostis epigejos</i>	18
<i>Betula pubescens</i>	18
<i>Betula pendula</i>	18
<i>Rubia peregrina</i>	17
<i>Rosa canina</i> aggr.	17
<i>Polypodium vulgare</i>	17
<i>Poa trivialis</i>	17
<i>Moehringia trinervia</i>	17
<i>Fraxinus excelsior</i>	17
<i>Brachythecium rutabulum</i>	16
<i>Ulex europaeus</i>	15
<i>Teucrium scorodonia</i>	15
<i>Sambucus nigra</i>	15
<i>Populus tremula</i>	15
<i>Hypnum cupressiforme</i> aggr.	15
<i>Glechoma hederacea</i>	15
<i>Agrostis capillaris</i>	15
<i>Ribes rubrum</i> aggr.	14
<i>Frangula alnus</i>	14
<i>Prunus serotina</i>	13
<i>Ilex aquifolium</i>	13
<i>Fagus sylvatica</i>	13
<i>Dicranum scoparium</i>	13
<i>Dactylis glomerata</i>	13
<i>Avenella flexuosa</i>	13
<i>Ruscus aculeatus</i>	12
<i>Pinus sylvestris</i>	12
<i>Mnium hornum</i>	12
<i>Cytisus scoparius</i>	12
<i>Poa pratensis</i> aggr.	11
<i>Oxalis acetosella</i>	11
<i>Luzula campestris</i> aggr.	11
<i>Corylus avellana</i>	11
<i>Cistus salviifolius</i>	11
<i>Alnus glutinosa</i>	11

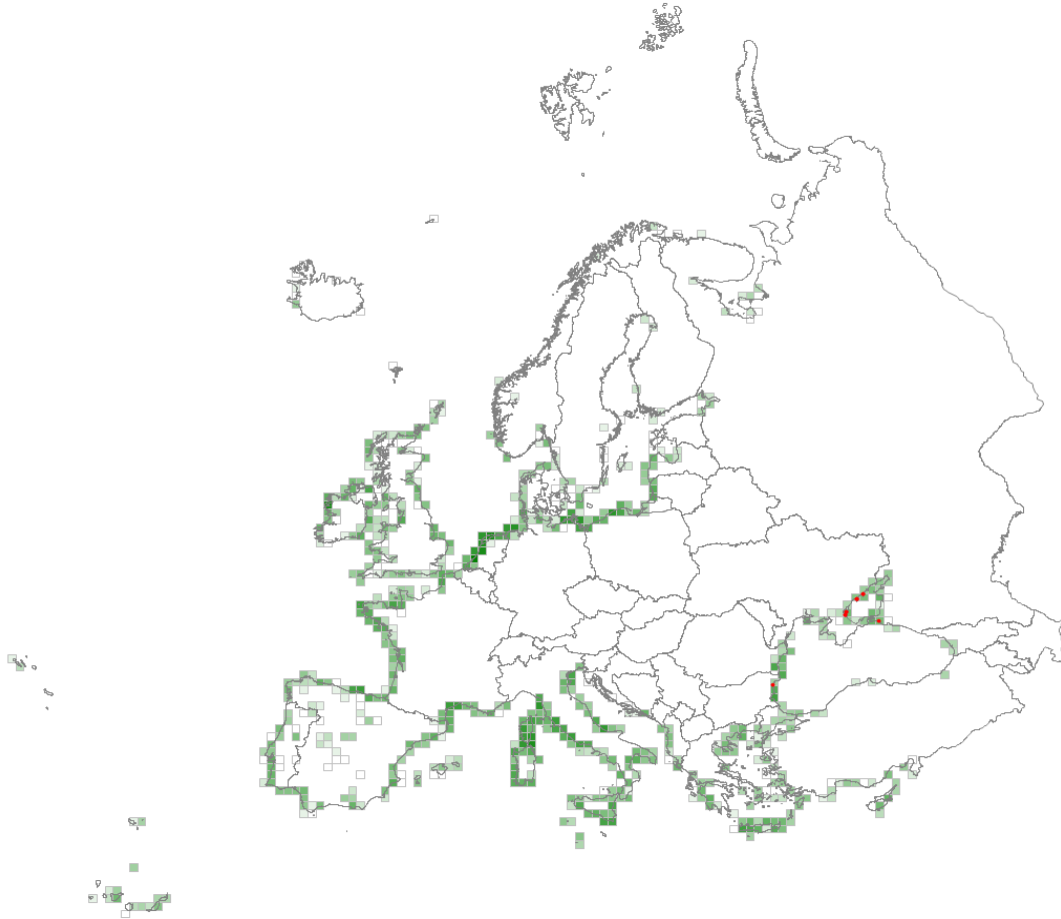
Dominant species (percentage frequencies of occurrences with cover > 25%)

<i>Quercus robur</i>	25
<i>Hedera helix</i> aggr.	13

<i>Quercus ilex</i>	10
<i>Betula pubescens</i>	9
<i>Populus tremula</i>	8
<i>Acer pseudoplatanus</i>	8
<i>Betula pendula</i>	7
<i>Sorbus aucuparia</i>	6
<i>Pinus pinaster</i>	6
<i>Fraxinus excelsior</i>	6

## N1E – Black Sea broad-leaved coastal dune forest

Natural or semi-natural tree and tree-shrub communities on coastal dunes along the Black Sea coast. The forests on larger dunes have xerothermic features, the trees being small and strongly branched while on smaller dunes species more typical of alluvial forest are found. Lianas are frequent. Although non-disturbed stands are dominated by native species, invasive aliens such as *Amorpha fruticosa*, *Robinia pseudoacacia* and *Elaeagnus angustifolia* can be frequent.



### Corresponding alliances in EuroVegChecklist 2016

- <> POP-02A Alnion incanae Pawłowski et al. 1928
- <> POP-02D Alno-Quercion roboris Horvat 1950
- <> FAG-03A Carpinion betuli Issler 1931

### Characteristic species combination

Diagnostic species (phi coefficient \* 100)

<i>Elaeagnus angustifolia</i>	82
<i>Inula caspica</i>	42
<i>Elytrigia elongata</i>	42
<i>Gypsophila perfoliata</i>	41
<i>Carex extensa</i>	32
<i>Limonium meyeri</i>	28
<i>Anthriscus cerefolium</i>	27
<i>Scorzonera parviflora</i>	27
<i>Lotus ucrainicus</i>	27

<i>Juncus soranthus</i>	25
<i>Centaureum anatolicum</i>	25
<i>Asparagus brachyphyllus</i>	25
<i>Cynoglossum officinale</i>	25
<i>Althaea armeniaca</i>	24
<i>Senecio leucanthemifolius</i>	24
<i>Potentilla chrysantha</i>	23
<i>Astragalus asper</i>	22
<i>Salvia sclarea</i>	21
<i>Lycium barbarum</i>	21
<i>Plantago cornutii</i>	20
<i>Bryonia alba</i>	20
<i>Cirsium alatum</i>	20
<i>Bupleurum rotundifolium</i>	20
<i>Achillea euxina</i>	19
<i>Echinops bannaticus</i>	19
<i>Asperugo procumbens</i>	19
<i>Euphorbia platyphyllos</i>	18
<i>Papaver dubium</i> aggr.	18
<i>Erysimum cuspidatum</i>	17
<i>Myosotis sicula</i>	17
<i>Veronica triphyllos</i>	17
<i>Galium aparine</i>	16
<i>Centaurea salonitana</i>	16
<i>Calamagrostis epigejos</i>	15

Constant species (percentage frequencies)

<i>Elaeagnus angustifolia</i>	88
<i>Phragmites australis</i>	50
<i>Galium aparine</i>	50
<i>Elytrigia elongata</i>	50
<i>Limonium meyeri</i>	38
<i>Elytrigia repens</i> aggr.	38
<i>Calamagrostis epigejos</i>	38
<i>Senecio leucanthemifolius</i>	31
<i>Gypsophila perfoliata</i>	31
<i>Carex extensa</i>	25
<i>Ulmus minor</i>	19
<i>Scorzonera parviflora</i>	19
<i>Plantago maritima</i>	19
<i>Juncus maritimus</i>	19
<i>Inula caspica</i>	19
<i>Chenopodium album</i> aggr.	19
<i>Cynoglossum officinale</i>	19
<i>Cynanchum acutum</i>	19
<i>Cichorium intybus</i>	19
<i>Calystegia sepium</i>	19
<i>Veronica triphyllos</i>	12
<i>Tripolium pannonicum</i>	12
<i>Stellaria media</i>	12
<i>Seseli tortuosum</i>	12
<i>Puccinellia distans</i>	12
<i>Poa pratensis</i> aggr.	12
<i>Plantago cornutii</i>	12
<i>Papaver dubium</i> aggr.	12
<i>Myosotis sicula</i>	12
<i>Lycopus europaeus</i>	12
<i>Lotus ucrainicus</i>	12
<i>Lepidium draba</i>	12



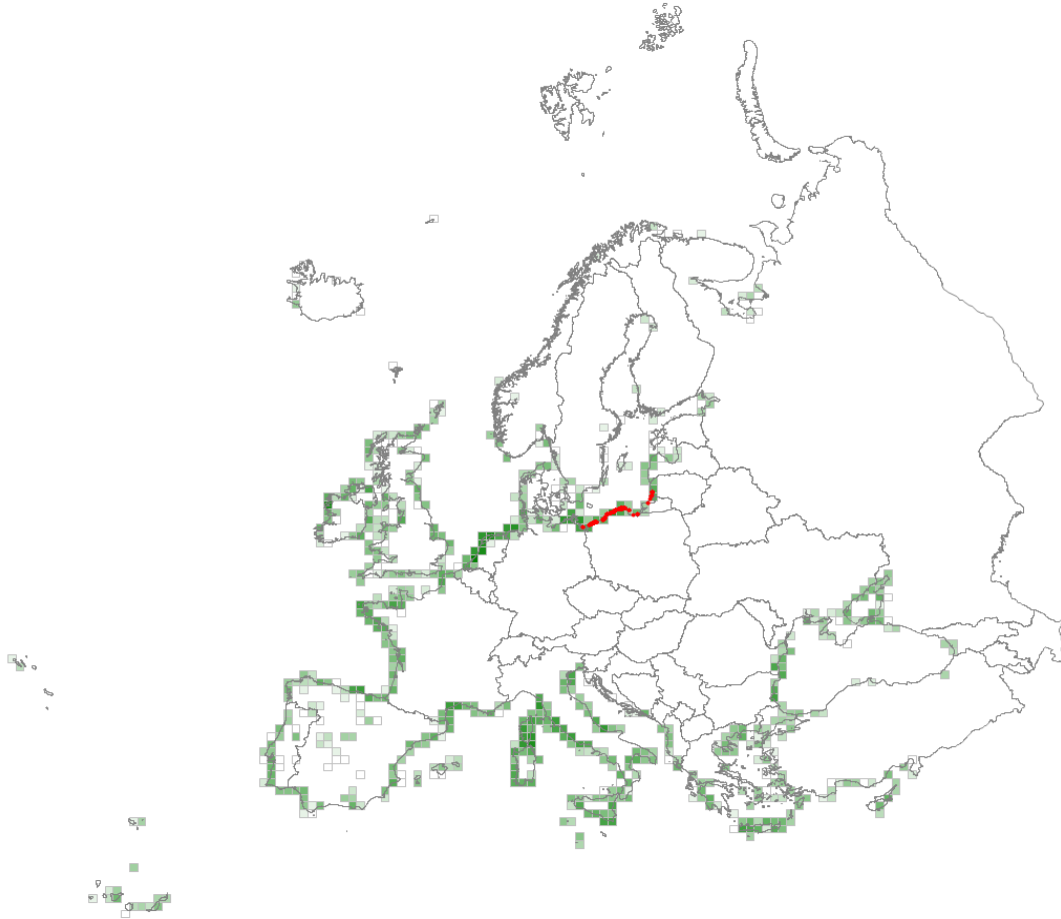
<i>Lamium amplexicaule</i>	12
<i>Lactuca tatarica</i>	12
<i>Falcaria vulgaris</i>	12
<i>Descurainia sophia</i>	12
<i>Capsella bursa-pastoris</i>	12
<i>Buglossoides arvensis</i>	12
<i>Artemisia santonicum</i>	12
<i>Arabidopsis thaliana</i>	12
<i>Anthriscus cerefolium</i>	12
<i>Anisantha tectorum</i>	12
<i>Anisantha sterilis</i>	12

Dominant species (percentage frequencies of occurrences with cover > 25%)

<i>Elaeagnus angustifolia</i>	69
<i>Elytrigia elongata</i>	25
<i>Elytrigia repens</i> aggr.	12
<i>Ulmus minor</i>	6
<i>Fraxinus ornus</i>	6
<i>Calamagrostis epigejos</i>	6

## N1F – Baltic coniferous coastal dune forest

Forests on coastal dunes on the Baltic coast dominated by *Pinus sylvestris*. Many of these forests are indistinguishable in their floristic composition from inland examples of the same general type.



### Corresponding alliances in EuroVegChecklist 2016

- <> PIC-03A Dicrano-Pinion *sylvestris* (Libbert 1933) W. Matuszkiewicz 1962 nom. conserv. propos.

### Characteristic species combination

Diagnostic species (phi coefficient \* 100)

<i>Dicranum undulatum</i>	58
<i>Goodyera repens</i>	51
<i>Pseudoscleropodium purum</i>	33
<i>Carex arenaria</i>	33
<i>Moneses uniflora</i>	33
<i>Chimaphila umbellata</i>	31
<i>Pyrola chlorantha</i>	30
<i>Hypopitys monotropa</i>	29
<i>Pinus sylvestris</i>	26
<i>Pleurozium schreberi</i>	24
<i>Cladonia glauca</i>	21
<i>Empetrum nigrum</i> aggr.	20
<i>Cladonia ciliata</i>	19

<i>Dicranum scoparium</i>	17
<i>Cladonia arbuscula</i> aggr.	17
<i>Hylocomium splendens</i>	17
<i>Leucobryum glaucum</i>	17
<i>Melampyrum pratense</i>	17
<i>Cladonia furcata</i>	17
<i>Hieracium umbellatum</i>	16
<i>Cladonia portentosa</i>	16
<i>Peltigera polydactyla</i>	16
<i>Cladonia phyllophora</i>	16
<i>Rubus hirtus</i>	16
<i>Avenella flexuosa</i>	16
<i>Betula pendula</i>	15

Constant species (percentage frequencies)

<i>Pinus sylvestris</i>	97
<i>Pleurozium schreberi</i>	87
<i>Pseudoscleropodium purum</i>	69
<i>Carex arenaria</i>	69
<i>Avenella flexuosa</i>	69
<i>Empetrum nigrum</i> aggr.	62
<i>Hylocomium splendens</i>	56
<i>Dicranum undulatum</i>	56
<i>Dicranum scoparium</i>	56
<i>Vaccinium vitis-idaea</i>	54
<i>Calluna vulgaris</i>	54
<i>Hypnum cupressiforme</i> aggr.	46
<i>Goodyera repens</i>	46
<i>Sorbus aucuparia</i>	44
<i>Betula pendula</i>	44
<i>Vaccinium myrtillus</i>	41
<i>Quercus robur</i>	38
<i>Melampyrum pratense</i>	38
<i>Cladonia arbuscula</i> aggr.	36
<i>Luzula campestris</i> aggr.	31
<i>Hieracium umbellatum</i>	28
<i>Frangula alnus</i>	28
<i>Polypodium vulgare</i>	26
<i>Cladonia rangiferina</i>	26
<i>Cladonia pyxidata</i> aggr.	26
<i>Anthoxanthum odoratum</i> aggr.	26
<i>Salix repens</i>	23
<i>Moneses uniflora</i>	23
<i>Juniperus communis</i> subsp. <i>communis</i>	23
<i>Cladonia portentosa</i>	23
<i>Cladonia furcata</i>	23
<i>Rhododendron tomentosum</i>	21
<i>Pyrola chlorantha</i>	21
<i>Orthilia secunda</i>	21
<i>Leucobryum glaucum</i>	21
<i>Hypopitys monotropa</i>	21
<i>Trientalis europaea</i>	18
<i>Cladonia mitis</i>	18
<i>Vaccinium uliginosum</i>	15
<i>Chimaphila umbellata</i>	15
<i>Dryopteris carthusiana</i>	15
<i>Dicranum polysetum</i>	15
<i>Corynephorus canescens</i>	15
<i>Cladonia glauca</i>	15

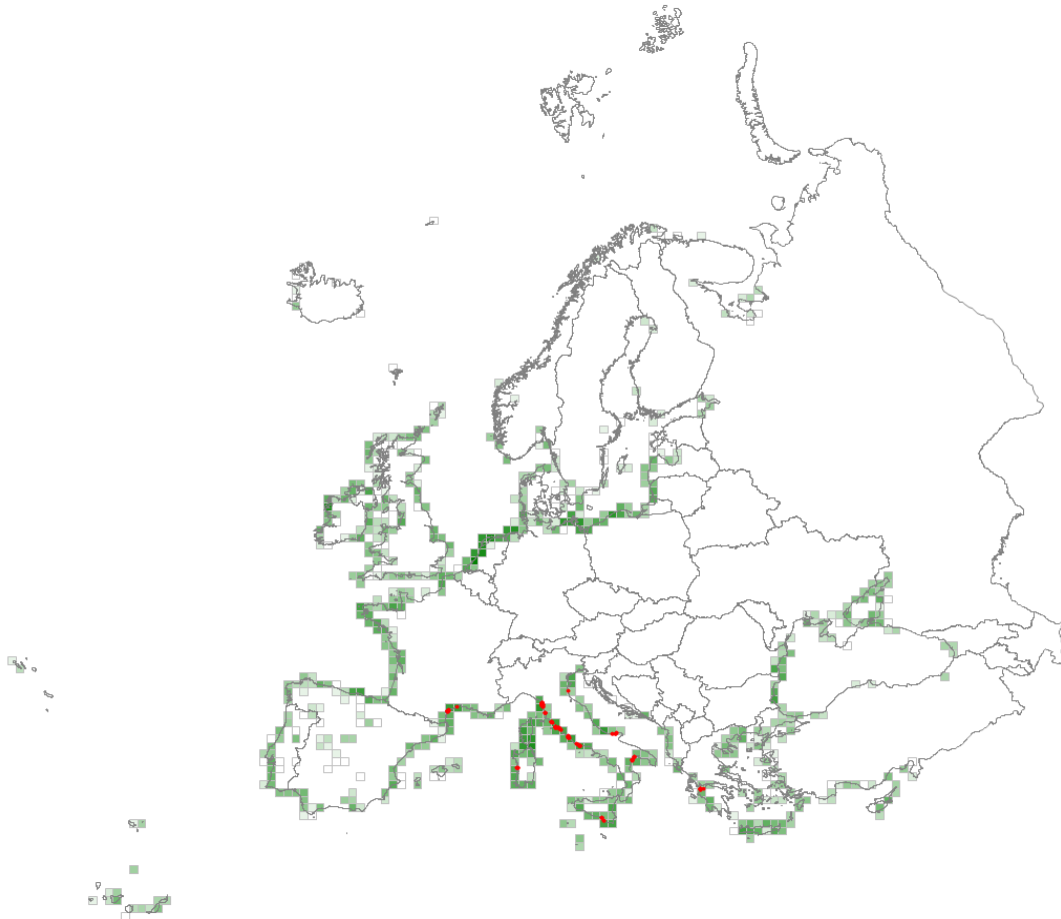
<i>Solidago virgaurea</i>	13
<i>Moehringia trinervia</i>	13
<i>Luzula pilosa</i>	13
<i>Hypochaeris radicata</i>	13
<i>Galium mollugo</i> aggr.	13
<i>Festuca rubra</i> aggr.	13
<i>Cladonia gracilis</i>	13

Dominant species (percentage frequencies of occurrences with cover > 25%)

<i>Pinus sylvestris</i>	90
<i>Pseudoscleropodium purum</i>	41
<i>Pleurozium schreberi</i>	41
<i>Avenella flexuosa</i>	23
<i>Empetrum nigrum</i> aggr.	18
<i>Calluna vulgaris</i>	18
<i>Hylocomium splendens</i>	8
<i>Vaccinium vitis-idaea</i>	5
<i>Pinus nigra</i>	5
<i>Cladonia portentosa</i>	5
<i>Cladonia arbuscula</i> aggr.	5

## N1G – Mediterranean coniferous coastal dune forest

Forests on coastal dunes in the Mediterranean Basin are dominated by different species of pine. Many stands are of planted origin. A variety of other woody species occur including shrubs such as junipers. Where shrubs exceed the cover of pine, the habitat should be considered N19 Mediterranean and Black Sea coastal dune scrub.



### Corresponding alliances in EuroVegChecklist 2016

- <> QUI-03D Pinion pineae Feinbrun 1959
- <> QUI-03A Pistacio lentisci-Pinion halepensis Biondi, Blasi, Galdenzi, Pesaresi et Vagge in Biondi et al. 2014

### Characteristic species combination

Diagnostic species (phi coefficient \* 100)

<i>Pinus pinea</i>	50
<i>Asparagus acutifolius</i>	23
<i>Pinus halepensis</i>	23
<i>Smilax aspera</i>	23
<i>Rhamnus alaternus</i>	22
<i>Bupleurum odontites</i>	21
<i>Solanum linnaeanum</i>	20
<i>Pistacia lentiscus</i>	19
<i>Phillyrea angustifolia</i>	18
<i>Ononis ornithopodioides</i>	17
<i>Rubia peregrina</i>	16

<i>Clematis viticella</i>	16
<i>Quercus ilex</i>	15
<i>Alkanna tinctoria</i>	15

Constant species (percentage frequencies)

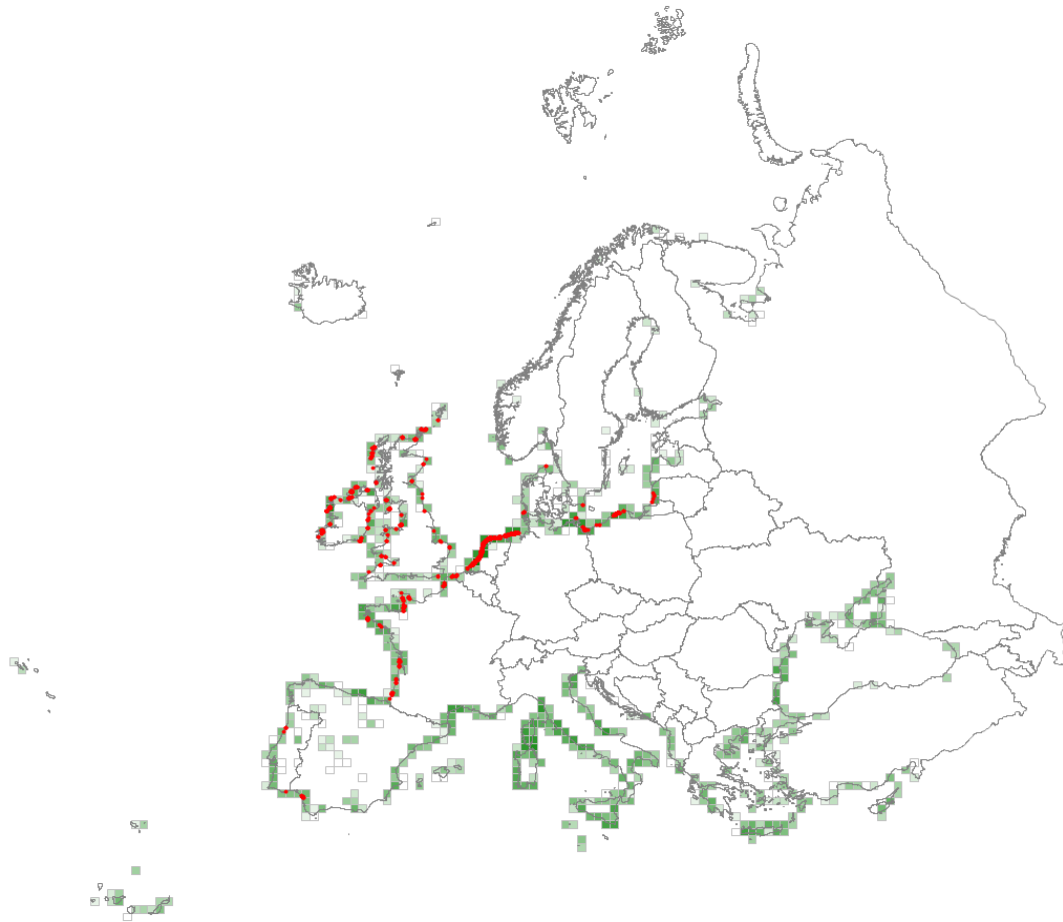
<i>Asparagus acutifolius</i>	60
<i>Smilax aspera</i>	58
<i>Pinus pinea</i>	52
<i>Rubia peregrina</i>	50
<i>Pistacia lentiscus</i>	50
<i>Pinus halepensis</i>	40
<i>Rhamnus alaternus</i>	38
<i>Quercus ilex</i>	35
<i>Ruscus aculeatus</i>	30
<i>Phillyrea angustifolia</i>	30
<i>Phillyrea latifolia</i>	22
<i>Rosmarinus officinalis</i>	20
<i>Myrtus communis</i>	20
<i>Lagurus ovatus</i>	20
<i>Juniperus oxycedrus</i> aggr.	20
<i>Hedera helix</i> aggr.	20
<i>Cistus creticus</i>	20
<i>Quercus coccifera</i>	18
<i>Prasium majus</i>	18
<i>Lonicera implexa</i>	18
<i>Sonchus oleraceus</i>	15
<i>Piptatherum miliaceum</i>	15
<i>Clematis flammula</i>	15
<i>Cistus salviifolius</i>	15
<i>Briza maxima</i>	15
<i>Brachypodium retusum</i>	15
<i>Sonchus bulbosus</i>	12
<i>Daphne gnidium</i>	12
<i>Brachypodium sylvaticum</i>	12
<i>Avena barbata</i>	12

Dominant species (percentage frequencies of occurrences with cover > 25%)

<i>Pinus pinea</i>	45
<i>Pinus halepensis</i>	40
<i>Pistacia lentiscus</i>	15
<i>Quercus ilex</i>	10
<i>Brachypodium retusum</i>	10
<i>Rosmarinus officinalis</i>	8
<i>Pinus pinaster</i>	8
<i>Juniperus oxycedrus</i> aggr.	8
<i>Asparagus acutifolius</i>	8
<i>Phillyrea angustifolia</i>	5
<i>Hedera helix</i> aggr.	5
<i>Cistus monspeliensis</i>	5

## N1H – Atlantic and Baltic moist and wet dune slack

Dune slacks develop in Atlantic and Baltic dune systems as moist-wet depressions between dune ridges. Primary slacks originate from the development of the beach-dune-slack-system, while secondary slacks occur where blow-outs have lowered the sand level of dune systems to that of groundwater or, unusually in the Wadden Sea, where parts of barrier islands are occasionally flooded by tidal inundation (so-called “green beaches”). The water table fluctuates seasonally, less so around the Baltic, and the mean wetness of slacks can vary so that the range of vegetation is considerable from dwarf rush and bryophyte pioneer vegetation, through wet grasslands, to various kinds of mire and swamp, with persistent areas of open water with aquatic plants.



### Corresponding alliances in EuroVegChecklist 2016

- <> SCH-03C *Anagallido tenellae-Juncion bulbosi* Br.-Bl. 1967
- <> SCH-01A *Caricion davallianae* Klika 1934
- <> SCH-03B *Caricion fuscae* Koch 1926 nom. conserv. propos.
- <> SCH-01B *Caricion viridulo-trinervis* Julve ex Hájek et Mucina in Theurillat et al. 2015
- <> LIT-01F *Hyperico elodis-Sparganion* Br.-Bl. et Tx. ex Oberd. 1957
- <> CHA-01C *Charion canescentis* Krausch 1964
- <> CHA-01A *Charion intermediae* Sauer 1937
- <> MOL-10B *Loto tenuis-Trifolion fragiferi* Westhoff et Den Held ex de Foucault 2009
- <> PHR-04A *Magnocaricion elatae* Koch 1926
- <> ISO-02A *Nanocyperion* Koch 1926
- <> POT-01B *Nymphaeion albae* Oberd. 1957
- <> PHR-01A *Phragmition communis* Koch 1926
- <> POT-01A *Potamogetonion* Libbert 1931
- <> SAG-01A *Saginion maritimae* Westhoff et al. 1962

### Characteristic species combination

#### Diagnostic species (phi coefficient \* 100)

<i>Salix repens</i>	20
<i>Hydrocotyle vulgaris</i>	17

#### Constant species (percentage frequencies)

<i>Agrostis stolonifera</i>	42
<i>Holcus lanatus</i>	37
<i>Salix repens</i>	34
<i>Phragmites australis</i>	26
<i>Festuca rubra</i> aggr.	26
<i>Trifolium repens</i>	25
<i>Hydrocotyle vulgaris</i>	25
<i>Mentha aquatica</i>	22
<i>Carex flacca</i>	22
<i>Calliergonella cuspidata</i>	21
<i>Carex nigra</i>	20
<i>Lotus corniculatus</i>	19
<i>Juncus articulatus</i>	19
<i>Carex arenaria</i>	19
<i>Ranunculus repens</i>	18
<i>Argentina anserina</i>	18
<i>Plantago lanceolata</i>	16
<i>Galium palustre</i> aggr.	16
<i>Anthoxanthum odoratum</i> aggr.	16
<i>Prunella vulgaris</i>	15
<i>Poa pratensis</i> aggr.	15
<i>Luzula campestris</i> aggr.	14
<i>Rhytiadelphus squarrosus</i>	13
<i>Ranunculus flammula</i>	13
<i>Potentilla erecta</i>	13
<i>Calamagrostis epigejos</i>	13
<i>Ranunculus acris</i> aggr.	12
<i>Linum catharticum</i>	12
<i>Cerastium fontanum</i> subsp. <i>vulgare</i>	12
<i>Agrostis capillaris</i>	12
<i>Lythrum salicaria</i>	11
<i>Leontodon saxatilis</i>	11
<i>Hypnum cupressiforme</i> aggr.	11
<i>Eleocharis palustris</i>	11
<i>Carex panicea</i>	11

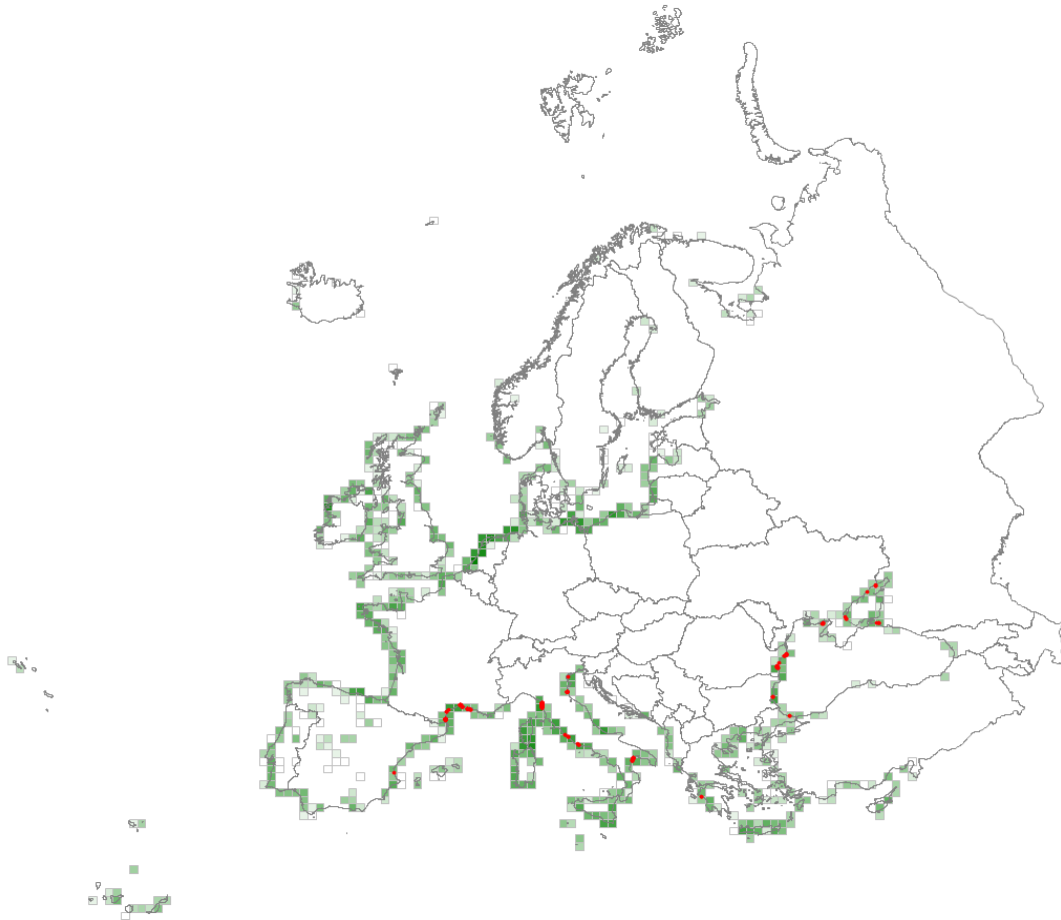
#### Dominant species (percentage frequencies of occurrences with cover > 25%)

<i>Salix repens</i>	14
<i>Agrostis stolonifera</i>	10
<i>Phragmites australis</i>	6
<i>Festuca rubra</i> aggr.	6
<i>Calliergonella cuspidata</i>	6



## N1J – Mediterranean and Black Sea moist and wet dune slack

Small permanent or temporary freshwater bodies that develop in the depressions between sand ridges in the dune systems along the Mediterranean and Black Sea coasts. The constituent vegetation depends on the depth and persistence of the water which is very variable, and also on the level of enrichment, which is usually eutrophic to mesotrophic, though locally dystrophic. There can be aquatic communities in the open waters and swamps around the margins and, where the slacks dry out in summer, conditions can become saline with ephemerals colonising.



### Corresponding alliances in EuroVegChecklist 2016

- <> JUN-01E *Agropyro-Plantaginion maritimi* Horvatić 1934
- > PHR-03A *Imperato cylindricae-Saccharion ravennae* Br.-Bl. et O. de Bolòs 1958
- <> ISO-01A *Isoëtium* Br.-Bl. 1935
- <> SAG-01C *Junco ranarii-Plantaginion commutatae* Horvatić 1934
- <> JUN-01D *Limonium etrusci* Viciani et al. 2012
- <> MOL-07A *Molinio-Holoschoenion* Br.-Bl. ex Tchou 1948
- <> PHR-01A *Phragmition communis* Koch 1926
- <> JUN-01C *Plantaginion crassifoliae* Br.-Bl. in Br.-Bl. et al. 1952
- <> SAG-01D *Romuleo-Saginion* (Wolff 1968) *Mucina* in *Mucina* et al. 2016
- <> SAG-01A *Saginion maritimae* Westhoff et al. 1962
- <> PHR-02A *Scirpion maritimi* Dahl et Hadač 1941
- <> SAG-01E *Sileno sedoidis-Catapodium loliacei* de Foucault et Bioret 2010
- <> SAG-01B *Spergularion macrorrhizae* Gamisans 1990

## Characteristic species combination

### Diagnostic species (phi coefficient \* 100)

<i>Tripidium ravennae</i>	39
<i>Juncus acutus</i>	26
<i>Juncus littoralis</i>	24
<i>Schoenus nigricans</i>	24
<i>Juncus maritimus</i>	23
<i>Periploca graeca</i>	20
<i>Sonchus maritimus</i>	19
<i>Phragmites australis</i>	18
<i>Scirpoides holoschoenus</i>	17
<i>Plantago crassifolia</i>	15

### Constant species (percentage frequencies)

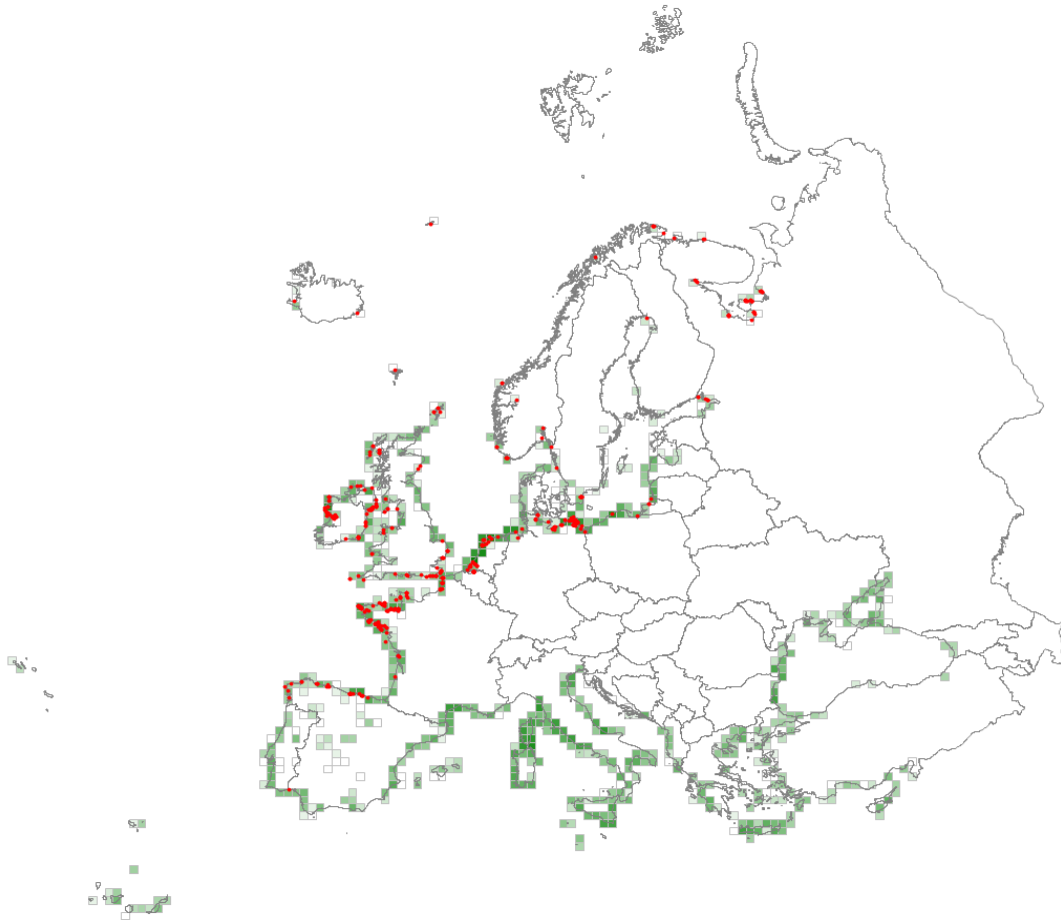
<i>Phragmites australis</i>	58
<i>Schoenus nigricans</i>	40
<i>Scirpoides holoschoenus</i>	29
<i>Juncus maritimus</i>	29
<i>Tripidium ravennae</i>	27
<i>Juncus acutus</i>	25
<i>Bolboschoenus maritimus</i>	25
<i>Dittrichia viscosa</i>	17
<i>Typha angustifolia</i>	15
<i>Tripolium pannonicum</i>	15
<i>Sonchus maritimus</i>	15
<i>Calystegia sepium</i>	12

### Dominant species (percentage frequencies of occurrences with cover > 25%)

<i>Schoenus nigricans</i>	29
<i>Phragmites australis</i>	17
<i>Tripidium ravennae</i>	15
<i>Bolboschoenus maritimus</i>	10

## N21 – Atlantic, Baltic and Arctic coastal shingle beach

These deposits of shingle are most typical of highly dynamic beaches along the Atlantic, Arctic and Baltic coasts, with concentrations along the English Channel. Often mobile and largely bare, they provide an inhospitable environment colonised only in more stable situations, with some deposition of finer material and drift detritus, by a distinctive suite of salt-tolerant and nitrophilous perennial plants. They also provide a habitat suitable for some nesting waders and seabirds and a variety of distinctive invertebrates. Locally, in southern England and the Baltic, larger apposition beaches are more extensively colonised by vegetation.



### Corresponding alliances in EuroVegChecklist 2016

- <> CAK-01C Agropyro-Rumicion Nordhagen 1940 nom. ambig. rejic. propos.
- <> CAK-01A Atriplicion littoralis Nordhagen 1940
- <> CAK-02B Atriplicion nudicaulis Golub et al. 2003
- <> CAK-02A Cakilion edentulae Thannheiser 1981
- > AMM-02B Mertensio maritima-Honckenyon diffusae Tx. et Géhu in Géhu 1998

### Characteristic species combination

Diagnostic species (phi coefficient \* 100)

<i>Honckenya peploides</i>	33
<i>Beta vulgaris</i> subsp. <i>maritima</i>	29
<i>Lathyrus japonicus</i>	23
<i>Atriplex praecox</i>	23
<i>Atriplex prostrata</i>	23
<i>Tripleurospermum maritimum</i> aggr.	21

<i>Atriplex littoralis</i>	19
<i>Atriplex glabriuscula</i>	18
<i>Polygonum raii</i>	17
<i>Rumex crispus</i>	17

Constant species (percentage frequencies)

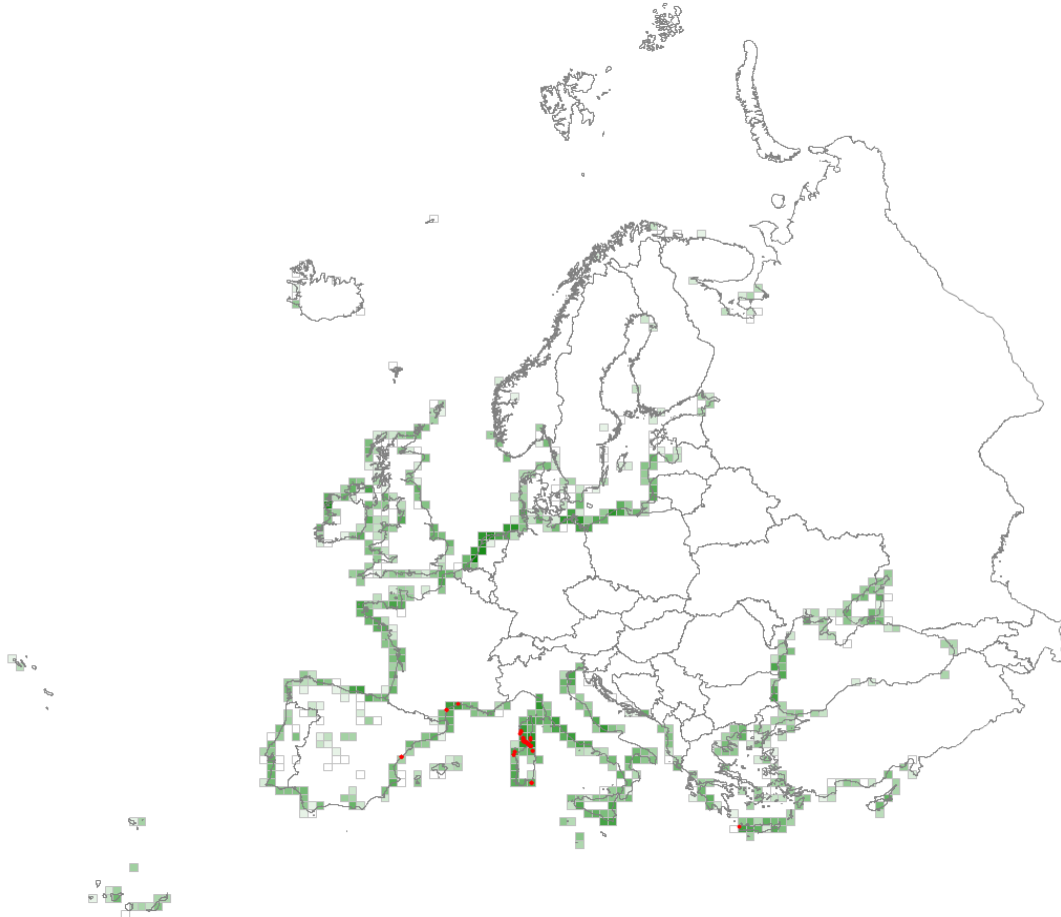
<i>Atriplex prostrata</i>	41
<i>Tripleurospermum maritimum</i> aggr.	40
<i>Honckenya peploides</i>	35
<i>Rumex crispus</i>	32
<i>Beta vulgaris</i> subsp. <i>maritima</i>	29
<i>Argentina anserina</i>	24
<i>Festuca rubra</i> aggr.	22
<i>Sonchus arvensis</i>	16
<i>Elytrigia repens</i> aggr.	15
<i>Elytrigia juncea</i>	15
<i>Atriplex littoralis</i>	15
<i>Lathyrus japonicus</i>	14
<i>Cakile maritima</i>	14
<i>Leymus arenarius</i>	12
<i>Crambe maritima</i>	12
<i>Cirsium arvense</i>	11
<i>Agrostis stolonifera</i>	11

Dominant species (percentage frequencies of occurrences with cover > 25%)

<i>Honckenya peploides</i>	12
<i>Tripleurospermum maritimum</i> aggr.	9
<i>Atriplex prostrata</i>	9
<i>Argentina anserina</i>	9
<i>Lathyrus japonicus</i>	8
<i>Beta vulgaris</i> subsp. <i>maritima</i>	8

## N22 – Mediterranean and Black Sea coastal shingle beach

Shingle and cobble beaches formed on dynamic coasts around the Mediterranean and Black Seas, where waves, mostly in winter, weather cliffs and redeposit the eroded material. Mixed with shells and decaying algae and sea grass washed ashore, it provides a nitrogen-rich surface for patchy and sporadic colonisation by annuals and some perennials, also sometimes weedy assemblages. Though widespread, its stands are narrow and localised and highly vulnerable to tourist recreation and coastal development.



### Corresponding alliances in EuroVegChecklist 2016

- <> CAK-03B Cakilion euxinae Géhu et al. 1994
- > CRI-02G Elytrigio bessarabicae-Lactucion tataricae Korzhenevskii ex Didukh et Mucina in Mucina et al. 2016
- <> CAK-03A Euphorbion peplidis Tx. ex Oberd. 1952

### Characteristic species combination

Diagnostic species (phi coefficient \* 100)

<i>Crithmum maritimum</i>	51
<i>Pancratium maritimum</i>	44
<i>Elytrigia juncea</i>	41
<i>Matthiola tricuspidata</i>	39
<i>Eryngium maritimum</i>	34
<i>Sporobolus pungens</i>	31
<i>Glaucium flavum</i>	29
<i>Achillea maritima</i>	28

<i>Senecio transiens</i>	25
<i>Silene sericea</i>	25
<i>Limonium dufourei</i>	22
<i>Matthiola sinuata</i>	22
<i>Anthemis maritima</i>	22
<i>Limonium virgatum</i>	19
<i>Medicago marina</i>	17
<i>Silene niceensis</i>	16
<i>Lotus cytisoides</i>	16
<i>Anchusa crispera</i>	15

Constant species (percentage frequencies)

<i>Crithmum maritimum</i>	85
<i>Elytrigia juncea</i>	80
<i>Pancratium maritimum</i>	60
<i>Eryngium maritimum</i>	60
<i>Sporobolus pungens</i>	35
<i>Matthiola tricuspidata</i>	30
<i>Glaucium flavum</i>	25
<i>Achillea maritima</i>	25
<i>Salsola kali aggr.</i>	20
<i>Medicago marina</i>	20
<i>Lotus cytisoides</i>	20
<i>Helichrysum italicum</i>	20
<i>Silene sericea</i>	15
<i>Reichardia picroides</i>	15
<i>Matthiola sinuata</i>	15
<i>Frankenia laevis</i>	15
<i>Calystegia soldanella</i>	15
<i>Cakile maritima</i>	15
<i>Anthemis maritima</i>	15
<i>Ammophila arenaria</i>	15

Dominant species (percentage frequencies of occurrences with cover > 25%)

<i>Crithmum maritimum</i>	30
<i>Elytrigia juncea</i>	25
<i>Matthiola tricuspidata</i>	10
<i>Sporobolus pungens</i>	5

## **N23 – Shingle and gravel beach with scrub**

[This habitat could not be formally defined in the expert system.]

Coastal gravel banks with scrub. Included are dense thermomediterranean scrub on gravel banks and heaths on shingle in the temperate zone.

## **N24 – Shingle and gravel beach forest**

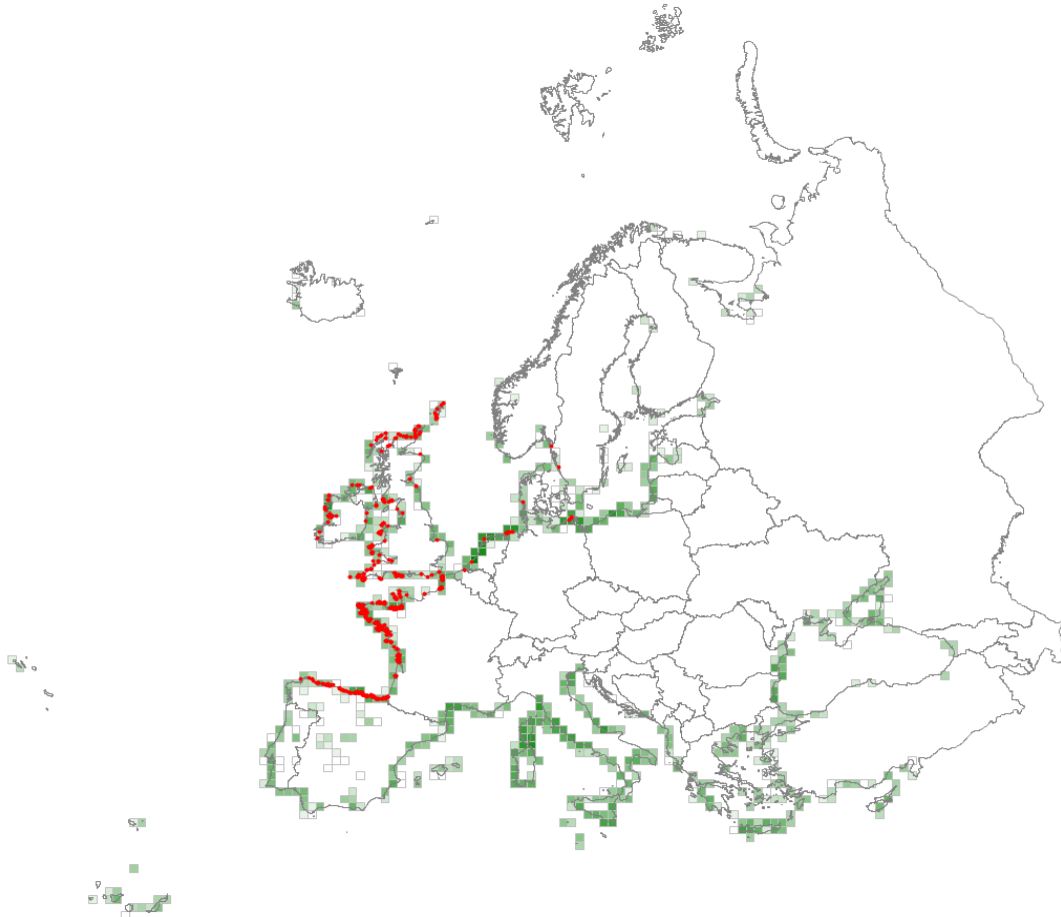
[This habitat could not be formally defined in the expert system.]

Coastal gravel banks, colonised by trees or riparian thickets, in particular, Mediterranean gravel banks colonised by *Quercus ilex* low forests, by *Tamarix africana* or *Vitex agnus-castus*.



## N31 – Atlantic and Baltic rocky sea cliff and shore

Cliffs, together with vegetated crevices, ledges and cliff-tops along the coasts of the Baltic Sea, the North Sea and the Atlantic Ocean south to middle Portugal. Exposed bedrock dominates the habitat, and its very variable composition and structure determine the character of available surfaces. The height and slope of the cliffs influence the input of salt spray which, on exposed coasts, can be very high close to the sea. This combination of local climatic and topographic conditions determines the often strong zonation of crevice vegetation, grasslands and heaths found on the cliffs, with regional climate also affecting the flora. Nesting seabirds also add a distinctive nutrient-demanding element to the flora on their guano.



### Corresponding alliances in EuroVegChecklist 2016

- > ASP-10A Asplenion marini Segal 1969
- <> CRI-03A Cochleario officinalis-Armerion maritimae Géhu et Géhu-Franck 1984
- > CRI-01A Crithmion maritimi Tx. et Oberd. 1958
- <> CRI-01C Crithmo-Daucion halophili Rivas-Mart. et al. 1990
- <> CRI-01B Crithmo-Staticion Molinier 1934
- > CRI-02A Dactylido hispanicae-Helichryson stoechadis Géhu et Biondi in Géhu 1994

### Characteristic species combination

Diagnostic species (phi coefficient \* 100)

<i>Spergularia rupicola</i>	42
<i>Armeria maritima</i>	35
<i>Crithmum maritimum</i>	29
<i>Armeria pubigera</i>	29

<i>Cochlearia danica</i>	27
<i>Cochlearia officinalis</i>	27
<i>Sagina maritima</i>	25
<i>Limonium binervosum</i>	24
<i>Plantago coronopus</i> aggr.	23
<i>Silene uniflora</i>	23
<i>Limonium dodartii</i>	19
<i>Limonium ovalifolium</i>	18
<i>Catapodium marinum</i>	18
<i>Plantago maritima</i>	17
<i>Schistidium maritimum</i>	17
<i>Ligusticum scothicum</i>	16

Constant species (percentage frequencies)

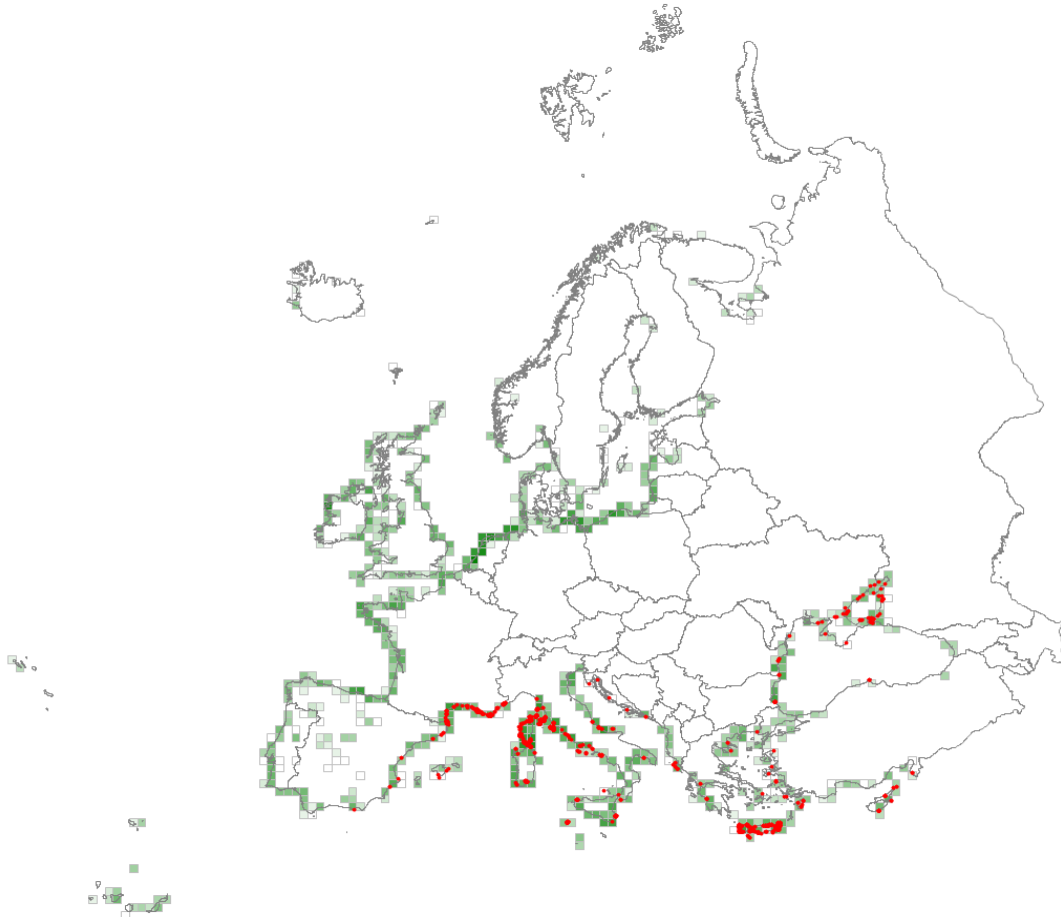
<i>Festuca rubra</i> aggr.	60
<i>Armeria maritima</i>	56
<i>Crithmum maritimum</i>	49
<i>Plantago coronopus</i> aggr.	46
<i>Plantago maritima</i>	37
<i>Spergularia rupicola</i>	27
<i>Silene uniflora</i>	21
<i>Cochlearia danica</i>	18
<i>Cochlearia officinalis</i>	17
<i>Sagina maritima</i>	15
<i>Daucus carota</i>	15
<i>Catapodium marinum</i>	15
<i>Beta vulgaris</i> subsp. <i>maritima</i>	13
<i>Agrostis stolonifera</i>	13
<i>Limbarda crithmoides</i>	12
<i>Tripleurospermum maritimum</i> aggr.	11
<i>Limonium binervosum</i>	11

Dominant species (percentage frequencies of occurrences with cover > 25%)

<i>Crithmum maritimum</i>	16
<i>Plantago coronopus</i> aggr.	9
<i>Armeria maritima</i>	9
<i>Plantago maritima</i>	8
<i>Festuca rubra</i> aggr.	5

## N32 – Mediterranean and Black Sea rocky sea cliff and shore

Cliffs, together with vegetated crevices, ledges and cliff-tops along the coasts of the Mediterranean Sea and the Atlantic Ocean in southern Portugal, and more locally, the Black Sea. Exposed bedrock dominates the habitat, and its variable composition and structure determine the character of available surfaces, the height and slope of the cliffs influencing the input of salt spray which, on exposed coasts, can be very high close to the sea. This combination of local climatic and topographic conditions determines the often strong zonation of crevice vegetation and grasslands found on the cliffs, with regional climate also affecting the flora, with many Mediterranean endemics.



### Corresponding alliances in EuroVegChecklist 2016

- <> CRI-01C Crithmo-Daucion halophili Rivas-Mart. et al. 1990
- <> CRI-01B Crithmo-Staticion Molinier 1934
- > CRI-02F Crucianellion rupestris S. Brullo et Furnari 1990
- > CRI-01F Kochio prostratae-Limonion meyeri Korzhenevskii 1987
- > DRY-02A Ptilostemonion echinocephali Korzhenevskii 1990

### Characteristic species combination

Diagnostic species (phi coefficient \* 100)

<i>Lotus cytisoides</i>	26
<i>Silene sedoides</i>	24
<i>Limonium graecum</i>	22
<i>Crithmum maritimum</i>	21
<i>Jacobaea maritima</i>	19

<i>Helichrysum litoreum</i>	19
<i>Limonium minutum</i>	18
<i>Limonium ilvae</i>	16
<i>Reichardia picroides</i>	15

Constant species (percentage frequencies)

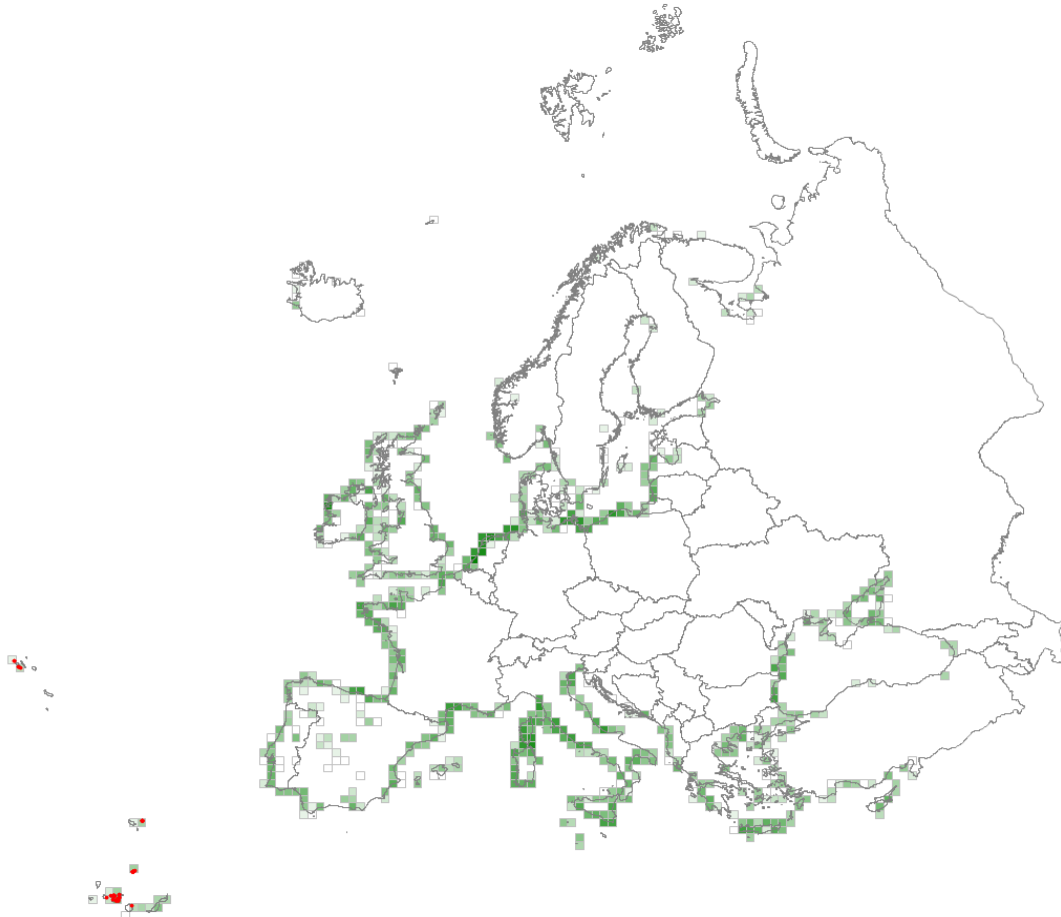
<i>Crithmum maritimum</i>	35
<i>Lotus cytisoides</i>	33
<i>Reichardia picroides</i>	27
<i>Dactylis glomerata</i>	23
<i>Daucus carota</i>	20
<i>Silene sedoides</i>	16
<i>Plantago coronopus</i> aggr.	14
<i>Jacobaea maritima</i>	14
<i>Parapholis incurva</i>	12
<i>Catapodium marinum</i>	12

Dominant species (percentage frequencies of occurrences with cover > 25%)

<i>Thymra capitata</i>	6
<i>Crithmum maritimum</i>	6

## N33 – Macaronesian rocky sea cliff and shore

The rocky cliffs of the Macaronesian islands comprise a narrow strip of basalt lava influenced by salt-spray whose zonation of crevice and ledge vegetation vary on the different island groups of the Canaries, Madeira and the Azores, with endemics providing a highly distinctive aspect to the flora. The habitat also provides important sites for nesting seabirds whose guano offers a nutrient-rich surface for colonisation.



### Corresponding alliances in EuroVegChecklist 2016

- > CRI-01E Crithmo-Frankenion hirsutae Mayer 1995
- > CRI-04B Euphorbio azoricae-Festucion petraeae Lüpnitz 1976
- > CRI-04A Frankenio-Astydiamion latifoliae Santos 1976
- > CRI-04C Helichryson obconico-devium Rivas-Mart. et al. 2002
- > CRI-01D Limonion anfracti-cancellati (Horvatić 1934) Mucina in Mucina et al. 2016

### Characteristic species combination

Diagnostic species (phi coefficient \* 100)

<i>Limonium pectinatum</i>	50
<i>Astydamia latifolia</i>	49
<i>Senecio incrassatus</i>	43
<i>Lotus glaucus</i>	43
<i>Frankenia ericifolia</i>	36
<i>Atriplex semibaccata</i>	34
<i>Frankenia laevis</i>	33
<i>Mesembryanthemum crystallinum</i>	32

<i>Schizogyne sericea</i>	31
<i>Argyranthemum frutescens</i>	29
<i>Limonium papillatum</i>	27
<i>Reichardia crystallina</i>	26
<i>Lotus sessilifolius</i>	24
<i>Asplenium marinum</i>	22
<i>Spergularia azorica</i>	22
<i>Limonium pyramidatum</i>	22
<i>Lotus loweanus</i>	22
<i>Umbilicus gaditanus</i>	22
<i>Euphorbia balsamifera</i>	21
<i>Aizoon canariense</i>	20
<i>Atriplex glauca</i>	19
<i>Mesembryanthemum nodiflorum</i>	19
<i>Tetraena fontanesii</i>	18
<i>Spergula fallax</i>	18
<i>Helichrysum obconicum</i>	17
<i>Helichrysum devium</i>	17

Constant species (percentage frequencies)

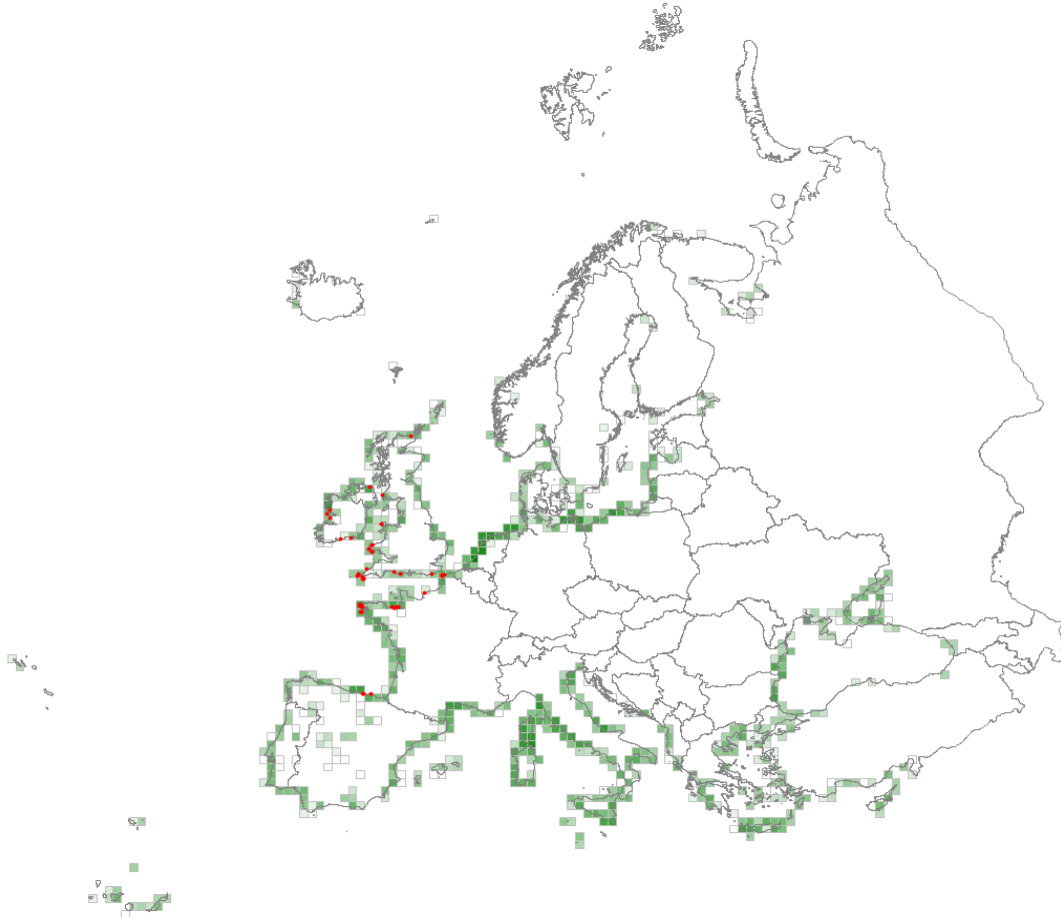
<i>Limonium pectinatum</i>	45
<i>Frankenia laevis</i>	40
<i>Astydamia latifolia</i>	35
<i>Schizogyne sericea</i>	30
<i>Senecio incrassatus</i>	25
<i>Lotus glaucus</i>	25
<i>Crithmum maritimum</i>	25
<i>Argyranthemum frutescens</i>	25
<i>Tetraena fontanesii</i>	20
<i>Plantago coronopus</i> aggr.	20
<i>Frankenia ericifolia</i>	20
<i>Euphorbia balsamifera</i>	20
<i>Suaeda vera</i>	15
<i>Reichardia crystallina</i>	15
<i>Mesembryanthemum nodiflorum</i>	15
<i>Mesembryanthemum crystallinum</i>	15
<i>Lotus sessilifolius</i>	15
<i>Atriplex semibaccata</i>	15
<i>Atriplex glauca</i>	15

Dominant species (percentage frequencies of occurrences with cover > 25%)

<i>Astydamia latifolia</i>	35
<i>Argyranthemum frutescens</i>	15
<i>Limonium pectinatum</i>	10
<i>Limonium papillatum</i>	10
<i>Frankenia laevis</i>	10
<i>Frankenia ericifolia</i>	10
<i>Crithmum maritimum</i>	10
<i>Salsola oppositifolia</i>	5
<i>Lotus loweanus</i>	5
<i>Lotus glaucus</i>	5
<i>Helichrysum devium</i>	5
<i>Euphorbia balsamifera</i>	5
<i>Aizoon canariense</i>	5

## N34 – Atlantic and Baltic soft sea cliff

Coastal loamy cliffs, with a bedrock of clays, shales or loamy sands, erode much quicker than cliffs with a hard bedrock, and therefore usually have a less steep slope and are often unstable. Along the Atlantic and Baltic coasts, they harbour relatively common and widespread species, even though a range of different micro-habitats may be found with ephemeral plant communities on the bare sediments, rank grasslands and scrub on more stable ground and flush vegetation around seepages.



### Corresponding alliances in EuroVegChecklist 2016

- > JUN-02A Agropyron pungentis Géhu 1968
- <> CRI-03A Cochleario officinalis-Armerion maritimae Géhu et Géhu-Franck 1984
- <> ART-03A Convolvulo arvensis-Agropyron repentis Görs 1967

### Characteristic species combination

Diagnostic species (phi coefficient \* 100)

<i>Armeria maritima</i>	48
<i>Silene uniflora</i>	43
<i>Plantago coronopus</i> aggr.	33
<i>Brassica oleracea</i>	25
<i>Anthyllis vulneraria</i>	24
<i>Erodium maritimum</i>	19
<i>Festuca rubra</i> aggr.	18
<i>Daucus carota</i>	17
<i>Cochlearia danica</i>	16

<i>Spergularia rupicola</i>	16
<i>Primula scotica</i>	16
<i>Cerastium diffusum</i>	16
<i>Festuca ovina/rubra</i>	16
<i>Tortula viridifolia</i>	15

Constant species (percentage frequencies)

<i>Armeria maritima</i>	76
<i>Festuca rubra</i> aggr.	74
<i>Plantago coronopus</i> aggr.	66
<i>Anthyllis vulneraria</i>	66
<i>Daucus carota</i>	50
<i>Silene uniflora</i>	39
<i>Dactylis glomerata</i>	37
<i>Plantago lanceolata</i>	34
<i>Lotus corniculatus</i>	34
<i>Plantago maritima</i>	32
<i>Agrostis stolonifera</i>	32
<i>Trifolium repens</i>	21
<i>Holcus lanatus</i>	21
<i>Leontodon saxatilis</i>	18
<i>Jacobaea vulgaris</i>	18
<i>Sonchus oleraceus</i>	13
<i>Hypochaeris radicata</i>	13
<i>Centaureum erythraea</i>	13
<i>Brassica oleracea</i>	13
<i>Tussilago farfara</i>	11
<i>Tripleurospermum maritimum</i> aggr.	11
<i>Spergularia rupicola</i>	11
<i>Sedum anglicum</i>	11
<i>Scilla verna</i>	11
<i>Cochlearia danica</i>	11
<i>Cerastium fontanum</i> subsp. <i>vulgare</i>	11
<i>Cerastium diffusum</i>	11
<i>Anagallis arvensis</i>	11

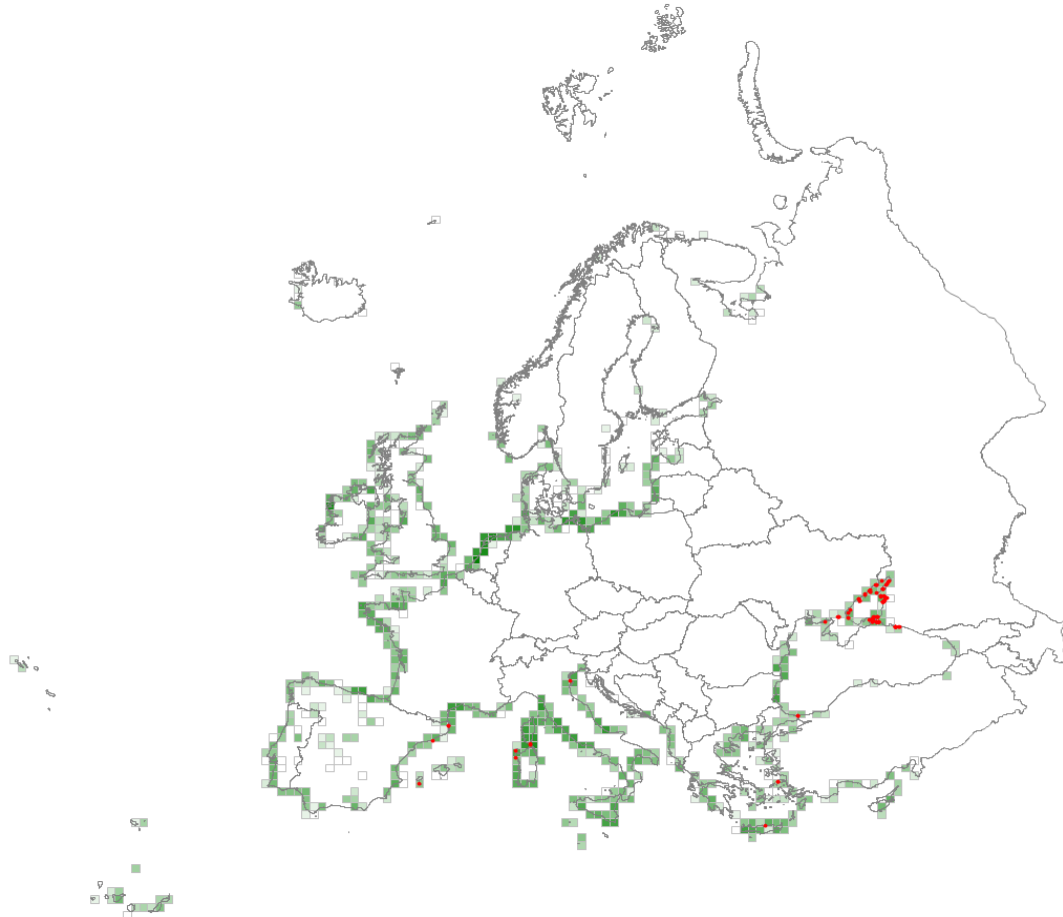
Dominant species (percentage frequencies of occurrences with cover > 25%)

<i>Armeria maritima</i>	18
<i>Silene uniflora</i>	16
<i>Plantago maritima</i>	16
<i>Plantago coronopus</i> aggr.	16
<i>Festuca rubra</i> aggr.	16
<i>Anthyllis vulneraria</i>	13
<i>Tussilago farfara</i>	5
<i>Jacobaea vulgaris</i>	5
<i>Daucus carota</i>	5



## N35 – Mediterranean and Black Sea soft sea cliff

Coastal soft cliffs around the Mediterranean and Black Seas that consist of readily-eroded clays, shales and sands. Usually, they have gently sloping and often unstable surfaces with a mixture of open soil, pioneer vegetation, scrub and flushes influenced by percolating waters. This habitat is poorly known, and there is little information on its ecological and floristic features.



### Corresponding alliances in EuroVegChecklist 2016

- > JUN-02B Agrostio-Elytrigion athericae S. Brullo et Siracusa 2000

### Characteristic species combination

Diagnostic species (phi coefficient \* 100)

<i>Glycyrrhiza glabra</i>	41
<i>Elytrigia elongata</i>	32
<i>Cynanchum acutum</i>	31
<i>Artemisia santonicum</i>	19
<i>Limonium meyeri</i>	18
<i>Galium humifusum</i>	17
<i>Echinops ossicus</i>	17
<i>Lactuca tatarica</i>	16
<i>Argusia sibirica</i>	15

Constant species (percentage frequencies)

<i>Glycyrrhiza glabra</i>	46
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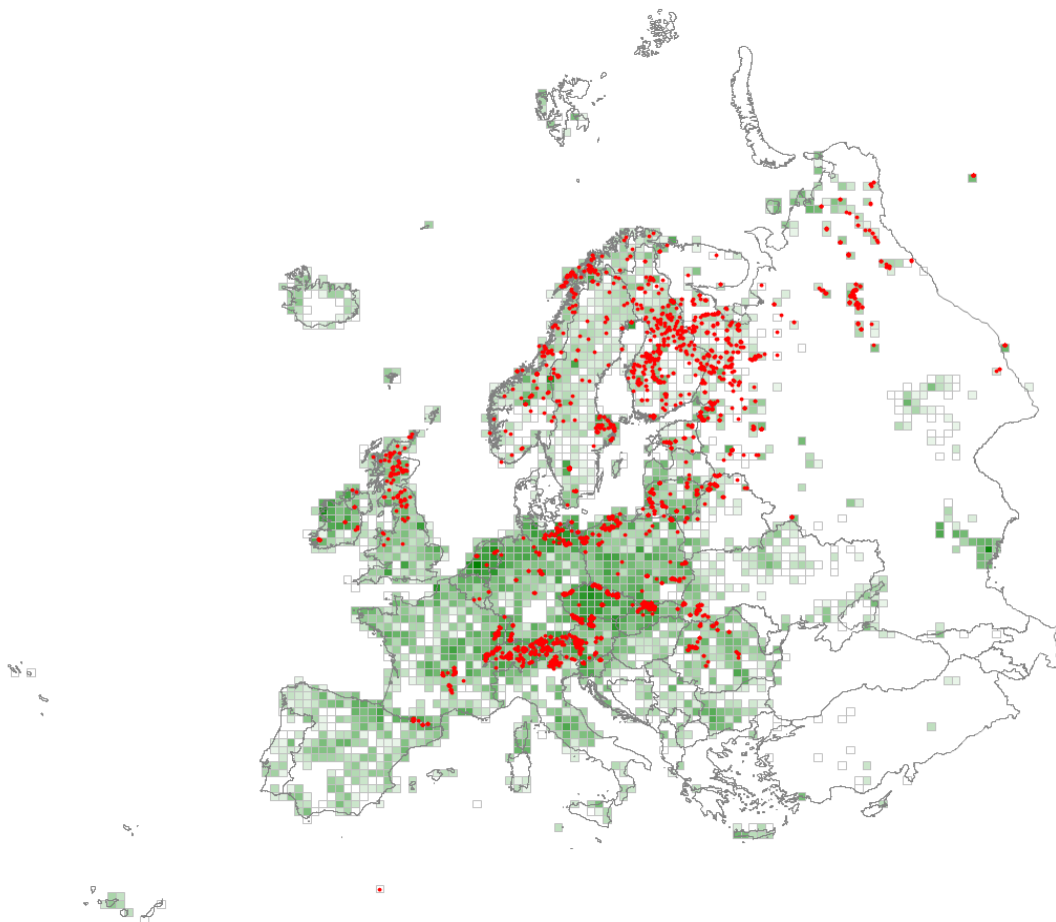
<i>Cynanchum acutum</i>	40
<i>Elytrigia elongata</i>	39
<i>Artemisia santonicum</i>	32
<i>Limonium meyeri</i>	25
<i>Elytrigia repens</i> aggr.	25
<i>Calamagrostis epigejos</i>	25
<i>Phragmites australis</i>	19
<i>Lactuca tatarica</i>	19
<i>Galium humifusum</i>	19
<i>Convolvulus arvensis</i>	14
<i>Bromus squarrosus</i>	14
<i>Senecio leucanthemifolius</i>	12
<i>Cichorium intybus</i>	12
<i>Salsola kali</i> aggr.	11
<i>Poa pratensis</i> aggr.	11
<i>Medicago falcata</i>	11
<i>Leymus racemosus</i>	11
<i>Cynodon dactylon</i>	11

Dominant species (percentage frequencies of occurrences with cover > 25%)

<i>Glycyrrhiza glabra</i>	42
<i>Elytrigia elongata</i>	23
<i>Teucrium polium</i> aggr.	7
<i>Senecio leucanthemifolius</i>	5
<i>Artemisia santonicum</i>	5

## Q11 – Raised bog

The mire surface and underlying peat of highly oligotrophic, strongly acidic peatlands with a raised centre from which water drains towards the edges. The peat is composed mainly of sphagnum remains. Raised bogs form on nearly flat ground and are ombrotrophic, i.e. derive moisture and nutrients only from rainfall. Raised bog complexes include larger and smaller bog pools, lawns, elevated hummocks and their associated vegetation. Raised bogs form only in cool climates with high rainfall, and they are most widespread in the boreal zone and in the mountains and hills of the temperate zone; they also occur locally in the lowlands of the temperate zone. They are characteristic of lowlands and hills of North-Western and Northern Europe, the adjacent Hercynian ranges, the Jura, the Alps and the Carpathians. Bogs harbour, in addition to sphagna such as *Sphagnum fuscum*, *S. magellanicum* aggr. and *S. majus*, which are often abundant, a small number of dwarf shrubs such as *Andromeda polifolia*, *Rhododendron tomentosum*, *Vaccinium oxycoccos*, and sedges such as *Carex magellanica*, *Carex pauciflora*, *Eriophorum vaginatum* and *Trichophorum cespitosum*, non-sphagnaceous bryophytes and lichens.



### Corresponding alliances in EuroVegChecklist 2016

- > OXY-02A *Oxycocco microcarpi*-*Empetrion hermaphroditum* Nordhagen ex Du Rietz 1954  
nom. conserv. propos.
- <> SCH-04A *Scheuchzerion palustris* Nordhagen ex Tx. 1937
- <> OXY-02B *Sphagnion medii* Kästner et Flössner 1933

## Characteristic species combination

### Diagnostic species (phi coefficient \* 100)

<i>Sphagnum magellanicum</i> aggr.	43
<i>Sphagnum fuscum</i>	39
<i>Eriophorum vaginatum</i>	38
<i>Vaccinium oxycoccos</i>	35
<i>Sphagnum recurvum</i> aggr.	34
<i>Vaccinium microcarpum</i>	33
<i>Chamaedaphne calyculata</i>	32
<i>Carex pauciflora</i>	31
<i>Andromeda polifolia</i>	30
<i>Polytrichum strictum</i>	29
<i>Sphagnum rubellum</i>	25
<i>Mylia anomala</i>	23
<i>Rubus chamaemorus</i>	21
<i>Drosera rotundifolia</i>	21
<i>Rhododendron tomentosum</i>	20
<i>Sphagnum capillifolium</i> aggr.	19
<i>Vaccinium uliginosum</i>	18
<i>Sphagnum russowii</i>	17
<i>Betula nana</i>	16
<i>Empetrum nigrum</i> aggr.	15

### Constant species (percentage frequencies)

<i>Eriophorum vaginatum</i>	82
<i>Sphagnum recurvum</i> aggr.	64
<i>Sphagnum magellanicum</i> aggr.	61
<i>Andromeda polifolia</i>	60
<i>Vaccinium oxycoccos</i>	58
<i>Vaccinium uliginosum</i>	48
<i>Polytrichum strictum</i>	48
<i>Calluna vulgaris</i>	48
<i>Empetrum nigrum</i> aggr.	47
<i>Sphagnum fuscum</i>	41
<i>Rubus chamaemorus</i>	39
<i>Drosera rotundifolia</i>	39
<i>Pinus sylvestris</i>	34
<i>Vaccinium myrtillus</i>	32
<i>Pleurozium schreberi</i>	32
<i>Rhododendron tomentosum</i>	31
<i>Betula nana</i>	31
<i>Vaccinium microcarpum</i>	30
<i>Aulacomnium palustre</i>	29
<i>Sphagnum capillifolium</i> aggr.	28
<i>Vaccinium vitis-idaea</i>	27
<i>Carex pauciflora</i>	27
<i>Chamaedaphne calyculata</i>	22
<i>Sphagnum rubellum</i>	21
<i>Trichophorum cespitosum</i>	18
<i>Mylia anomala</i>	18
<i>Sphagnum russowii</i>	17
<i>Cladonia arbuscula</i> aggr.	16
<i>Betula pubescens</i>	16
<i>Molinia caerulea</i> aggr.	15
<i>Eriophorum angustifolium</i>	15
<i>Cladonia rangiferina</i>	15
<i>Polytrichum commune</i>	14
<i>Sphagnum papillosum</i>	12

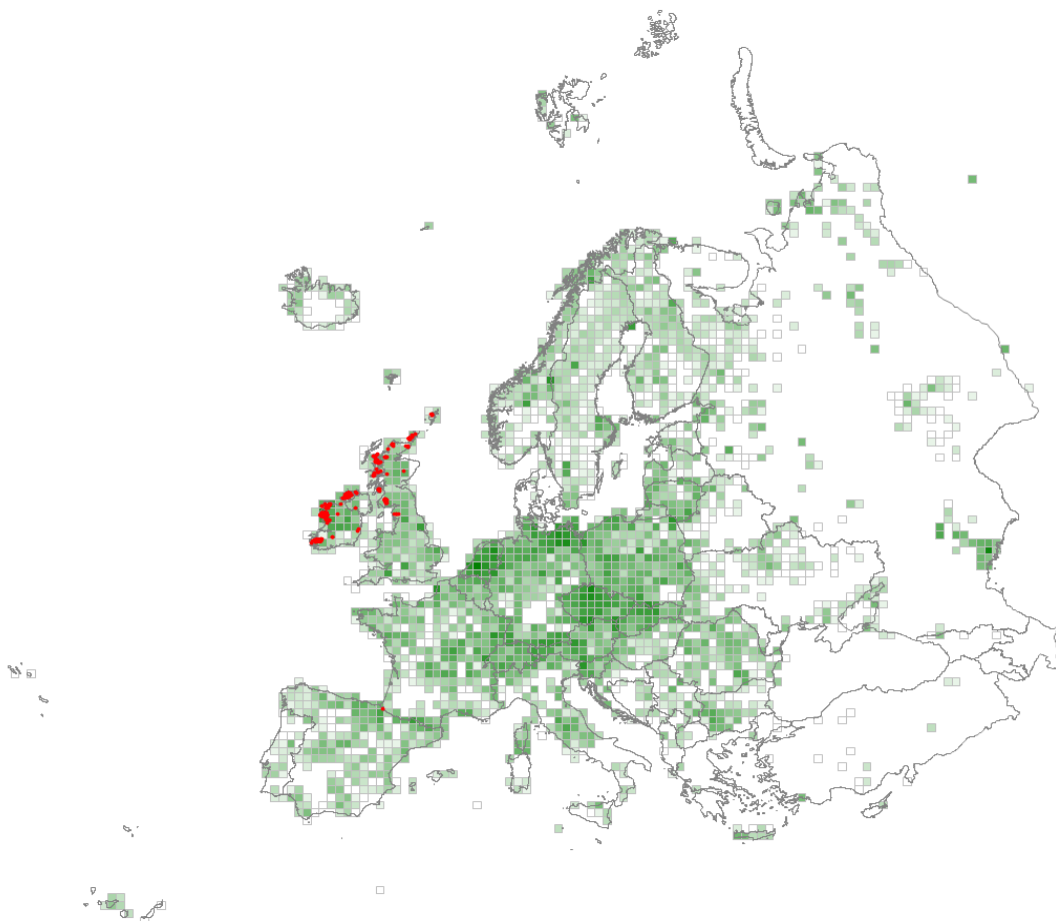
<i>Picea abies</i>	12
<i>Carex rostrata</i>	12
<i>Carex nigra</i>	12
<i>Potentilla erecta</i>	11

Dominant species (percentage frequencies of occurrences with cover > 25%)

<i>Sphagnum fuscum</i>	28
<i>Sphagnum recurvum</i> aggr.	26
<i>Sphagnum magellanicum</i> aggr.	25
<i>Eriophorum vaginatum</i>	19
<i>Calluna vulgaris</i>	15
<i>Sphagnum capillifolium</i> aggr.	12
<i>Empetrum nigrum</i> aggr.	9
<i>Sphagnum rubellum</i>	6
<i>Vaccinium uliginosum</i>	5
<i>Rubus chamaemorus</i>	5
<i>Chamaedaphne calyculata</i>	5

## Q12 – Blanket bog

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. Blanket bogs are a habitat of North-Western Europe, characteristic of the western and northern British Isles, the Faeroe Islands and the western seaboard of Scandinavia with small outliers in France, Portugal and Spain. They often cover extensive areas with local topographic features supporting distinct communities. Sphagna such as *Sphagnum compactum*, *S. papillosum*, *S. rubellum* and *S. tenellum* play an important role in all of them, accompanied by *Calluna vulgaris*, *Eriophorum angustifolium*, *E. vaginatum*, *Molinia caerulea*, *Narthecium ossifragum*, *Schoenus nigricans* and *Trichophorum cespitosum*. Blanket bog complexes include dystrophic pools and acidic flushes as well as the mire surface.



### Corresponding alliances in EuroVegChecklist 2016

- <> OXY-01A *Ericion tetralicis* Schwickerath 1933
  - > *Erico mackaiana*-*Sphagnion papillosum* (Fernández Prieto et al. 1987) Rivas-Mart. et al. 1999
- <> OXY-01B *Oxycocco-Ericion tetralicis* Nordhagen ex Tx. 1937

### Characteristic species combination

Diagnostic species (phi coefficient \* 100)

*Pleurozia purpurea*

<i>Campylopus atrovirens</i>	59
<i>Racomitrium lanuginosum</i>	58
<i>Narthecium ossifragum</i>	49
<i>Sphagnum tenellum</i>	42
<i>Erica tetralix</i>	41
<i>Odontoschisma sphagni</i>	41
<i>Trichoporum cespitosum</i>	40
<i>Kurzia pauciflora</i>	35
<i>Mylia taylorii</i>	33
<i>Cladonia portentosa</i>	31
<i>Sphagnum subnitens</i>	31
<i>Breutelia chrysocoma</i>	31
<i>Sphagnum papillosum</i>	30
<i>Erica cinerea</i>	29
<i>Sphagnum capillifolium</i> aggr.	28
<i>Diplophyllum albicans</i>	27
<i>Sphagnum auriculatum</i> aggr.	26
<i>Polygala serpyllifolia</i>	25
<i>Eriophorum angustifolium</i>	25
<i>Calluna vulgaris</i>	23
<i>Cladonia uncialis</i>	23
<i>Drosera rotundifolia</i>	22
<i>Sphagnum compactum</i>	21
<i>Molinia caerulea</i> aggr.	21
<i>Sphagnum rubellum</i>	20
<i>Scapania gracilis</i>	20
<i>Juncus squarrosus</i>	20
<i>Hypnum cupressiforme</i> aggr.	19
<i>Rhynchospora alba</i>	19
<i>Cephalozia connivens</i>	19
<i>Eriophorum vaginatum</i>	19
<i>Cephalozia bicuspidata</i>	19
<i>Sphagnum cuspidatum</i>	17
<i>Myrica gale</i>	16
<i>Drosera longifolia</i>	16
<i>Sphagnum imbricatum</i>	16
<i>Potentilla erecta</i>	16
<i>Schoenus nigricans</i>	15

Constant species (percentage frequencies)

<i>Calluna vulgaris</i>	93
<i>Racomitrium lanuginosum</i>	90
<i>Erica tetralix</i>	86
<i>Trichoporum cespitosum</i>	75
<i>Molinia caerulea</i> aggr.	75
<i>Narthecium ossifragum</i>	69
<i>Eriophorum angustifolium</i>	64
<i>Potentilla erecta</i>	62
<i>Hypnum cupressiforme</i> aggr.	59
<i>Pleurozia purpurea</i>	51
<i>Cladonia uncialis</i>	45
<i>Erica cinerea</i>	43
<i>Cladonia portentosa</i>	43
<i>Sphagnum capillifolium</i> aggr.	41
<i>Eriophorum vaginatum</i>	41
<i>Drosera rotundifolia</i>	41
<i>Sphagnum tenellum</i>	40
<i>Campylopus atrovirens</i>	40
<i>Sphagnum papillosum</i>	39

<i>Odontoschisma sphagni</i>	37
<i>Sphagnum subnitens</i>	29
<i>Carex panicea</i>	29
<i>Schoenus nigricans</i>	26
<i>Juncus squarrosus</i>	26
<i>Sphagnum auriculatum</i> aggr.	25
<i>Polygala serpyllifolia</i>	25
<i>Rhynchospora alba</i>	21
<i>Diplophyllum albicans</i>	21
<i>Kurzia pauciflora</i>	20
<i>Sphagnum cuspidatum</i>	18
<i>Sphagnum compactum</i>	18
<i>Sphagnum rubellum</i>	17
<i>Myrica gale</i>	17
<i>Mylia taylorii</i>	17
<i>Breutelia chrysocoma</i>	17
<i>Drosera longifolia</i>	15
<i>Cephalozia bicuspidata</i>	15
<i>Nardus stricta</i>	14
<i>Leucobryum glaucum</i>	14
<i>Sphagnum magellanicum</i> aggr.	13
<i>Pleurozium schreberi</i>	13
<i>Carex echinata</i>	13
<i>Pedicularis sylvatica</i>	12
<i>Cladonia arbuscula</i> aggr.	12
<i>Pinguicula vulgaris</i>	11
<i>Cephalozia connivens</i>	11

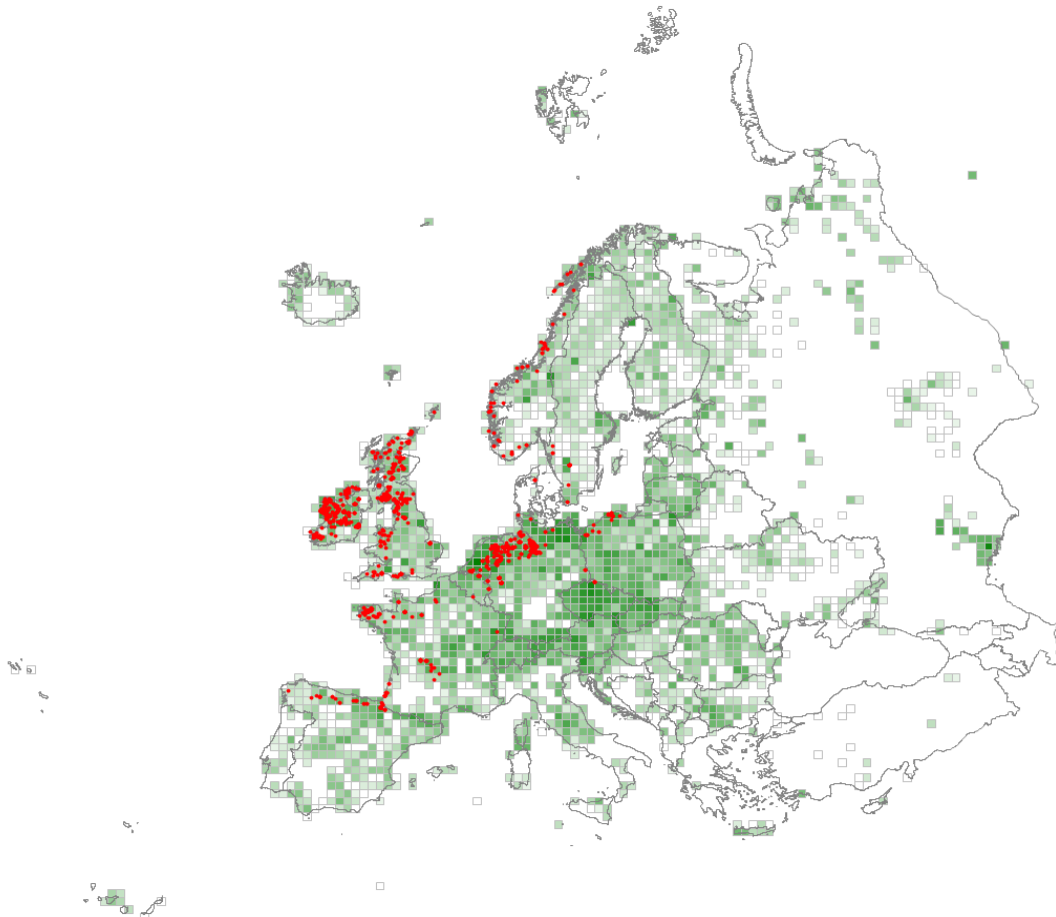
Dominant species (percentage frequencies of occurrences with cover > 25%)

<i>Calluna vulgaris</i>	33
<i>Molinia caerulea</i> aggr.	28
<i>Trichophorum cespitosum</i>	26
<i>Racomitrium lanuginosum</i>	20
<i>Sphagnum papillosum</i>	12
<i>Narthecium ossifragum</i>	8
<i>Sphagnum rubellum</i>	7
<i>Sphagnum capillifolium</i> aggr.	7
<i>Erica tetralix</i>	7
<i>Schoenus nigricans</i>	5
<i>Rhynchospora alba</i>	5
<i>Eriophorum angustifolium</i>	5
<i>Campylopus atrovirens</i>	5



## Q21 – Oceanic valley mire

Topogenous wetlands in which the peat-forming vegetation depends on water draining from the surrounding landscape. Most valley mires are habitat complexes including poor fens, transition mires and pools. Acid valley mires often have vegetation resembling that of bogs, especially in those parts relatively distant from flowing water. Basic and neutral valley mires support mainly poor-fen vegetation, but in large mire systems, this is accompanied by wet acid grassland, large sedges and reeds. *Sphagnum* hummocks form locally, and transition mires or littoral and spring communities colonise small depressions. Excluded are rich-fen valley mires.



### Corresponding alliances in EuroVegChecklist 2016

- <> OXY-01A *Ericion tetralicis* Schwickerath 1933
- <> OXY-01B *Oxycocco-Ericion tetralicis* Nordhagen ex Tx. 1937
- <> OXY-02B *Sphagnion medii* Kästner et Flössner 1933

### Characteristic species combination

Diagnostic species (phi coefficient \* 100)

<i>Narthecium ossifragum</i>	52
<i>Erica tetralix</i>	46
<i>Sphagnum papillosum</i>	45
<i>Odontoschisma sphagni</i>	35
<i>Eriophorum angustifolium</i>	32
<i>Drosera rotundifolia</i>	28
<i>Sphagnum tenellum</i>	28

<i>Trichophorum cespitosum</i>	26
<i>Eriophorum vaginatum</i>	22
<i>Sphagnum capillifolium</i> aggr.	21
<i>Calluna vulgaris</i>	18
<i>Molinia caerulea</i> aggr.	18
<i>Sphagnum subnitens</i>	18
<i>Sphagnum rubellum</i>	17
<i>Rhynchospora alba</i>	17
<i>Cephalozia connivens</i>	17
<i>Sphagnum magellanicum</i> aggr.	17
<i>Mylia anomala</i>	16
<i>Vaccinium oxycoccos</i>	16

Constant species (percentage frequencies)

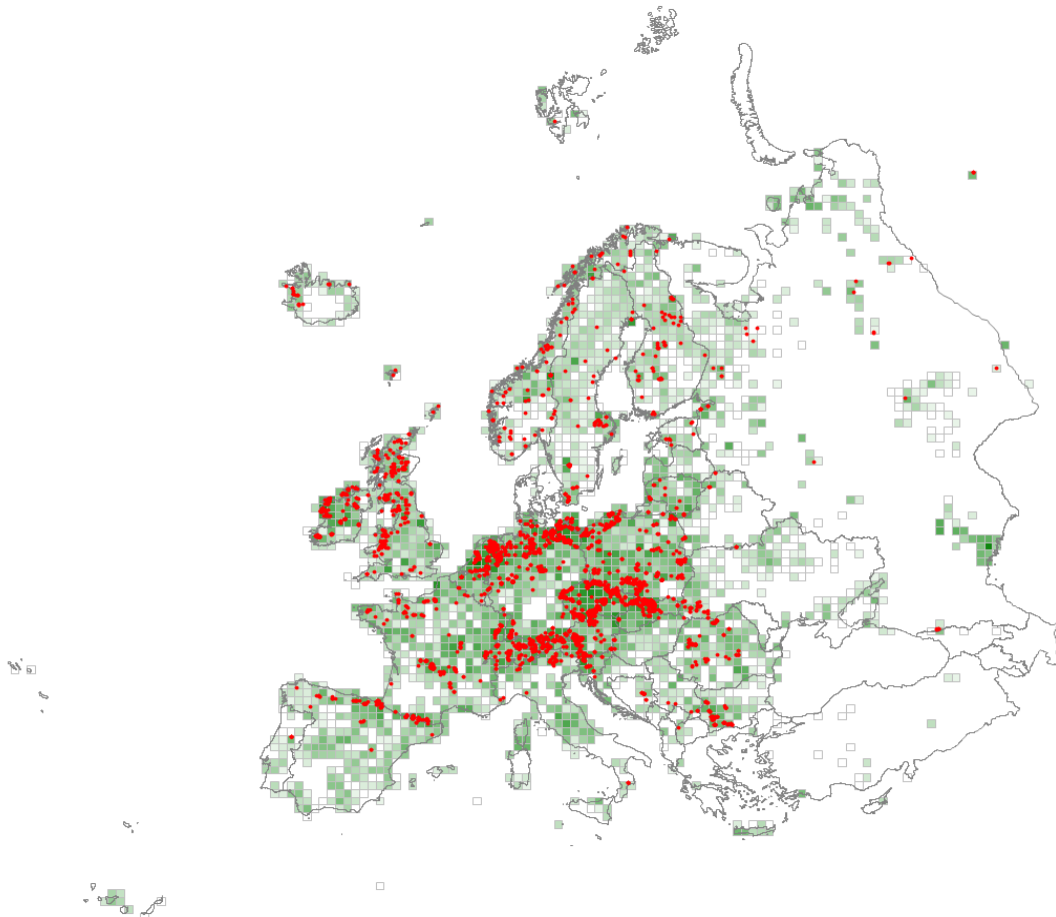
<i>Erica tetralix</i>	94
<i>Eriophorum angustifolium</i>	84
<i>Calluna vulgaris</i>	75
<i>Narthecium ossifragum</i>	73
<i>Molinia caerulea</i> aggr.	64
<i>Sphagnum papillosum</i>	58
<i>Drosera rotundifolia</i>	52
<i>Trichophorum cespitosum</i>	49
<i>Eriophorum vaginatum</i>	47
<i>Hypnum cupressiforme</i> aggr.	33
<i>Odontoschisma sphagni</i>	31
<i>Sphagnum capillifolium</i> aggr.	30
<i>Potentilla erecta</i>	28
<i>Vaccinium oxycoccos</i>	27
<i>Sphagnum tenellum</i>	27
<i>Sphagnum magellanicum</i> aggr.	25
<i>Andromeda polifolia</i>	23
<i>Sphagnum recurvum</i> aggr.	22
<i>Rhynchospora alba</i>	19
<i>Cladonia portentosa</i>	19
<i>Aulacomnium palustre</i>	19
<i>Sphagnum subnitens</i>	16
<i>Juncus squarrosus</i>	16
<i>Sphagnum rubellum</i>	15
<i>Sphagnum cuspidatum</i>	15
<i>Pleurozium schreberi</i>	14
<i>Mylia anomala</i>	13
<i>Carex panicea</i>	13
<i>Myrica gale</i>	11
<i>Dicranum scoparium</i>	11
<i>Cladonia uncialis</i>	11

Dominant species (percentage frequencies of occurrences with cover > 25%)

<i>Calluna vulgaris</i>	22
<i>Sphagnum papillosum</i>	21
<i>Erica tetralix</i>	19
<i>Narthecium ossifragum</i>	16
<i>Molinia caerulea</i> aggr.	13
<i>Trichophorum cespitosum</i>	10
<i>Eriophorum vaginatum</i>	10
<i>Sphagnum magellanicum</i> aggr.	9
<i>Sphagnum capillifolium</i> aggr.	8
<i>Sphagnum recurvum</i> aggr.	6
<i>Eriophorum angustifolium</i>	5

## Q22 – Poor fen

This type of mire, fed by a throughput of acid, nutrient-poor groundwater occurs in a variety of topographic situations (around upland springs, in the lags of raised bogs, in forest hollows and among infertile fen-grassland complexes) throughout the siliceous landscapes of temperate Europe, particularly in the north. There is a continuous surface carpet of oligotrophic sphagna and small sedges and an associated flora of mire generalists characteristic of less minerotrophic situations. Surface patterning is usually very limited, but towards the boreal regions, there can be a gentle hummock-hollow pattern with scattered trees in drier areas.



### Corresponding alliances in EuroVegChecklist 2016

<> SCH-03D Sphagno-Caricion canescentis Passarge (1964) 1978 nom. conserv. propos.

### Characteristic species combination

Diagnostic species (phi coefficient \* 100)

<i>Sphagnum recurvum</i> aggr.	33
<i>Sphagnum palustre</i> aggr.	22
<i>Straminergon stramineum</i>	20
<i>Viola palustris</i>	20
<i>Eriophorum angustifolium</i>	18
<i>Carex echinata</i>	18
<i>Carex canescens</i>	18
<i>Agrostis canina</i>	18
<i>Vaccinium oxycoccos</i>	16

<i>Carex nigra</i>	16
<i>Polytrichum commune</i>	16
<i>Carex rostrata</i>	16
<i>Drosera rotundifolia</i>	16
<i>Sphagnum papillosum</i>	15

Constant species (percentage frequencies)

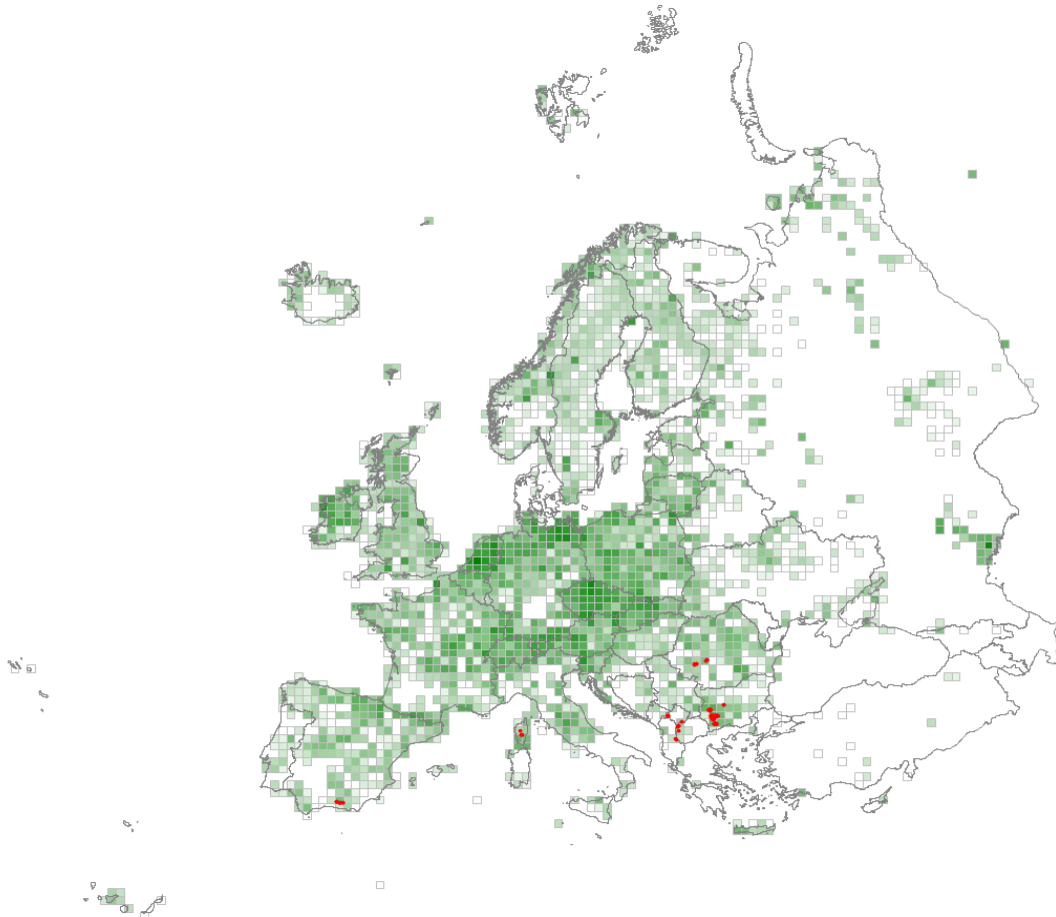
<i>Sphagnum recurvum</i> aggr.	62
<i>Eriophorum angustifolium</i>	49
<i>Carex nigra</i>	43
<i>Potentilla erecta</i>	42
<i>Molinia caerulea</i> aggr.	39
<i>Polytrichum commune</i>	36
<i>Agrostis canina</i>	35
<i>Carex echinata</i>	34
<i>Carex rostrata</i>	32
<i>Viola palustris</i>	31
<i>Sphagnum palustre</i> aggr.	31
<i>Drosera rotundifolia</i>	30
<i>Vaccinium oxycoccos</i>	28
<i>Aulacomnium palustre</i>	28
<i>Straminergon stramineum</i>	25
<i>Eriophorum vaginatum</i>	22
<i>Sphagnum papillosum</i>	20
<i>Carex canescens</i>	20
<i>Nardus stricta</i>	17
<i>Juncus effusus</i>	17
<i>Comarum palustre</i>	17
<i>Menyanthes trifoliata</i>	16
<i>Carex panicea</i>	16
<i>Calluna vulgaris</i>	16
<i>Anthoxanthum odoratum</i> aggr.	16
<i>Sphagnum magellanicum</i> aggr.	14
<i>Sphagnum capillifolium</i> aggr.	13
<i>Lysimachia vulgaris</i>	13
<i>Festuca rubra</i> aggr.	12
<i>Erica tetralix</i>	12
<i>Betula pubescens</i>	12
<i>Andromeda polifolia</i>	12
<i>Polytrichum strictum</i>	11
<i>Luzula campestris</i> aggr.	11
<i>Epilobium palustre</i>	11
<i>Cirsium palustre</i>	11

Dominant species (percentage frequencies of occurrences with cover > 25%)

<i>Sphagnum recurvum</i> aggr.	46
<i>Sphagnum palustre</i> aggr.	16
<i>Sphagnum papillosum</i>	12
<i>Polytrichum commune</i>	11
<i>Molinia caerulea</i> aggr.	9
<i>Carex rostrata</i>	6
<i>Carex nigra</i>	6
<i>Eriophorum angustifolium</i>	5

## Q23 – Relict mire of Mediterranean mountains

Oligo- to mesotrophic mire occurring on the waterlogged margins of glacial lakes and around streams in the montane and subalpine belts of the Spanish Sierra Nevada, Corsica, and the western Balkan Peninsula (and also the High Atlas of Morocco). It develops on blankets of thin peat over siliceous bedrocks, kept constantly wet and cool (covered by snow in the high Balkan mountains for much of the year) and providing a splash of green in prevailing dry landscapes. The vegetation is dominated by small sedges or graminoids often with distinctive endemic and relict species.



### Corresponding alliances in EuroVegChecklist 2016

- > SCH-03F Caricion intricatae Quézel 1953
- > SCH-03E Festucion frigidae Rivas-Mart. et al. 2002
- > SCH-03G Narthecion scardici Horvat ex Lakušić 1968

### Characteristic species combination

Diagnostic species (phi coefficient \* 100)

<i>Gymnadenia frivaldii</i>	75
<i>Pinguicula balcanica</i>	74
<i>Plantago gentianoides</i>	60
<i>Dactylorhiza cordigera</i>	60
<i>Primula frondosa</i>	54
<i>Carex bulgarica</i>	48
<i>Taraxacum apenninum</i>	44
<i>Cardamine rivularis</i>	43

<i>Warnstorfia exannulata</i>	39
<i>Primula deorum</i>	39
<i>Eriophorum latifolium</i>	38
<i>Sphagnum platyphyllum</i>	37
<i>Geum coccineum</i>	37
<i>Scapania irrigua</i>	35
<i>Narthecium scardicum</i>	35
<i>Soldanella pindicola</i>	35
<i>Carex echinata</i>	34
<i>Philonotis seriata</i>	31
<i>Carex nigra</i>	30
<i>Juncus thomasi</i>	29
<i>Sesleria comosa</i>	28
<i>Festuca frigida</i>	27
<i>Nardus stricta</i>	27
<i>Sphagnum subsecundum</i>	24
<i>Palustriella decipiens</i>	24
<i>Straminergon stramineum</i>	23
<i>Warnstorfia sarmentosa</i>	23
<i>Epilobium nutans</i>	23
<i>Cirsium heterotrichum</i>	22
<i>Sphagnum contortum</i>	22
<i>Willemetia stipitata</i>	21
<i>Bellis bernardii</i>	21
<i>Gentiana pyrenaica</i>	21
<i>Juncus alpinoarticulatus</i>	20
<i>Scorzoneroides crocea</i>	20
<i>Pinguicula corsica</i>	19
<i>Parnassia palustris</i>	19
<i>Juncus filiformis</i>	18
<i>Alchemilla glabra</i>	18
<i>Ligusticum mutellina</i>	18
<i>Calliergonella lindbergii</i>	18
<i>Gentianella bulgarica</i>	17
<i>Narthecium reverchonii</i>	17
<i>Scorzoneroides microcephala</i>	16
<i>Veratrum lobelianum</i>	15
<i>Ranunculus pyrenaicus</i>	15
<i>Jungermannia hyalina</i>	15
<i>Silene asterias</i>	15
<i>Jacobaea panicii</i>	15

Constant species (percentage frequencies)

<i>Carex nigra</i>	78
<i>Nardus stricta</i>	76
<i>Carex echinata</i>	63
<i>Pinguicula balcanica</i>	59
<i>Gymnadenia frivaldii</i>	56
<i>Eriophorum latifolium</i>	54
<i>Plantago gentianoides</i>	44
<i>Warnstorfia exannulata</i>	41
<i>Parnassia palustris</i>	41
<i>Luzula campestris</i> aggr.	39
<i>Deschampsia cespitosa</i> aggr.	39
<i>Dactylorhiza cordigera</i>	39
<i>Potentilla erecta</i>	32
<i>Straminergon stramineum</i>	29
<i>Primula frondosa</i>	29
<i>Festuca rubra</i> aggr.	27

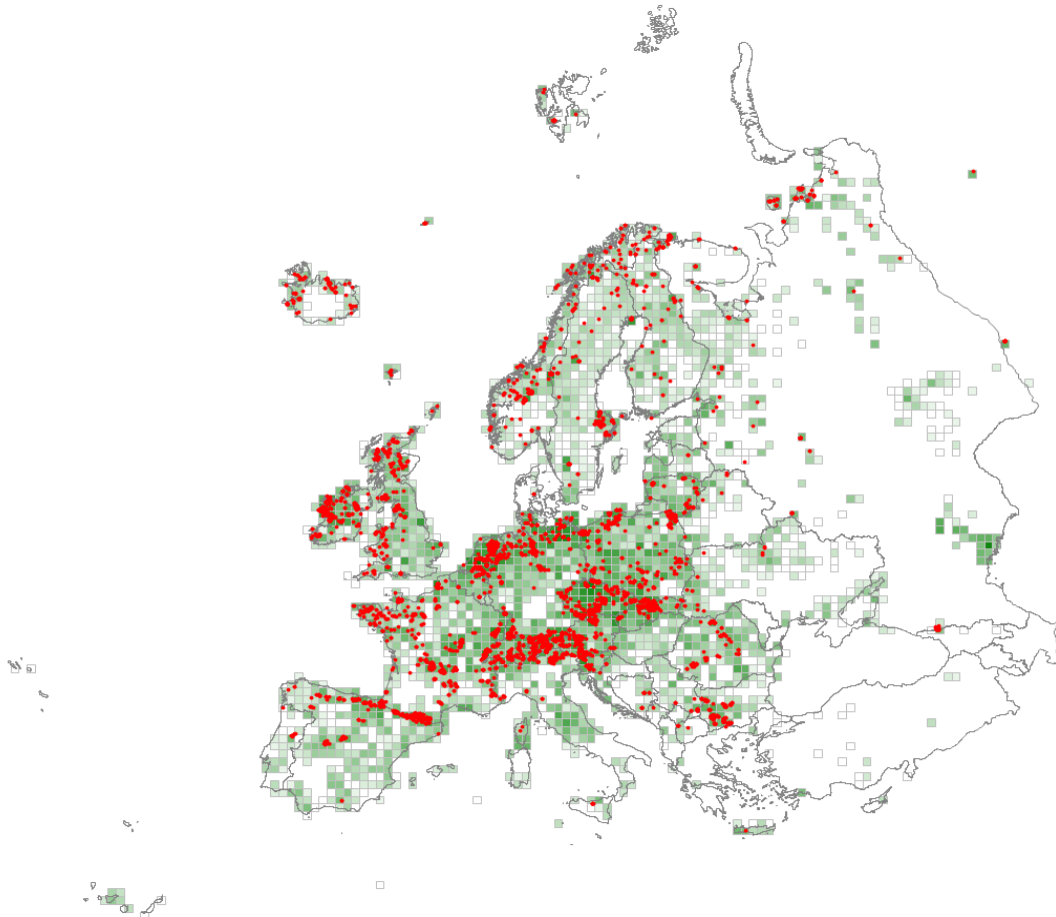
<i>Carex bulgarica</i>	27
<i>Agrostis canina</i>	27
<i>Taraxacum apenninum</i>	24
<i>Philonotis seriata</i>	24
<i>Cardamine rivularis</i>	24
<i>Sphagnum subsecundum</i>	22
<i>Sphagnum platyphyllum</i>	22
<i>Scapania irrigua</i>	22
<i>Ligusticum mutellina</i>	22
<i>Juncus alpinoarticulatus</i>	22
<i>Sesleria comosa</i>	20
<i>Juncus articulatus</i>	20
<i>Geum coccineum</i>	20
<i>Bryum pseudotriquetrum</i>	20
<i>Aulacomnium palustre</i>	20
<i>Warnstorfia sarmentosa</i>	17
<i>Trichophorum cespitosum</i>	17
<i>Sphagnum contortum</i>	17
<i>Saxifraga stellaris</i>	17
<i>Primula farinosa</i>	17
<i>Primula deorum</i>	17
<i>Juncus filiformis</i>	17
<i>Veratrum lobelianum</i>	15
<i>Trifolium pratense</i>	15
<i>Sphagnum warnstorfii</i>	15
<i>Philonotis fontana</i>	15
<i>Eriophorum angustifolium</i>	15
<i>Alchemilla glabra</i>	15
<i>Willemetia stipitata</i>	12
<i>Sphagnum teres</i>	12
<i>Soldanella pindicola</i>	12
<i>Selaginella selaginoides</i>	12
<i>Palustriella decipiens</i>	12
<i>Narthecium scardicum</i>	12
<i>Carex pallescens</i>	12
<i>Carex lepidocarpa</i>	12
<i>Campylium stellatum</i>	12

Dominant species (percentage frequencies of occurrences with cover > 25%)

<i>Sphagnum platyphyllum</i>	15
<i>Carex nigra</i>	12
<i>Warnstorfia exannulata</i>	10
<i>Eriophorum latifolium</i>	10
<i>Trichophorum cespitosum</i>	7
<i>Sphagnum warnstorfii</i>	7
<i>Sphagnum subsecundum</i>	7

## Q24 – Intermediate fen and soft-water spring mire

These weakly acidic minerotrophic mires occur on peat fed from upper catchments by diffuse seepage of non-calcareous groundwater discharged via springs. They occur widely throughout temperate Europe, though at higher altitudes in the warmer south. The vegetation is typically dominated by a carpet of brown mosses and minerotrophic sphagna, small sedges and associated herbs, though generally without rich-fen indicators, and sometimes with drier hummocks on which sub-shrubs and occasional trees can be found.



### Corresponding alliances in EuroVegChecklist 2016

- <> SCH-03C Anagallido tenellae-Juncion bulbosi Br.-Bl. 1967
- <> SCH-03B Caricion fuscae Koch 1926 nom. conserv. propos.
- > SCH-03A Drepanocladion exannulati Krajina 1933

### Characteristic species combination

Diagnostic species (phi coefficient \* 100)

<i>Sphagnum auriculatum</i> aggr.	22
<i>Warnstorfia exannulata</i>	21
<i>Sphagnum subsecundum</i>	18
<i>Eriophorum angustifolium</i>	18
<i>Carex rostrata</i>	17
<i>Comarum palustre</i>	17
<i>Carex echinata</i>	16
<i>Carex canescens</i>	16
<i>Viola palustris</i>	15



Constant species (percentage frequencies)

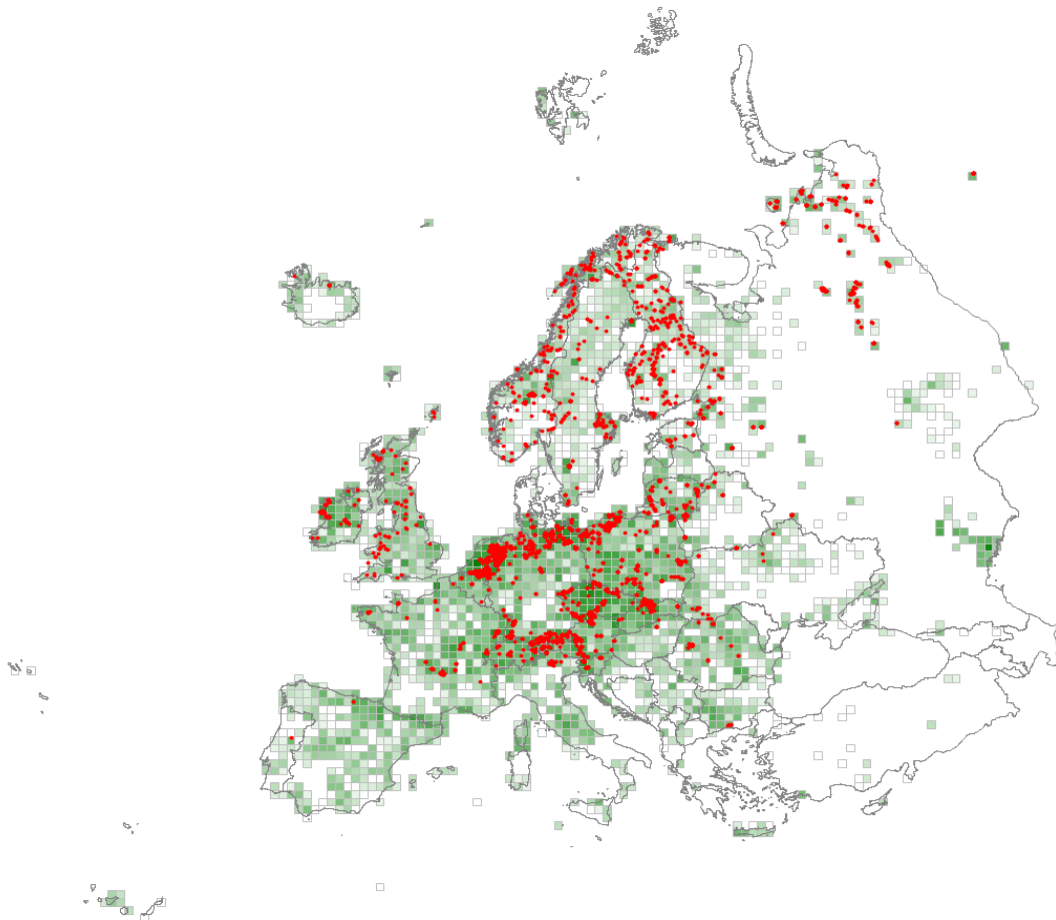
<i>Eriophorum angustifolium</i>	47
<i>Carex nigra</i>	40
<i>Carex rostrata</i>	34
<i>Carex echinata</i>	31
<i>Potentilla erecta</i>	30
<i>Comarum palustre</i>	28
<i>Agrostis canina</i>	28
<i>Molinia caerulea</i> aggr.	27
<i>Menyanthes trifoliata</i>	26
<i>Galium palustre</i> aggr.	26
<i>Carex panicea</i>	26
<i>Viola palustris</i>	25
<i>Warnstorfia exannulata</i>	22
<i>Sphagnum auriculatum</i> aggr.	22
<i>Equisetum fluviatile</i>	21
<i>Calliergonella cuspidata</i>	21
<i>Epilobium palustre</i>	19
<i>Carex canescens</i>	18
<i>Aulacomnium palustre</i>	18
<i>Straminergon stramineum</i>	17
<i>Sphagnum subsecundum</i>	17
<i>Ranunculus flammula</i>	17
<i>Caltha palustris</i>	17
<i>Parnassia palustris</i>	16
<i>Drosera rotundifolia</i>	16
<i>Juncus bulbosus</i>	14
<i>Equisetum palustre</i>	14
<i>Bryum pseudotriquetrum</i>	14
<i>Sphagnum teres</i>	13
<i>Juncus articulatus</i>	13
<i>Hydrocotyle vulgaris</i>	13
<i>Festuca rubra</i> aggr.	13
<i>Carex lasiocarpa</i>	12
<i>Valeriana dioica</i>	11
<i>Lysimachia vulgaris</i>	11
<i>Juncus effusus</i>	11
<i>Galium uliginosum</i>	11
<i>Cirsium palustre</i>	11
<i>Cardamine pratensis</i>	11
<i>Anthoxanthum odoratum</i> aggr.	11

Dominant species (percentage frequencies of occurrences with cover > 25%)

<i>Sphagnum auriculatum</i> aggr.	11
<i>Warnstorfia exannulata</i>	8
<i>Carex rostrata</i>	8
<i>Carex nigra</i>	8
<i>Sphagnum subsecundum</i>	7
<i>Sphagnum teres</i>	6
<i>Menyanthes trifoliata</i>	6

## Q25 – Non-calcareous quaking mire

This habitat develops by terrestrialisation of open water through the outgrowth of sodden floating rafts of vegetation and accumulating peat from the margins of acidic lakes and ponds, the whole forming a flat quaking surface. It is widely distributed through Europe, though usually highly localised, with the largest areas reported from the Nordic countries. On the matted carpets of sedges and other vascular plants typical of minerotrophic situations, sphagna, other mosses and often abundant liverworts develop, thicker stretches sometimes forming irregular ombrotrophic hummocks. The main threat for such mires is drainage, leading quickly and often irreversibly to the development of other habitats, like poor fens. Quaking areas in percolation mires (which have a much higher species richness) need a very long time to regenerate after rewetting if the regulatory mechanism of the peat body has been destroyed by drainage.



### Corresponding alliances in EuroVegChecklist 2016

- <> SCH-04A Scheuchzerion palustris Nordhagen ex Tx. 1937
- <> SCH-03D Sphagno-Caricion canescentis Passarge (1964) 1978 nom. conserv. propos.
- <> LIT-01G Sphagno-Utricularion T. Müller et Görs 1960

### Characteristic species combination

Diagnostic species (phi coefficient \* 100)

<i>Sphagnum cuspidatum</i>	37
<i>Scheuchzeria palustris</i>	34
<i>Sphagnum majus</i>	30
<i>Sphagnum lindbergii</i>	29

<i>Carex limosa</i>	25
<i>Warnstorfia fluitans</i>	24
<i>Sphagnum recurvum</i> aggr.	21
<i>Carex rostrata</i>	20
<i>Sphagnum balticum</i>	18
<i>Vaccinium oxycoccos</i>	18
<i>Rhynchospora alba</i>	18
<i>Eriophorum angustifolium</i>	16
<i>Sphagnum riparium</i>	16

Constant species (percentage frequencies)

<i>Eriophorum angustifolium</i>	43
<i>Sphagnum recurvum</i> aggr.	40
<i>Sphagnum cuspidatum</i>	40
<i>Carex rostrata</i>	40
<i>Vaccinium oxycoccos</i>	31
<i>Carex limosa</i>	29
<i>Andromeda polifolia</i>	25
<i>Scheuchzeria palustris</i>	24
<i>Drosera rotundifolia</i>	23
<i>Menyanthes trifoliata</i>	22
<i>Eriophorum vaginatum</i>	21
<i>Rhynchospora alba</i>	19
<i>Warnstorfia fluitans</i>	18
<i>Molinia caerulea</i> aggr.	15
<i>Comarum palustre</i>	15
<i>Straminergon stramineum</i>	14
<i>Sphagnum lindbergii</i>	14
<i>Sphagnum majus</i>	13
<i>Carex lasiocarpa</i>	13
<i>Sphagnum papillosum</i>	12
<i>Sphagnum magellanicum</i> aggr.	12
<i>Sphagnum balticum</i>	11

Dominant species (percentage frequencies of occurrences with cover > 25%)

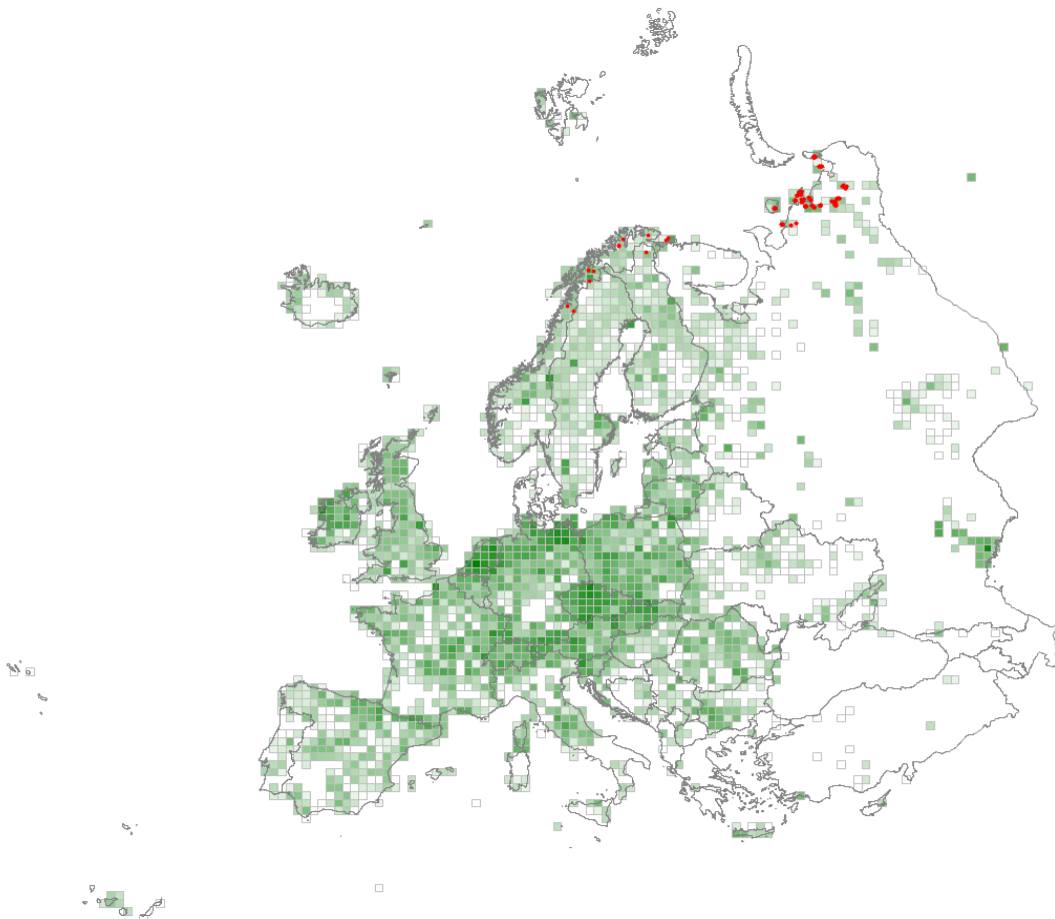
<i>Sphagnum recurvum</i> aggr.	28
<i>Sphagnum cuspidatum</i>	28
<i>Carex rostrata</i>	12
<i>Sphagnum lindbergii</i>	9
<i>Sphagnum majus</i>	7
<i>Sphagnum balticum</i>	6
<i>Rhynchospora alba</i>	6
<i>Eriophorum angustifolium</i>	5

### Q3 – Palsa and polygon mires

[Individual habitats Q31 and Q32 at hierarchical Level 3 could not be separated by the expert system. Therefore only the habitat Q3 at Level 2 was defined.]

**Q31 – Palsa mire** Palsa mire develops where thick peat is subject to sporadic permafrost in Iceland, northern Fennoscandia and Arctic Russia where there is low precipitation and an annual mean temperature below  $-1^{\circ}\text{C}$ . The permafrost dynamics produce a typical patterning with palsa mounds 2–4 m (sometimes 7 m) high, elevated in central thicker areas by permafrost lenses. The carpet of *Sphagnum* peat limits the penetration of thaw, maintaining a perennially frozen core of peat, silt and ice lenses beneath. Pounikko hummock ridges can be found in marginal areas subject to seasonal freezing, and there are plateau-wide palsas and string mires in the Arctic. Intact palsa mounds show a patterning of weakly minerotrophic vegetation with different assemblages of mosses, herbs and sub-shrubs on their tops and sides. Old palsa mounds can become dry, and erosion may lead to melting and collapse. A complete melting leaves behind thermokarst ponds.

**Q32 – Polygon mire** Complex mires of the Arctic and subarctic patterned by surface microrelief of large, 10–30 m in diameter, low-centre or high-centre polygons formed by the juxtaposition of dry, 0.3–0.5 m high ridges. The non-sphagnaceous mosses, e.g. *Dicranum elongatum*, and *Polytrichum strictum*, and lichens, especially of the genera *Cladonia* and *Flavocetraria*, outweigh the sphagna and together with dwarf shrubs occur on the ridges. Wet hollows are occupied by grasses, sedges such as *Carex rariflora*, and *Eriophorum scheuchzeri*, and mosses including sphagna. Polygon mires rarely occur in North-Eastern Europe (Novaya Zemlya, Svalbard and Russian Nenets Autonomous Okrug), in the tundra where the mean annual temperature is below  $-1^{\circ}\text{C}$ .



## Corresponding alliances in EuroVegChecklist 2016

<> Rubo chamaemori-Dicranion elongati Lavrinenko et Lavrinenko 2015

### Characteristic species combination

Diagnostic species (phi coefficient \* 100)

<i>Dicranum elongatum</i>	80
<i>Sphenobolus minutus</i>	70
<i>Cladonia amaurocraea</i>	68
<i>Alectoria nigricans</i>	64
<i>Cladonia subfurcata</i>	64
<i>Bryocaulon divergens</i>	64
<i>Ochrolechia androgyna</i>	60
<i>Cetraria nivalis</i>	59
<i>Rubus chamaemorus</i>	53
<i>Ochrolechia frigida</i>	53
<i>Sphaerophorus globosus</i> aggr.	53
<i>Cladonia sulphurina</i>	52
<i>Cetraria cucullata</i>	50
<i>Cladonia arbuscula</i> aggr.	49
<i>Ochrolechia inaequatula</i>	48
<i>Immadophila ericetorum</i>	48
<i>Carex rariflora</i>	47
<i>Cladonia gracilis</i>	46
<i>Cladonia coccifera</i> aggr.	46
<i>Cladonia bellidiflora</i>	45
<i>Cetraria islandica</i>	45
<i>Polytrichum strictum</i>	44
<i>Thamnia vermicularis</i>	44
<i>Rhododendron tomentosum</i>	43
<i>Cladonia stellaris</i>	42
<i>Cladonia rangiferina</i>	42
<i>Pertusaria dactylina</i>	41
<i>Cetrariella delisei</i>	41
<i>Omphalina hudsoniana</i>	41
<i>Betula nana</i>	37
<i>Sphagnum fuscum</i>	36
<i>Cladonia cornuta</i>	36
<i>Polytrichum hyperboreum</i>	36
<i>Cladonia uncialis</i>	35
<i>Andromeda polifolia</i>	34
<i>Cladonia deformis</i> aggr.	33
<i>Alectoria ochroleuca</i>	32
<i>Empetrum nigrum</i> aggr.	32
<i>Luzula wahlenbergii</i>	32
<i>Polytrichum jensenii</i>	30
<i>Cladonia squamosa</i>	29
<i>Dicranum flexicaule</i>	28
<i>Cladonia rei</i>	28
<i>Cladonia crispata</i>	27
<i>Cladonia macrophylla</i>	26
<i>Tuckermannopsis inermis</i>	26
<i>Dicranum congestum</i>	25
<i>Vaccinium vitis-idaea</i>	23
<i>Bryoria nitidula</i>	23
<i>Cetrariella fastigiata</i>	23
<i>Vaccinium uliginosum</i>	23

<i>Omphalina umbellifera</i>	22
<i>Sphagnum russowii</i>	20
<i>Aulacomnium turgidum</i>	20
<i>Cladonia groenlandica</i>	20
<i>Sphagnum balticum</i>	19
<i>Sphagnum lenense</i>	18
<i>Eriophorum scheuchzeri</i>	18
<i>Cladonia maxima</i>	18
<i>Cladonia cyanipes</i>	18
<i>Poa arctica</i>	17
<i>Arctocetraria andrejevii</i>	17
<i>Carex rotundata</i>	17
<i>Sphagnum aongstroemii</i>	16
<i>Vaccinium microcarpum</i>	15

Constant species (percentage frequencies)

<i>Rubus chamaemorus</i>	100
<i>Dicranum elongatum</i>	100
<i>Cladonia arbuscula</i> aggr.	98
<i>Empetrum nigrum</i> aggr.	95
<i>Vaccinium vitis-idaea</i>	85
<i>Cetraria islandica</i>	85
<i>Cladonia rangiferina</i>	83
<i>Cladonia gracilis</i>	83
<i>Cetraria nivalis</i>	81
<i>Cladonia amaurocraea</i>	80
<i>Polytrichum strictum</i>	73
<i>Ochrolechia frigida</i>	73
<i>Cladonia coccifera</i> aggr.	73
<i>Betula nana</i>	71
<i>Rhododendron tomentosum</i>	68
<i>Cladonia uncialis</i>	68
<i>Andromeda polifolia</i>	68
<i>Sphenolobus minutus</i>	63
<i>Sphaerophorus globosus</i> aggr.	63
<i>Bryocaulon divergens</i>	61
<i>Alectoria nigricans</i>	61
<i>Vaccinium uliginosum</i>	59
<i>Cladonia bellidiflora</i>	59
<i>Cetraria cucullata</i>	54
<i>Ochrolechia androgyna</i>	51
<i>Cladonia sulphurina</i>	51
<i>Cladonia subfurcata</i>	49
<i>Thamnolia vermicularis</i>	46
<i>Cladonia stellaris</i>	44
<i>Carex rariflora</i>	41
<i>Sphagnum fuscum</i>	39
<i>Pleurozium schreberi</i>	36
<i>Ochrolechia inaequatula</i>	36
<i>Cladonia cornuta</i>	36
<i>Icmadophila ericetorum</i>	34
<i>Cladonia crispata</i>	34
<i>Eriophorum vaginatum</i>	32
<i>Cetrariella delisei</i>	32
<i>Polytrichum hyperboreum</i>	29
<i>Pertusaria dactylina</i>	29
<i>Cladonia deformis</i> aggr.	29
<i>Cladonia squamosa</i>	27
<i>Alectoria ochroleuca</i>	22

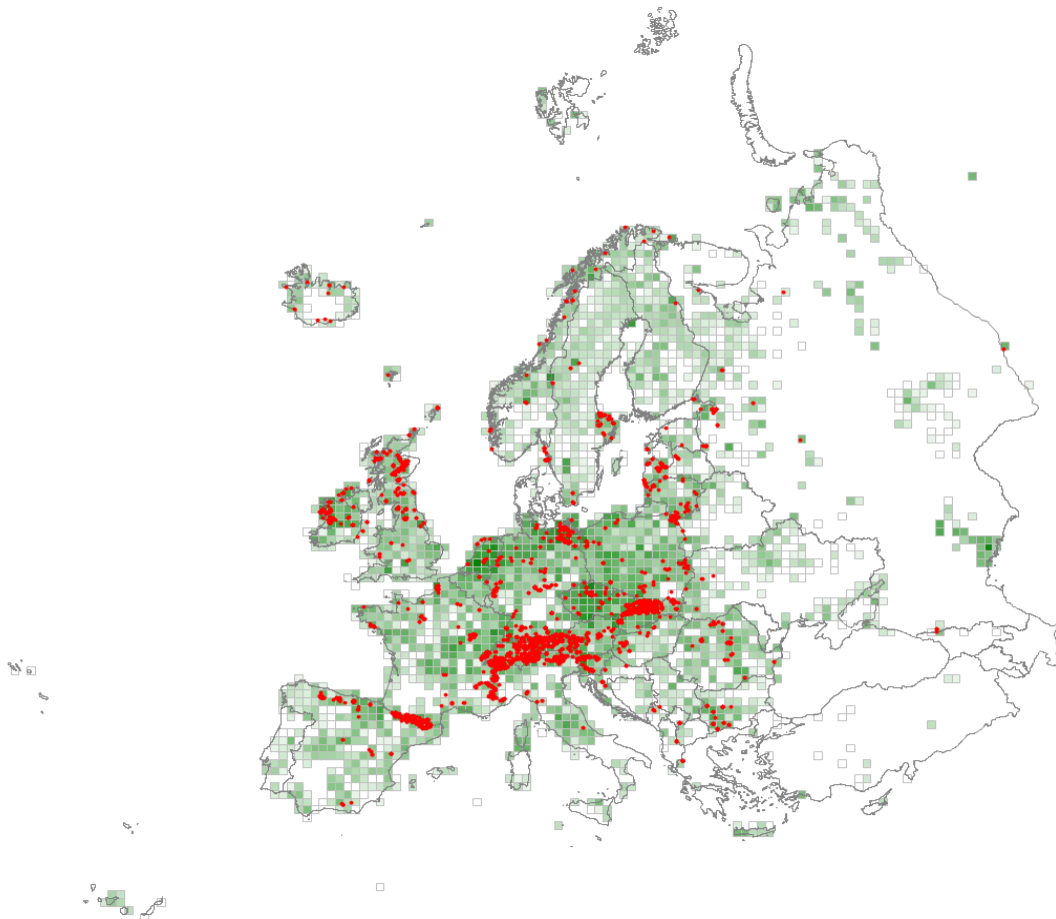
<i>Sphagnum russowii</i>	20
<i>Omphalina hudsoniana</i>	20
<i>Cladonia macrophylla</i>	20
<i>Cladonia pyxidata</i> aggr.	19
<i>Ptilidium ciliare</i>	15
<i>Vaccinium microcarpum</i>	14
<i>Aulacomnium turgidum</i>	14
<i>Sphagnum balticum</i>	12
<i>Polytrichum jensenii</i>	12
<i>Peltigera scabrosa</i>	12
<i>Luzula wahlenbergii</i>	12
<i>Cladonia rei</i>	12

Dominant species (percentage frequencies of occurrences with cover > 25%)

<i>Cladonia arbuscula</i> aggr.	27
<i>Rubus chamaemorus</i>	17
<i>Rhododendron tomentosum</i>	17
<i>Cetraria nivalis</i>	15
<i>Cladonia rangiferina</i>	14
<i>Dicranum elongatum</i>	8
<i>Polytrichum strictum</i>	7

## Q41 – Alkaline, calcareous, carbonate-rich small-sedge spring fen

Short-sedge fens, spring fens and fen grasslands kept continually wet by base-rich, nutrient-poor waters, occurring through the lowlands and mountains of temperate Europe and more locally in the boreal zone. They are most common, rich and diverse in the limestone massifs of Central European mountains, especially the Alps and Carpathians. The soil is rich in organic matter and has high pH, often with precipitation of carbonate or tufa. Small basiphilous sedges dominate the vegetation with rich associated flora and a patchy carpet of fen bryophytes while sphagna are absent.



### Corresponding alliances in EuroVegChecklist 2016

- <> SCH-01A *Caricion davallianae* Klika 1934
- <> SCH-01B *Caricion viridulo-trinervis* Julve ex Hájek et Mucina in Theurillat et al. 2015

### Characteristic species combination

Diagnostic species (phi coefficient \* 100)

<i>Carex davalliana</i>	35
<i>Eleocharis quinqueflora</i>	32
<i>Eriophorum latifolium</i>	31
<i>Carex panicea</i>	28
<i>Carex lepidocarpa</i>	28
<i>Palustriella commutata</i> aggr.	26
<i>Scorpidium revolvens</i> aggr.	24
<i>Campylium stellatum</i>	24



<i>Carex hostiana</i>	24
<i>Juncus alpinoarticulatus</i>	23
<i>Philonotis calcarea</i>	22
<i>Bryum pseudotriquetrum</i>	21
<i>Parnassia palustris</i>	20
<i>Pinguicula vulgaris</i>	20
<i>Fissidens adianthoides</i>	20
<i>Primula farinosa</i>	19
<i>Valeriana dioica</i>	18
<i>Carex flava</i>	18
<i>Tofieldia calyculata</i>	18
<i>Equisetum palustre</i>	18
<i>Dactylorhiza majalis</i>	18
<i>Triglochin palustris</i>	16
<i>Juncus articulatus</i>	16
<i>Calliergonella cuspidata</i>	16
<i>Epipactis palustris</i>	15

Constant species (percentage frequencies)

<i>Carex panicea</i>	68
<i>Potentilla erecta</i>	54
<i>Campylium stellatum</i>	51
<i>Carex davalliana</i>	47
<i>Eriophorum latifolium</i>	45
<i>Parnassia palustris</i>	44
<i>Scorpidium revolvens</i> aggr.	42
<i>Molinia caerulea</i> aggr.	42
<i>Equisetum palustre</i>	38
<i>Carex nigra</i>	37
<i>Bryum pseudotriquetrum</i>	35
<i>Juncus articulatus</i>	34
<i>Carex lepidocarpa</i>	34
<i>Pinguicula vulgaris</i>	33
<i>Eriophorum angustifolium</i>	32
<i>Eleocharis quinqueflora</i>	32
<i>Calliergonella cuspidata</i>	32
<i>Valeriana dioica</i>	28
<i>Palustriella commutata</i> aggr.	28
<i>Carex flacca</i>	28
<i>Succisa pratensis</i>	27
<i>Briza media</i>	27
<i>Primula farinosa</i>	26
<i>Carex hostiana</i>	25
<i>Juncus alpinoarticulatus</i>	24
<i>Triglochin palustris</i>	23
<i>Carex flava</i>	23
<i>Tofieldia calyculata</i>	22
<i>Epipactis palustris</i>	20
<i>Fissidens adianthoides</i>	19
<i>Cirsium palustre</i>	19
<i>Plagiomnium affine</i> aggr.	18
<i>Linum catharticum</i>	18
<i>Prunella vulgaris</i>	16
<i>Crepis paludosa</i>	16
<i>Caltha palustris</i>	16
<i>Aneura pinguis</i>	16
<i>Phragmites australis</i>	15
<i>Dactylorhiza majalis</i>	15
<i>Agrostis stolonifera</i>	15

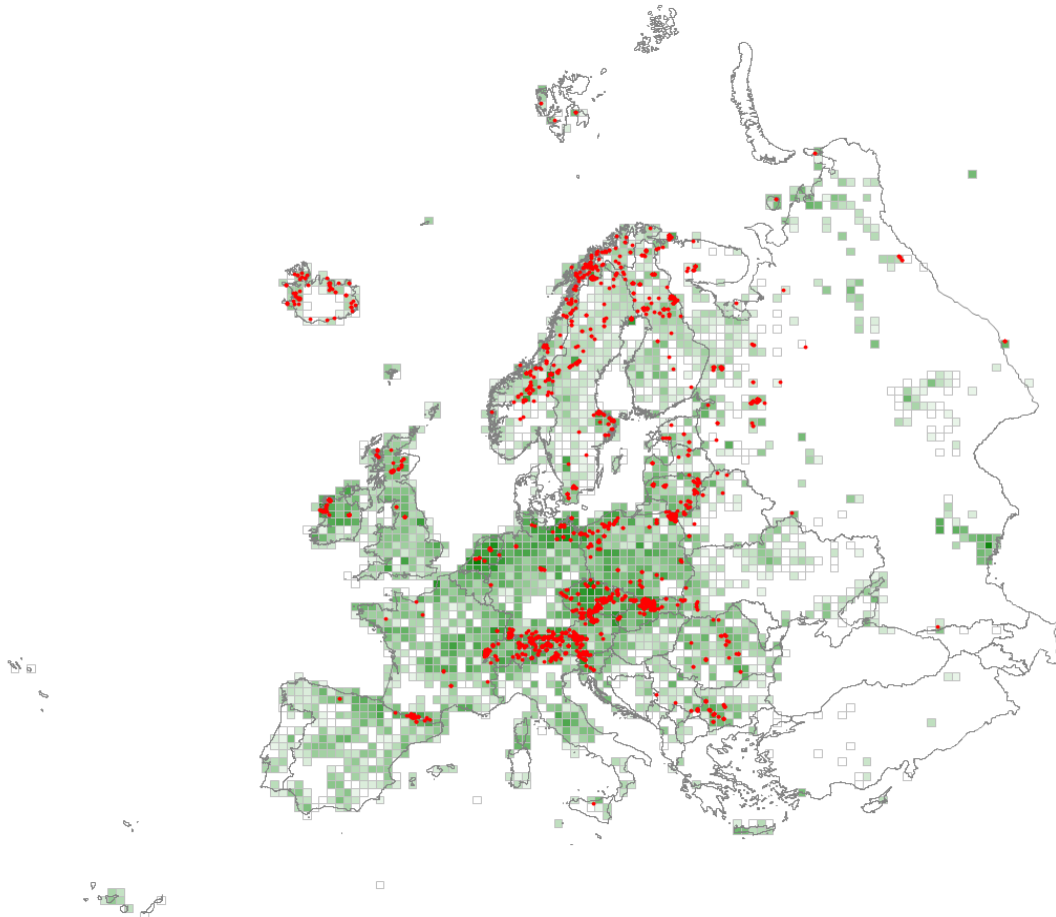
<i>Selaginella selaginoides</i>	14
<i>Menyanthes trifoliata</i>	14
<i>Festuca rubra</i> aggr.	13
<i>Equisetum variegatum</i>	13
<i>Ranunculus acris</i> aggr.	12
<i>Philonotis calcarea</i>	11
<i>Mentha aquatica</i>	11
<i>Galium uliginosum</i>	11
<i>Deschampsia cespitosa</i> aggr.	11
<i>Carex rostrata</i>	11
<i>Carex echinata</i>	11
<i>Carex dioica</i>	11
<i>Blysmus compressus</i>	11
<i>Bellidiastrum michelii</i>	11
<i>Bartsia alpina</i>	11

Dominant species (percentage frequencies of occurrences with cover > 25%)

<i>Scorpidium revolvens</i> aggr.	19
<i>Carex davalliana</i>	17
<i>Palustriella commutata</i> aggr.	12
<i>Campylium stellatum</i>	10
<i>Eleocharis quinqueflora</i>	9
<i>Carex panicea</i>	6
<i>Carex lepidocarpa</i>	6

## Q42 – Extremely rich moss-sedge fen

Base-rich fens without calcium carbonate precipitation, often with calcium-tolerant sphagna, e.g. *Sphagnum contortum*, *S. subfulvum*, *S. teres* and *S. warnstorffii*. The sphagna are accompanied by other mosses such as *Paludella squarrosa* and *Tomentypnum nitens*), sedges, sundews and other calcicole as well as calcifuge vascular plants classifying this habitat among the most species-rich mires.



### Corresponding alliances in EuroVegChecklist 2016

- <> SCH-02A Saxifrago-Tomentypnion Lapshina 2010
- > SCH-02D Sphagno warnstorffii-Tomentypnion nitentis Dahl 1957

### Characteristic species combination

Diagnostic species (phi coefficient \* 100)

<i>Sphagnum warnstorffii</i>	52
<i>Paludella squarrosa</i>	41
<i>Sphagnum contortum</i>	34
<i>Sphagnum teres</i>	33
<i>Tomentypnum nitens</i>	30
<i>Trichoporum alpinum</i>	30
<i>Cinclidium stygium</i>	27
<i>Scorpidium revolvens</i> aggr.	27
<i>Carex dioica</i>	27
<i>Menyanthes trifoliata</i>	25

<i>Campylium stellatum</i>	24
<i>Carex rostrata</i>	24
<i>Aulacomnium palustre</i>	23
<i>Straminergon stramineum</i>	21
<i>Loeskyphnum badium</i>	21
<i>Carex lasiocarpa</i>	20
<i>Eriophorum angustifolium</i>	19
<i>Aneura pinguis</i>	19
<i>Drosera rotundifolia</i>	19
<i>Calliergon giganteum</i>	18
<i>Carex panicea</i>	18
<i>Viola palustris</i>	18
<i>Carex flava</i>	17
<i>Sphagnum subsecundum</i>	17
<i>Galium uliginosum</i>	17
<i>Bryum pseudotriquetrum</i>	17
<i>Comarum palustre</i>	17
<i>Helodium blandowii</i>	16
<i>Eriophorum latifolium</i>	16
<i>Carex chordorrhiza</i>	16
<i>Carex diandra</i>	16
<i>Carex nigra</i>	16
<i>Breidleria pratensis</i>	15
<i>Valeriana dioica</i>	15
<i>Vaccinium oxycoccos</i>	15
<i>Meesia triquetra</i>	15
<i>Carex echinata</i>	15

Constant species (percentage frequencies)

<i>Eriophorum angustifolium</i>	51
<i>Sphagnum warnstorffii</i>	50
<i>Campylium stellatum</i>	50
<i>Potentilla erecta</i>	48
<i>Carex rostrata</i>	47
<i>Scorpidium revolvens</i> aggr.	46
<i>Aulacomnium palustre</i>	45
<i>Menyanthes trifoliata</i>	44
<i>Carex panicea</i>	43
<i>Carex nigra</i>	41
<i>Molinia caerulea</i> aggr.	36
<i>Drosera rotundifolia</i>	35
<i>Tomentypnum nitens</i>	33
<i>Parnassia palustris</i>	32
<i>Equisetum palustre</i>	31
<i>Sphagnum teres</i>	29
<i>Carex echinata</i>	29
<i>Calliergonella cuspidata</i>	29
<i>Bryum pseudotriquetrum</i>	29
<i>Viola palustris</i>	28
<i>Comarum palustre</i>	28
<i>Straminergon stramineum</i>	27
<i>Sphagnum contortum</i>	27
<i>Equisetum fluviatile</i>	27
<i>Vaccinium oxycoccos</i>	26
<i>Carex lasiocarpa</i>	26
<i>Carex dioica</i>	25
<i>Trichophorum alpinum</i>	24
<i>Paludella squarrosa</i>	24
<i>Galium uliginosum</i>	24

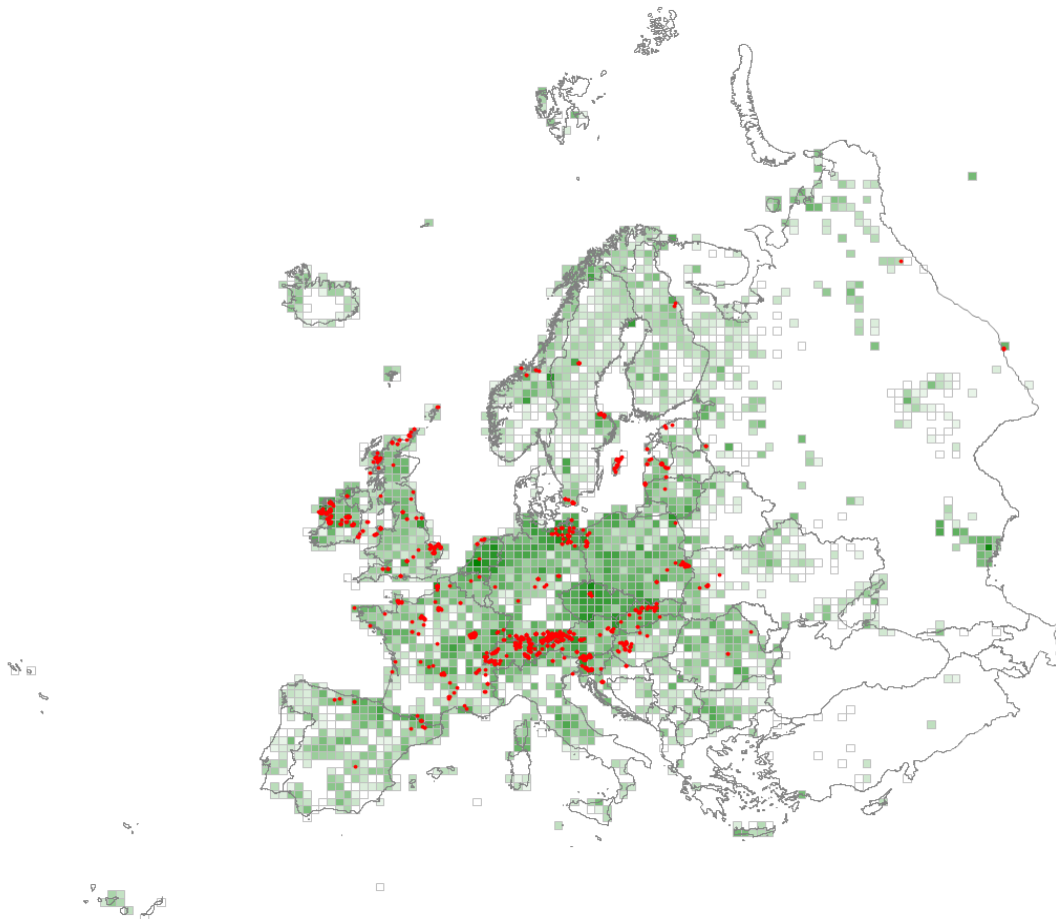
<i>Valeriana dioica</i>	23
<i>Eriophorum latifolium</i>	23
<i>Agrostis canina</i>	23
<i>Trichophorum cespitosum</i>	22
<i>Carex flava</i>	22
<i>Aneura pinguis</i>	22
<i>Andromeda polifolia</i>	22
<i>Festuca rubra</i> aggr.	21
<i>Cirsium palustre</i>	21
<i>Cinclidium stygium</i>	20
<i>Plagiomnium affine</i> aggr.	19
<i>Epilobium palustre</i>	18
<i>Succisa pratensis</i>	17
<i>Galium palustre</i> aggr.	17
<i>Briza media</i>	17
<i>Sphagnum subsecundum</i>	16
<i>Selaginella selaginoides</i>	16
<i>Pinguicula vulgaris</i>	16
<i>Calliergon giganteum</i>	16
<i>Sphagnum recurvum</i> aggr.	15
<i>Crepis paludosa</i>	15
<i>Carex limosa</i>	15
<i>Betula pubescens</i>	15
<i>Filipendula ulmaria</i>	14
<i>Caltha palustris</i>	14
<i>Anthoxanthum odoratum</i> aggr.	14
<i>Pedicularis palustris</i>	13
<i>Lysimachia vulgaris</i>	13
<i>Climacium dendroides</i>	13
<i>Carex chordorrhiza</i>	13
<i>Betula nana</i>	13
<i>Scorpidium scorpioides</i>	12
<i>Phragmites australis</i>	12
<i>Luzula campestris</i> aggr.	12
<i>Juncus articulatus</i>	12
<i>Carex davalliana</i>	12
<i>Vaccinium uliginosum</i>	11
<i>Triglochin palustris</i>	11
<i>Philonotis fontana</i>	11
<i>Nardus stricta</i>	11
<i>Fissidens adianthoides</i>	11
<i>Epipactis palustris</i>	11
<i>Carex diandra</i>	11
<i>Bistorta vivipara</i>	11

Dominant species (percentage frequencies of occurrences with cover > 25%)

<i>Sphagnum warnstorffii</i>	24
<i>Scorpidium revolvens</i> aggr.	15
<i>Campylium stellatum</i>	10
<i>Trichophorum cespitosum</i>	7
<i>Sphagnum teres</i>	7
<i>Sphagnum contortum</i>	7
<i>Tomentypnum nitens</i>	6
<i>Menyanthes trifoliata</i>	6
<i>Carex lasiocarpa</i>	6
<i>Carex rostrata</i>	5

## Q43 – Tall-sedge base-rich fen

Tall-sedge fens are dominated by medium to tall graminoids and tall herbs, along with a patchier tier of low plants, and a ground carpet of rich-fen bryophytes. They are limited to flat landforms where base-rich, nutrient-poor groundwater from springs and seepage lines keep the surface very wet, even in summer. They occur throughout Europe, particularly in the Atlantic and Central European lowlands, becoming transitional in species composition northwards to quaking calcareous fens, though sometimes covering large areas in Fennoscandia.



### Corresponding alliances in EuroVegChecklist 2016

- <> SCH-01A Caricion davallianae Klika 1934
- <> SCH-02A Saxifrago-Tomentypnion Lapshina 2010

### Characteristic species combination

Diagnostic species (phi coefficient \* 100)

<i>Schoenus ferrugineus</i>	48
<i>Campyllum stellatum</i>	32
<i>Juncus subnodulosus</i>	31
<i>Carex hostiana</i>	30
<i>Scorpidium revolvens</i> aggr.	25
<i>Fissidens adianthoides</i>	25
<i>Carex panicea</i>	25
<i>Eriophorum latifolium</i>	24
<i>Succisa pratensis</i>	24

<i>Schoenus nigricans</i>	23
<i>Parnassia palustris</i>	22
<i>Molinia caerulea</i> aggr.	21
<i>Epipactis palustris</i>	20
<i>Carex davalliana</i>	19
<i>Carex lepidocarpa</i>	19
<i>Pinguicula vulgaris</i>	19
<i>Primula farinosa</i>	19
<i>Dactylorhiza incarnata</i>	18
<i>Valeriana dioica</i>	17
<i>Cladium mariscus</i>	16
<i>Scorpidium scorpioides</i>	16
<i>Tofieldia calyculata</i>	16
<i>Potentilla erecta</i>	15

Constant species (percentage frequencies)

<i>Molinia caerulea</i> aggr.	74
<i>Campylium stellatum</i>	66
<i>Potentilla erecta</i>	61
<i>Carex panicea</i>	59
<i>Parnassia palustris</i>	47
<i>Succisa pratensis</i>	45
<i>Scorpidium revolvens</i> aggr.	43
<i>Schoenus ferrugineus</i>	41
<i>Phragmites australis</i>	41
<i>Schoenus nigricans</i>	38
<i>Juncus subnodulosus</i>	38
<i>Eriophorum latifolium</i>	35
<i>Pinguicula vulgaris</i>	31
<i>Carex hostiana</i>	31
<i>Equisetum palustre</i>	28
<i>Primula farinosa</i>	27
<i>Calliergonella cuspidata</i>	27
<i>Epipactis palustris</i>	26
<i>Carex davalliana</i>	26
<i>Valeriana dioica</i>	25
<i>Fissidens adianthoides</i>	25
<i>Carex lepidocarpa</i>	24
<i>Mentha aquatica</i>	23
<i>Cirsium palustre</i>	21
<i>Scorpidium scorpioides</i>	20
<i>Eriophorum angustifolium</i>	20
<i>Tofieldia calyculata</i>	19
<i>Linum catharticum</i>	19
<i>Carex flacca</i>	19
<i>Bryum pseudotriquetrum</i>	19
<i>Menyanthes trifoliata</i>	17
<i>Carex nigra</i>	16
<i>Aneura pinguis</i>	16
<i>Lythrum salicaria</i>	15
<i>Juncus articulatus</i>	15
<i>Carex flava</i>	15
<i>Briza media</i>	15
<i>Galium uliginosum</i>	14
<i>Dactylorhiza incarnata</i>	14
<i>Cladium mariscus</i>	13
<i>Triglochin palustris</i>	12
<i>Salix repens</i>	12
<i>Eupatorium cannabinum</i>	12

<i>Ctenidium molluscum</i>	12
<i>Carex rostrata</i>	12
<i>Carex elata</i>	12
<i>Selaginella selaginoides</i>	11
<i>Hydrocotyle vulgaris</i>	11

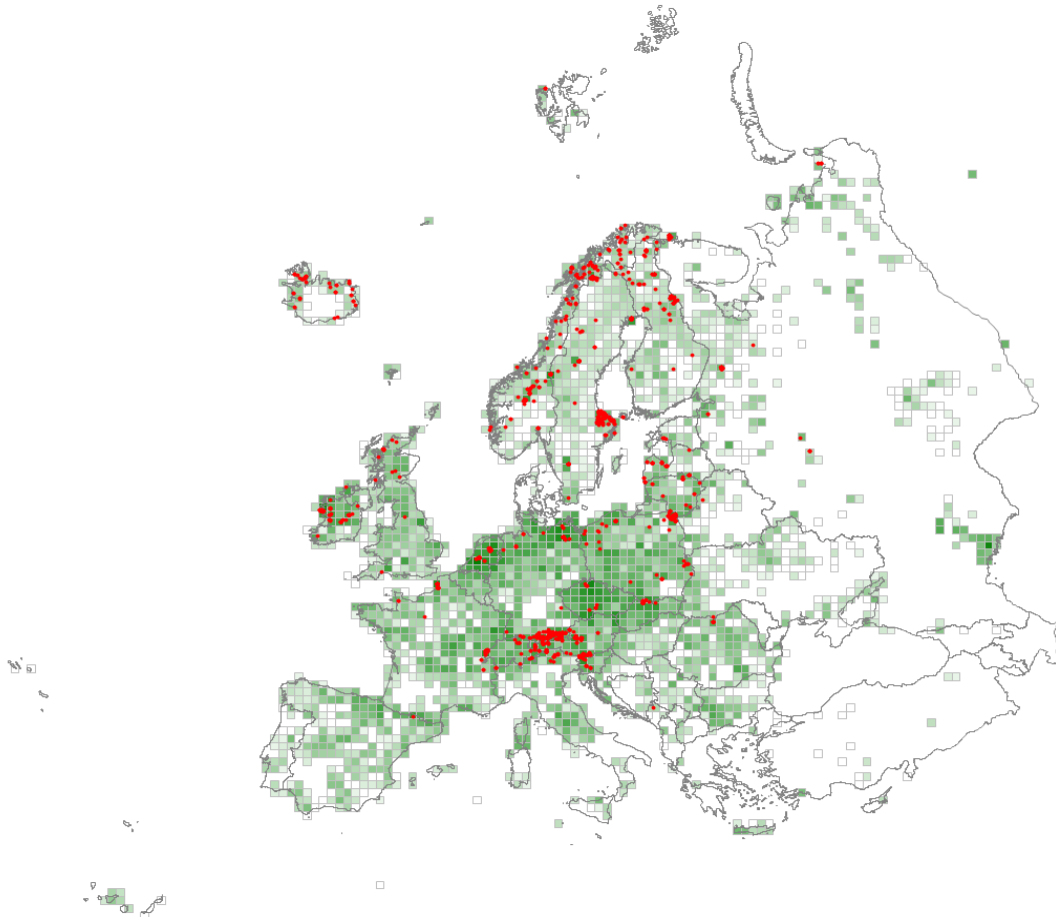
Dominant species (percentage frequencies of occurrences with cover > 25%)

<i>Schoenus ferrugineus</i>	36
<i>Schoenus nigricans</i>	28
<i>Juncus subnodulosus</i>	26
<i>Campylium stellatum</i>	18
<i>Scorpidium revolvens</i> aggr.	11
<i>Molinia caerulea</i> aggr.	10
<i>Cladium mariscus</i>	6



## Q44 – Calcareous quaking mire

Calcareous quaking mire develops in as a topogenic mire in basins fed by very calcareous, nutrient-poor groundwater, with generally thin peat, less than 2 m thick. It occurs widely throughout Europe but is most widespread in Finland and Sweden. The surface is kept permanently very wet and covered by an extensive moss carpet with only sparse vascular plants, sometimes disposed over irregular patterns of flarks and hollows. Calcium precipitation can occur on the surface, and the carpet is often interrupted by stretches of open water.



### Corresponding alliances in EuroVegChecklist 2016

- > LIT-01H *Scorpidio-Utricularion minoris* Pietsch 1965
- > SCH-02C *Stygio-Caricion limosae* Nordhagen 1943

### Characteristic species combination

Diagnostic species (phi coefficient \* 100)

<i>Scorpidium scorpioides</i>	65
<i>Carex limosa</i>	41
<i>Pseudocalliergon trifarium</i>	34
<i>Carex chordorrhiza</i>	32
<i>Menyanthes trifoliata</i>	31
<i>Carex lasiocarpa</i>	30
<i>Utricularia intermedia</i>	26
<i>Carex livida</i>	26
<i>Utricularia minor</i>	26
<i>Drosera longifolia</i>	23

<i>Scorpidium revolvens</i> aggr.	22
<i>Calliergon giganteum</i>	21
<i>Carex rostrata</i>	20
<i>Eriophorum angustifolium</i>	16
<i>Equisetum fluviatile</i>	16
<i>Carex diandra</i>	15

Constant species (percentage frequencies)

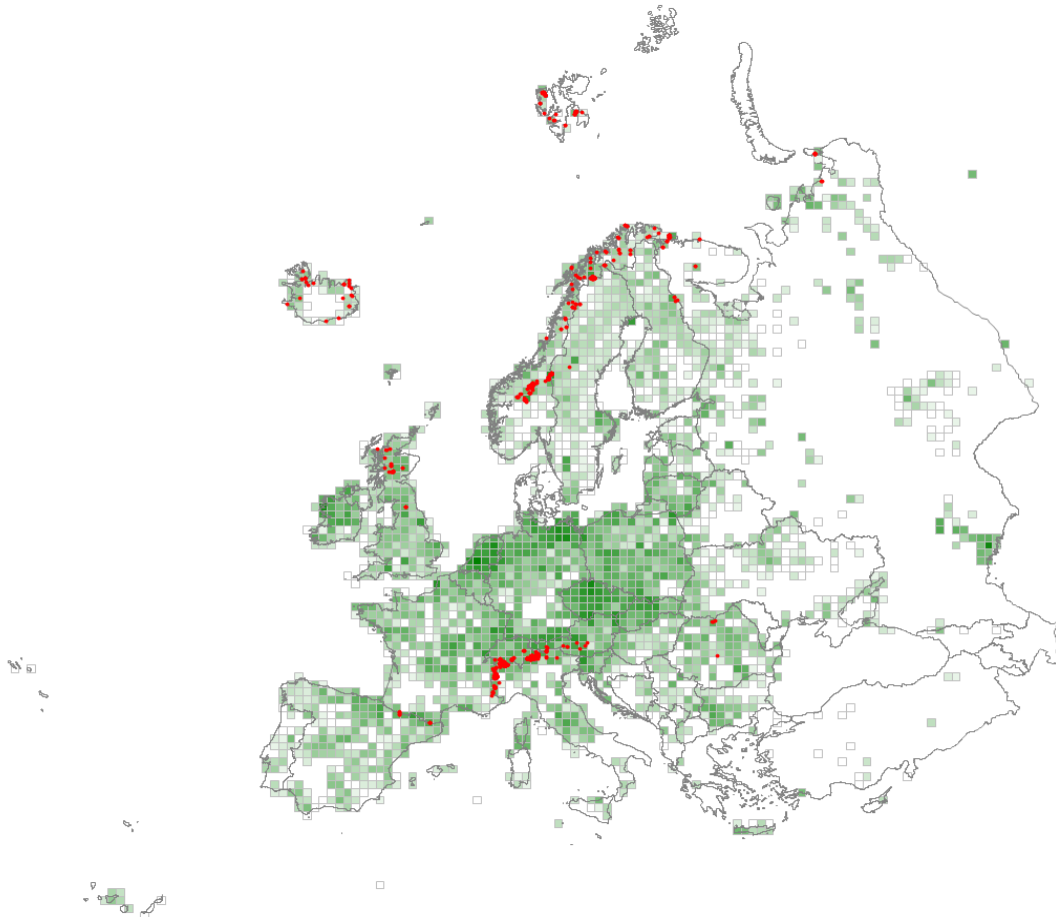
<i>Scorpidium scorpioides</i>	79
<i>Menyanthes trifoliata</i>	54
<i>Carex limosa</i>	46
<i>Eriophorum angustifolium</i>	44
<i>Carex rostrata</i>	41
<i>Carex lasiocarpa</i>	38
<i>Scorpidium revolvens</i> aggr.	37
<i>Equisetum fluviatile</i>	30
<i>Campylium stellatum</i>	30
<i>Utricularia minor</i>	25
<i>Carex chordorrhiza</i>	25
<i>Pseudocalliergon trifarium</i>	23
<i>Utricularia intermedia</i>	22
<i>Drosera longifolia</i>	22
<i>Carex panicea</i>	20
<i>Comarum palustre</i>	19
<i>Calliergon giganteum</i>	19
<i>Phragmites australis</i>	18
<i>Molinia caerulea</i> aggr.	15
<i>Trichophorum cespitosum</i>	14
<i>Rhynchospora alba</i>	14
<i>Aneura pinguis</i>	14
<i>Carex elata</i>	13
<i>Trichophorum alpinum</i>	12
<i>Pedicularis palustris</i>	12
<i>Andromeda polifolia</i>	12
<i>Galium palustre</i> aggr.	11
<i>Cinclidium stygium</i>	11

Dominant species (percentage frequencies of occurrences with cover > 25%)

<i>Scorpidium scorpioides</i>	52
<i>Scorpidium revolvens</i> aggr.	13
<i>Carex limosa</i>	12
<i>Menyanthes trifoliata</i>	9
<i>Carex lasiocarpa</i>	9
<i>Carex chordorrhiza</i>	7
<i>Carex rostrata</i>	6

## Q45 – Arctic-alpine rich fen

Fens developed on open substrates constantly flushed by icy, base-rich water alongside small rivers, springs or glaciers in the alpine belt of European mountains and in the Arctic. Constant disturbance by moving water and freeze-thaw, aeration with turbulent flow and low productivity prevent peat accumulation. Consequently, this fen typically occurs as small unstable patches colonising bare ground. The vegetation consists of small basiphilous sedges, rushes and herbs, brown mosses and liverworts.



### Corresponding alliances in EuroVegChecklist 2016

- > SCH-01C Caricion atrofusco-saxatilis Nordhagen 1943
- > SCH-02B Caricion stantis Matveyeva 1994

### Characteristic species combination

Diagnostic species (phi coefficient \* 100)

<i>Juncus triglumis</i>	52
<i>Carex microglochin</i>	41
<i>Carex capillaris</i>	39
<i>Tofieldia pusilla</i>	39
<i>Catoscopium nigratum</i>	36
<i>Equisetum variegatum</i>	36
<i>Carex bicolor</i>	34
<i>Scorpidium revolvens</i> aggr.	32
<i>Oncophorus virens</i>	32
<i>Salix myrsinites</i>	31

<i>Thalictrum alpinum</i>	30
<i>Bistorta vivipara</i>	30
<i>Meesia uliginosa</i>	28
<i>Kobresia simpliciuscula</i>	28
<i>Carex saxatilis</i>	27
<i>Juncus arcticus</i>	26
<i>Campylium stellatum</i>	26
<i>Carex atrofusca</i>	26
<i>Salix arbuscula</i>	26
<i>Juncus biglumis</i>	25
<i>Juncus alpinoarticulatus</i>	25
<i>Cinclidium stygium</i>	24
<i>Selaginella selaginoides</i>	24
<i>Fissidens osmundoides</i>	24
<i>Saxifraga aizoides</i>	23
<i>Bryum pseudotriquetrum</i>	23
<i>Salix reticulata</i>	22
<i>Carex maritima</i>	22
<i>Tritomaria polita</i>	22
<i>Carex frigida</i>	21
<i>Carex dioica</i>	20
<i>Palustriella commutata</i> aggr.	20
<i>Carex parallela</i>	19
<i>Bartsia alpina</i>	19
<i>Pinguicula alpina</i>	19
<i>Juncus castaneus</i>	18
<i>Pinguicula vulgaris</i>	17
<i>Carex capitata</i>	17
<i>Eleocharis quinqueflora</i>	17
<i>Lophozia bantriensis</i>	16
<i>Carex norvegica</i>	16
<i>Bryum pallens</i>	16
<i>Tomentypnum nitens</i>	16
<i>Pseudocalliergon turgescens</i>	16
<i>Saussurea alpina</i> aggr.	15
<i>Pseudocalliergon trifarium</i>	15
<i>Pedicularis oederi</i>	15

Constant species (percentage frequencies)

<i>Bistorta vivipara</i>	67
<i>Scorpidium revolvens</i> aggr.	55
<i>Campylium stellatum</i>	54
<i>Juncus triglumis</i>	46
<i>Equisetum variegatum</i>	43
<i>Bryum pseudotriquetrum</i>	39
<i>Selaginella selaginoides</i>	35
<i>Saxifraga aizoides</i>	34
<i>Eriophorum angustifolium</i>	34
<i>Carex capillaris</i>	33
<i>Tofieldia pusilla</i>	31
<i>Thalictrum alpinum</i>	31
<i>Pinguicula vulgaris</i>	28
<i>Parnassia palustris</i>	26
<i>Juncus alpinoarticulatus</i>	26
<i>Carex nigra</i>	24
<i>Bartsia alpina</i>	24
<i>Trichophorum cespitosum</i>	22
<i>Palustriella commutata</i> aggr.	21
<i>Deschampsia cespitosa</i> aggr.	21

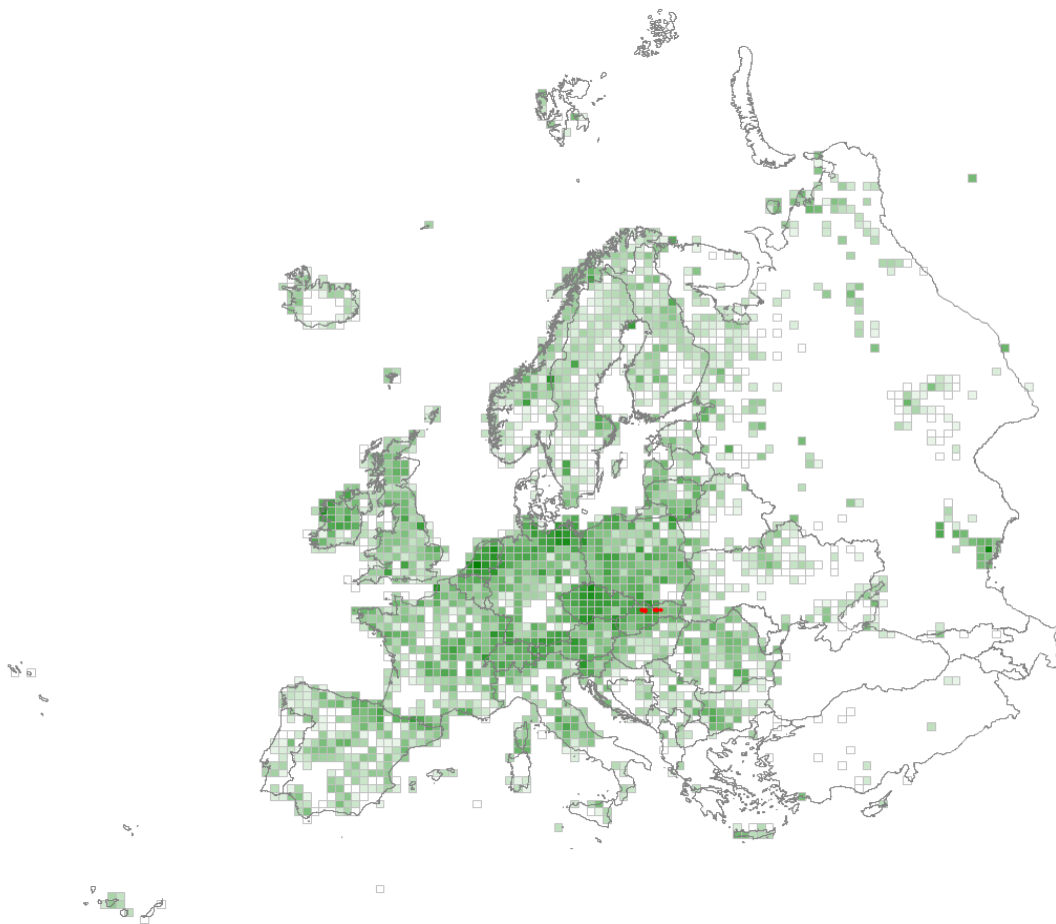
<i>Salix reticulata</i>	20
<i>Carex microglochin</i>	20
<i>Carex dioica</i>	19
<i>Agrostis stolonifera</i>	19
<i>Primula farinosa</i>	18
<i>Cinclidium stygium</i>	18
<i>Carex bicolor</i>	18
<i>Aneura pinguis</i>	18
<i>Tomentypnum nitens</i>	17
<i>Saussurea alpina</i> aggr.	17
<i>Eleocharis quinqueflora</i>	17
<i>Betula nana</i>	17
<i>Salix myrsinites</i>	16
<i>Salix arbuscula</i>	16
<i>Pinguicula alpina</i>	16
<i>Catoscopium nigratum</i>	16
<i>Carex panicea</i>	16
<i>Philonotis fontana</i>	14
<i>Oncophorus virens</i>	14
<i>Carex frigida</i>	14
<i>Carex davalliana</i>	14
<i>Festuca rubra</i> aggr.	13
<i>Equisetum palustre</i>	13
<i>Equisetum arvense</i>	13
<i>Potentilla erecta</i>	12
<i>Meesia uliginosa</i>	12
<i>Carex atrofusca</i>	12
<i>Andromeda polifolia</i>	12
<i>Vaccinium uliginosum</i>	11
<i>Scorpidium scorpioides</i>	11
<i>Kobresia simpliciuscula</i>	11
<i>Juncus biglumis</i>	11
<i>Carex saxatilis</i>	11

Dominant species (percentage frequencies of occurrences with cover > 25%)

<i>Scorpidium revolvens</i> aggr.	26
<i>Campylium stellatum</i>	13
<i>Trichophorum cespitosum</i>	9
<i>Carex microglochin</i>	9

## Q46 – Carpathian travertine fen with halophytes

Short-sedge fens developed on active travertine springs fed by extremely mineral-rich groundwater coming from deep aquifers upwards along Tertiary faults. They have conserved ancient species composition that combines plant and animal (e.g. snails and ostracods) specialists dwelling in short-sedge calcareous fens of temperate Europe, e.g. *Eleocharis quinqueflora*, *Parnassia palustris*, *Pinguicula vulgaris*, *Primula farinosa* and *Schoenus ferrugineus*, with halophytic species, e.g. *Centaurium littorale* subsp. *uliginosum*, *Glaux maritima*, *Plantago maritima* subsp. *salsa*, *Scorzonera parviflora* and *Triglochin maritima*). A characteristic species of this habitat is *Trichophorum pumilum*, a rare glacial relict of low-productive tundra, fen and salt marsh habitats. Many of these species have isolated relict populations in this habitat. Their species composition is similar to halophytic fens of the southern Siberian high-mountain regions which are climatically analogous to the European full glacial period. The habitat is endemic to the Inner Western Carpathian basins. Most of the localities were destroyed in the past.



### Corresponding alliances in EuroVegChecklist 2016

<> SCH-01A Caricion davallianae Klika 1934

### Characteristic species combination

Diagnostic species (phi coefficient \* 100)

<i>Trichophorum pumilum</i>	86
<i>Blysmus compressus</i>	63

<i>Primula farinosa</i>	61
<i>Triglochin maritima</i>	58
<i>Triglochin palustris</i>	54
<i>Epipactis palustris</i>	50
<i>Schoenoplectus lacustris</i> subsp. <i>glaucus</i>	47
<i>Centaureum littorale</i>	47
<i>Campyliadelphus elodes</i>	44
<i>Pinguicula vulgaris</i>	40
<i>Campylium stellatum</i>	39
<i>Parnassia palustris</i>	38
<i>Carex davalliana</i>	34
<i>Pedicularis palustris</i>	33
<i>Carex distans</i>	30
<i>Valeriana dioica</i>	30
<i>Equisetum variegatum</i>	25
<i>Carex lepidocarpa</i>	24
<i>Carex hostiana</i>	24
<i>Tomentypnum nitens</i>	23
<i>Polygala amarella</i>	22
<i>Tofieldia calyculata</i>	21
<i>Bryum pseudotriquetrum</i>	21
<i>Odontites vulgaris</i> aggr.	20
<i>Plantago maritima</i>	19
<i>Bryum neodamense</i>	19
<i>Polygala amara</i>	18
<i>Schoenus ferrugineus</i>	17
<i>Scorpidium revolvens</i> aggr.	17
<i>Taraxacum</i> sect. <i>Palustria</i>	17
<i>Juncus articulatus</i>	17
<i>Glaux maritima</i>	16
<i>Carex nigra</i>	15

Constant species (percentage frequencies)

<i>Triglochin maritima</i>	90
<i>Primula farinosa</i>	85
<i>Parnassia palustris</i>	80
<i>Campylium stellatum</i>	80
<i>Trichophorum pumilum</i>	75
<i>Triglochin palustris</i>	75
<i>Pinguicula vulgaris</i>	65
<i>Epipactis palustris</i>	65
<i>Schoenoplectus lacustris</i> subsp. <i>glaucus</i>	60
<i>Blysmus compressus</i>	60
<i>Molinia caerulea</i> aggr.	55
<i>Potentilla erecta</i>	50
<i>Valeriana dioica</i>	45
<i>Carex davalliana</i>	45
<i>Plantago maritima</i>	40
<i>Carex nigra</i>	40
<i>Pedicularis palustris</i>	35
<i>Juncus articulatus</i>	35
<i>Carex panicea</i>	35
<i>Carex distans</i>	35
<i>Bryum pseudotriquetrum</i>	35
<i>Scorpidium revolvens</i> aggr.	30
<i>Festuca rubra</i> aggr.	30
<i>Equisetum variegatum</i>	30
<i>Equisetum palustre</i>	30
<i>Centaureum littorale</i>	30

<i>Carex lepidocarpa</i>	30
<i>Tomentypnum nitens</i>	25
<i>Tofieldia calyculata</i>	25
<i>Menyanthes trifoliata</i>	25
<i>Eriophorum angustifolium</i>	25
<i>Carex hostiana</i>	25
<i>Campyliadelphus elodes</i>	25
<i>Ranunculus acris</i> aggr.	20
<i>Odontites vulgaris</i> aggr.	20
<i>Glaux maritima</i>	20
<i>Calliergonella cuspidata</i>	20
<i>Briza media</i>	20
<i>Achillea millefolium</i> aggr.	20
<i>Trifolium repens</i>	15
<i>Schoenus ferrugineus</i>	15
<i>Polygala amarella</i>	15
<i>Lotus tenuis</i>	15
<i>Lotus corniculatus</i>	15
<i>Frangula alnus</i>	15
<i>Festuca ovina</i>	15
<i>Eriophorum latifolium</i>	15
<i>Aneura pinguis</i>	15
<i>Agrostis stolonifera</i>	15
<i>Acer campestre</i>	15

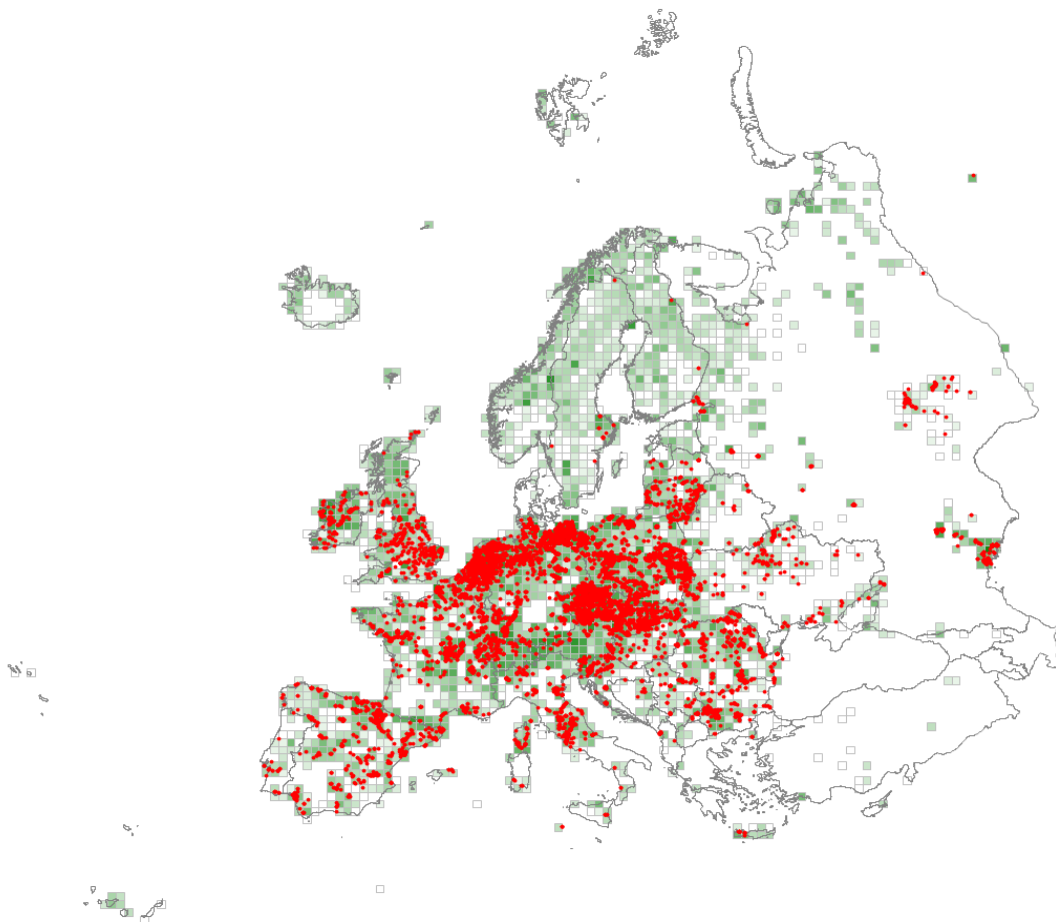
Dominant species (percentage frequencies of occurrences with cover > 25%)

<i>Campylium stellatum</i>	40
<i>Trichophorum pumilum</i>	30
<i>Scorpidium revolvens</i> aggr.	30
<i>Campyliadelphus elodes</i>	20
<i>Molinia caerulea</i> aggr.	15
<i>Schoenoplectus lacustris</i> subsp. <i>glaucus</i>	10
<i>Primula farinosa</i>	10
<i>Blysmus compressus</i>	10
<i>Palustriella commutata</i> aggr.	5
<i>Epipactis palustris</i>	5
<i>Carex lepidocarpa</i>	5
<i>Carex davalliana</i>	5
<i>Bryum pseudotriquetrum</i>	5



## Q51 – Tall-helophyte bed

This habitat of tall graminoid helophytes characteristically occupies a zone from shallow to moderately deep mesotrophic to eutrophic fresh or slightly brackish water along the banks of rivers and lakes, in artificial water bodies and at nutrient-rich terrestrial sites on waterlogged ground. It is a very widespread, but naturally fragmented habitat, throughout the European lowlands. The occurrence of different dominant species depends on water depth, duration of flooding, substratum, trophic level, disturbance by waves or current, herbivory and human influence, some of the plants being cut for fodder or thatching. Because of the competitive ability and clonal growth of tall helophytes, the stands are usually species-poor and often dominated by one or a few co-dominants. The habitat is vulnerable to drainage and pollution, land reclamation for agricultural and urban development, and the decline of marshland exploitation for renewable crops.



### Corresponding alliances in EuroVegChecklist 2016

- <> PHR-05D Deschampsion argenteae Capelo et al. 2000
- > PHR-05B Phalaridion arundinaceae Kopecký 1961
- <> PHR-01A Phragmition communis Koch 1926

### Characteristic species combination

Diagnostic species (phi coefficient \* 100)

<i>Glyceria maxima</i>	23
<i>Typha latifolia</i>	19
<i>Acorus calamus</i>	17

Constant species (percentage frequencies)

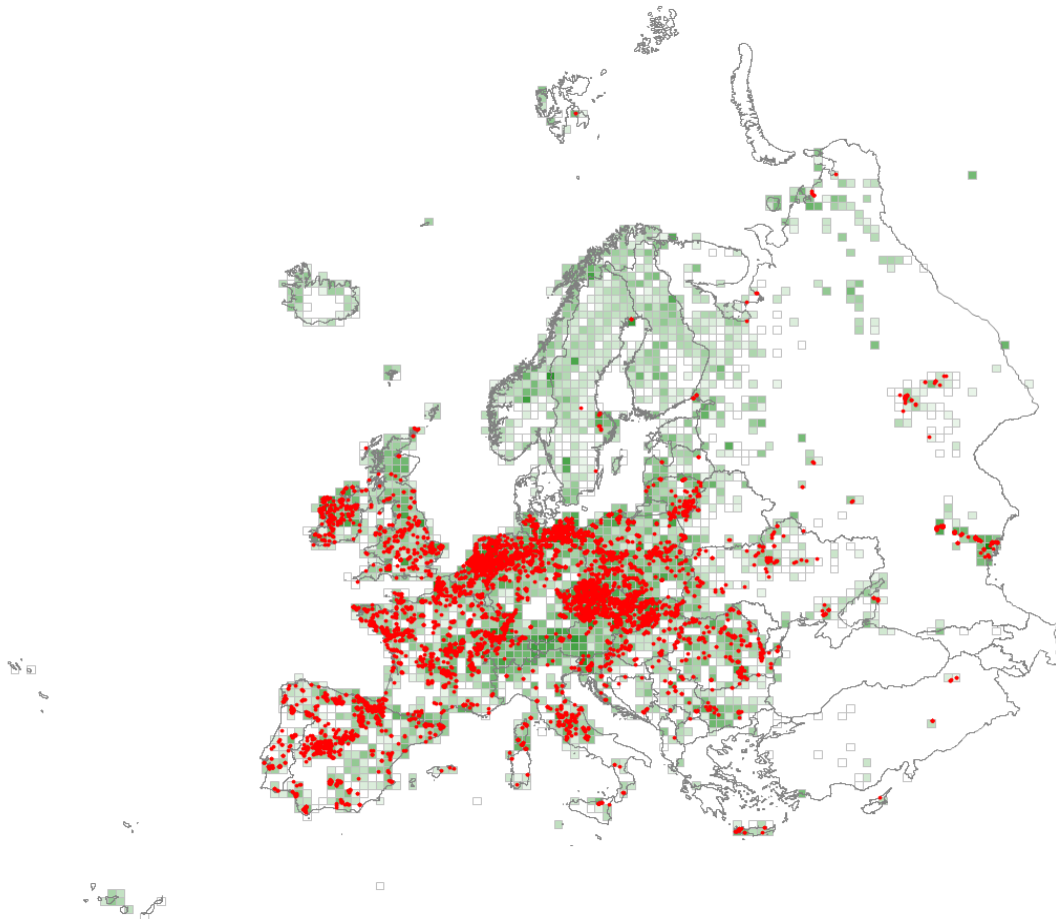
<i>Phragmites australis</i>	41
<i>Lythrum salicaria</i>	31
<i>Glyceria maxima</i>	29
<i>Galium palustre</i> aggr.	29
<i>Phalaroides arundinacea</i>	26
<i>Typha latifolia</i>	23
<i>Iris pseudacorus</i>	23
<i>Lycopus europaeus</i>	22
<i>Lysimachia vulgaris</i>	21
<i>Mentha aquatica</i>	19
<i>Equisetum fluviatile</i>	19
<i>Lemna minor</i>	18
<i>Sparganium erectum</i> aggr.	16
<i>Alisma plantago-aquatica</i>	15
<i>Typha angustifolia</i>	14
<i>Myosotis scorpioides</i> aggr.	14
<i>Carex acuta</i>	13
<i>Schoenoplectus lacustris</i>	12
<i>Ranunculus repens</i>	12
<i>Solanum dulcamara</i>	11
<i>Persicaria amphibia</i>	11
<i>Calystegia sepium</i>	11
<i>Agrostis stolonifera</i>	11

Dominant species (percentage frequencies of occurrences with cover > 25%)

<i>Phragmites australis</i>	21
<i>Glyceria maxima</i>	13
<i>Typha latifolia</i>	10
<i>Phalaroides arundinacea</i>	7
<i>Typha angustifolia</i>	6

## Q52 – Small-helophyte bed

Small and amphibious helophyte-dominated freshwater vegetation is a widespread, very common but fragmented habitat throughout the European lowlands, occurring in the shallow littoral zones of lakes, ponds and rivers subject to periodic and repeated variation in water levels. It is characterised by amphibious plants and provides an important habitat for benthic invertebrates, fish, amphibians and several species of birds, by offering shelter and food. Like other wetland types, this habitat has suffered much from the intensification of agricultural land use, including drainage, modification of flooding and reclamation, and expansion of urban areas.



### Corresponding alliances in EuroVegChecklist 2016

- > PHR-06B Alopecuro-Glycerion spicatae S. Brullo et al. 1994
- > PHR-07A Arctophilion fulvae Pstryakov et Gogoleva in Kholod 2007
- <> PHR-05D Deschampsion argenteae Capelo et al. 2000
- > PHR-06A Eleocharito palustris-Sagittarion sagittifoliae Passarge 1964
- > PHR-05A Glycerio-Sparganion Br.-Bl. et Sissingh in Boer 1942

### Characteristic species combination

Diagnostic species (phi coefficient \* 100)

<i>Glyceria fluitans</i> aggr.	17
<i>Alisma plantago-aquatica</i>	16

Constant species (percentage frequencies)

<i>Galium palustre</i> aggr.	29
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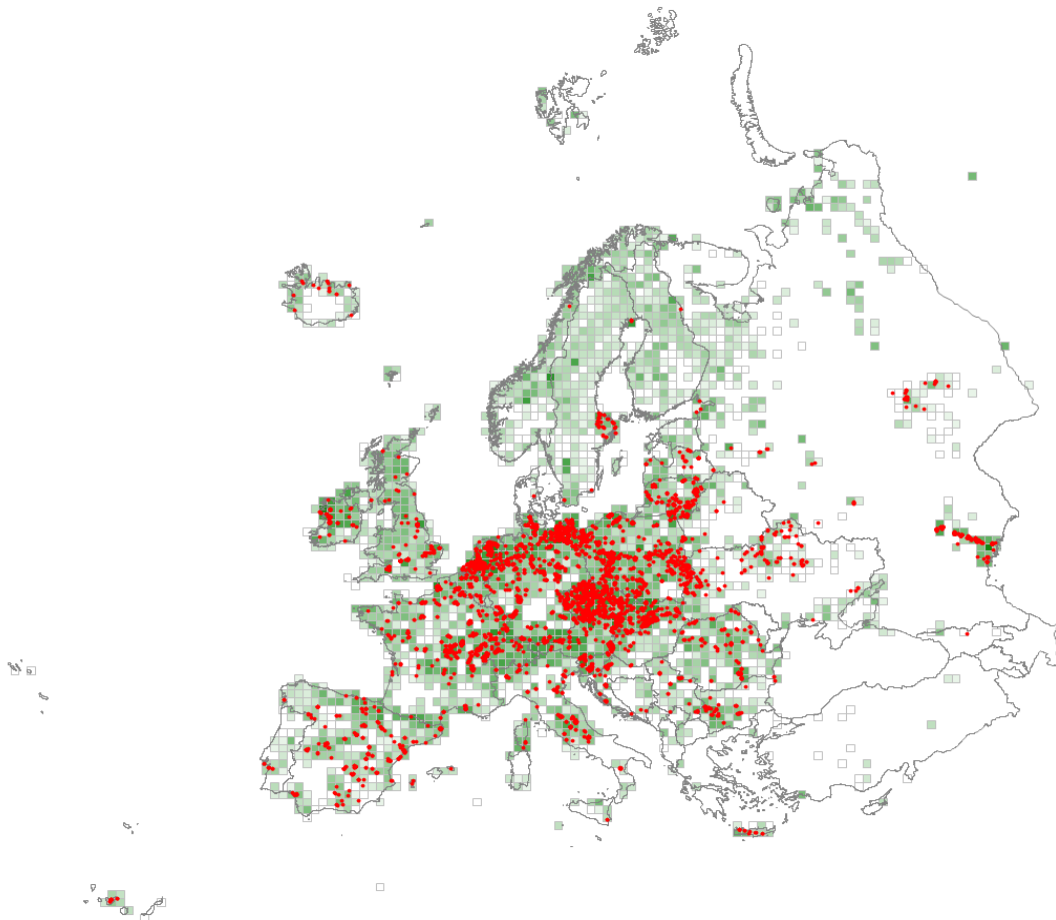
<i>Glyceria fluitans</i> aggr.	28
<i>Eleocharis palustris</i>	28
<i>Alisma plantago-aquatica</i>	27
<i>Myosotis scorpioides</i> aggr.	23
<i>Ranunculus repens</i>	22
<i>Agrostis stolonifera</i>	22
<i>Mentha aquatica</i>	20
<i>Ranunculus flammula</i>	19
<i>Persicaria amphibia</i>	17
<i>Lycopus europaeus</i>	17
<i>Lemna minor</i>	16
<i>Lythrum salicaria</i>	15
<i>Veronica beccabunga</i>	13
<i>Rorippa amphibia</i>	12
<i>Oenanthe aquatica</i>	12
<i>Juncus effusus</i>	12
<i>Juncus articulatus</i>	12
<i>Phragmites australis</i>	11
<i>Phalaroides arundinacea</i>	11
<i>Lysimachia vulgaris</i>	11

Dominant species (percentage frequencies of occurrences with cover > 25%)

<i>Glyceria fluitans</i> aggr.	10
<i>Eleocharis palustris</i>	10

## Q53 – Tall-sedge bed

This habitat develops throughout the European lowlands, though less commonly to the warmer south, on the margins of standing and slow-moving fresh waters just above the mean water level, but subject to periodic flooding, and on year-round water-saturated soils. Tall-sedge communities are usually species-poor, dominated by one productive plant, often of densely tussock habit, and accompanied by few characteristic species growing in mosaics on and between the tussocks. The particular dominant depends on climate, substrate, hydrology and trophic level of the habitat and, now usually in the past, on management by grazing or cutting. The main threats are the expansion of agricultural, industrial and urban areas and changes in the level of groundwater and its pollution. In many places, the habitat is totally transformed without the possibility of natural recovery, and strong intervention is usually needed for recovery.



### Corresponding alliances in EuroVegChecklist 2016

- > PHR-05C Caricion broterianae (Rivas-Mart. et al. 1986) J.A. Molina 1996
- > PHR-04C Carici-Rumicion hydrolapathi Passarge 1964
- <> PHR-04A Magnocaricion elatae Koch 1926
- > PHR-04B Magnocaricion gracilis Géhu 1961

### Characteristic species combination

Diagnostic species (phi coefficient \* 100)

<i>Carex acuta</i>	36
<i>Carex vesicaria</i>	28
<i>Carex riparia</i>	23

Constant species (percentage frequencies)

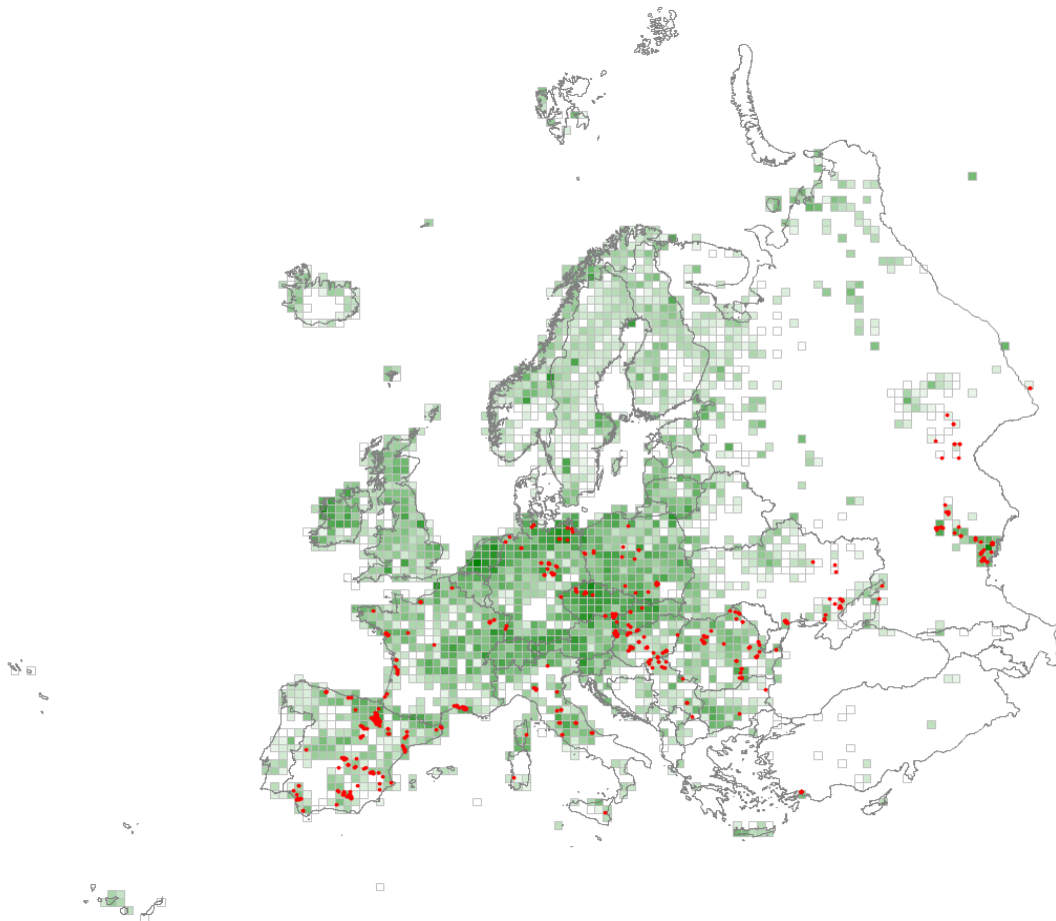
<i>Carex acuta</i>	44
<i>Galium palustre</i> aggr.	37
<i>Lythrum salicaria</i>	33
<i>Lysimachia vulgaris</i>	27
<i>Carex vesicaria</i>	26
<i>Phragmites australis</i>	23
<i>Carex riparia</i>	21
<i>Iris pseudacorus</i>	20
<i>Carex acutiformis</i>	20
<i>Phalaroides arundinacea</i>	18
<i>Equisetum fluviatile</i>	17
<i>Caltha palustris</i>	17
<i>Ranunculus repens</i>	16
<i>Lycopus europaeus</i>	16
<i>Persicaria amphibia</i>	14
<i>Filipendula ulmaria</i>	13
<i>Equisetum palustre</i>	13
<i>Mentha aquatica</i>	12
<i>Juncus effusus</i>	12
<i>Carex rostrata</i>	12
<i>Glyceria maxima</i>	11
<i>Carex paniculata</i>	11
<i>Carex disticha</i>	11

Dominant species (percentage frequencies of occurrences with cover > 25%)

<i>Carex acuta</i>	32
<i>Carex riparia</i>	15
<i>Carex vesicaria</i>	13
<i>Carex acutiformis</i>	10
<i>Cladium mariscus</i>	8
<i>Carex paniculata</i>	8

## Q54 – Inland saline or brackish helophyte bed

This habitat includes helophyte beds developing in and around inland saline or brackish lakes, ponds and other standing or slowly flowing waters such as saline Mediterranean rivers that are subject to summer drying. The habitat may include, depending on the particular hydrological regime, emergent communities dominated by a variety of tall or tussocky species tolerant of brackish or saline conditions. It is distributed in both the continental part of Europe and the arid Mediterranean region, where it can dry out completely in the summer and become hyper-saline. Threats include land reclamation for agricultural and urban expansion, anthropogenic changes in hydrology, and the input of freshwater to serve waterfowl hunting or ecotourism in dry areas. Safeguarding the distinctive hydrology and controlling the spread of helophytes by grazing are the main conservation actions.



### Corresponding alliances in EuroVegChecklist 2016

- > PHR-02B *Meliloto dentati-Bolboschoenion maritimi* Hroudová et al. 2009
- <> PHR-02A *Scirpion maritimi* Dahl et Hadač 1941
- > PHR-01B *Typhion laxmannii* Nedelcu 1968

### Characteristic species combination

Diagnostic species (phi coefficient \* 100)

<i>Schoenoplectus lacustris</i> subsp. <i>glaucus</i>	27
<i>Phragmites australis</i>	24
<i>Typha domingensis</i>	24
<i>Bolboschoenus maritimus</i>	19
<i>Juncus subulatus</i>	16

<i>Tripolium pannonicum</i>	16
<i>Scorzonera parviflora</i>	15

Constant species (percentage frequencies)

<i>Phragmites australis</i>	79
<i>Schoenoplectus lacustris</i> subsp. <i>glaucus</i>	35
<i>Bolboschoenus maritimus</i>	33
<i>Tripolium pannonicum</i>	25
<i>Juncus gerardi</i>	21
<i>Agrostis stolonifera</i>	18
<i>Atriplex prostrata</i>	17
<i>Puccinellia distans</i>	15
<i>Typha domingensis</i>	12
<i>Juncus maritimus</i>	11
<i>Eleocharis palustris</i>	11

Dominant species (percentage frequencies of occurrences with cover > 25%)

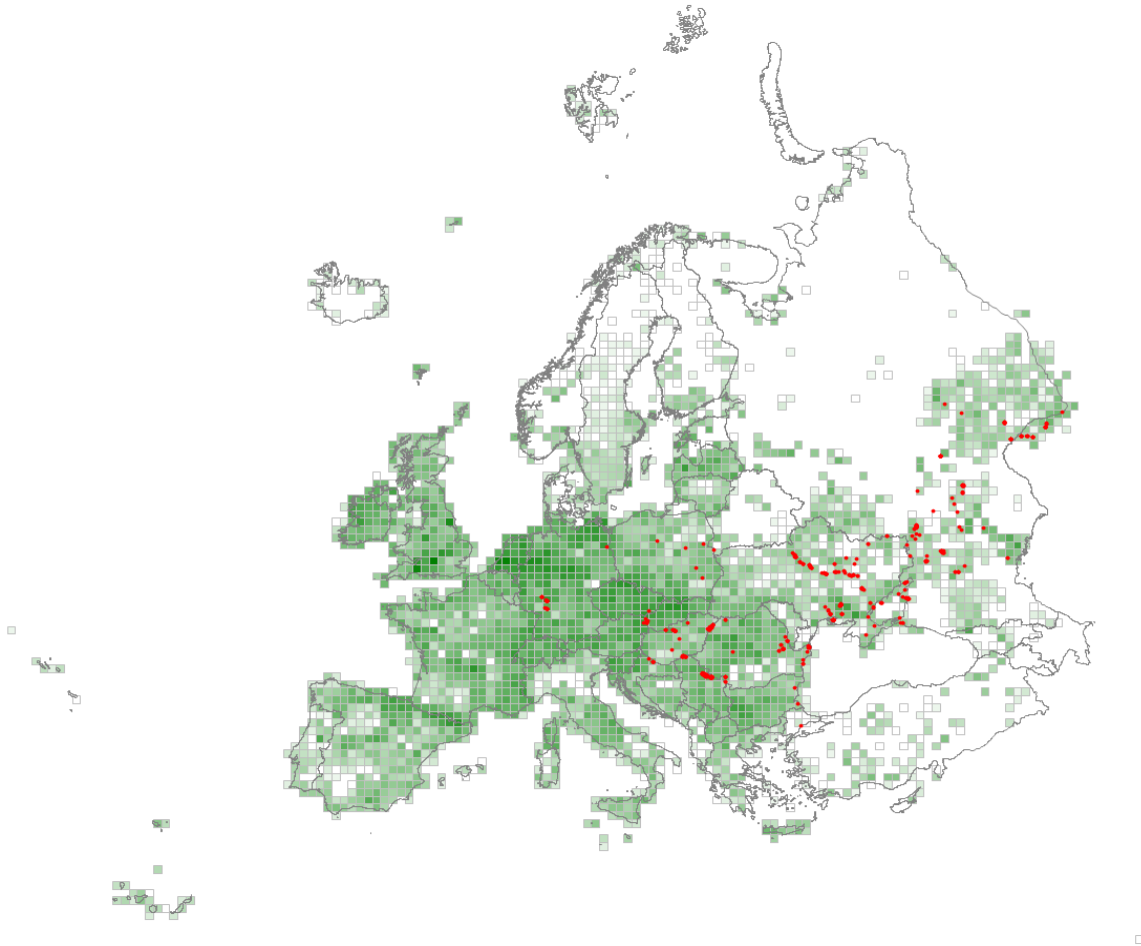
<i>Phragmites australis</i>	30
<i>Schoenoplectus lacustris</i> subsp. <i>glaucus</i>	15
<i>Bolboschoenus maritimus</i>	11
<i>Typha domingensis</i>	6
<i>Juncus maritimus</i>	6



## R11 – Pannonian and Pontic sandy steppe

Rather open steppe grassland dominated by perennial tussock grasses and herbs, with frequent spring annuals and cryptogams, typical of nutrient-poor, sandy soils on plains and dunes through the Pannonian, Pontic and southern Baltic regions. The climate is continental with cold winters, often with long frosts and shallow snow, and hot, droughty summers. Traditionally used for extensive grazing by stock, particularly sheep, but now widely abandoned.

**Remark:** This habitat also occurs at some sites in the southern Baltic area (north of the Carpathians); therefore, an addition of the Sarmatic region in the habitat name can be considered.



### Corresponding alliances in EuroVegChecklist 2016

- <> SED-04H *Bassia laniflorae*-*Bromion tectorum* Borhidi 1996 nom. conserv. propos.
- > COR-02B *Festucion beckeri* Vicherek 1972
- > COR-02A *Festucion vaginatae* de Soó 1929
- <> COR-01B *Koelerion glaucae* Volk 1931

### Characteristic species combination

Diagnostic species (phi coefficient \* 100)

<i>Festuca beckeri</i>	47
<i>Koeleria glauca</i>	45
<i>Festuca vaginata</i>	43
<i>Thymus pallasianus</i>	40
<i>Bassia laniflora</i>	39

<i>Jurinea cyanoides</i>	38
<i>Helichrysum arenarium</i>	36
<i>Silene borysthenica</i>	36
<i>Gypsophila paniculata</i>	36
<i>Euphorbia seguieriana</i>	31
<i>Astragalus varius</i>	30
<i>Scorzonera ensifolia</i>	28
<i>Jacobaea borysthenica</i>	26
<i>Centaurea arenaria</i> aggr.	26
<i>Secale sylvestre</i>	26
<i>Artemisia campestris</i>	25
<i>Dianthus platyodon</i>	25
<i>Tragopogon ucrainicus</i>	25
<i>Stipa borysthenica</i> aggr.	25
<i>Tragopogon borystenicus</i>	23
<i>Anchusa gmelinii</i>	23
<i>Achillea micrantha</i>	22
<i>Carex colchica</i>	22
<i>Anthemis ruthenica</i>	21
<i>Festuca wagneri</i>	21
<i>Tragopogon floccosus</i>	20
<i>Cleistogenes squarrosa</i>	20
<i>Dianthus bessarabicus</i>	19
<i>Erysimum montanum</i>	19
<i>Plantago arenaria</i>	19
<i>Minuartia viscosa</i>	19
<i>Corispermum nitidum</i>	18
<i>Herniaria polygama</i>	18
<i>Veronica dillenii</i>	17
<i>Pilosella echioides</i>	17
<i>Erysimum canum</i>	17
<i>Odontarrhena tortuosa</i>	17
<i>Cladonia polycarpoides</i>	16
<i>Asperula graveolens</i>	16
<i>Dianthus borbasii</i>	16
<i>Potentilla cinerea</i>	16
<i>Polygonum arenarium</i>	15
<i>Carex supina</i>	15

Constant species (percentage frequencies)

<i>Euphorbia seguieriana</i>	53
<i>Artemisia campestris</i>	49
<i>Helichrysum arenarium</i>	44
<i>Koeleria glauca</i>	43
<i>Poa bulbosa</i>	42
<i>Festuca beckeri</i>	41
<i>Bassia laniflora</i>	32
<i>Gypsophila paniculata</i>	25
<i>Secale sylvestre</i>	22
<i>Rumex acetosella</i>	22
<i>Festuca vaginata</i>	22
<i>Eryngium campestre</i>	22
<i>Carex colchica</i>	22
<i>Astragalus varius</i>	22
<i>Anisantha tectorum</i>	22
<i>Syntrichia ruralis</i> aggr.	20
<i>Centaurea arenaria</i> aggr.	20
<i>Jurinea cyanoides</i>	19
<i>Thymus pallasianus</i>	18

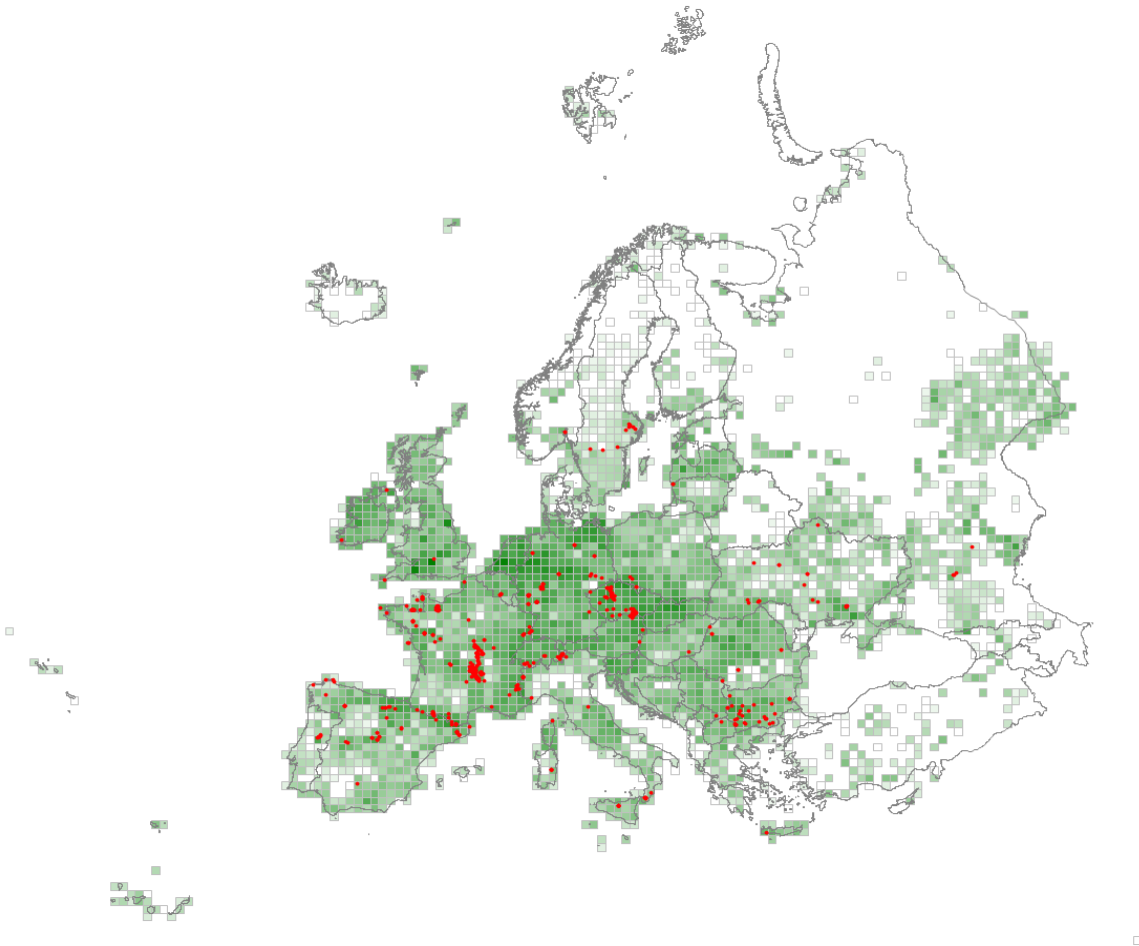
<i>Silene borysthenica</i>	18
<i>Potentilla cinerea</i>	18
<i>Cynodon dactylon</i>	18
<i>Polygonum arenarium</i>	17
<i>Chondrilla juncea</i>	16
<i>Anthemis ruthenica</i>	16
<i>Stipa pennata</i>	15
<i>Stipa borysthenica</i> aggr.	15
<i>Linaria genistifolia</i>	15
<i>Plantago arenaria</i>	14
<i>Odontarrhena tortuosa</i>	14
<i>Corynephorus canescens</i>	14
<i>Bromus squarrosus</i>	14
<i>Achillea micrantha</i>	14
<i>Veronica dillenii</i>	13
<i>Silene otites</i> aggr.	13
<i>Artemisia austriaca</i>	13
<i>Alyssum turkestanicum</i>	13
<i>Poa pratensis</i> aggr.	12
<i>Euphorbia cyparissias</i>	12
<i>Erysimum montanum</i>	12
<i>Seseli tortuosum</i>	11
<i>Pilosella echioides</i>	11
<i>Galium verum</i>	11
<i>Draba verna</i> aggr.	11
<i>Cerastium semidecandrum</i>	11

Dominant species (percentage frequencies of occurrences with cover > 25%)

<i>Festuca beckeri</i>	13
<i>Festuca vaginata</i>	12
<i>Syntrichia ruralis</i> aggr.	6
<i>Bassia laniflora</i>	5

## R12 – Cryptogam- and annual-dominated vegetation on siliceous rock outcrops

Open pioneer grassland dominated by perennial succulents and annuals, with subordinate small tussock grasses, sometimes geophytes and often a prominent contingent of cryptogams. Typically forming small stands on very shallow and skeletal, impoverished, acid soils on siliceous rock outcrops, eroded slopes and disturbed or artificial habitats like soil heaps and wall tops, the habitat occurs throughout temperate and boreal Europe up to the subalpine belt, in situations where the permeable soils dry quickly in summer, but where spring rains can permit a quick flush of growth by the annuals.



### Corresponding alliances in EuroVegChecklist 2016

- > SED-02E Hyperico perforati-Scleranthion perennis Moravec 1967
- > SED-02G Poo bulbosae-Stipion graniticolae Vynokurov 2014
- > SED-01B Rumici acetosellae-Agrostion borealis Knapp 1964
- > SED-02F Scabioso-Trifolion dalmatici Horvatić et N. Randelović in N. Randelović 1977
- > SED-02C Sedion anglici Br.-Bl. in Br.-Bl. et Tx. 1952
- > SED-02D Sedion pyrenaici Tx. in Rivas-Mart. et al. 2011
- > SED-02A Sedo albi-Veronicion dillenii Korneck 1974
- > SED-02B Sedo-Scleranthion Br.-Bl. et Richard 1950
- <> SED-03A Thero-Airion Tx. ex Oberd. 1957

### Characteristic species combination

Diagnostic species (phi coefficient \* 100)

<i>Scleranthus perennis</i>	23
<i>Gagea bohemica</i>	22

<i>Sedum album</i>	21
<i>Draba verna</i> aggr.	20
<i>Sedum rupestre</i>	18
<i>Myosotis stricta</i>	17
<i>Veronica verna</i>	16
<i>Trifolium arvense</i>	15

Constant species (percentage frequencies)

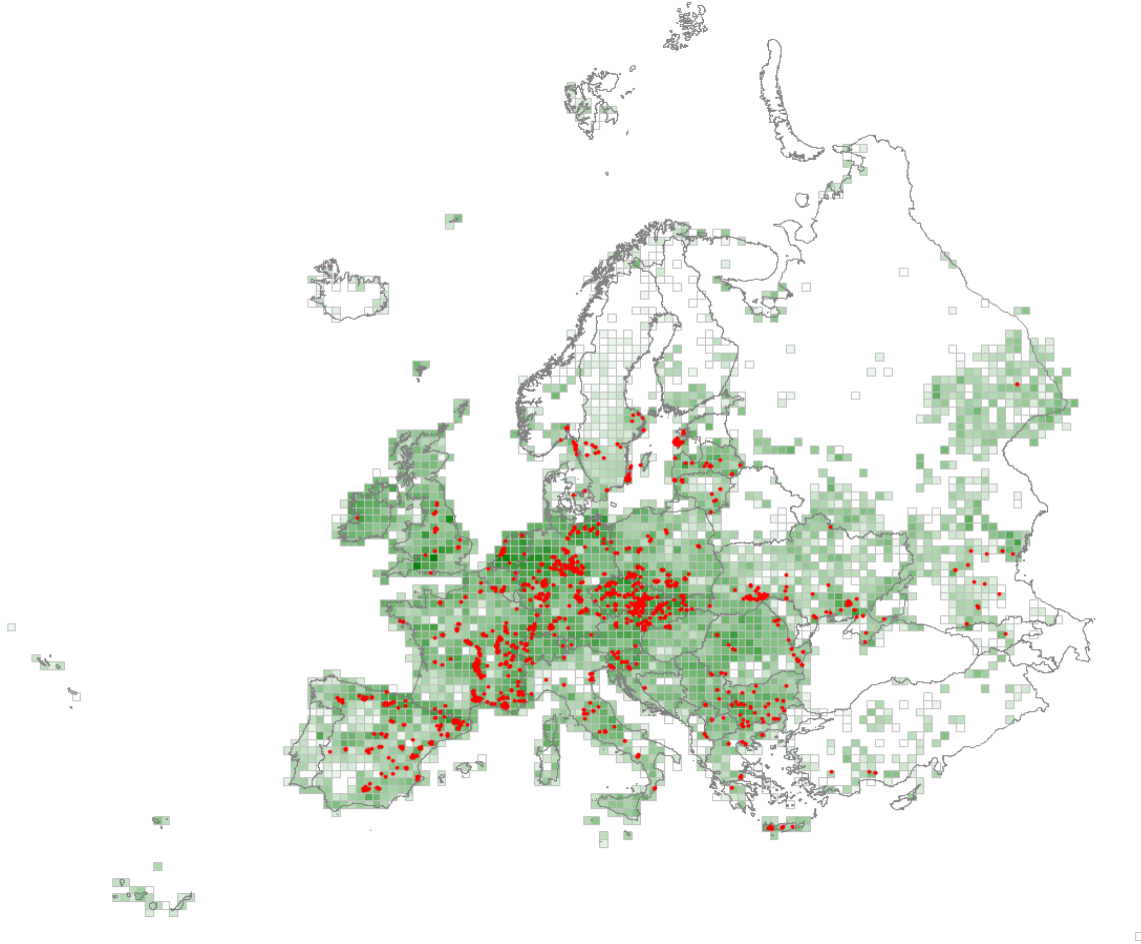
<i>Sedum album</i>	42
<i>Poa bulbosa</i>	39
<i>Scleranthus perennis</i>	34
<i>Draba verna</i> aggr.	33
<i>Trifolium arvense</i>	32
<i>Rumex acetosella</i>	29
<i>Sedum rupestre</i>	27
<i>Arenaria serpyllifolia</i>	27
<i>Sedum acre</i>	26
<i>Potentilla argentea</i>	25
<i>Veronica arvensis</i>	23
<i>Veronica verna</i>	21
<i>Potentilla tabernaemontani</i>	21
<i>Plantago lanceolata</i>	19
<i>Ceratodon purpureus</i>	19
<i>Erodium cicutarium</i>	18
<i>Cerastium pumilum</i>	18
<i>Myosotis stricta</i>	16
<i>Aira caryophylla</i>	16
<i>Sanguisorba minor</i> aggr.	15
<i>Polytrichum piliferum</i>	15
<i>Festuca ovina</i>	15
<i>Euphorbia cyparissias</i>	15
<i>Sedum sexangulare</i>	14
<i>Pilosella officinarum</i>	13
<i>Petrorhagia prolifera</i>	13
<i>Hypnum cupressiforme</i> aggr.	13
<i>Jasione montana</i>	12
<i>Hypericum perforatum</i>	12
<i>Bromus hordeaceus</i>	12
<i>Vulpia bromoides</i>	11
<i>Thymus praecox</i>	11
<i>Syntrichia ruralis</i> aggr.	11
<i>Eryngium campestre</i>	11
<i>Echium vulgare</i>	11

Dominant species (percentage frequencies of occurrences with cover > 25%)

<i>Sedum album</i>	16
<i>Poa bulbosa</i>	5

## R13 – Cryptogam- and annual-dominated vegetation on calcareous and ultramafic rock outcrops

Open pioneer grassland with perennial succulents and spring annuals, subordinate small tussock grasses and herbs, and often with a very prominent and rich contingent of cryptogams. Typically found in small patches on very shallow and skeletal, impoverished, base-rich soils on a wide variety of base-rich and sometimes ultramafic bedrocks, and similar artificial habitats like quarry spoil and wall-tops. It is found from the hemiboreal to the submediterranean zone, occurring mainly at higher altitudes further south.



### Corresponding alliances in EuroVegChecklist 2016

- > SED-04F Aethionemion saxatilis Bergmeier et al. 2009
- > SED-04A Alysso alyssoidis-Sedion Oberd. et T. Müller in T. Müller 1961
- <> SED-04D Armerion junceae Br.-Bl. ex Br.-Bl. et al. 1952
- <> SED-04H Bassio laniflorae-Bromion tectorum Borhidi 1996 nom. conserv. propos.
- > SED-04C Sedion micrantho-sediformis Rivas-Mart., P. Sánchez et Alcaraz ex P. Sánchez et Alcaraz 1993
- <> SED-04G Sileno conicae-Cerastion semidecandri Korneck 1974
- > SED-04B Tortello tortuosae-Sedion albi Hallberg ex Dengler et Löbel 2006
- > SED-04E Valerianion tuberosae Guinochet 1975
- > SED-01A Veronico-Poion glaucae Nordhagen 1943

### Characteristic species combination

Diagnostic species (phi coefficient \* 100)

<i>Saxifraga tridactylites</i>	30
<i>Arenaria serpyllifolia</i>	24

<i>Clinopodium acinos</i>	22
<i>Draba verna</i> aggr.	22
<i>Sedum acre</i>	20
<i>Sedum album</i>	19
<i>Alyssum alyssoides</i>	18
<i>Abietinella abietina</i>	17
<i>Homalothecium sericeum</i>	16
<i>Hornungia petraea</i>	16
<i>Poa compressa</i>	16

Constant species (percentage frequencies)

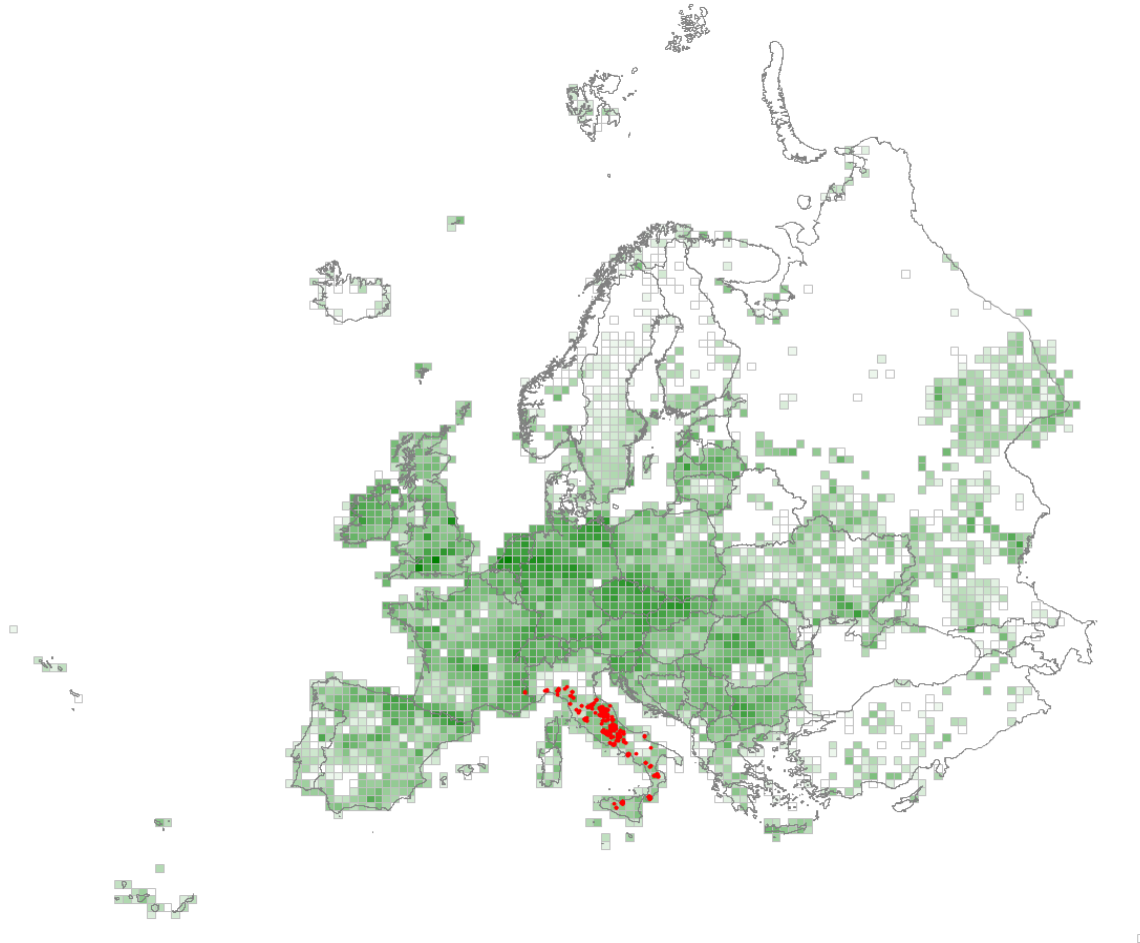
<i>Arenaria serpyllifolia</i>	46
<i>Sedum album</i>	38
<i>Sedum acre</i>	38
<i>Draba verna</i> aggr.	36
<i>Clinopodium acinos</i>	29
<i>Poa bulbosa</i>	26
<i>Saxifraga tridactylites</i>	25
<i>Medicago minima</i>	22
<i>Sanguisorba minor</i> aggr.	20
<i>Potentilla tabernaemontani</i>	20
<i>Poa compressa</i>	20
<i>Alyssum alyssoides</i>	20
<i>Syntrichia ruralis</i> aggr.	18
<i>Euphorbia cyparissias</i>	18
<i>Cerastium semidecandrum</i>	18
<i>Cerastium pumilum</i>	18
<i>Veronica arvensis</i>	17
<i>Sedum sexangulare</i>	16
<i>Erodium cicutarium</i>	15
<i>Echium vulgare</i>	15
<i>Artemisia campestris</i>	15
<i>Abietinella abietina</i>	15
<i>Tortella tortuosa</i>	13
<i>Hypnum cupressiforme</i> aggr.	13
<i>Hornungia petraea</i>	13
<i>Festuca ovina</i>	13
<i>Ceratodon purpureus</i>	13
<i>Plantago lanceolata</i>	12
<i>Holosteum umbellatum</i>	12
<i>Thymus pulegioides</i>	11
<i>Teucrium chamaedrys</i>	11
<i>Medicago lupulina</i>	11

Dominant species (percentage frequencies of occurrences with cover > 25%)

<i>Sedum album</i>	11
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## R14 – Perennial rocky grassland of the Italian Peninsula

Unique to base-rich bedrocks in the Italian Peninsula and Sicily, best developed within the submediterranean bioclimatic zone, this grassland is variously dominated by perennial grasses and herbs, or mat formers and sub-shrubs on steeper, rockier ground. Generally species-rich, and sometimes with contingents of annuals and, in disturbed places, geophytes, the habitat sometimes hosts endemic plants. Developed through clearance of broadleaved and mixed forest it is maintained by traditional grazing in a distinctive cultural landscape.



### Corresponding alliances in EuroVegChecklist 2016

- > ONO-03A Alysson bertolonii E. Pignatti et Pignatti 1977
- > ONO-03C Cytiso spinescentis-Bromion erecti Bonin 1978
- > ONO-03B Cytiso spinescentis-Saturejion montanae Pirone et Tammaro 1997
- > ONO-03D Seslerio nitidae-Caricion macrolepidis Ubaldi 1997

### Characteristic species combination

Diagnostic species (phi coefficient \* 100)

<i>Phleum ambiguum</i>	47
<i>Erysimum pseudorhaeticum</i>	42
<i>Festuca circummediterranea</i>	35
<i>Festuca inops</i>	35
<i>Koeleria lobata</i>	33
<i>Crepis lacera</i>	31
<i>Thymus longicaulis</i>	31
<i>Eryngium amethystinum</i>	28



<i>Bromopsis erecta</i>	27
<i>Potentilla rigoana</i>	26
<i>Festuca robustifolia</i>	25
<i>Centaurea ambigua</i>	25
<i>Armeria canescens</i>	24
<i>Galium lucidum</i>	23
<i>Globularia meridionalis</i>	22
<i>Sedum rupestre</i>	21
<i>Brachypodium genuense</i>	21
<i>Petrorhagia saxifraga</i>	20
<i>Knautia purpurea</i>	20
<i>Asperula purpurea</i>	20
<i>Inula montana</i>	20
<i>Allium sphaerocephalon</i>	20
<i>Valeriana tuberosa</i>	19
<i>Dianthus sylvestris</i>	19
<i>Scorzoneroides cichoriacea</i>	18
<i>Artemisia alba</i>	17
<i>Muscari neglectum</i>	17
<i>Polygala flavescens</i>	17
<i>Bupleurum baldense</i> aggr.	17
<i>Anthyllis vulneraria</i>	17
<i>Cerastium ligusticum</i>	17
<i>Cerastium arvense</i>	16
<i>Cytisus spinescens</i>	16
<i>Stipa dasyvaginata</i>	15
<i>Globularia bisnagarica</i>	15

Constant species (percentage frequencies)

<i>Bromopsis erecta</i>	66
<i>Thymus longicaulis</i>	50
<i>Anthyllis vulneraria</i>	47
<i>Festuca circummediterranea</i>	46
<i>Phleum ambiguum</i>	45
<i>Pilosella officinarum</i>	42
<i>Koeleria lobata</i>	41
<i>Galium lucidum</i>	41
<i>Sanguisorba minor</i> aggr.	39
<i>Eryngium amethystinum</i>	38
<i>Teucrium chamaedrys</i>	33
<i>Sedum rupestre</i>	31
<i>Petrorhagia saxifraga</i>	30
<i>Dianthus sylvestris</i>	28
<i>Clinopodium alpinum</i>	28
<i>Helichrysum italicum</i>	27
<i>Cerastium arvense</i>	27
<i>Erysimum pseudorhaeticum</i>	26
<i>Allium sphaerocephalon</i>	26
<i>Helianthemum nummularium</i>	25
<i>Asperula purpurea</i>	25
<i>Plantago lanceolata</i>	22
<i>Lotus corniculatus</i>	21
<i>Festuca inops</i>	21
<i>Armeria canescens</i>	21
<i>Satureja montana</i> aggr.	20
<i>Hippocrepis comosa</i>	20
<i>Helianthemum canum</i>	20
<i>Inula montana</i>	18
<i>Globularia meridionalis</i>	18

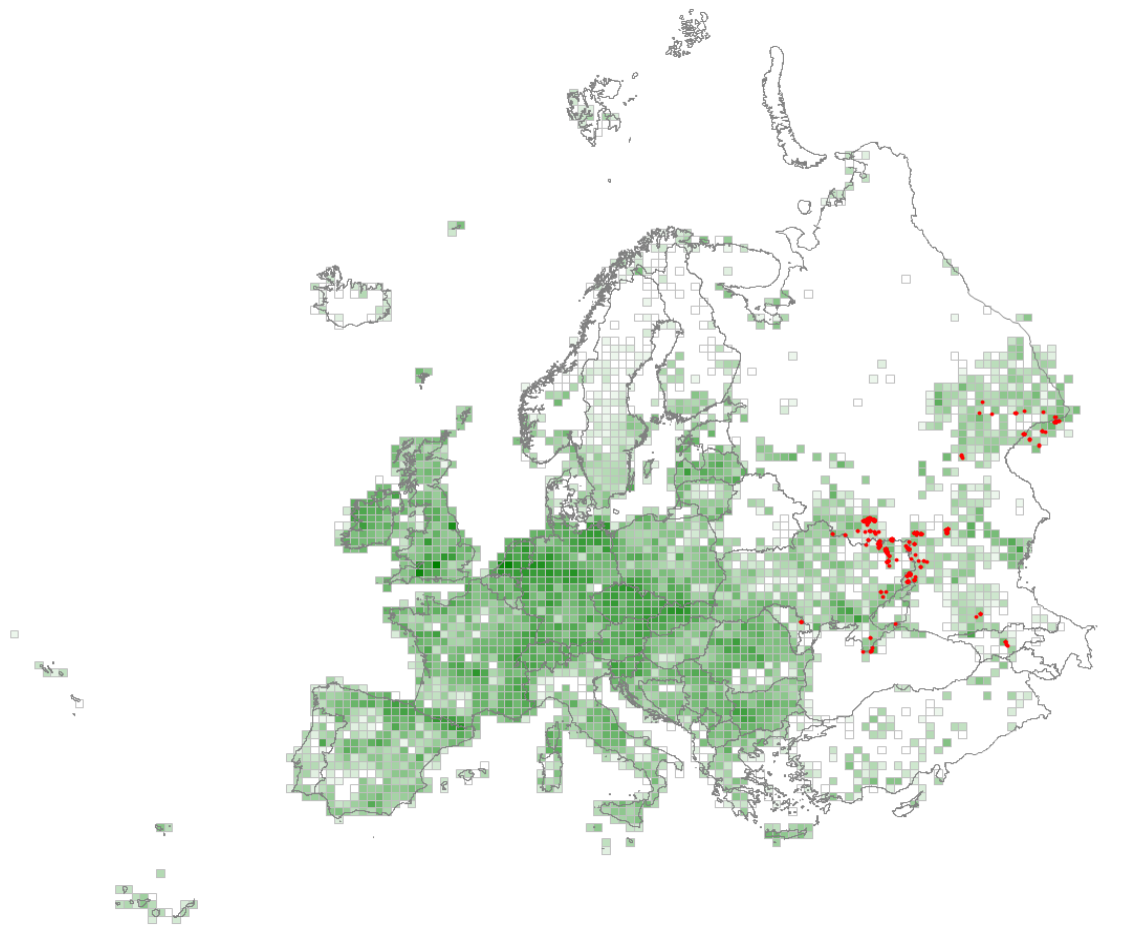
<i>Galium corrudifolium</i>	18
<i>Dactylis glomerata</i>	18
<i>Asperula cynanchica</i>	18
<i>Muscari neglectum</i>	17
<i>Helictochloa versicolor</i>	17
<i>Brachypodium genuense</i>	17
<i>Asperula aristata</i>	17
<i>Artemisia alba</i>	17
<i>Teucrium montanum</i>	16
<i>Valeriana tuberosa</i>	15
<i>Sedum sexangulare</i>	15
<i>Hypericum perforatum</i>	15
<i>Globularia bisnagarica</i>	15
<i>Crepis lacera</i>	15
<i>Convolvulus cantabrica</i>	15
<i>Bupleurum baldense</i> aggr.	15
<i>Brachypodium rupestre</i>	15
<i>Anthoxanthum odoratum</i> aggr.	15
<i>Trifolium campestre</i>	14
<i>Silene otites</i> aggr.	14
<i>Minuartia verna</i> aggr.	14
<i>Knautia purpurea</i>	14
<i>Carex caryophyllea</i>	14
<i>Silene vulgaris</i>	13
<i>Seseli montanum</i>	13
<i>Reichardia picroides</i>	13
<i>Poa alpina</i>	13
<i>Festuca robustifolia</i>	13
<i>Thesium humifusum</i>	12
<i>Stachys recta</i>	12
<i>Silene italica</i> aggr.	12
<i>Poa bulbosa</i>	12
<i>Plantago holosteum</i>	12
<i>Cynosurus echinatus</i>	12
<i>Cyanus triumfettii</i> aggr.	12
<i>Centaurea ambigua</i>	12
<i>Cytisus spinescens</i>	11

Dominant species (percentage frequencies of occurrences with cover > 25%)

<i>Bromopsis erecta</i>	16
<i>Festuca circummediterranea</i>	11
<i>Brachypodium genuense</i>	8

## R15 – Continental dry rocky steppic grassland and dwarf scrub on chalk outcrops

Usually open vegetation dominated by dwarf shrubs and perennial mat-forming continental steppe plants on free-draining base-rich soils on rocky chalk outcrops in the Don and (possibly also) Volga basins.



### Corresponding alliances in EuroVegChecklist 2016

- > FES-06A Artemisio hololeucaae-Hyssopion cretacei Romashchenko et al. 1996
- > FES-06B Euphorbio cretophilaee-Thymion cretacei Didukh 1989

### Characteristic species combination

Diagnostic species (phi coefficient \* 100)

<i>Thymus calcareus</i>	74
<i>Onosma simplicissima</i>	53
<i>Gypsophila altissima</i>	53
<i>Astragalus albicaulis</i>	51
<i>Polygala cretacea</i>	48
<i>Asperula tephrocarpa</i>	47
<i>Jurinea arachnoidea</i>	47
<i>Linum ucranicum</i>	46
<i>Polygala sibirica</i>	45
<i>Artemisia salsoloides</i>	44
<i>Pimpinella titanophila</i>	39
<i>Matthiola fragrans</i>	39
<i>Cephalaria uralensis</i>	38

<i>Koeleria talievii</i>	38
<i>Salvia nutans</i>	37
<i>Euphorbia petrophila</i>	35
<i>Viola ambigua</i>	34
<i>Hedysarum grandiflorum</i>	33
<i>Stipa capillata</i>	33
<i>Gypsophila oligosperma</i>	33
<i>Silene supina</i>	32
<i>Psephellus sumensis</i>	31
<i>Artemisia hololeuca</i>	30
<i>Psephellus carbonatus</i>	30
<i>Linum pallasianum</i>	30
<i>Potentilla humifusa</i>	30
<i>Galium octonarium</i>	30
<i>Euphorbia seguieriana</i>	30
<i>Thesium ramosum</i>	29
<i>Psephellus marschallianus</i>	29
<i>Campanula sibirica</i>	29
<i>Erysimum diffusum</i>	28
<i>Hyssopus officinalis</i>	28
<i>Scrophularia cretacea</i>	28
<i>Pimpinella tragium</i>	28
<i>Lomelosia isetensis</i>	28
<i>Odontarrhena tortuosa</i>	27
<i>Astragalus austriacus</i>	27
<i>Bromopsis riparia</i>	27
<i>Astragalus subuliformis</i>	25
<i>Reseda lutea</i>	24
<i>Stipa pennata</i>	24
<i>Hyacinthella pallasiana</i>	23
<i>Medicago falcata</i>	22
<i>Brassica elongata</i> subsp. <i>pinnatifida</i>	22
<i>Rhaponticoides ruthenica</i>	21
<i>Linum perenne</i>	21
<i>Onobrychis arenaria</i>	21
<i>Hedysarum razoumovianum</i>	20
<i>Crambe tataria</i>	20
<i>Festuca valesiaca</i> aggr.	20
<i>Elytrigia lolioides</i>	20
<i>Atraphaxis frutescens</i>	20
<i>Trinia multicaulis</i>	20
<i>Stipa zalesskii</i>	19
<i>Meniocus linifolius</i>	19
<i>Centaurea orientalis</i>	19
<i>Salvia verticillata</i>	18
<i>Jurinea stoechadifolia</i>	18
<i>Hieracium virosum</i>	18
<i>Genista scythica</i>	18
<i>Dianthus pseudarmeria</i>	18
<i>Verbascum marschallianum</i>	17
<i>Astragalus tenuifolius</i>	17
<i>Bupleurum falcatum</i>	17
<i>Scabiosa ochroleuca</i>	17
<i>Archanthemis trotzkiana</i>	17
<i>Allium inaequale</i>	17
<i>Teucrium polium</i> aggr.	17
<i>Stipa lessingiana</i>	17
<i>Echinops ritro</i>	17
<i>Nonea pulla</i>	17

<i>Galatella villosa</i>	17
<i>Taraxacum serotinum</i>	17
<i>Adonis vernalis</i>	17
<i>Arenaria procera</i>	16
<i>Psephellus leucophyllus</i>	16
<i>Hedysarum argyrophyllum</i>	16
<i>Euphorbia subtilis</i>	16
<i>Zygophyllum pinnatum</i>	16
<i>Melampyrum arvense</i>	16
<i>Hypericum elegans</i>	16
<i>Oxytropis pilosa</i>	15
<i>Hedysarum cretaceum</i>	15
<i>Helichrysum tanaiticum</i>	15
<i>Caragana frutex</i>	15
<i>Festuca cretacea</i>	15

Constant species (percentage frequencies)

<i>Thymus calcareus</i>	54
<i>Euphorbia seguieriana</i>	50
<i>Festuca valesiaca</i> aggr.	46
<i>Stipa capillata</i>	44
<i>Teucrium polium</i> aggr.	41
<i>Onosma simplicissima</i>	38
<i>Medicago falcata</i>	38
<i>Gypsophila altissima</i>	38
<i>Jurinea arachnoidea</i>	36
<i>Campanula sibirica</i>	33
<i>Salvia nutans</i>	32
<i>Erysimum diffusum</i>	32
<i>Pimpinella tragium</i>	29
<i>Bromopsis riparia</i>	29
<i>Stachys recta</i>	28
<i>Cephalaria uralensis</i>	27
<i>Thesium ramosum</i>	26
<i>Stipa pennata</i>	26
<i>Astragalus albicaulis</i>	26
<i>Artemisia salsoloides</i>	26
<i>Reseda lutea</i>	25
<i>Polygala sibirica</i>	23
<i>Polygala cretacea</i>	23
<i>Thalictrum minus</i>	22
<i>Securigera varia</i>	22
<i>Odontarrhena tortuosa</i>	22
<i>Linum ucranicum</i>	22
<i>Koeleria pyramidata</i>	22
<i>Echinops ritro</i>	22
<i>Carex humilis</i>	22
<i>Bupleurum falcatum</i>	22
<i>Asperula tephrocarpa</i>	22
<i>Viola ambigua</i>	21
<i>Scabiosa ochroleuca</i>	21
<i>Asperula cynanchica</i>	21
<i>Vincetoxicum hirundinaria</i>	20
<i>Galium octonarum</i>	19
<i>Salvia verticillata</i>	18
<i>Euphorbia petrophila</i>	18
<i>Silene supina</i>	17
<i>Poa bulbosa</i>	17
<i>Stipa lessingiana</i>	16

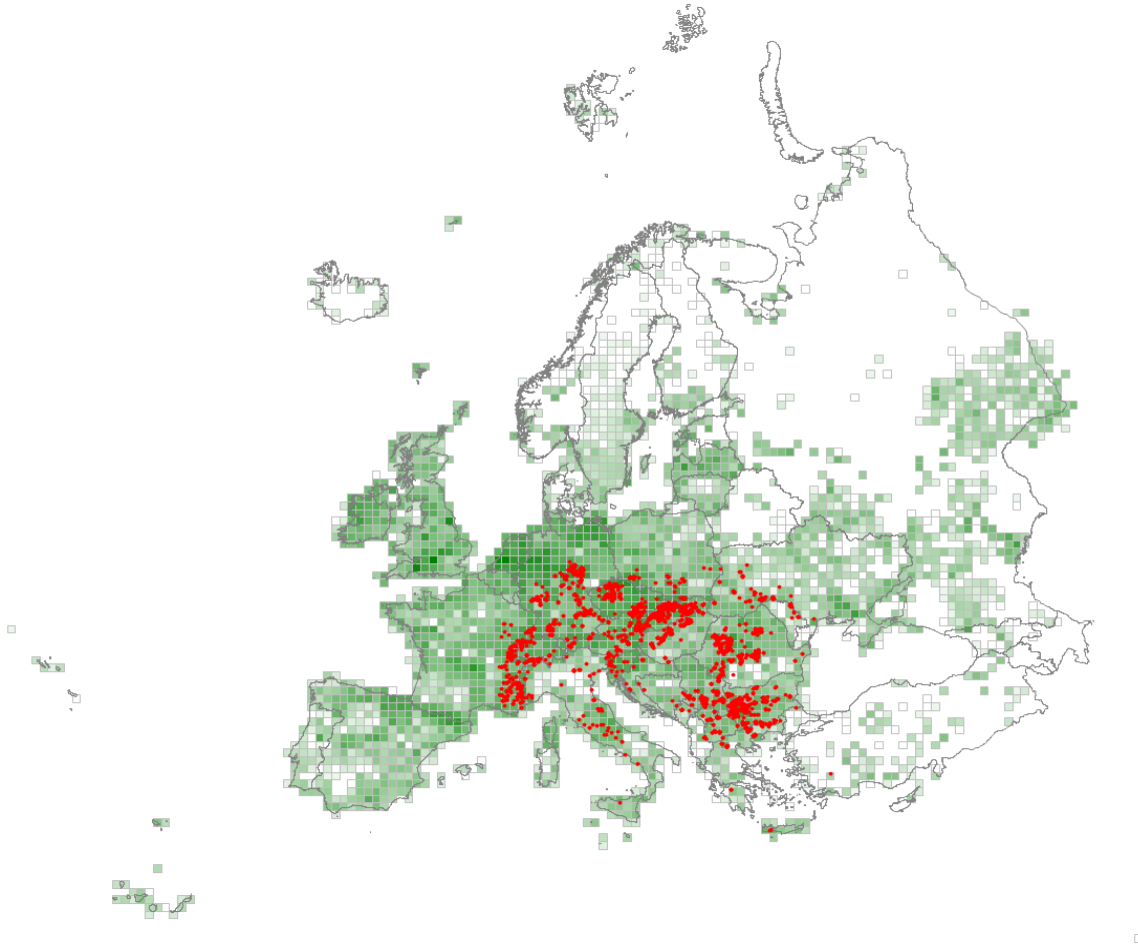
<i>Psephellus marschallianus</i>	16
<i>Potentilla humifusa</i>	16
<i>Pimpinella titanophila</i>	16
<i>Meniocus linifolius</i>	16
<i>Matthiola fragrans</i>	16
<i>Hedysarum grandiflorum</i>	16
<i>Genista tinctoria</i>	16
<i>Galium verum</i>	16
<i>Centaurea stoebe</i>	16
<i>Astragalus austriacus</i>	16
<i>Artemisia campestris</i>	16
<i>Psephellus sumensis</i>	15
<i>Koeleria talievii</i>	15
<i>Helichrysum arenarium</i>	15
<i>Helianthemum nummularium</i>	15
<i>Galatella villosa</i>	15
<i>Euphorbia nicaeensis</i>	15
<i>Astragalus onobrychis</i>	15
<i>Poa compressa</i>	13
<i>Plantago lanceolata</i>	13
<i>Onobrychis arenaria</i>	13
<i>Lomelosia isetensis</i>	13
<i>Hyssopus officinalis</i>	13
<i>Artemisia lerchiana</i>	13
<i>Anthericum ramosum</i>	13
<i>Plantago media</i>	12
<i>Linum perenne</i>	12
<i>Hypericum perforatum</i>	12
<i>Astragalus subuliformis</i>	12
<i>Ajuga chamaepitys</i>	12
<i>Adonis vernalis</i>	12
<i>Psephellus carbonatus</i>	11
<i>Potentilla cinerea</i>	11
<i>Linum tenuifolium</i>	11
<i>Gypsophila oligosperma</i>	11
<i>Filipendula vulgaris</i>	11
<i>Ephedra distachya</i>	11
<i>Caragana frutex</i>	11
<i>Achillea setacea</i>	11

Dominant species (percentage frequencies of occurrences with cover > 25%)

<i>Artemisia salsoloides</i>	13
<i>Thymus calcareus</i>	7

## R16 – Perennial rocky grassland of Central and South-Eastern Europe

Open grassland generally dominated by perennial grasses with rich mixtures of associated rosette herbs, mat-formers and geophytes, and especially towards Southern Europe, annuals. It occurs on shallow, impoverished soils over both calcareous and siliceous bedrocks, through the lowlands and submontane zone of Central and Southern Europe, best developed on steeper ground unsuited for agriculture, but extended where forest clearance and grazing, particularly by goats, have been part of traditional farming.



### Corresponding alliances in EuroVegChecklist 2016

- > FES-05A *Alyso-Festucion pallentis* Moravec in Holub et al. 1967
- > FES-05H *Androsaco tauricae-Caricion humilis* Didukh in Mucina et Didukh 2014
- > FES-05B *Asplenio-Festucion pallentis* Zólyomi 1936 corr. 1966
- > FES-05C *Bromo pannonici-Festucion csikhegyensis* Zólyomi 1966 corr. Mucina in Di Pietro et al. 2015
- > FES-05I *Diantho lumnitzeri-Seslerion* (Soó 1971) Chytrý et Mucina in Mucina et Kolbek 1993
- > FES-05D *Chrysopogono-Festucion dalmatica* Borhidi 1996
- > FES-05F *Pimpinello-Thymion zygoidi* Dihoru et Donița 1970
- > FES-05G *Potentillo arenariae-Linion czerniaevii* Krasova et Smetana 1999
- > FES-05E *Saturejion montanae* Horvat in Horvat et al. 1974
- > FES-10A *Saturejo-Thymion* Micevski 1971
- > FES-05J *Seslerion rigidae* Zólyomi 1936

## Characteristic species combination

### Diagnostic species (phi coefficient \* 100)

<i>Festuca pallens</i>	27
<i>Potentilla incana</i>	23
<i>Seseli osseum</i>	22
<i>Euphorbia cyparissias</i>	21
<i>Jovibarba globifera</i>	20
<i>Teucrium montanum</i>	17
<i>Asperula cynanchica</i>	17
<i>Anthericum ramosum</i>	17
<i>Carex humilis</i>	16
<i>Allium senescens</i> aggr.	16

### Constant species (percentage frequencies)

<i>Euphorbia cyparissias</i>	53
<i>Teucrium chamaedrys</i>	40
<i>Asperula cynanchica</i>	39
<i>Teucrium montanum</i>	36
<i>Carex humilis</i>	36
<i>Sanguisorba minor</i> aggr.	33
<i>Helianthemum nummularium</i>	30
<i>Stachys recta</i>	28
<i>Festuca pallens</i>	26
<i>Vincetoxicum hirundinaria</i>	25
<i>Sedum album</i>	25
<i>Melica ciliata</i> aggr.	25
<i>Thymus praecox</i>	22
<i>Potentilla incana</i>	22
<i>Centaurea stoebe</i>	22
<i>Anthericum ramosum</i>	22
<i>Anthyllis vulneraria</i>	21
<i>Sesleria caerulea</i>	18
<i>Clinopodium acinos</i>	16
<i>Pilosella officinarum</i>	15
<i>Hypericum perforatum</i>	15
<i>Allium senescens</i> aggr.	14
<i>Seseli osseum</i>	13
<i>Jovibarba globifera</i>	13
<i>Galium mollugo</i> aggr.	13
<i>Dianthus carthusianorum</i> aggr.	13
<i>Artemisia campestris</i>	13
<i>Allium flavum</i>	13
<i>Sedum acre</i>	12
<i>Scabiosa ochroleuca</i>	12
<i>Koeleria macrantha</i>	12
<i>Asplenium ruta-muraria</i>	12
<i>Arenaria serpyllifolia</i>	12
<i>Medicago falcata</i>	11
<i>Lotus corniculatus</i>	11
<i>Leontodon crispus</i> aggr.	11
<i>Hippocrepis comosa</i>	11
<i>Fumana procumbens</i>	11
<i>Eryngium campestre</i>	11
<i>Campanula rotundifolia</i>	11
<i>Bupleurum falcatum</i>	11
<i>Bothriochloa ischaemum</i>	11
<i>Achillea millefolium</i> aggr.	11



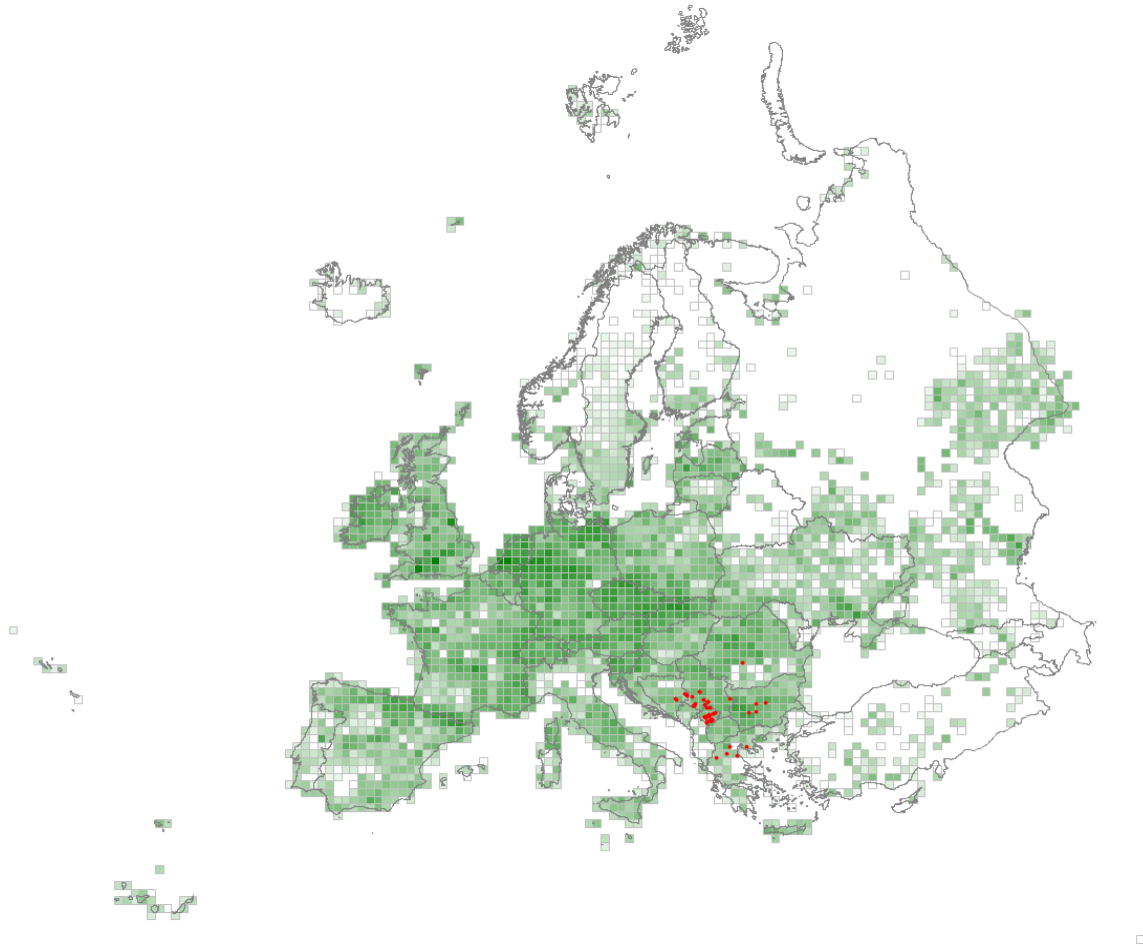
Dominant species (percentage frequencies of occurrences with cover > 25%)

*Carex humilis* 11

*Festuca pallens* 5

## R17 – Heavy-metal dry grassland of the Balkans

Grassland confined to dry, nutrient-poor soils rich in heavy metals derived from ultramafic bedrock in the mountains of the Balkans, Euboea and Cyprus with an open cover of grasses and forbs, including many endemics.



### Corresponding alliances in EuroVegChecklist 2016

- > FES-11C Alysson heldreichii Bergmeier et al. 2009
- > FES-11B Centaureo-Bromion fibrosi Blečić et al. 1969
- > FES-11A Polygonion albanicae Ritter-Studnička 1970

### Characteristic species combination

Diagnostic species (phi coefficient \* 100)

<i>Euphorbia glabriflora</i>	66
<i>Odontarrhena markgrafii</i>	57
<i>Stachys scardica</i>	49
<i>Halacsya sendtneri</i>	44
<i>Plantago holosteum</i>	40
<i>Centaurea kosaninii</i>	38
<i>Minuartia verna</i> aggr.	35
<i>Potentilla visianii</i>	33
<i>Pontechium maculatum</i>	33
<i>Scabiosa fumarioides</i>	32
<i>Poa badensis</i> aggr.	32
<i>Fumana bonapartei</i>	32

<i>Astragalus onobrychis</i>	31
<i>Artemisia alba</i>	31
<i>Linum tauricum</i>	31
<i>Bromopsis riparia</i>	31
<i>Festuca panciciana</i>	30
<i>Silene bupleuroides</i>	30
<i>Euphorbia barrelieri</i>	29
<i>Verbascum glabratum</i>	28
<i>Erysimum diffusum</i>	27
<i>Cytisus pseudoprocumbens</i>	27
<i>Alyssum montanum</i> aggr.	26
<i>Silene paradoxa</i>	26
<i>Iris reichenbachii</i>	26
<i>Achillea coarctata</i>	25
<i>Medicago prostrata</i>	25
<i>Sedum hispanicum</i>	24
<i>Leontodon crispus</i> aggr.	24
<i>Stipa mayeri</i>	23
<i>Saponaria intermedia</i>	23
<i>Linaria concolor</i>	23
<i>Convolvulus boissieri</i>	23
<i>Centaurea stereophylla</i>	23
<i>Paragymnopteris marantae</i>	23
<i>Traunsteinera globosa</i>	22
<i>Thesium ramosum</i>	22
<i>Odontarrhena muralis</i>	22
<i>Pilosella cymosa</i>	22
<i>Colchicum hungaricum</i>	22
<i>Sesleria latifolia</i>	22
<i>Potentilla tommasiniana</i>	22
<i>Noccaea goesingensis</i>	22
<i>Potentilla heptaphylla</i>	21
<i>Alyssum bosniacum</i>	21
<i>Stachys recta</i>	20
<i>Linum perenne</i>	20
<i>Carduus candicans</i>	20
<i>Tragopogon pterodes</i>	20
<i>Polygala doerfleri</i>	20
<i>Euphrasia pectinata</i>	20
<i>Achillea pseudopectinata</i>	20
<i>Veronica austriaca</i>	19
<i>Odontarrhena heldreichii</i>	19
<i>Crepis pontana</i>	19
<i>Orobanche gracilis</i>	19
<i>Plantago argentea</i>	19
<i>Dorycnium pentaphyllum</i>	18
<i>Atocion armeria</i>	18
<i>Stipa pulcherrima</i>	18
<i>Cerastium moesiacum</i>	18
<i>Trinia glauca</i>	18
<i>Aethionema saxatile</i>	17
<i>Potentilla pedata</i>	17
<i>Armeria rumelica</i>	17
<i>Thymus longicaulis</i>	17
<i>Ornithogalum collinum</i>	17
<i>Euphorbia montenegrina</i>	17
<i>Convolvulus cantabrica</i>	17
<i>Bupleurum flavicans</i>	17
<i>Sanguisorba minor</i> aggr.	16

<i>Ranunculus concinnatus</i>	16
<i>Potentilla astracanica</i>	16
<i>Onosma echioides</i>	16
<i>Eryngium serbicum</i>	16
<i>Centaurea vermia</i>	16
<i>Teucrium montanum</i>	16
<i>Dianthus giganteus</i>	16
<i>Trifolium alpestre</i>	16
<i>Leucanthemum graminifolium</i>	16
<i>Polygala supina</i>	16
<i>Podospermum laciniatum</i>	15
<i>Galium lucidum</i>	15
<i>Cerastium decalvans</i>	15
<i>Scleranthus perennis</i>	15
<i>Chrysopogon gryllus</i>	15
<i>Dianthus noeanus</i>	15
<i>Stipa novakii</i>	15
<i>Centaurea kotschyana</i>	15

Constant species (percentage frequencies)

<i>Minuartia verna</i> aggr.	61
<i>Sanguisorba minor</i> aggr.	50
<i>Plantago holosteum</i>	50
<i>Euphorbia glabriflora</i>	50
<i>Stachys recta</i>	39
<i>Odontarrhena markgrafii</i>	39
<i>Dorycnium pentaphyllum</i>	39
<i>Astragalus onobrychis</i>	39
<i>Stachys scardica</i>	36
<i>Teucrium montanum</i>	33
<i>Bromopsis riparia</i>	33
<i>Sedum album</i>	31
<i>Leontodon crispus</i> aggr.	31
<i>Erysimum diffusum</i>	31
<i>Artemisia alba</i>	31
<i>Thymus longicaulis</i>	28
<i>Poa badensis</i> aggr.	28
<i>Galium lucidum</i>	28
<i>Odontarrhena muralis</i>	25
<i>Alyssum montanum</i> aggr.	25
<i>Veronica austriaca</i>	22
<i>Thymus praecox</i>	22
<i>Sedum hispanicum</i>	22
<i>Scleranthus perennis</i>	22
<i>Convolvulus cantabrica</i>	22
<i>Anthyllis vulneraria</i>	22
<i>Trinia glauca</i>	19
<i>Trifolium alpestre</i>	19
<i>Thesium ramosum</i>	19
<i>Scabiosa columbaria</i> aggr.	19
<i>Rumex acetosella</i>	19
<i>Poa bulbosa</i>	19
<i>Pilosella cymosa</i>	19
<i>Melica ciliata</i> aggr.	19
<i>Lotus corniculatus</i>	19
<i>Hippocrepis comosa</i>	19
<i>Halacsya sendtneri</i>	19
<i>Centaurea stoebe</i>	19
<i>Stipa pulcherrima</i>	17

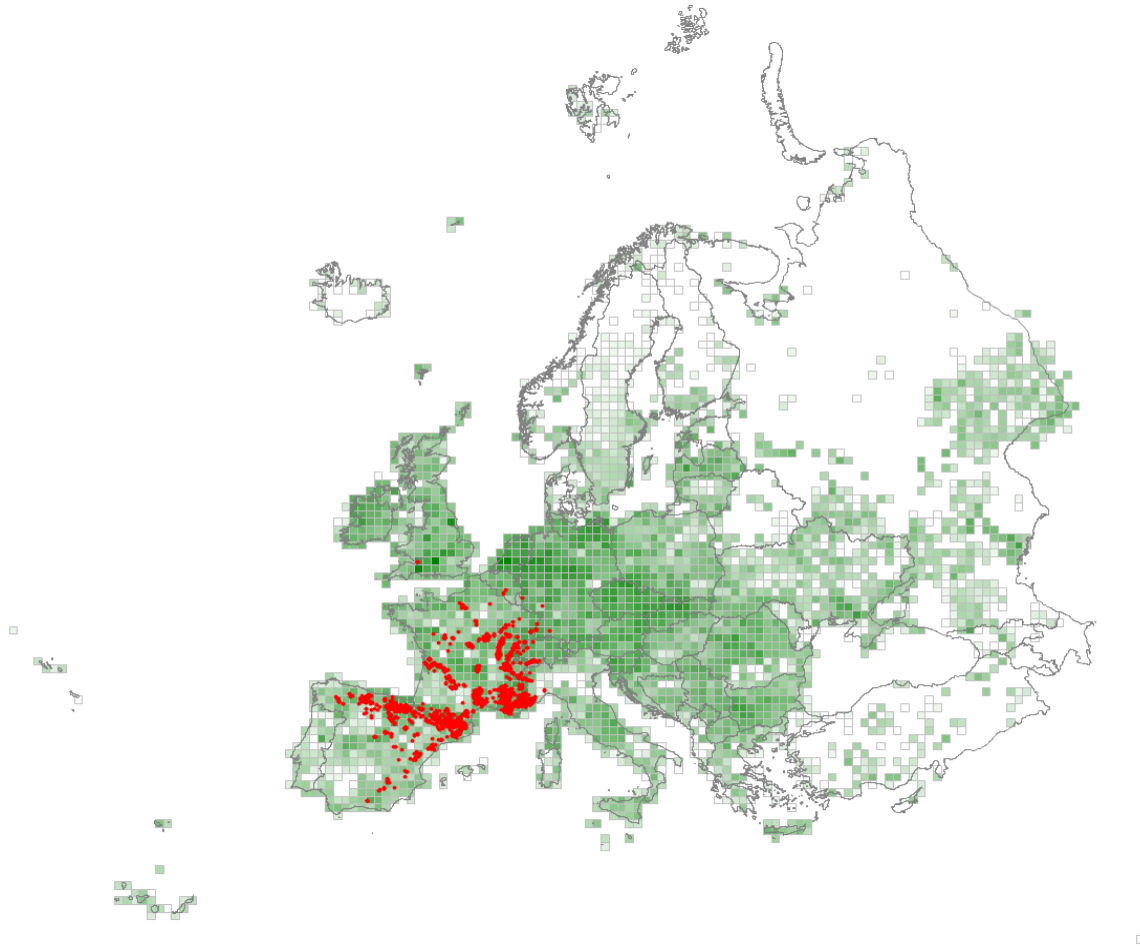
<i>Silene bupleuroides</i>	17
<i>Potentilla heptaphylla</i>	17
<i>Pontechium maculatum</i>	17
<i>Paragymnopteris marantae</i>	17
<i>Linum tauricum</i>	17
<i>Chrysopogon gryllus</i>	17
<i>Festuca panciciana</i>	17
<i>Centaurea kosaninii</i>	17
<i>Aethionema saxatile</i>	17
<i>Stipa pennata</i>	14
<i>Silene paradoxa</i>	14
<i>Primula veris</i>	14
<i>Medicago prostrata</i>	14
<i>Koeleria splendens</i>	14
<i>Euphorbia cyparissias</i>	14
<i>Euphorbia barrelieri</i>	14
<i>Eryngium campestre</i>	14
<i>Asperula purpurea</i>	14
<i>Achillea coarctata</i>	14
<i>Trifolium arvense</i>	11
<i>Traunsteinera globosa</i>	11
<i>Sedum ochroleucum</i>	11
<i>Sedum acre</i>	11
<i>Scabiosa fumarioides</i>	11
<i>Potentilla visianii</i>	11
<i>Potentilla pedata</i>	11
<i>Potentilla astracantha</i>	11
<i>Podospermum laciniatum</i>	11
<i>Poa alpina</i>	11
<i>Plantago lanceolata</i>	11
<i>Plantago argentea</i>	11
<i>Paronychia kapela</i>	11
<i>Orobanche gracilis</i>	11
<i>Linum perenne</i>	11
<i>Iris reichenbachii</i>	11
<i>Hypericum perforatum</i>	11
<i>Hypericum barbatum</i>	11
<i>Genista tinctoria</i>	11
<i>Galium verum</i>	11
<i>Galatella linosyris</i>	11
<i>Fumana bonapartei</i>	11
<i>Filipendula vulgaris</i>	11
<i>Euphrasia pectinata</i>	11
<i>Clinopodium alpinum</i>	11
<i>Cerastium arvense</i>	11
<i>Carex kitaibeliana</i>	11
<i>Carex caryophyllea</i>	11
<i>Campanula glomerata</i>	11
<i>Asperula cynanchica</i>	11
<i>Allium flavum</i>	11

Dominant species (percentage frequencies of occurrences with cover > 25%)

<i>Euphorbia glabriflora</i>	11
<i>Scabiosa fumarioides</i>	6
<i>Minuartia verna</i> aggr.	6
<i>Halacsya sendtneri</i>	6
<i>Convolvulus boissieri</i>	6

## R18 – Perennial rocky calcareous grassland of subatlantic-submediterranean Europe

Open grassland dominated by perennials and especially rich in mat-formers, typical of rudimentary, shallow, nutrient-poor, base-rich soils over sloping, rubbly limestone terrain. It occurs in the lowland to submontane belts in subatlantic and submediterranean Western Europe, including some areas at higher altitudes in the Western Mediterranean mountains, which were traditionally maintained by extensive grazing.



### Corresponding alliances in EuroVegChecklist 2016

- > FES-07B *Artemisio albae-Dichanthion ischaemi* X. Font ex Rivas-Mart. et M.L. López in Rivas-Mart. et al. 2002
- > FES-08B *Festuco-Bromion* Barbero et Loisel 1971
- > FES-08A *Xerobromion erecti* Zoller 1954

### Characteristic species combination

Diagnostic species (phi coefficient \* 100)

<i>Koeleria vallesiana</i>	28
<i>Coronilla minima</i>	28
<i>Seseli montanum</i>	25
<i>Potentilla tabernaemontani</i>	23
<i>Fumana procumbens</i>	21
<i>Helianthemum apenninum</i>	20
<i>Bromopsis erecta</i>	20
<i>Globularia bisnagarica</i>	19
<i>Hippocrepis comosa</i>	19

<i>Ononis striata</i>	19
<i>Inula montana</i>	17
<i>Carex halleriana</i>	17
<i>Aphyllanthes monspeliensis</i>	17
<i>Linum suffruticosum</i> aggr.	16
<i>Teucrium chamaedrys</i>	16
<i>Carex humilis</i>	16
<i>Asperula cynanchica</i>	16
<i>Teucrium montanum</i>	15
<i>Onobrychis supina</i>	15

Constant species (percentage frequencies)

<i>Koeleria vallesiana</i>	56
<i>Teucrium chamaedrys</i>	51
<i>Bromopsis erecta</i>	50
<i>Coronilla minima</i>	42
<i>Carex humilis</i>	36
<i>Asperula cynanchica</i>	36
<i>Thymus vulgaris</i>	33
<i>Hippocrepis comosa</i>	33
<i>Eryngium campestre</i>	33
<i>Seseli montanum</i>	32
<i>Potentilla tabernaemontani</i>	32
<i>Anthyllis vulneraria</i>	32
<i>Teucrium montanum</i>	31
<i>Fumana procumbens</i>	30
<i>Sanguisorba minor</i> aggr.	29
<i>Pilosella officinarum</i>	29
<i>Carex halleriana</i>	28
<i>Helianthemum apenninum</i>	27
<i>Thymus serpyllum</i>	25
<i>Aphyllanthes monspeliensis</i>	25
<i>Scabiosa columbaria</i> aggr.	24
<i>Helianthemum canum</i>	24
<i>Festuca ovina</i>	24
<i>Linum suffruticosum</i> aggr.	21
<i>Helianthemum nummularium</i>	19
<i>Globularia bisnagarica</i>	19
<i>Helictochloa pratensis</i>	18
<i>Stachys recta</i>	16
<i>Lotus corniculatus</i>	16
<i>Inula montana</i>	16
<i>Festuca rubra</i> aggr.	16
<i>Dorycnium pentaphyllum</i>	16
<i>Trinia glauca</i>	15
<i>Teucrium polium</i> aggr.	15
<i>Sedum sediforme</i>	15
<i>Potentilla pusilla</i>	15
<i>Lavandula angustifolia</i>	15
<i>Juniperus communis</i> subsp. <i>communis</i>	15
<i>Helichrysum stoechas</i>	15
<i>Helictochloa bromoides</i>	15
<i>Helianthemum italicum</i>	15
<i>Galium corrudifolium</i>	15
<i>Anthyllis montana</i>	15
<i>Thymus praecox</i>	14
<i>Ononis pusilla</i>	14
<i>Genista scorpius</i>	14
<i>Astragalus monspessulanus</i>	14

<i>Allium sphaerocephalon</i>	14
<i>Lavandula latifolia</i>	13
<i>Euphorbia cyparissias</i>	13
<i>Brachypodium pinnatum</i>	13
<i>Argyrolobium zanonii</i>	13
<i>Sedum album</i>	12
<i>Buxus sempervirens</i>	12
<i>Brachypodium phoenicoides</i>	12
<i>Thesium divaricatum</i>	11
<i>Sesleria caerulea</i>	11
<i>Linum tenuifolium</i>	11
<i>Globularia vulgaris</i>	11
<i>Dianthus sylvestris</i>	11

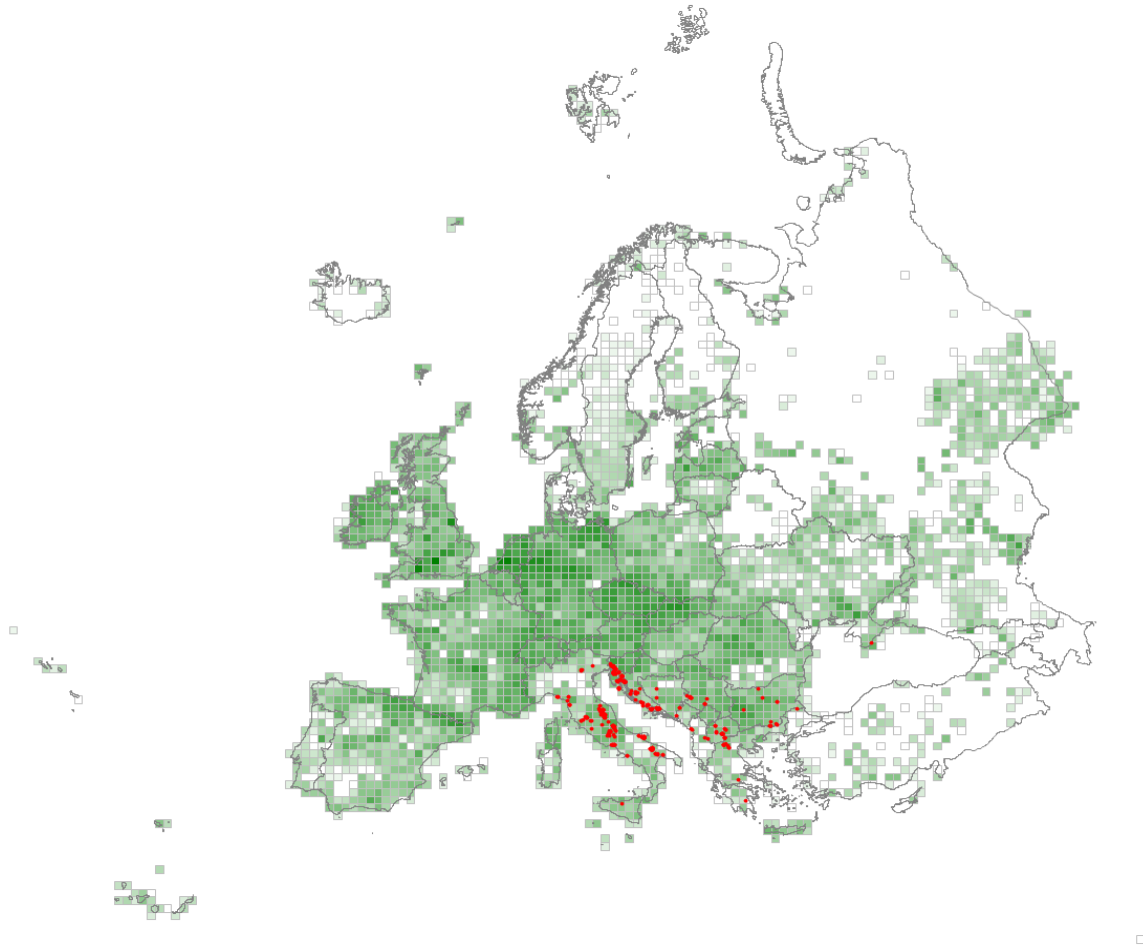
Dominant species (percentage frequencies of occurrences with cover > 25%)

<i>Bromopsis erecta</i>	11
<i>Carex humilis</i>	7



## R19 – Dry steppic submediterranean pasture of the Amphi-Adriatic region

Dry steppic pasture typical of sharply-draining, base-rich soils developed over valley sides, dolines and sink-holes around the Adriatic seaboard where the submediterranean climate is characterised by late autumn and spring rains and summer drought. Dominated by often rich mixtures of graminoids, forbs and mat-formers, the habitat is dependent on extensive grazing and now often survives patchily among mosaics of scrub and forest.



### Corresponding alliances in EuroVegChecklist 2016

- > FES-09C *Centaureion dichroanthae* Pignatti 1952
- > FES-09E *Hippocrepido glaucae-Stipion austroitalicae* Forte et Terzi in Forte et al. 2005
- > FES-09A *Chrysopogono grylli-Koelerion splendidis* Horvatić 1973
- > FES-09B *Saturejion subspicatae* Tomić-Stanković 1970

### Characteristic species combination

Diagnostic species (phi coefficient \* 100)

<i>Satureja montana</i> aggr.	38
<i>Centaurea rupestris</i> aggr.	31
<i>Genista sylvestris</i>	31
<i>Scorzonera villosa</i>	27
<i>Koeleria splendens</i>	27
<i>Eryngium amethystinum</i>	27
<i>Fumana procumbens</i>	26
<i>Sesleria juncifolia</i>	24

<i>Festuca illyrica</i>	24
<i>Dianthus sylvestris</i>	24
<i>Galium corrudifolium</i>	22
<i>Koeleria lobata</i>	22
<i>Bromopsis erecta</i>	22
<i>Teucrium montanum</i>	22
<i>Genista sericea</i>	21
<i>Stipa austroitalica</i>	21
<i>Centaurea spinosociliata</i>	21
<i>Crepis chondrilloides</i>	21
<i>Leontodon apulus</i>	20
<i>Onosma echioides</i>	19
<i>Euphorbia spinosa</i>	19
<i>Bupleurum baldense</i> aggr.	18
<i>Thesium humifusum</i>	18
<i>Astragalus muelleri</i>	18
<i>Ruta graveolens</i>	18
<i>Edraianthus tenuifolius</i>	18
<i>Plantago holosteum</i>	18
<i>Chrysopogon gryllus</i>	17
<i>Santolina etrusca</i>	16
<i>Centaurea tommasinii</i>	16
<i>Sanguisorba minor</i> aggr.	16
<i>Leontodon crispus</i> aggr.	16
<i>Medicago prostrata</i>	15
<i>Linum tenuifolium</i>	15

Constant species (percentage frequencies)

<i>Bromopsis erecta</i>	55
<i>Satureja montana</i> aggr.	53
<i>Sanguisorba minor</i> aggr.	48
<i>Teucrium montanum</i>	44
<i>Fumana procumbens</i>	36
<i>Eryngium amethystinum</i>	36
<i>Dianthus sylvestris</i>	36
<i>Anthyllis vulneraria</i>	33
<i>Teucrium chamaedrys</i>	31
<i>Carex humilis</i>	31
<i>Galium corrudifolium</i>	29
<i>Teucrium polium</i> aggr.	28
<i>Koeleria splendens</i>	28
<i>Koeleria lobata</i>	27
<i>Sesleria juncifolia</i>	25
<i>Helichrysum italicum</i>	25
<i>Plantago holosteum</i>	23
<i>Galium lucidum</i>	23
<i>Thymus longicaulis</i>	21
<i>Asperula aristata</i>	21
<i>Leontodon crispus</i> aggr.	20
<i>Globularia cordifolia</i>	20
<i>Chrysopogon gryllus</i>	19
<i>Pilosella officinarum</i>	18
<i>Euphorbia spinosa</i>	18
<i>Convolvulus cantabrica</i>	18
<i>Juniperus oxycedrus</i> aggr.	17
<i>Centaurea rupestris</i> aggr.	17
<i>Anthyllis montana</i>	17
<i>Linum tenuifolium</i>	16
<i>Helianthemum canum</i>	16

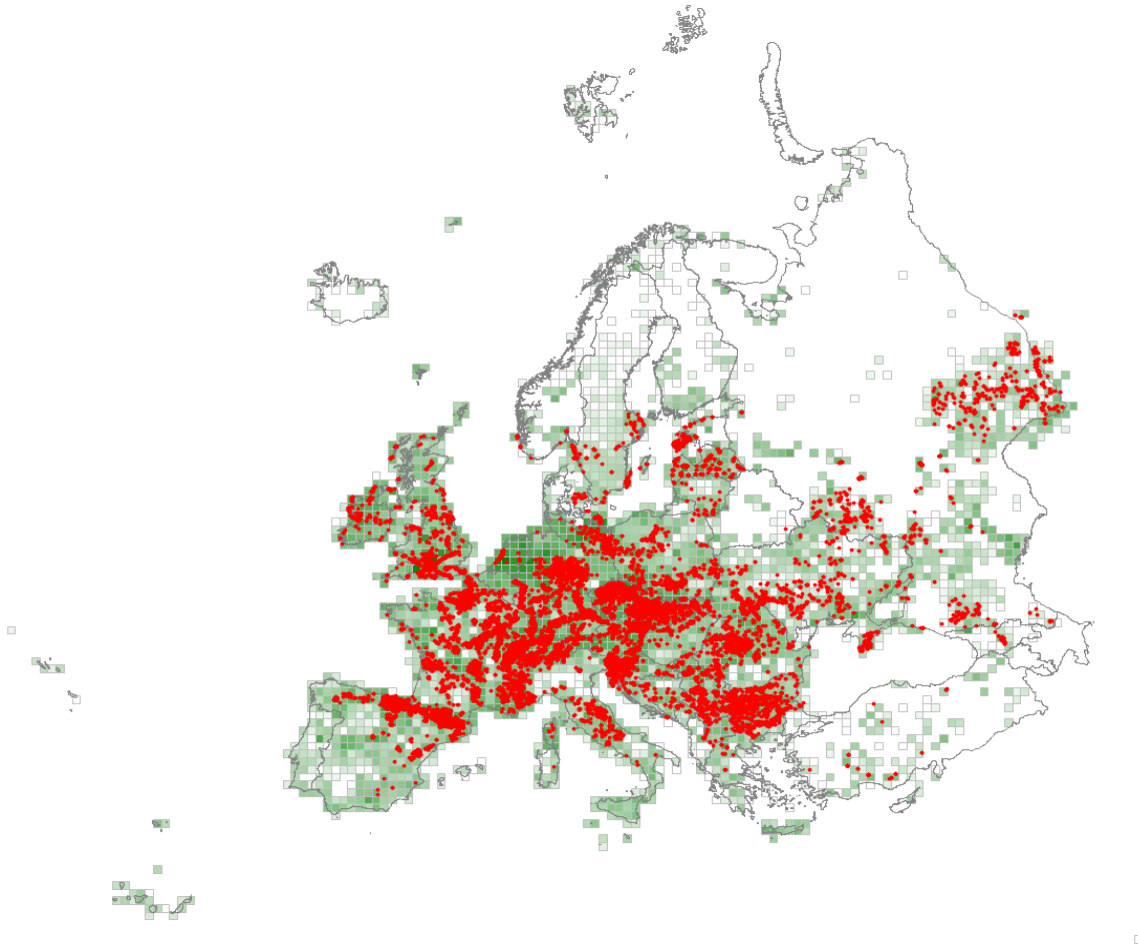
<i>Festuca valesiaca</i> aggr.	16
<i>Bupleurum baldense</i> aggr.	16
<i>Thesium humifusum</i>	15
<i>Reichardia picroides</i>	15
<i>Linum strictum</i> aggr.	15
<i>Stachys recta</i>	14
<i>Sedum rupestre</i>	14
<i>Scorzonera villosa</i>	13
<i>Rhamnus saxatilis</i>	13
<i>Hypericum perforatum</i>	13
<i>Hippocrepis comosa</i>	13
<i>Globularia bisnagarica</i>	13
<i>Genista sylvestris</i>	13
<i>Asperula purpurea</i>	13
<i>Sedum sexangulare</i>	12
<i>Minuartia verna</i> aggr.	12
<i>Lotus corniculatus</i>	12
<i>Dorycnium pentaphyllum</i>	12
<i>Carex caryophyllea</i>	12
<i>Artemisia alba</i>	12
<i>Aethionema saxatile</i>	12
<i>Helianthemum nummularium</i>	11
<i>Festuca circummediterranea</i>	11
<i>Eryngium campestre</i>	11
<i>Cephalaria leucantha</i>	11

Dominant species (percentage frequencies of occurrences with cover > 25%)

<i>Sesleria juncifolia</i>	13
<i>Satureja montana</i> aggr.	10
<i>Carex humilis</i>	9
<i>Bromopsis erecta</i>	7
<i>Chrysopogon gryllus</i>	6

## R1A – Semi-dry perennial calcareous grassland (meadow steppe)

Semi-natural grassland on deeper and not so drought-prone, nutrient-poor, base-rich soils over limestone throughout the lowlands and submontane belts of submediterranean to hemiboreal Europe. Generally closed and dominated by mixtures of graminoids and forbs, often extremely species-rich, with many rare plants and sometimes striking contingents of orchids and varying much across the large range with different sets of continental or submediterranean companions. Dependent on extensive grazing, usually with sheep, or on an annual mowing, and often developed over centuries of traditional pastoralism, contributing to some striking cultural landscapes.



### Corresponding alliances in EuroVegChecklist 2016

- > FES-07A *Brachypodium phoenicoidis* Br.-Bl. ex Molinier 1934
- > FES-01A *Bromion erecti* Koch 1926
- > FES-01B *Cirsio-Brachypodium pinnati* Hadač et Klika in Klika et Hadač 1944
- > FES-07C *Diplachnion serotinae* Br.-Bl. 1961
- > FES-01C *Filipendulo vulgaris-Helictotrichion pratensis* Dengler et Löbel in Dengler et al. 2003
- > FES-01D *Gentianello amarellae-Helictotrichion pratensis* Royer ex Dengler in Mucina et al. 2009
- > FES-01G *Chrysopogono-Danthonion calycinae* Kojić 1959
- <> FES-02B *Koelerio-Phleion phleoidis* Korneck 1974
- > FES-01F *Polygalo mediterraneae-Bromion erecti* (Biondi et al. 2005) Di Pietro in Di Pietro et al. 2015
- > FES-01E *Potentillo-Brachypodium pinnati* Br.-Bl. 1967
- > FES-09D *Scorzonerion villosae* Horvatić ex Kovačević 1959

## Characteristic species combination

### Diagnostic species (phi coefficient \* 100)

<i>Plantago media</i>	22
<i>Trifolium montanum</i>	18
<i>Linum catharticum</i>	18
<i>Pimpinella saxifraga</i>	17
<i>Salvia pratensis</i>	17
<i>Centaurea scabiosa</i>	17
<i>Cirsium acaulon</i>	16
<i>Galium verum</i>	16
<i>Briza media</i>	16

### Constant species (percentage frequencies)

<i>Lotus corniculatus</i>	46
<i>Sanguisorba minor</i> aggr.	44
<i>Galium verum</i>	44
<i>Achillea millefolium</i> aggr.	41
<i>Plantago lanceolata</i>	38
<i>Brachypodium pinnatum</i>	38
<i>Briza media</i>	37
<i>Euphorbia cyparissias</i>	35
<i>Plantago media</i>	34
<i>Pimpinella saxifraga</i>	33
<i>Poa pratensis</i> aggr.	32
<i>Bromopsis erecta</i>	31
<i>Linum catharticum</i>	30
<i>Pilosella officinarum</i>	29
<i>Dactylis glomerata</i>	29
<i>Helianthemum nummularium</i>	27
<i>Carex flacca</i>	27
<i>Teucrium chamaedrys</i>	26
<i>Hypericum perforatum</i>	25
<i>Thymus pulegioides</i>	24
<i>Leontodon hispidus</i>	24
<i>Centaurea scabiosa</i>	24
<i>Asperula cynanchica</i>	24
<i>Carex caryophyllea</i>	23
<i>Festuca ovina</i>	22
<i>Trifolium montanum</i>	21
<i>Scabiosa columbaria</i> aggr.	21
<i>Knautia arvensis</i>	21
<i>Anthyllis vulneraria</i>	21
<i>Trifolium pratense</i>	20
<i>Salvia pratensis</i>	20
<i>Medicago falcata</i>	20
<i>Leucanthemum vulgare</i> aggr.	20
<i>Centaurea jacea</i>	20
<i>Medicago lupulina</i>	19
<i>Koeleria pyramidata</i>	19
<i>Filipendula vulgaris</i>	19
<i>Eryngium campestre</i>	19
<i>Agrimonia eupatoria</i>	19
<i>Securigera varia</i>	18
<i>Hippocrepis comosa</i>	18
<i>Galium mollugo</i> aggr.	18
<i>Festuca rubra</i> aggr.	18
<i>Ononis spinosa</i>	17

<i>Fragaria viridis</i>	17
<i>Festuca stricta</i> subsp. <i>sulcata</i>	17
<i>Cirsium acaulon</i>	17
<i>Viola hirta</i>	16
<i>Ranunculus bulbosus</i>	16
<i>Daucus carota</i>	16
<i>Carlina vulgaris</i> aggr.	16
<i>Campanula rotundifolia</i>	16
<i>Anthoxanthum odoratum</i> aggr.	15
<i>Agrostis capillaris</i>	15
<i>Primula veris</i>	14
<i>Origanum vulgare</i>	14
<i>Helictochloa pratensis</i>	14
<i>Arrhenatherum elatius</i>	14
<i>Thymus praecox</i>	13
<i>Festuca valesiaca</i> aggr.	13
<i>Dianthus carthusianorum</i> aggr.	13
<i>Stachys recta</i>	12
<i>Potentilla tabernaemontani</i>	12
<i>Koeleria macrantha</i>	12
<i>Stachys officinalis</i>	11
<i>Phleum phleoides</i>	11
<i>Carlina acaulis</i>	11

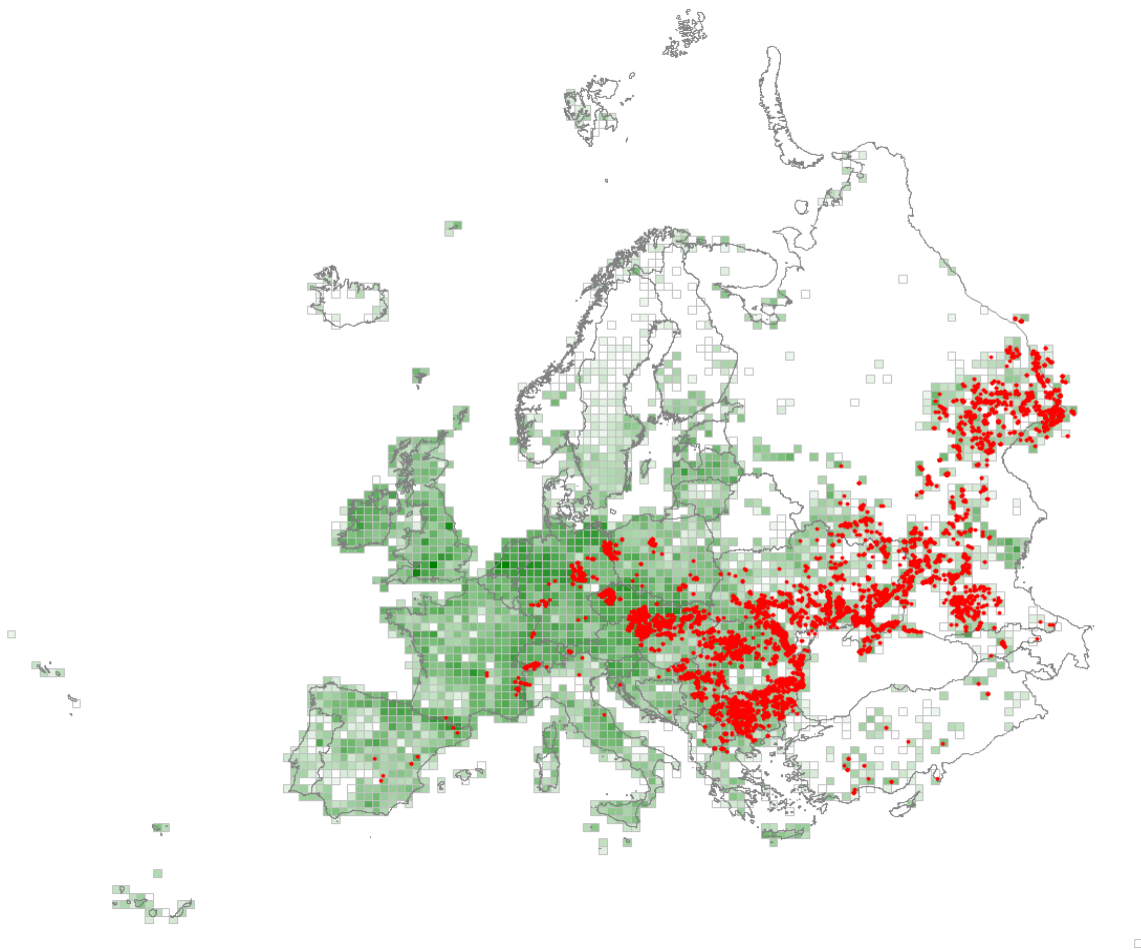
Dominant species (percentage frequencies of occurrences with cover > 25%)

<i>Brachypodium pinnatum</i>	14
<i>Bromopsis erecta</i>	13

## R1B – Continental dry grassland (true steppe)

Steppe and steppe-like grassland on mostly base-rich soils over limestones, of varying depth and stoniness, occurring through the lowland to submontane belts of continental Europe. Dominated by plants adapted to long periods of summer drought, mostly tall tussock grasses and perennial forbs, it shows wide variation in species composition and particular topographic location across the substantial range. In more extreme situations, the grasslands are natural, but they often sustain extensive grazing.

**Remark:** This habitat also includes many dry grasslands that are not “true steppe”. Therefore the name should be changed, e.g. Continental steppic grassland (including the true steppe). For the steppe zone, this habitat is probably too broad. It includes specific types on rock outcrops (petrophytic steppe) and on solonetz soil (solonetz steppe), each of them with a distinct group of specialist species. These types need to be considered as a potential addition to the EUNIS classification system in the future.



### Corresponding alliances in EuroVegChecklist 2016

- > FES-03D *Aconopogonion alpini* Yamalov et al. 2009 nom. inval.
- > FES-02E *Adonido vernalis-Stipion tirsae* Didukh in Didukh et Mucina 2014
- > FES-02H *Agropyron pectinati* Golub et Uzhamskaya 1991
- <> ART-03C *Artemisio marschallianae-Elytrigion intermedii* Korotchenko et Didukh 1997
- > FES-02G *Artemisio tauricae-Festucion Korzhenevsky et Klyukin* 1991
- > FES-02I *Artemisio-Kochion* Soó 1964
- <> ART-02A *Bassio-Artemisio austriacae* Solomeshch in A. Ishbirdin et al. 1988
- > FES-03E *Centaureion sumensis* Golub et al. 1995
- > FES-02D *Centaureo carbonatae-Koelerion talievii* Romashchenko et al. 1996
- > FES-02A *Festucion valesiacae* Klika 1931 nom. conserv. propos.

- > FES-03A Helictotricho desertorum-Stipion rubentis Toman 1969
- ↔ FES-02B Koelerio-Phleion phleoidis Korneck 1974
- > FES-03C Lathyro pallescentis-Helictotrichion schelliani Solomeshch et al. 1994
- > FES-03B Scorzonero austriacae-Koelerion sclerophyllae Solomeshch et al. 1994
- > FES-02C Stipion lessingianae Soó 1947
- > FES-02J Stipo-Poion xerophilae Br.-Bl. et Richard 1950
- > FES-02F Veronico multifidae-Stipion ponticae Didukh in Didukh et Mucina 2014

### Characteristic species combination

#### Diagnostic species (phi coefficient \* 100)

<i>Festuca valesiaca</i> aggr.	32
<i>Stipa capillata</i>	26
<i>Bothriochloa ischaemum</i>	24
<i>Medicago falcata</i>	23
<i>Salvia nemorosa</i>	20
<i>Artemisia austriaca</i>	18
<i>Eryngium campestre</i>	17
<i>Verbascum phoeniceum</i>	17
<i>Galatella villosa</i>	16
<i>Centaurea stoebe</i>	16
<i>Potentilla argentea</i>	15
<i>Falcaria vulgaris</i>	15
<i>Nonea pulla</i>	15
<i>Taraxacum serotinum</i>	15

#### Constant species (percentage frequencies)

<i>Festuca valesiaca</i> aggr.	71
<i>Eryngium campestre</i>	46
<i>Medicago falcata</i>	39
<i>Stipa capillata</i>	35
<i>Bothriochloa ischaemum</i>	32
<i>Galium verum</i>	30
<i>Artemisia austriaca</i>	28
<i>Teucrium chamaedrys</i>	27
<i>Poa pratensis</i> aggr.	27
<i>Plantago lanceolata</i>	27
<i>Potentilla argentea</i>	26
<i>Poa bulbosa</i>	24
<i>Euphorbia cyparissias</i>	24
<i>Centaurea stoebe</i>	24
<i>Thymus pulegioides</i>	23
<i>Achillea millefolium</i> aggr.	23
<i>Asperula cynanchica</i>	20
<i>Koeleria pyramidata</i>	19
<i>Koeleria macrantha</i>	19
<i>Falcaria vulgaris</i>	19
<i>Elytrigia repens</i> aggr.	19
<i>Convolvulus arvensis</i>	19
<i>Securigera varia</i>	18
<i>Salvia nemorosa</i>	18
<i>Euphorbia seguieriana</i>	18
<i>Stachys recta</i>	17
<i>Plantago media</i>	17
<i>Hypericum perforatum</i>	17
<i>Artemisia campestris</i>	17
<i>Sanguisorba minor</i> aggr.	16
<i>Teucrium polium</i> aggr.	15



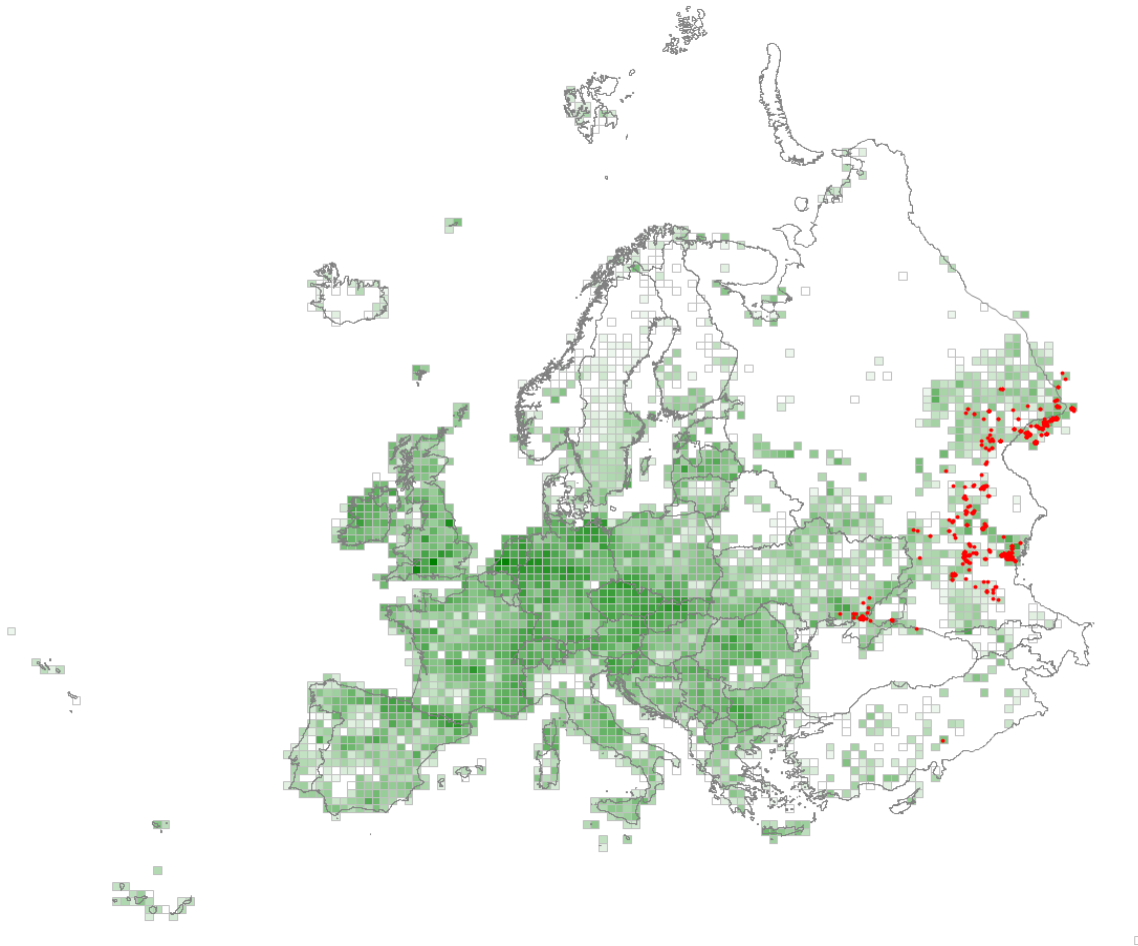
<i>Festuca stricta</i> subsp. <i>sulcata</i>	15
<i>Veronica spicata</i>	14
<i>Scabiosa ochroleuca</i>	14
<i>Lotus corniculatus</i>	14
<i>Galatella villosa</i>	14
<i>Fragaria viridis</i>	14
<i>Filipendula vulgaris</i>	14
<i>Achillea setacea</i>	14
<i>Trifolium arvense</i>	13
<i>Stipa lessingiana</i>	13
<i>Potentilla cinerea</i>	13
<i>Elytrigia intermedia</i>	13
<i>Campanula sibirica</i>	13
<i>Astragalus onobrychis</i>	13
<i>Arenaria serpyllifolia</i>	13
<i>Agropyron cristatum</i>	13
<i>Agrimonia eupatoria</i>	13
<i>Thalictrum minus</i>	12
<i>Potentilla incana</i>	12
<i>Phleum phleoides</i>	12
<i>Cichorium intybus</i>	12
<i>Bromus squarrosus</i>	12
<i>Achillea nobilis</i>	12
<i>Verbascum phoeniceum</i>	11
<i>Thymus odoratissimus</i> aggr.	11
<i>Stipa pennata</i>	11
<i>Pilosella officinarum</i>	11
<i>Medicago minima</i>	11
<i>Medicago lupulina</i>	11
<i>Euphorbia nicaeensis</i>	11
<i>Clinopodium acinos</i>	11
<i>Carex humilis</i>	11

Dominant species (percentage frequencies of occurrences with cover > 25%)

<i>Festuca valesiaca</i> aggr.	29
<i>Bothriochloa ischaemum</i>	11
<i>Stipa capillata</i>	8

## R1C – Desert steppe

Continental, temperate very dry zonal steppe, occurring in a transition belt between the true steppe region and the semi-desert region of southern Ukraine, the south-east of European Russia and ranging further into Kazakhstan. Dry steppe is dominated by a combination of xerophytic tall and low grasses, e.g. *Agropyron* and *Stipa*, and xerophytic semi-shrubs, e.g. *Artemisia* and *Tanacetum*. Vegetation cover is relatively low, with most biomass belowground. Typically found on southern black soil (chernozems) and light chestnut soils (kastanozems).



### Corresponding alliances in EuroVegChecklist 2016

- > FES-04C Caricion stenophyllae Golub et Saveleva 1991
- > FES-04B Stipion korshinskyi Toman 1969
- > FES-04A Tanacetum achilleifolii-Stipion lessingiana Royer ex Lysenko et Mucina in Mucina et al. 2016

### Characteristic species combination

Diagnostic species (phi coefficient \* 100)

<i>Tanacetum achilleifolium</i>	55
<i>Artemisia lerchiana</i>	50
<i>Bassia prostrata</i>	48
<i>Agropyron desertorum</i>	48
<i>Stipa lessingiana</i>	47
<i>Leymus ramosus</i>	41
<i>Ferula caspica</i>	36

<i>Tulipa biebersteiniana</i>	34
<i>Ornithogalum fischerianum</i>	31
<i>Galatella villosa</i>	30
<i>Stipa sareptana</i>	30
<i>Galatella tatarica</i>	30
<i>Artemisia austriaca</i>	28
<i>Klasea erucifolia</i>	27
<i>Tulipa gesneriana</i>	26
<i>Astragalus macropus</i>	26
<i>Astragalus testiculatus</i>	26
<i>Limonium sareptanum</i>	26
<i>Allium tulipifolium</i>	24
<i>Klasea cardunculus</i>	24
<i>Trinia hispida</i>	23
<i>Artemisia pauciflora</i>	23
<i>Ferula tatarica</i>	23
<i>Palimbia defoliata</i>	22
<i>Jurinea multiflora</i>	22
<i>Carex stenophylla</i>	21
<i>Poa bulbosa</i>	21
<i>Atraphaxis frutescens</i>	21
<i>Astragalus rupifragus</i>	21
<i>Festuca valesiaca</i> aggr.	21
<i>Psathyrostachys juncea</i>	20
<i>Ranunculus oxyspermus</i>	20
<i>Gagea bulbifera</i>	20
<i>Artemisia taurica</i>	19
<i>Alyssum turkestanicum</i>	19
<i>Androsace maxima</i>	19
<i>Astragalus tenuifolius</i>	19
<i>Astragalus reduncus</i>	19
<i>Prangos odontalgica</i>	18
<i>Krascheninnikovia ceratoides</i>	18
<i>Euphorbia undulata</i>	18
<i>Colchicum laetum</i>	18
<i>Ephedra distachya</i>	18
<i>Elaeosticta lutea</i>	18
<i>Lappula patula</i>	18
<i>Meniocus linifolius</i>	17
<i>Odontarrhena tortuosa</i>	17
<i>Palimbia turgaica</i>	17
<i>Veronica verna</i>	17
<i>Allium flavescens</i>	17
<i>Linaria macroua</i>	16
<i>Koeleria pyramidata</i>	16
<i>Goniolimon rubellum</i>	16
<i>Allium lineare</i>	16
<i>Bromus squarrosus</i>	15
<i>Arenaria procera</i>	15
<i>Seseli glabratum</i>	15

Constant species (percentage frequencies)

<i>Poa bulbosa</i>	64
<i>Artemisia lerchiana</i>	63
<i>Bassia prostrata</i>	56
<i>Festuca valesiaca</i> aggr.	46
<i>Tanacetum achilleifolium</i>	44
<i>Artemisia austriaca</i>	43
<i>Stipa lessingiana</i>	42

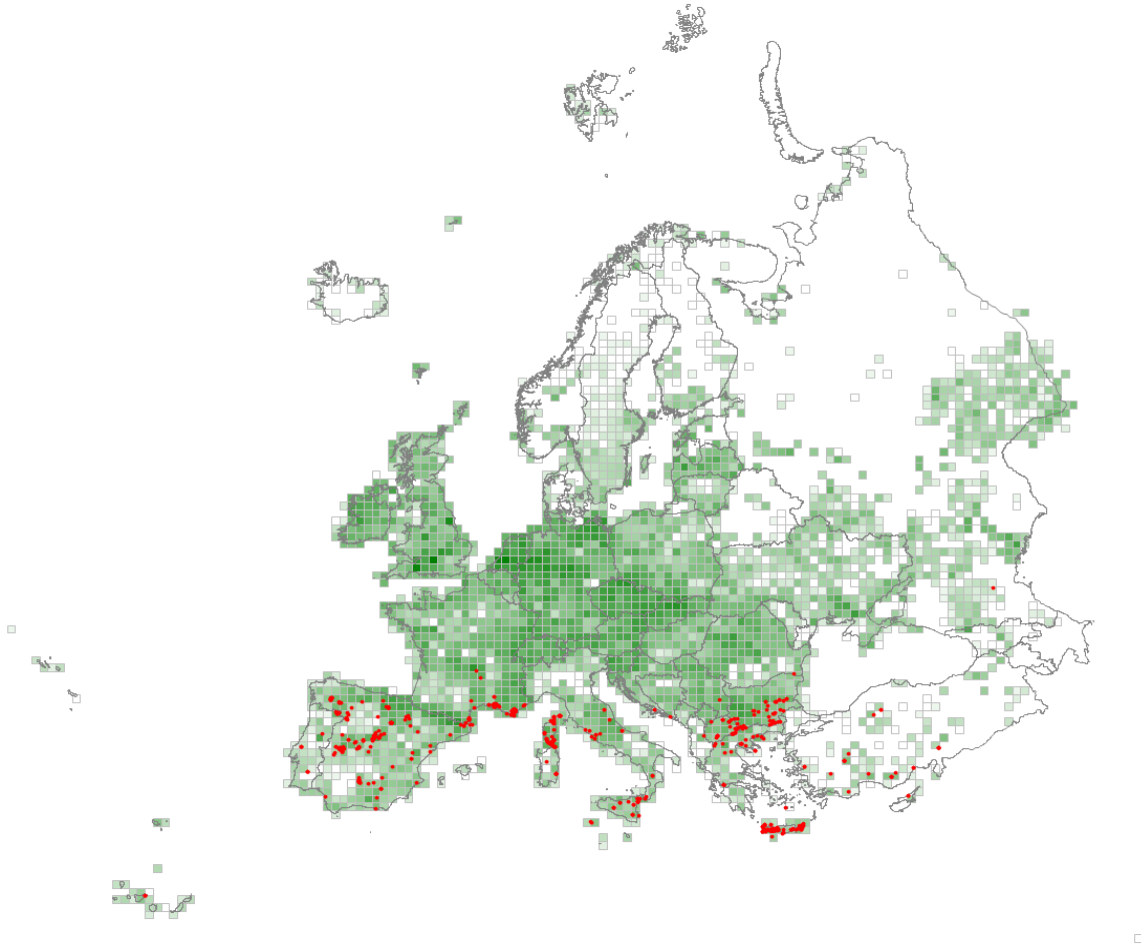
<i>Agropyron desertorum</i>	34
<i>Alyssum turkestanicum</i>	32
<i>Bromus squarrosus</i>	28
<i>Galatella villosa</i>	26
<i>Koeleria pyramidata</i>	23
<i>Veronica verna</i>	22
<i>Leymus ramosus</i>	22
<i>Ferula caspica</i>	20
<i>Tulipa biebersteiniana</i>	19
<i>Stipa capillata</i>	18
<i>Ephedra distachya</i>	18
<i>Carex stenophylla</i>	18
<i>Stipa sareptana</i>	17
<i>Meniocus linifolius</i>	15
<i>Falcaria vulgaris</i>	15
<i>Artemisia taurica</i>	15
<i>Androsace maxima</i>	15
<i>Odontarrhena tortuosa</i>	14
<i>Klasea erucifolia</i>	14
<i>Euphorbia seguieriana</i>	14
<i>Galatella tatarica</i>	13
<i>Festuca stricta</i> subsp. <i>sulcata</i>	13
<i>Tulipa gesneriana</i>	11
<i>Ornithogalum fischerianum</i>	11
<i>Medicago falcata</i>	11
<i>Limonium sareptanum</i>	11
<i>Echinops ritro</i>	11
<i>Astragalus testiculatus</i>	11
<i>Artemisia pauciflora</i>	11
<i>Anisantha tectorum</i>	11
<i>Agropyron cristatum</i>	11

Dominant species (percentage frequencies of occurrences with cover > 25%)

<i>Poa bulbosa</i>	8
<i>Stipa lessingiana</i>	6
<i>Artemisia lerchiana</i>	5

## R1D – Mediterranean closely grazed dry grassland

Heavily-grazed pasture of the Mediterranean Basin, mostly on silt and clay soils in the lowlands, dominated by rosette plants, various *Fabaceae* species and small grasses tolerant of intensive herbivory and trampling. The soils are dry in summer which helps exclude nitrophilous plants that might be encouraged by manuring but, refreshed by autumn rains, the herbage remains green and productive through the winter, providing valuable forage. Companion plants vary widely across the large range.



### Corresponding alliances in EuroVegChecklist 2016

- > BUL-01D Ornithogalo corsici-Trifolion subterranei (Farris et al. 2013) Farris et Mucina in Mucina et al. 2016
- > BUL-01E Plantaginion cupanii S. Brullo et Grillo 1978
- > BUL-01B Plantaginion serrariae Galán de Mera et al. 2000
- > BUL-01C Poo bulbosae-Astragalion sesamei Rivas Goday et Ladero 1970
- > BUL-01F Romuleion Oberd. 1954
- > BUL-01A Trifolio subterranei-Periballion minutae Rivas Goday 1964

### Characteristic species combination

Diagnostic species (phi coefficient \* 100)

<i>Trifolium subterraneum</i>	37
<i>Parentucellia latifolia</i>	32
<i>Trifolium suffocatum</i>	24
<i>Trifolium nigrescens</i>	23
<i>Bellis annua</i>	21

<i>Poa bulbosa</i>	21
<i>Erodium cicutarium</i>	21
<i>Trifolium tomentosum</i>	20
<i>Erodium botrys</i>	19
<i>Trifolium cherleri</i>	18
<i>Plantago lagopus</i>	18
<i>Ranunculus paludosus</i>	17
<i>Plantago coronopus</i> aggr.	17
<i>Astragalus pelecinus</i>	16
<i>Trifolium scabrum</i>	16
<i>Scleranthus verticillatus</i>	16
<i>Moenchia erecta</i>	15

Constant species (percentage frequencies)

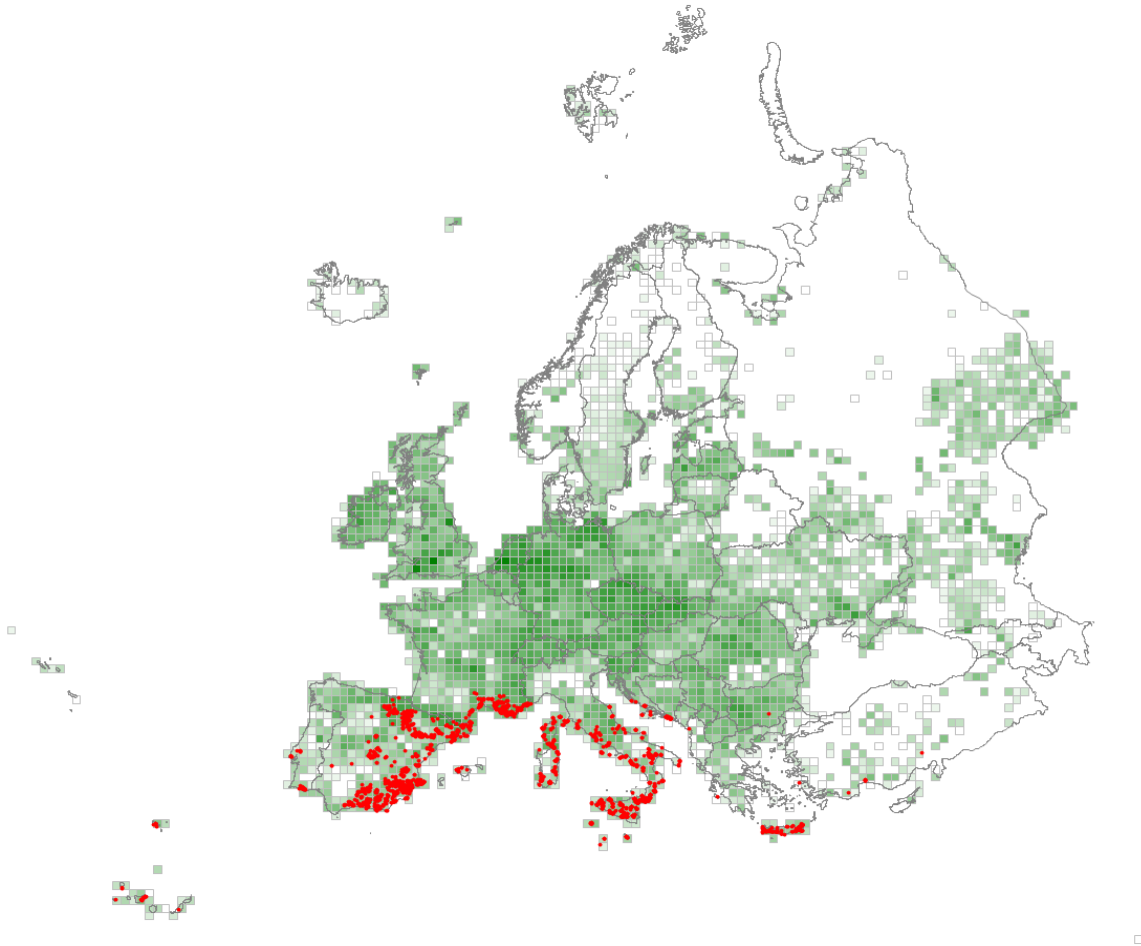
<i>Poa bulbosa</i>	66
<i>Erodium cicutarium</i>	38
<i>Plantago coronopus</i> aggr.	34
<i>Trifolium subterraneum</i>	32
<i>Plantago lanceolata</i>	26
<i>Parentucellia latifolia</i>	26
<i>Trifolium scabrum</i>	25
<i>Trifolium campestre</i>	23
<i>Sherardia arvensis</i>	23
<i>Eryngium campestre</i>	23
<i>Cynodon dactylon</i>	21
<i>Trifolium nigrescens</i>	20
<i>Plantago lagopus</i>	20
<i>Hypochaeris glabra</i>	18
<i>Tuberaria guttata</i>	17
<i>Anthemis arvensis</i>	17
<i>Trifolium arvense</i>	16
<i>Vulpia myuros</i>	15
<i>Bellis annua</i>	15
<i>Trifolium glomeratum</i>	14
<i>Rumex acetosella</i>	14
<i>Ranunculus paludosus</i>	14
<i>Dactylis glomerata</i>	14
<i>Vulpia ciliata</i>	13
<i>Veronica arvensis</i>	13
<i>Trifolium cherleri</i>	13
<i>Bromus hordeaceus</i>	13
<i>Trifolium tomentosum</i>	12
<i>Trifolium suffocatum</i>	12
<i>Sanguisorba minor</i> aggr.	12
<i>Psilurus incurvus</i>	12
<i>Plantago bellardii</i>	12
<i>Ornithopus compressus</i>	12
<i>Hedypnois rhagadioloides</i>	12
<i>Cerastium glomeratum</i>	12
<i>Petrorhagia prolifera</i>	11
<i>Bothriochloa ischaemum</i>	11
<i>Anagallis arvensis</i>	11

Dominant species (percentage frequencies of occurrences with cover > 25%)

<i>Poa bulbosa</i>	25
<i>Trifolium subterraneum</i>	10
<i>Plantago coronopus</i> aggr.	5

## R1E – Mediterranean tall perennial dry grassland

Grassland on base-rich soils over various types of calcareous bedrock through the Mediterranean region, where grazing and trampling sustain open or closed swards, generally dominated by tall, dense tussock grasses that lend a steppe-like character. Summer drought and disturbance by grazing and burning help prevent reversion to a forest but can encourage the invasion of aliens.



### Corresponding alliances in EuroVegChecklist 2016

- > LYG-02A *Agropyro pectinati-Lygeion sparti* Br.-Bl. et O. de Bolòs 1958 corr. Rivas-Mart. et al. 1999
- > LYG-01G *Cymbopogono-Brachypodion ramosi* Horvatić 1963
- > LYG-01C *Festucion scariosae* Martínez-Parras et al. 1984
- > LYG-01H *Hyparrhenion hirtae* Br.-Bl. et al. 1956
- > LYG-01E *Leontodonto tuberosi-Bellion sylvestris* Biondi et al. 2001
- > LYG-02C *Moricandio-Lygeion sparti* S. Brullo et al. 1990
- > LYG-01A *Phlomidio lychnitis-Brachypodion retusi* Mateo ex Theurillat et Mucina in Mucina et al. 2016
- > LYG-01F *Reichardio maritimae-Dactylidion hispanicae* Biondi et al. 2001
- > LYG-02D *Scorzonero creticae-Lygeion sparti* S. Brullo et al. 2002
- > LYG-01D *Stipion parviflorae* De la Torre et al. 1996
- > LYG-02B *Stipion tenacissimae* Rivas-Mart. 1984
- > LYG-01B *Trisetio velutini-Brachypodion boissieri* Rivas-Mart. et al. 2002

## Characteristic species combination

### Diagnostic species (phi coefficient \* 100)

<i>Macrochloa tenacissima</i>	24
<i>Helictotrichon filifolium</i>	20
<i>Lygeum spartum</i>	18
<i>Teucrium pseudochamaepitys</i>	15
<i>Brachypodium retusum</i>	15

### Constant species (percentage frequencies)

<i>Dactylis glomerata</i>	52
<i>Brachypodium retusum</i>	40
<i>Reichardia picroides</i>	25
<i>Eryngium campestre</i>	21
<i>Sedum sediforme</i>	20
<i>Lygeum spartum</i>	19
<i>Daucus carota</i>	19
<i>Thymus vulgaris</i>	18
<i>Carlina corymbosa</i> aggr.	18
<i>Hyparrhenia hirta</i>	17
<i>Bituminaria bituminosa</i>	17
<i>Macrochloa tenacissima</i>	16
<i>Linum strictum</i> aggr.	15
<i>Helictochloa bromoides</i>	15
<i>Asphodelus ramosus</i>	14
<i>Pallenis spinosa</i>	12
<i>Koeleria vallesiana</i>	12
<i>Teucrium polium</i> aggr.	11
<i>Foeniculum vulgare</i>	11
<i>Brachypodium phoenicoides</i>	11

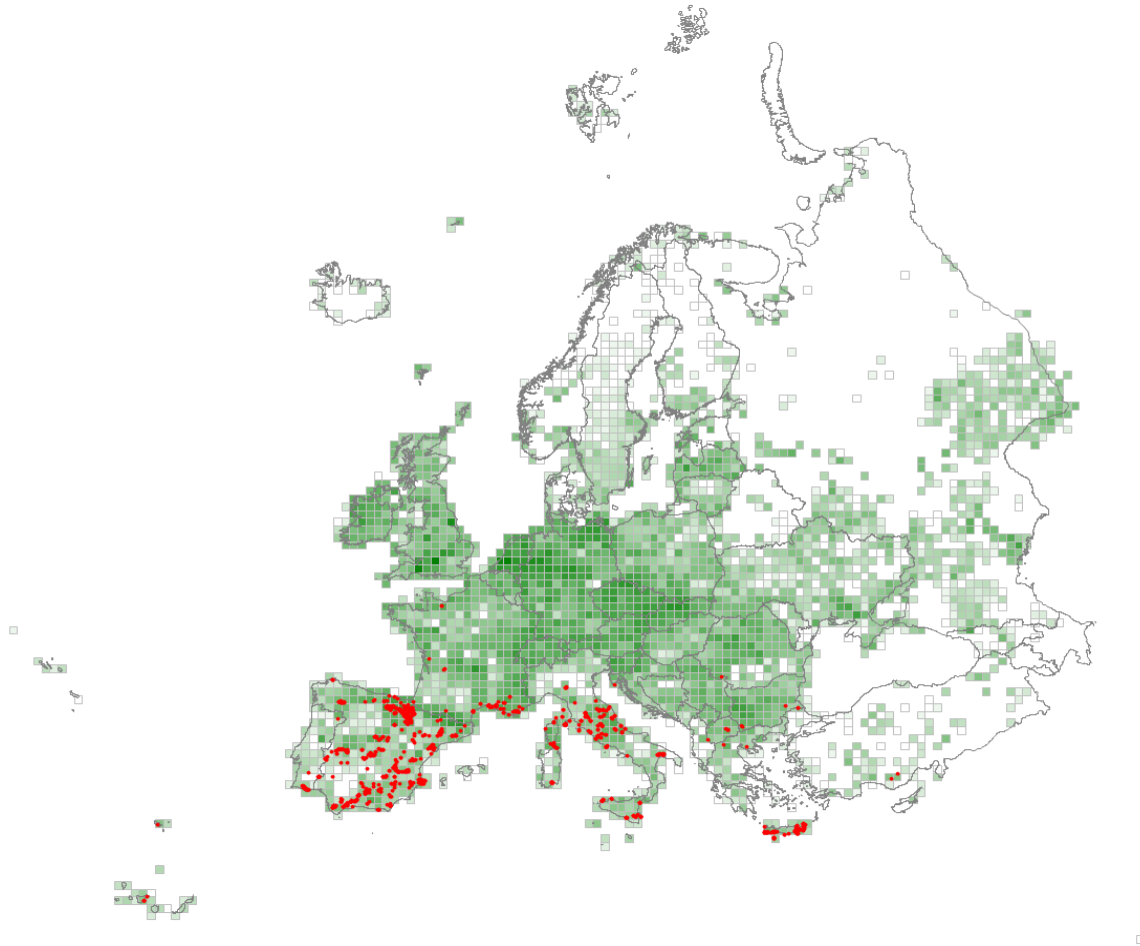
### Dominant species (percentage frequencies of occurrences with cover > 25%)

<i>Lygeum spartum</i>	18
<i>Brachypodium retusum</i>	15
<i>Macrochloa tenacissima</i>	14
<i>Hyparrhenia hirta</i>	7
<i>Brachypodium phoenicoides</i>	7



## R1F – Mediterranean annual-rich dry grassland

Usually ephemeral vegetation related to the yearly cycle of spring rains and summer drought through the Mediterranean where a high diversity of small annual plants make a brief colourful appearance on bare patches of mainly base-rich soils. The species composition varies greatly, according to the particular regional terrain and climate and the impact of traditional pastoralism.



### Corresponding alliances in EuroVegChecklist 2016

- > TRA-03B *Dauco-Catananchion luteae* S. Brullo 1985
- > TRA-02E *Diantho humilis-Velezion rigidae* Korzhenevskii et Kliukin ex Didukh et Mucina 2014
- > TRA-01D *Omphalodion commutatae* Rivas-Mart., Izco et M. Costa ex Izco 1976 corr. Pérez Raya et al. 1991
- > TRA-02C *Onobrychido-Ptilostemonion stellati* S. Brullo et al. 2001
- > TRA-03A *Plantagini-Catapodion marini* S. Brullo 1985
- > TRA-01C *Sedo-Ctenopsion gypsophilae* Rivas Goday et Rivas-Mart. ex Izco 1974
- > TRA-01B *Stipion retortae* O. de Bolòs 1957
- > TRA-01A *Trachynion distachyae* Rivas-Mart. 1978
- > TRA-02A *Vulpio ciliatae-Crepidion neglectae* Poldini 1989
- > TRA-02B *Vulpion ligusticae* Aubert et Loisel 1971
- > TRA-02D *Xeranthemion annui* Oberd. 1954

## Characteristic species combination

### Diagnostic species (phi coefficient \* 100)

<i>Euphorbia exigua</i>	29
<i>Trachynia distachya</i>	27
<i>Minuartia hybrida</i> aggr.	27
<i>Asterolinon linum-stellatum</i>	26
<i>Catapodium rigidum</i>	25
<i>Filago pyramidata</i>	24
<i>Asteriscus aquaticus</i>	24
<i>Neatostema apulum</i>	24
<i>Hippocrepis ciliata</i>	24
<i>Campanula erinus</i>	23
<i>Hornungia petraea</i>	23
<i>Linum strictum</i> aggr.	22
<i>Cleonia lusitanica</i>	22
<i>Bombycilaena erecta</i>	21
<i>Galium parisiense</i>	21
<i>Medicago minima</i>	20
<i>Polygala monspeliaca</i>	20
<i>Trifolium scabrum</i>	20
<i>Helianthemum salicifolium</i>	20
<i>Clypeola jonthlasi</i>	19
<i>Atractylis cancellata</i>	19
<i>Campanula fastigiata</i>	18
<i>Vulpia unilateralis</i>	17
<i>Ononis reclinata</i>	16
<i>Astragalus sesameus</i>	16
<i>Velezia rigida</i>	16
<i>Aegilops geniculata</i>	15

### Constant species (percentage frequencies)

<i>Trachynia distachya</i>	41
<i>Catapodium rigidum</i>	41
<i>Asterolinon linum-stellatum</i>	34
<i>Linum strictum</i> aggr.	33
<i>Euphorbia exigua</i>	32
<i>Medicago minima</i>	31
<i>Trifolium scabrum</i>	30
<i>Filago pyramidata</i>	24
<i>Sherardia arvensis</i>	23
<i>Minuartia hybrida</i> aggr.	22
<i>Erodium cicutarium</i>	19
<i>Trifolium campestre</i>	18
<i>Hornungia petraea</i>	18
<i>Helianthemum salicifolium</i>	18
<i>Bombycilaena erecta</i>	18
<i>Arenaria leptoclados</i>	18
<i>Leontodon saxatilis</i>	17
<i>Hypochaeris achyrophorus</i>	17
<i>Galium parisiense</i>	17
<i>Anagallis arvensis</i>	17
<i>Campanula erinus</i>	16
<i>Neatostema apulum</i>	15
<i>Hippocrepis ciliata</i>	15
<i>Arenaria serpyllifolia</i>	14
<i>Vulpia ciliata</i>	13
<i>Trifolium stellatum</i>	13
<i>Ononis reclinata</i>	13

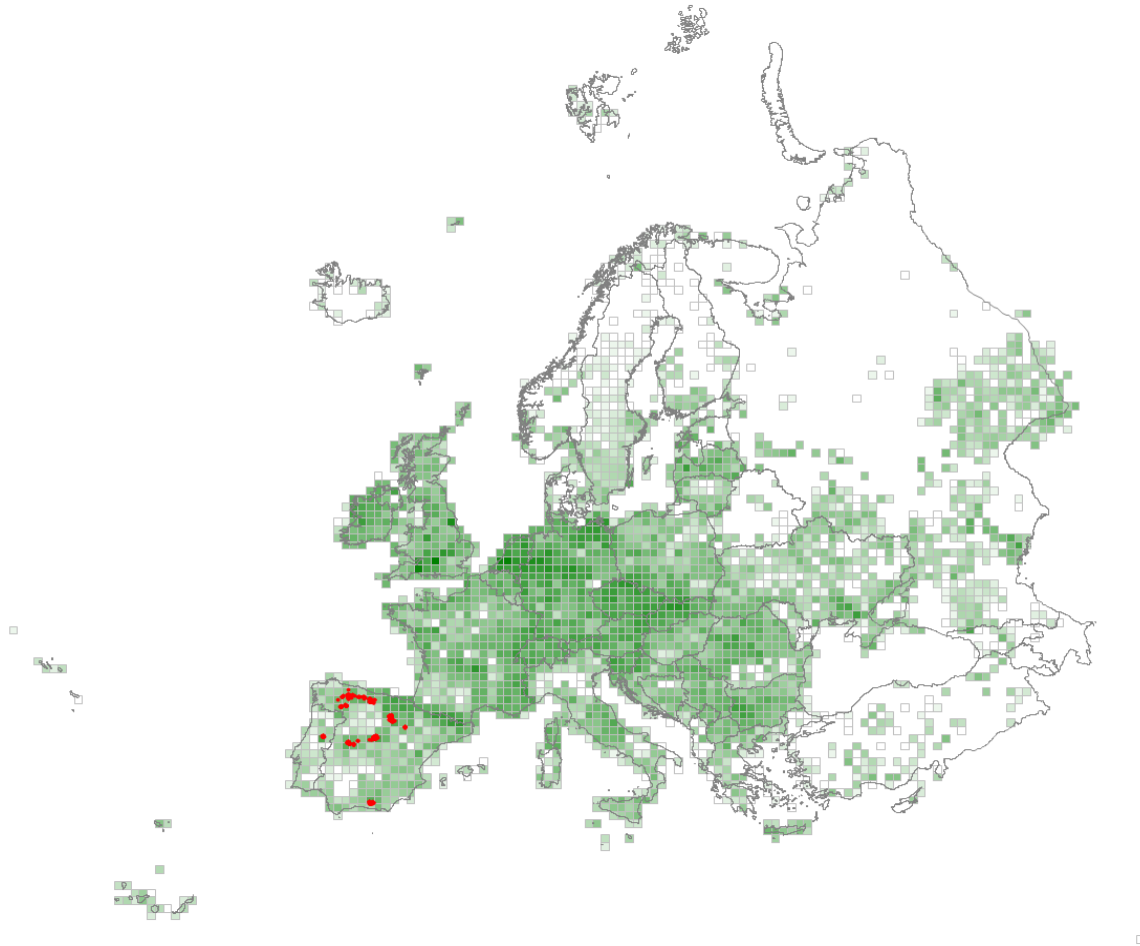
<i>Cerastium pumilum</i>	13
<i>Scorpiurus muricatus</i>	12
<i>Clypeola jonthlaspi</i>	12
<i>Aegilops geniculata</i>	12
<i>Draba verna</i> aggr.	11
<i>Atractylis cancellata</i>	11

Dominant species (percentage frequencies of occurrences with cover > 25%)

<i>Trachynia distachya</i>	9
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## R1G – Iberian oromediterranean siliceous dry grassland

Grassland of base-poor soils over siliceous bedrock on the slopes and crests of high mountains in the Iberian Peninsula with a short growing season and harsh winters with strong winds which blow the ground free of snow and leave the surface subject to deep cold and the development of freeze-thaw features. The vegetation cover, moderately open to closed, is dominated by prostrate or dwarf grasses and forbs and includes many endemics.



### Corresponding alliances in EuroVegChecklist 2016

- > IND-01B Jasionion carpetanae González-Albo 1941
- > IND-01C Ptilotrichion purpurei Quézel 1953
- > IND-01A Teesdaliopsio confertae-Luzulion caespitosae Rivas-Mart. 1987

### Characteristic species combination

Diagnostic species (phi coefficient \* 100)

<i>Luzula caespitosa</i>	61
<i>Festuca indigesta</i>	55
<i>Jasione crispa</i> aggr.	49
<i>Pilosella vahlii</i>	47
<i>Luzula spicata</i> subsp. <i>nevadensis</i>	46
<i>Sedum brevifolium</i>	45
<i>Teesdalia conferta</i>	43
<i>Dianthus langeanus</i>	42
<i>Scorzoneroides cantabrica</i>	42
<i>Silene ciliata</i>	41

<i>Agrostis tileni</i>	40
<i>Neoschischkinia truncatula</i>	32
<i>Armeria bigerrensis</i>	29
<i>Phalacrocarpum oppositifolium</i>	24
<i>Armeria caespitosa</i>	21
<i>Sempervivum vicentei</i>	21
<i>Sedum candolleanum</i>	20
<i>Leontodon boryi</i>	19
<i>Genista sanabrensis</i>	19
<i>Rumex suffruticosus</i>	19
<i>Plantago alpina</i>	19
<i>Minuartia recurva</i>	19
<i>Jasione laevis</i>	19
<i>Phyteuma hemisphaericum</i>	18
<i>Leucanthemopsis pallida</i>	18
<i>Cryptogramma crispera</i>	18
<i>Armeria duriaei</i>	17
<i>Festuca eskia</i>	17
<i>Festuca pseudeskia</i>	16
<i>Arenaria pungens</i>	16
<i>Hieracium loscosianum</i>	15
<i>Festuca iberica</i>	15
<i>Thymus serpylloides</i>	15

Constant species (percentage frequencies)

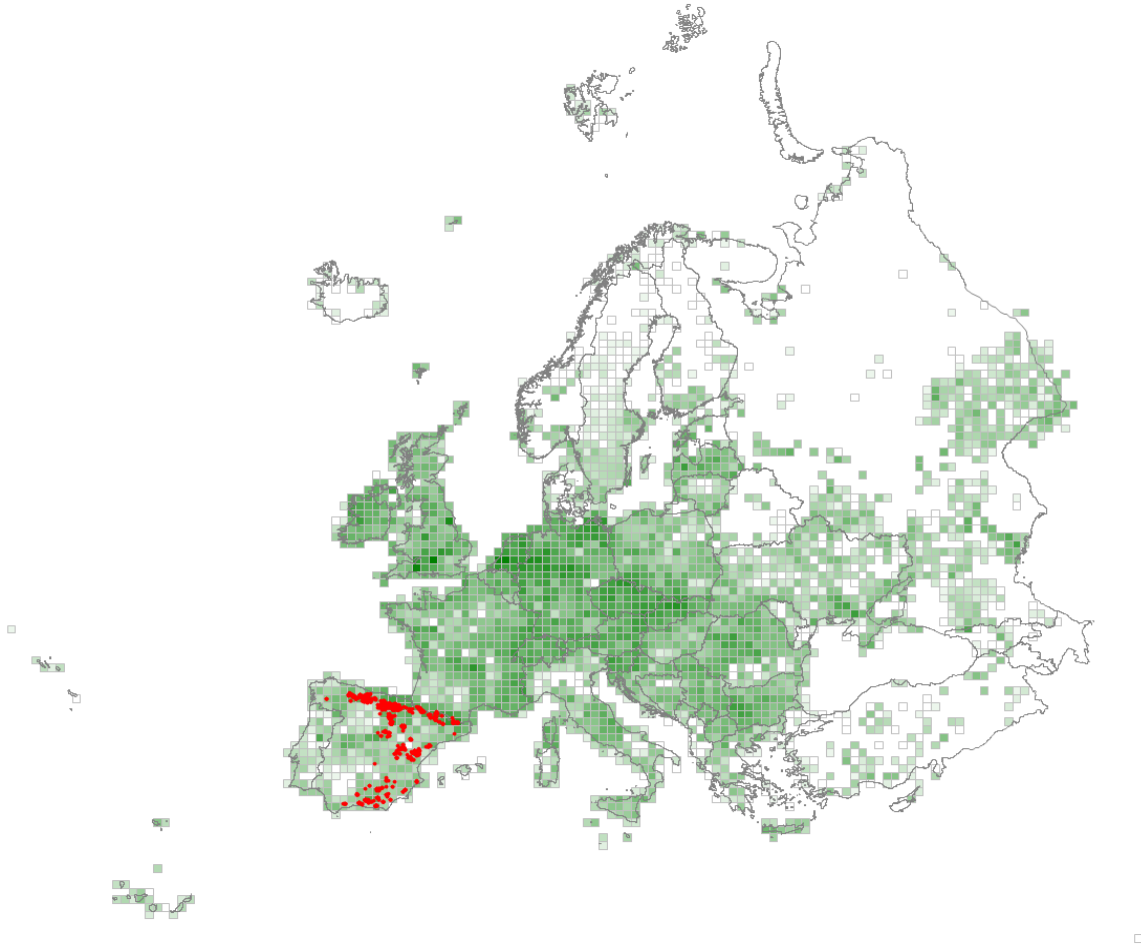
<i>Sedum brevifolium</i>	65
<i>Jasione crispa</i> aggr.	61
<i>Festuca indigesta</i>	58
<i>Avenella flexuosa</i>	55
<i>Luzula caespitosa</i>	42
<i>Silene ciliata</i>	33
<i>Neoschischkinia truncatula</i>	29
<i>Pilosella vahlii</i>	25
<i>Luzula spicata</i> subsp. <i>nevadensis</i>	24
<i>Scorzoneroides cantabrica</i>	21
<i>Teesdalia conferta</i>	20
<i>Dianthus langeanus</i>	20
<i>Plantago alpina</i>	19
<i>Phyteuma hemisphaericum</i>	19
<i>Solidago virgaurea</i>	18
<i>Agrostis tileni</i>	16
<i>Juniperus communis</i> subsp. <i>nana</i>	15
<i>Jasione laevis</i>	15
<i>Rumex acetosella</i>	14
<i>Nardus stricta</i>	14
<i>Minuartia recurva</i>	14
<i>Calluna vulgaris</i>	14
<i>Antennaria dioica</i>	14
<i>Festuca iberica</i>	13
<i>Festuca eskia</i>	13
<i>Cryptogramma crispera</i>	13
<i>Armeria bigerrensis</i>	13
<i>Pilosella castellana</i>	12
<i>Phalacrocarpum oppositifolium</i>	12
<i>Jurinea humilis</i>	12

Dominant species (percentage frequencies of occurrences with cover > 25%)

<i>Festuca indigesta</i>	29
<i>Luzula caespitosa</i>	25

## R1H – Iberian oromediterranean basiphilous dry grassland

Grassland of base-rich soils over calcareous bedrocks on the slopes and crests of high mountains in the Iberian Peninsula and France, with a short growing season and harsh winters when strong winds blow the ground free of snow and leave the surface subject to deep cold which encourages the development of freeze-thaw features. The vegetation cover, moderately open to closed, is dominated by prostrate or dwarf grasses and forbs and includes many endemics.



### Corresponding alliances in EuroVegChecklist 2016

- > ONO-02D Avenion sempervirentis Barbero 1968
- > ONO-01A Festucion burnatii Rivas Goday et Rivas-Mart. ex Mayor et al. 1973
- > ONO-02C Festucion scopariae Br.-Bl. 1948
- > ONO-02B Ononidion cristatae Royer 1991
- > ONO-02A Ononidion striatae Br.-Bl. et Susplugas 1937
- > ONO-01B Sideritido fontquerianae-Arenarion microphyllae Rivas Goday et Borja 1961  
corr. Rivas-Mart. et al. 2002

### Characteristic species combination

Diagnostic species (phi coefficient \* 100)

<i>Festuca hystrix</i>	71
<i>Poa ligulata</i>	42
<i>Koeleria vallesiana</i>	36
<i>Teucrium expassum</i>	32
<i>Helianthemum canum</i>	31

<i>Arenaria grandiflora</i>	30
<i>Oreochloa confusa</i>	24
<i>Arenaria aggregata</i> aggr.	24
<i>Saxifraga conifera</i>	24
<i>Carthamus mitissimus</i>	24
<i>Dianthus pungens</i>	23
<i>Seseli montanum</i>	23
<i>Thymus mastigophorus</i>	22
<i>Thymus munbyanus</i>	21
<i>Jurinea humilis</i>	20
<i>Helianthemum apenninum</i>	20
<i>Potentilla pusilla</i>	20
<i>Festuca burnatii</i>	19
<i>Festuca marginata</i> subsp. <i>andres-molinae</i>	18
<i>Coronilla minima</i>	18
<i>Arenaria armerina</i>	18
<i>Artemisia pedemontana</i>	17
<i>Festuca nevadensis</i>	17
<i>Sideritis hyssopifolia</i> aggr.	17
<i>Thymus leptophyllus</i>	17
<i>Achillea odorata</i>	16
<i>Matthiola perennis</i>	16
<i>Globularia vulgaris</i>	15
<i>Draba dedeana</i>	15
<i>Silene legionensis</i>	15
<i>Saponaria caespitosa</i>	15

Constant species (percentage frequencies)

<i>Festuca hystrix</i>	73
<i>Koeleria vallesiana</i>	71
<i>Helianthemum canum</i>	51
<i>Anthyllis vulneraria</i>	32
<i>Seseli montanum</i>	29
<i>Poa ligulata</i>	29
<i>Coronilla minima</i>	28
<i>Helianthemum apenninum</i>	27
<i>Arenaria grandiflora</i>	26
<i>Thymus praecox</i>	24
<i>Carex humilis</i>	24
<i>Teucrium expassum</i>	22
<i>Potentilla pusilla</i>	21
<i>Sedum album</i>	20
<i>Helictochloa pratensis</i>	17
<i>Teucrium chamaedrys</i>	16
<i>Jurinea humilis</i>	16
<i>Arenaria aggregata</i> aggr.	16
<i>Eryngium campestre</i>	15
<i>Dianthus pungens</i>	15
<i>Bromopsis erecta</i>	15
<i>Globularia vulgaris</i>	14
<i>Fumana procumbens</i>	14
<i>Linum suffruticosum</i> aggr.	13
<i>Genista scorpius</i>	13
<i>Carthamus mitissimus</i>	13
<i>Paronychia kapela</i>	12
<i>Helictochloa bromoides</i>	12
<i>Sedum acre</i>	11
<i>Sanguisorba minor</i> aggr.	11
<i>Pilosella officinarum</i>	11

<i>Ononis pusilla</i>	11
<i>Lavandula latifolia</i>	11
<i>Helichrysum stoechas</i>	11
<i>Galium pumilum</i>	11
<i>Crepis albida</i>	11
<i>Aphyllanthes monspeliensis</i>	11

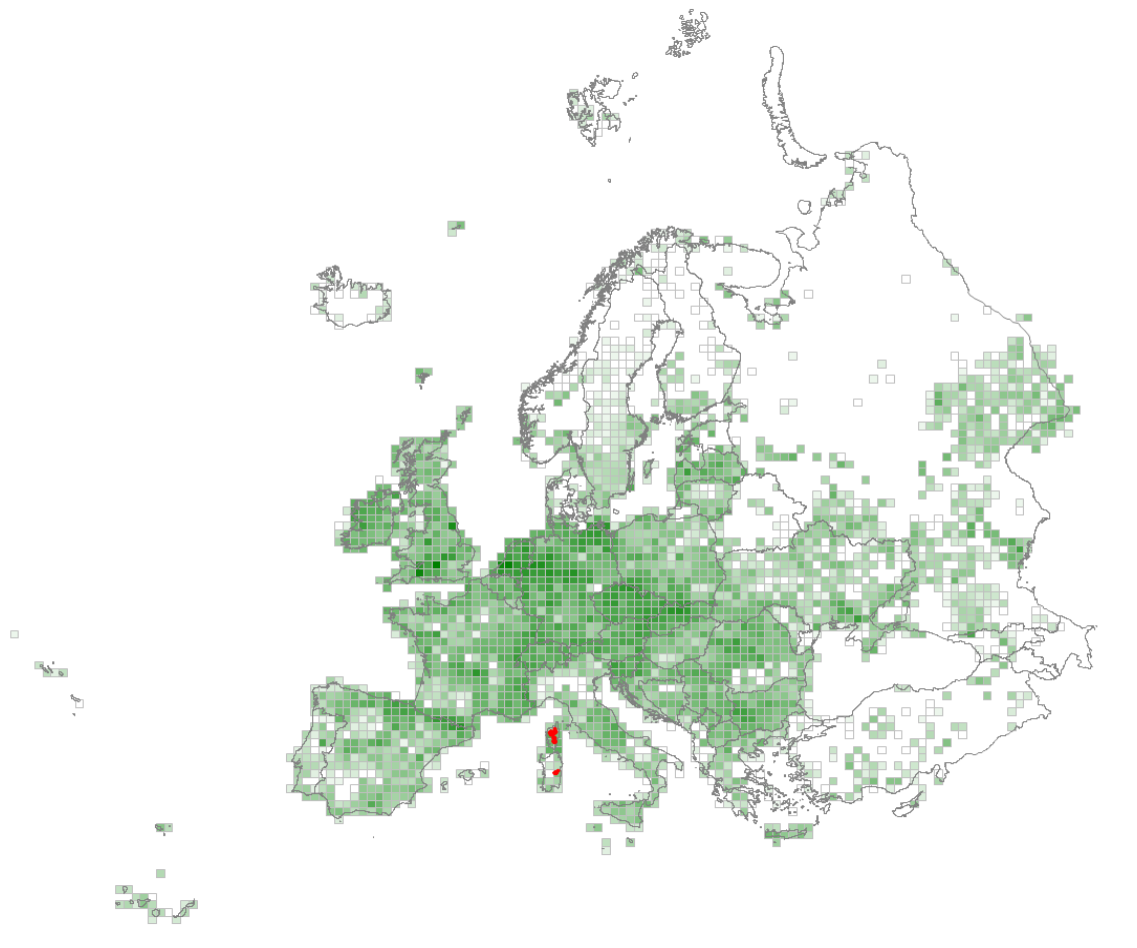
Dominant species (percentage frequencies of occurrences with cover > 25%)

<i>Festuca hystrix</i>	30
<i>Koeleria vallesiana</i>	6



## R1J – Cyrno-Sardean oromediterranean siliceous dry grassland

Grassland of base-poor soils over siliceous bedrock on the slopes and crests of high mountains in Corsica and Sardinia, with a short growing season and harsh winters when strong winds blow the ground free of snow and leave the surface subject to deep cold which encourages the development of freeze-thaw features. The cover of vegetation is intermediate to complete, dominated by prostrate herbs, cushion plants and dwarf shrubs, and includes many endemics.



### Corresponding alliances in EuroVegChecklist 2016

- > PIL-01A Sesamoido pygmaeae-Poion violaceae Gamisans 1975

### Characteristic species combination

Diagnostic species (phi coefficient \* 100)

<i>Cerastium soleirolii</i>	74
<i>Sagina pilifera</i>	64
<i>Galium corsicum</i>	45
<i>Genista lobelii</i>	45
<i>Hypochaeris robertia</i>	42
<i>Poa balbisii</i>	41
<i>Carlina macrocephala</i>	40
<i>Plantago subulata</i>	39
<i>Ligusticum corsicum</i>	39
<i>Thymus herba-barona</i>	38
<i>Pilosella soleiroliana</i>	38

<i>Stachys corsica</i>	37
<i>Bellium bellidioides</i>	33
<i>Armeria sardo</i>	31
<i>Pilosella lactucella</i>	27
<i>Festuca morisiana</i>	27
<i>Hypochaeris cretensis</i>	26
<i>Anthyllis hermanniae</i>	26
<i>Sesamoides minor</i>	24
<i>Berberis aetnensis</i>	24
<i>Trisetum gracile</i>	24
<i>Silene nodulosa</i>	24
<i>Armeria multiceps</i>	24
<i>Odontites corsica</i>	23
<i>Paronychia polygonifolia</i>	22
<i>Carex caryophyllea</i>	22
<i>Noccaea brevistyla</i>	22
<i>Sedum monregalense</i>	22
<i>Cerastium gibraltarium</i>	22
<i>Sedum brevifolium</i>	20
<i>Saxifraga pedemontana</i>	20
<i>Petrorhagia saxifraga</i>	20
<i>Bromus grossus</i>	20
<i>Veronica repens</i>	20
<i>Sedum annuum</i>	20
<i>Luzula spicata</i>	19
<i>Agrostis castellana</i>	18
<i>Ruta corsica</i>	18
<i>Helleborus lividus</i>	18
<i>Juniperus communis</i> subsp. <i>nana</i>	17
<i>Rumex acetosella</i>	17
<i>Crepis bellidifolia</i>	17
<i>Bellardiochloa variegata</i>	15
<i>Veronica verna</i>	15
<i>Genista salzmannii</i>	15

Constant species (percentage frequencies)

<i>Cerastium soleirolii</i>	75
<i>Sagina pilifera</i>	55
<i>Rumex acetosella</i>	55
<i>Hypochaeris robertia</i>	55
<i>Plantago subulata</i>	50
<i>Juniperus communis</i> subsp. <i>nana</i>	40
<i>Genista lobelii</i>	40
<i>Carex caryophyllea</i>	40
<i>Thymus herba-barona</i>	35
<i>Nardus stricta</i>	35
<i>Galium corsicum</i>	35
<i>Agrostis castellana</i>	35
<i>Sedum brevifolium</i>	30
<i>Poa bulbosa</i>	30
<i>Poa balbisii</i>	30
<i>Petrorhagia saxifraga</i>	30
<i>Carlina macrocephala</i>	30
<i>Bellium bellidioides</i>	30
<i>Avenella flexuosa</i>	30
<i>Stachys corsica</i>	25
<i>Pilosella lactucella</i>	25
<i>Luzula spicata</i>	25
<i>Brachypodium pinnatum</i>	25

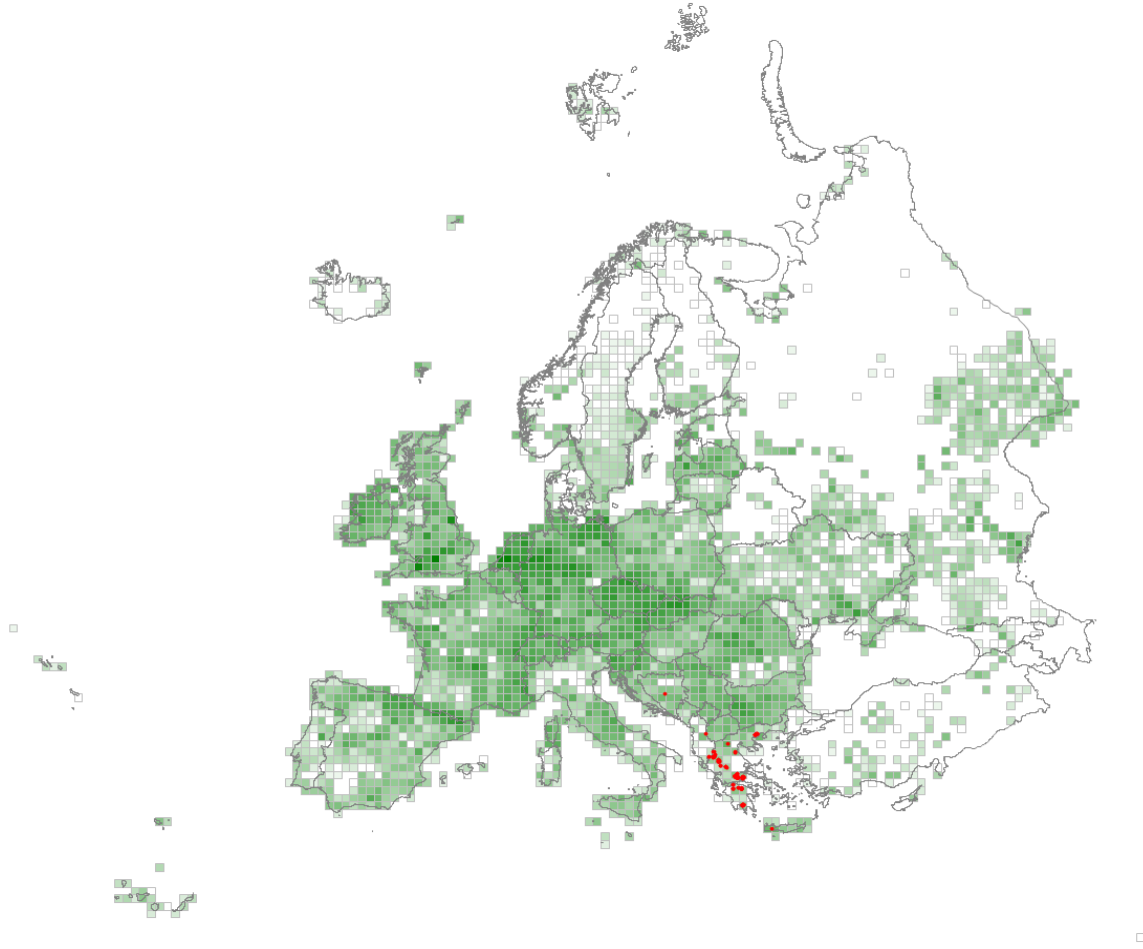
<i>Anthyllis hermanniae</i>	25
<i>Anthoxanthum odoratum</i> aggr.	25
<i>Veronica verna</i>	20
<i>Pilosella soleiroliana</i>	20
<i>Ligusticum corsicum</i>	20
<i>Hypochaeris cretensis</i>	20
<i>Dianthus sylvestris</i>	20
<i>Arrhenatherum elatius</i>	20
<i>Silene vulgaris</i>	15
<i>Scleranthus annuus</i>	15
<i>Saxifraga pedemontana</i>	15
<i>Paronychia polygonifolia</i>	15
<i>Helleborus lividus</i>	15
<i>Helichrysum italicum</i>	15
<i>Festuca rubra</i> aggr.	15
<i>Cystopteris fragilis</i>	15
<i>Cerastium gibraltarium</i>	15
<i>Brachypodium rupestre</i>	15
<i>Berberis aetnensis</i>	15
<i>Bellardiochloa variegata</i>	15
<i>Asplenium trichomanes</i>	15
<i>Armeria sardo</i>	15
<i>Amelanchier ovalis</i>	15

Dominant species (percentage frequencies of occurrences with cover > 25%)

<i>Sagina pilifera</i>	15
<i>Plantago subulata</i>	15
<i>Carex caryophyllea</i>	10
<i>Thymus catharinae</i>	5
<i>Genista lobelii</i>	5
<i>Festuca morisiana</i>	5
<i>Brachypodium pinnatum</i>	5

## R1K – Balkan and Anatolian oromediterranean dry grassland

Closed grassland of deeper acid soils occurring over various bedrocks above the tree line in Greece and Anatolia. It is found on high mountain slopes and depressions where snow accumulates and provides springtime irrigation with melt-water. The vegetation is species-rich, but the dominants and associates vary from place to place. It provides valuable summer grazing for traditional pastoralism.



### Corresponding alliances in EuroVegChecklist 2016

- > ANA-01A *Trifolium parnassii* Quézel 1964

### Characteristic species combination

Diagnostic species (phi coefficient \* 100)

<i>Trifolium parnassii</i>	84
<i>Herniaria parnassica</i>	73
<i>Alopecurus gerardi</i>	69
<i>Lotus stenodon</i>	54
<i>Campanula tymphaea</i>	50
<i>Dianthus viscidus</i>	48
<i>Luzula pindica</i>	46
<i>Campanula radicata</i>	43
<i>Plantago atrata</i>	41
<i>Silene roemerii</i>	37
<i>Crocus sieberi</i>	32
<i>Dianthus tymphresteus</i>	32

<i>Phleum alpinum</i> aggr.	31
<i>Thesium parnassi</i>	31
<i>Edraianthus parnassicus</i>	27
<i>Poa trichopoda</i>	25
<i>Taraxacum</i> sect. <i>Erythrosperma</i>	24
<i>Campanula spatulata</i>	24
<i>Bellardiochloa variegata</i>	23
<i>Crocus veluchensis</i>	23
<i>Astragalus depressus</i>	21
<i>Poa thessala</i>	20
<i>Armeria canescens</i>	19
<i>Ornithogalum exscapum</i>	19
<i>Onobrychis montana</i>	19
<i>Pilosella hoppeana</i>	17
<i>Podospermum roseum</i>	17
<i>Thymus boissieri</i>	17
<i>Trifolium heldreichianum</i>	16
<i>Ranunculus sartorianus</i>	16
<i>Ranunculus hayekii</i>	16
<i>Beta nana</i>	16
<i>Ranunculus demissus</i>	16
<i>Plantago holosteum</i>	16
<i>Scrophularia aestivalis</i>	15
<i>Poa pumila</i>	15
<i>Luzula spicata</i>	15
<i>Festuca varia</i>	15
<i>Festuca olympica</i>	15
<i>Armeria rumelica</i>	15

Constant species (percentage frequencies)

<i>Trifolium parnassii</i>	75
<i>Herniaria parnassica</i>	62
<i>Alopecurus gerardi</i>	62
<i>Phleum alpinum</i> aggr.	40
<i>Plantago atrata</i>	38
<i>Lotus stenodon</i>	30
<i>Thymus longicaulis</i>	25
<i>Dianthus viscidus</i>	25
<i>Campanula tymphaea</i>	25
<i>Taraxacum</i> sect. <i>Erythrosperma</i>	22
<i>Poa alpina</i>	22
<i>Luzula pindica</i>	22
<i>Campanula spatulata</i>	22
<i>Bellardiochloa variegata</i>	22
<i>Trifolium repens</i>	20
<i>Scleranthus perennis</i>	20
<i>Rumex acetosella</i>	20
<i>Plantago holosteum</i>	20
<i>Pilosella hoppeana</i>	20
<i>Nardus stricta</i>	20
<i>Luzula spicata</i>	20
<i>Campanula radicata</i>	20
<i>Silene roemeri</i>	18
<i>Lotus corniculatus</i>	18
<i>Eryngium amethystinum</i>	18
<i>Campanula sibirica</i>	18
<i>Bellis perennis</i>	18
<i>Armeria canescens</i>	18
<i>Poa thessala</i>	15

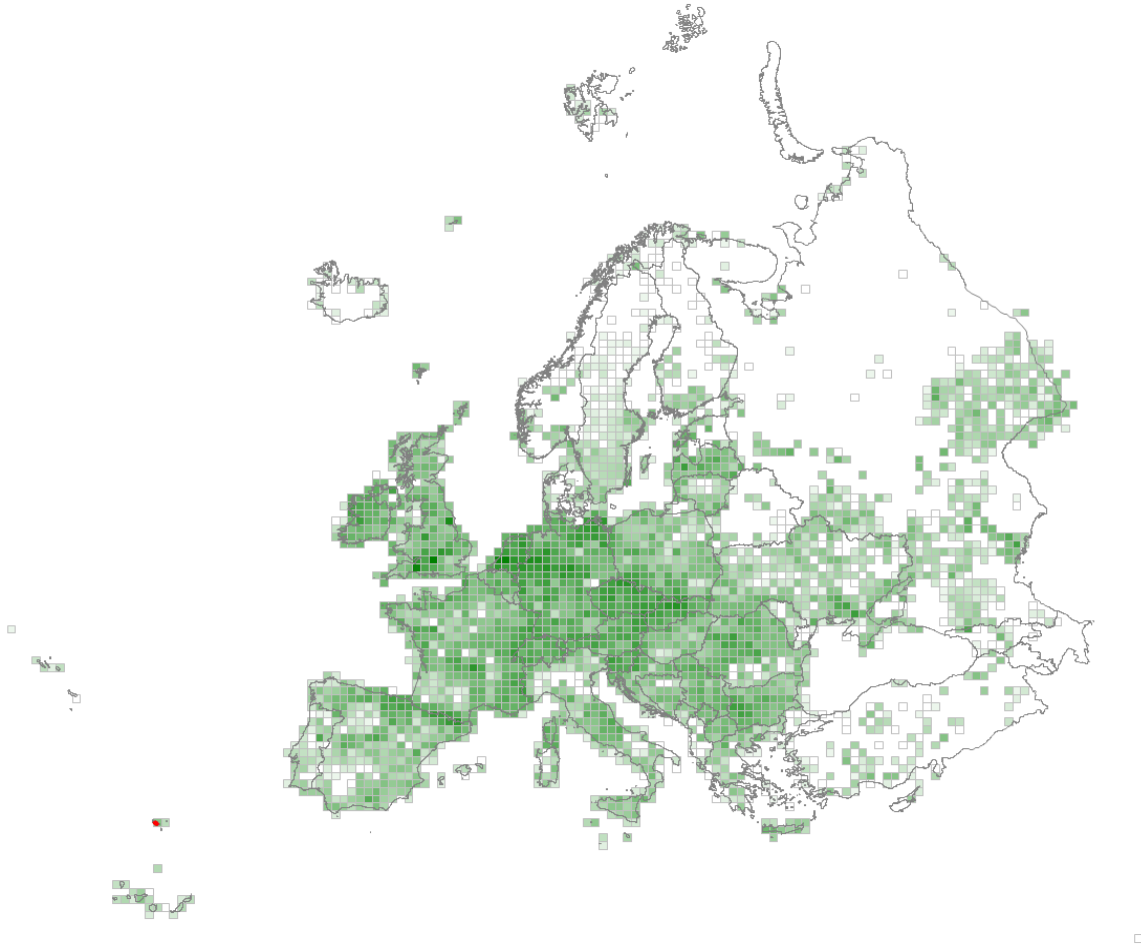
<i>Plantago lanceolata</i>	15
<i>Medicago lupulina</i>	15
<i>Festuca varia</i>	15
<i>Crocus veluchensis</i>	15
<i>Crocus sieberi</i>	15
<i>Clinopodium alpinum</i>	15
<i>Anthoxanthum odoratum</i> aggr.	15
<i>Thesium parnassi</i>	12
<i>Onobrychis montana</i>	12
<i>Daphne oleoides</i>	12
<i>Astragalus depressus</i>	12

Dominant species (percentage frequencies of occurrences with cover > 25%)

<i>Plantago atrata</i>	20
<i>Nardus stricta</i>	18
<i>Plantago holosteum</i>	10
<i>Phleum alpinum</i> aggr.	8
<i>Trifolium parnassii</i>	5
<i>Trifolium heldreichianum</i>	5
<i>Thymus longicaulis</i>	5
<i>Pilosella hoppeana</i>	5
<i>Festuca varia</i>	5

## R1L – Madeiran oromediterranean siliceous dry grassland

Highly distinctive tussocky grassland, rich in endemics, restricted to mountains in Madeira, where it occurs in crevices and on ledges in siliceous volcanic rocks where the soils are kept permanently moist by the very humid climate. It typically occurs in mosaics with heaths and forests, being threatened by the decline of domestic goat grazing.



### Corresponding alliances in EuroVegChecklist 2016

- > SAC-02A *Deschampsia maderensis*-*Parafestuca albida* Capelo et al. 2000

### Characteristic species combination

Diagnostic species (phi coefficient \* 100)

<i>Tolpis macrorhiza</i>	68
<i>Vicia capreolata</i>	65
<i>Parafestuca albida</i>	60
<i>Galium productum</i>	57
<i>Odontites holliana</i>	56
<i>Deschampsia maderensis</i>	53
<i>Erica maderensis</i>	53
<i>Bupleurum salicifolium</i>	53
<i>Erysimum bicolor</i>	50
<i>Sinapidendron frutescens</i>	50
<i>Festuca jubata</i>	49
<i>Armeria maderensis</i>	49
<i>Drabella muralis</i>	47

<i>Sedum farinosum</i>	43
<i>Saxifraga maderensis</i>	38
<i>Anthyllis lemanniana</i>	38
<i>Aichryson villosum</i>	38
<i>Bunium brevifolium</i>	33
<i>Ranunculus cortusifolius</i>	33
<i>Viola paradoxa</i>	32
<i>Pericallis aurita</i>	32
<i>Helichrysum melaleucum</i>	32
<i>Andryala glandulosa</i>	32
<i>Dactylis smithii</i>	30
<i>Aeonium glandulosum</i>	29
<i>Genista tenera</i>	29
<i>Rumex maderensis</i>	29
<i>Cardamine hirsuta</i>	28
<i>Centranthus calcitrapae</i>	28
<i>Musschia aurea</i>	27
<i>Monizia edulis</i>	27
<i>Fumaria capreolata</i>	23
<i>Aichryson divaricatum</i>	22
<i>Aphanes australis</i>	21
<i>Plantago malato-belizii</i>	20
<i>Senecio vulgaris</i>	19
<i>Geranium purpureum</i>	18
<i>Plantago arborescens</i>	18
<i>Senecio sylvaticus</i>	17

Constant species (percentage frequencies)

<i>Tolpis macrorhiza</i>	50
<i>Vicia capreolata</i>	43
<i>Ranunculus cortusifolius</i>	36
<i>Parafestuca albida</i>	36
<i>Odontites holliana</i>	36
<i>Helichrysum melaleucum</i>	36
<i>Galium productum</i>	36
<i>Erysimum bicolor</i>	36
<i>Bupleurum salicifolium</i>	36
<i>Anthoxanthum odoratum</i> aggr.	36
<i>Aeonium glandulosum</i>	36
<i>Sinapidendron frutescens</i>	29
<i>Senecio vulgaris</i>	29
<i>Geranium purpureum</i>	29
<i>Festuca jubata</i>	29
<i>Erica maderensis</i>	29
<i>Drabella muralis</i>	29
<i>Deschampsia maderensis</i>	29
<i>Dactylis smithii</i>	29
<i>Centranthus calcitrapae</i>	29
<i>Cardamine hirsuta</i>	29
<i>Armeria maderensis</i>	29
<i>Sedum farinosum</i>	21
<i>Pericallis aurita</i>	21
<i>Andryala glandulosa</i>	21
<i>Viola paradoxa</i>	14
<i>Teesdalia nudicaulis</i>	14
<i>Senecio sylvaticus</i>	14
<i>Saxifraga maderensis</i>	14
<i>Rumex maderensis</i>	14
<i>Plantago arborescens</i>	14



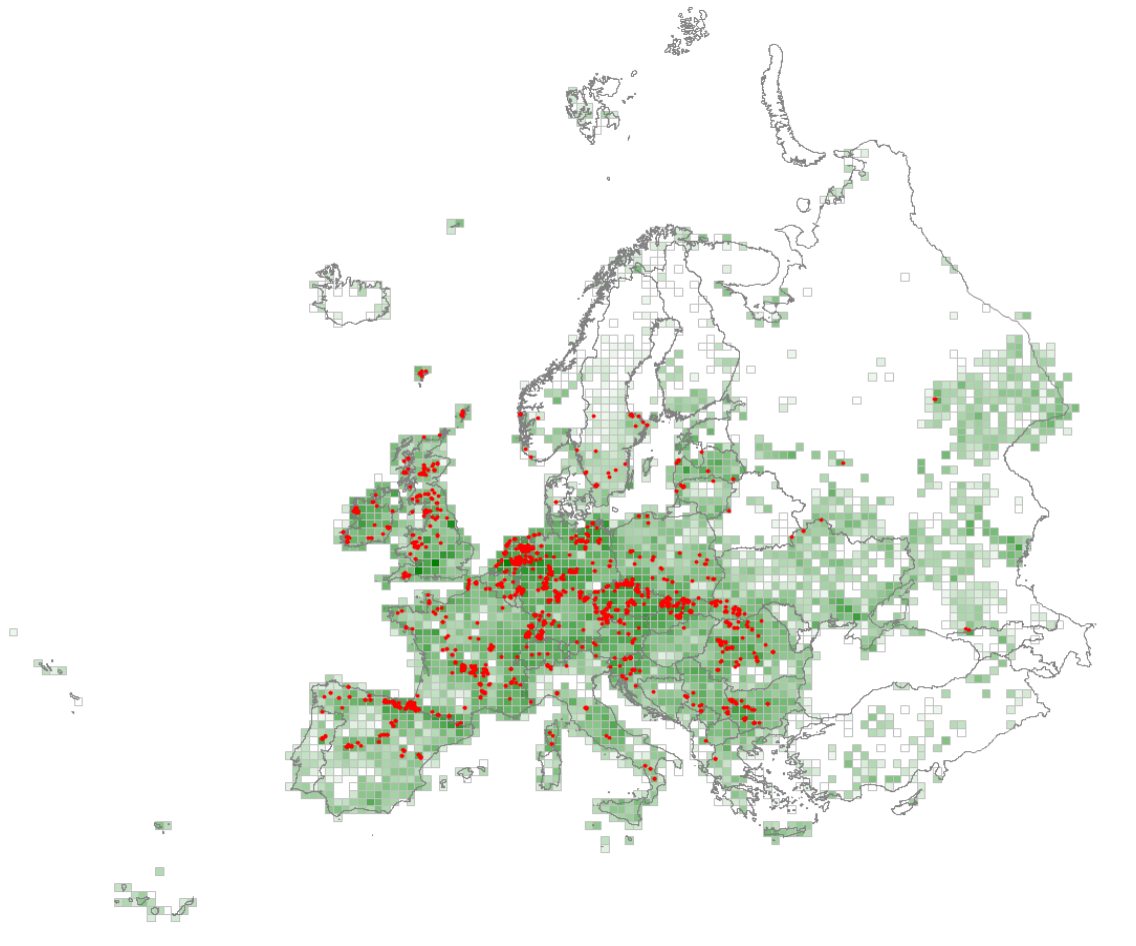
<i>Ornithopus perpusillus</i>	14
<i>Myosotis ramosissima</i>	14
<i>Luzula elegans</i>	14
<i>Leontodon saxatilis</i>	14
<i>Hypochaeris glabra</i>	14
<i>Geranium rotundifolium</i>	14
<i>Genista tenera</i>	14
<i>Galium murale</i>	14
<i>Fumaria capreolata</i>	14
<i>Carlina salicifolia</i>	14
<i>Bunium brevifolium</i>	14
<i>Arabis alpina</i>	14
<i>Anthyllis lemanniana</i>	14
<i>Aichryson villosum</i>	14

Dominant species (percentage frequencies of occurrences with cover > 25%)

<i>Odontites holliana</i>	29
<i>Aeonium glandulosum</i>	14
<i>Parafestuca albida</i>	7
<i>Monizia edulis</i>	7
<i>Festuca jubata</i>	7
<i>Deschampsia maderensis</i>	7
<i>Aichryson villosum</i>	7

## R1M – Lowland to montane, dry to mesic grassland usually dominated by *Nardus stricta*

Usually dominated by the tightly tussocky *Nardus stricta*, this grassland is characteristic of nutrient-poor, acidic soils, sometimes seasonally wet, on siliceous substrates through the entire lowlands and submontane belts of temperate Europe, though optimally developed in the cooler and rainier climate of the Atlantic region. Other grasses may share dominance, but the associated flora is generally rather species-poor and related to the type and intensity of grazing.



### Corresponding alliances in EuroVegChecklist 2016

- > NAR-01H Achilleo-Arnicion Horvat et Pawłowski in Horvat 1960
- > NAR-01G Cirsio vallis-demoni-Nardion Giacomini et Gentile ex Di Pietro et Theurillat in Di Pietro et al. 2015
- > NAR-01A Equiseto-Galion borealis Tx. in Tx. et Böttcher 1969
- > NAR-01F Nardo-Agrostion caninae Cortini-Pedrotti et al. 1973
- > NAR-01D Nardo-Agrostion tenuis Sillinger 1933
- > NAR-01C Nardo-Juncion squarrosi (Oberd. 1957) Passarge 1964
- > NAR-01B Violion caninae Schwickerath 1944

### Characteristic species combination

Diagnostic species (phi coefficient \* 100)

<i>Nardus stricta</i>	27
<i>Galium saxatile</i>	26
<i>Danthonia decumbens</i>	26
<i>Carex pilulifera</i>	25

<i>Luzula campestris</i> aggr.	20
<i>Potentilla erecta</i>	19
<i>Agrostis capillaris</i>	16
<i>Festuca filiformis</i>	15

Constant species (percentage frequencies)

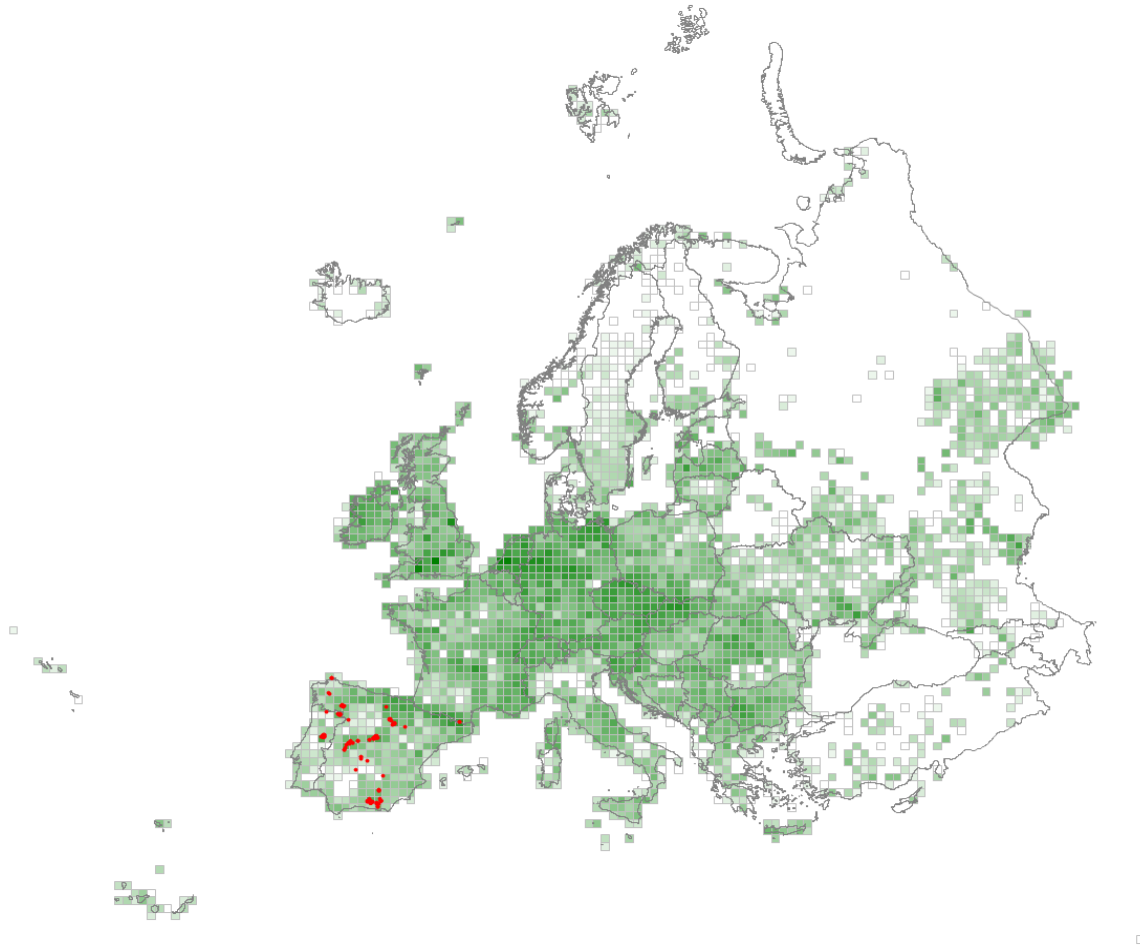
<i>Potentilla erecta</i>	75
<i>Nardus stricta</i>	75
<i>Agrostis capillaris</i>	59
<i>Luzula campestris</i> aggr.	56
<i>Danthonia decumbens</i>	48
<i>Carex pilulifera</i>	44
<i>Galium saxatile</i>	43
<i>Calluna vulgaris</i>	42
<i>Avenella flexuosa</i>	41
<i>Festuca rubra</i> aggr.	38
<i>Anthoxanthum odoratum</i> aggr.	38
<i>Veronica officinalis</i>	31
<i>Vaccinium myrtillus</i>	29
<i>Pilosella officinarum</i>	29
<i>Festuca ovina</i>	23
<i>Pleurozium schreberi</i>	21
<i>Rumex acetosella</i>	20
<i>Viola canina</i>	19
<i>Molinia caerulea</i> aggr.	19
<i>Rhytidiadelphus squarrosus</i>	18
<i>Hypericum maculatum</i> aggr.	17
<i>Festuca filiformis</i>	17
<i>Achillea millefolium</i> aggr.	17
<i>Polygala vulgaris</i>	15
<i>Hypnum cupressiforme</i> aggr.	15
<i>Campanula rotundifolia</i>	14
<i>Rumex acetosa</i>	13
<i>Plantago lanceolata</i>	13
<i>Hypochaeris radicata</i>	13
<i>Dicranum scoparium</i>	13
<i>Polygala serpyllifolia</i>	12
<i>Lotus corniculatus</i>	12
<i>Briza media</i>	12
<i>Arnica montana</i>	12
<i>Holcus mollis</i>	11
<i>Deschampsia cespitosa</i> aggr.	11

Dominant species (percentage frequencies of occurrences with cover > 25%)

<i>Nardus stricta</i>	50
<i>Festuca ovina</i>	7
<i>Galium saxatile</i>	6
<i>Avenella flexuosa</i>	6
<i>Festuca filiformis</i>	5

## R1N – Open Iberian supramediterranean dry acid and neutral grassland

Dominated by small tussock grasses, forbs and mat-formers, including many endemics, this grassland occurs on shallow skeletal soils, nutrient-poor and drought-prone, developed over outcrops of siliceous and ultramafic bedrocks at moderate to high altitudes in the western Iberian Peninsula. The habitat is a traditional part of pastoral landscapes grazed mostly by sheep.



### Corresponding alliances in EuroVegChecklist 2016

- > IND-02B *Armerion eriophyllae* Pinto da Silva 1970
- > IND-02A *Hieracio castellani-Plantaginion radicatae* Rivas-Mart. et Cantó 1987
- > IND-02C *Thymion serpylloides* Rivas Goday et Rivas-Mart. in Rivas-Mart. 1965

### Characteristic species combination

Diagnostic species (phi coefficient \* 100)

<i>Lotus glareosus</i>	42
<i>Pilosella castellana</i>	41
<i>Koeleria crassipes</i>	32
<i>Arenaria querooides</i>	29
<i>Festuca summilusitana</i>	28
<i>Armeria eriophylla</i>	24
<i>Thymus izcoi</i>	24
<i>Neoschischkinia reuteri</i>	23
<i>Plantago subulata</i>	23
<i>Neoschischkinia truncatula</i>	23

<i>Leucanthemopsis pulverulenta</i>	21
<i>Reseda virgata</i>	20
<i>Molineriella laevis</i>	20
<i>Sedum brevifolium</i>	19
<i>Sagina merinoi</i>	19
<i>Paronychia polygonifolia</i>	19
<i>Jasione crispa</i> aggr.	18
<i>Odontarrhena serpyllifolia</i>	18
<i>Festuca indigesta</i>	18
<i>Cerastium gracile</i>	17
<i>Narcissus rupicola</i>	17
<i>Sedum arenarium</i>	17
<i>Filago minima</i>	17
<i>Festuca iberica</i>	17
<i>Festuca brigantina</i>	17
<i>Anthemis alpestris</i>	17
<i>Brassica oxyrrhina</i>	17
<i>Echium salmanticum</i>	17
<i>Scorzoneroides microcephala</i>	16
<i>Centaurea micrantha</i>	16
<i>Gagea nevadensis</i>	15

Constant species (percentage frequencies)

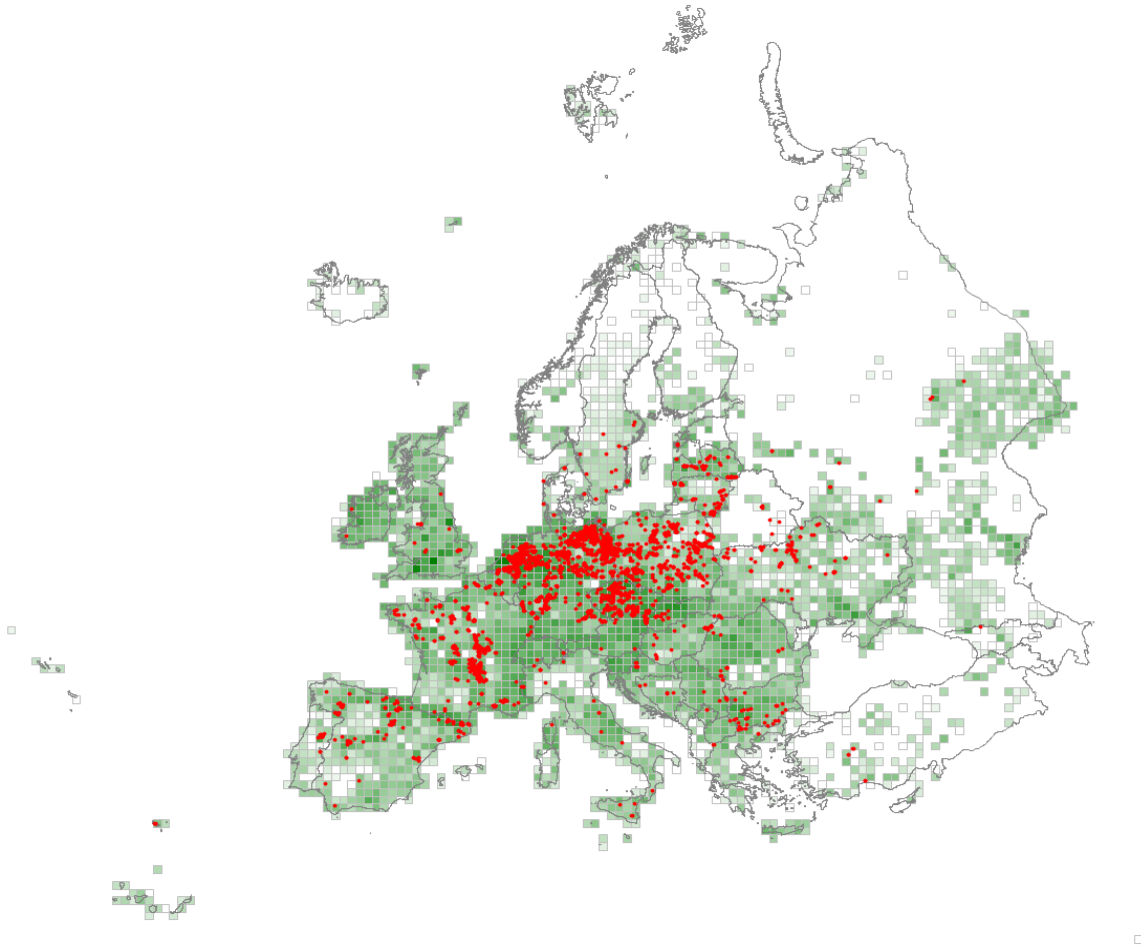
<i>Lotus glareosus</i>	34
<i>Pilosella castellana</i>	33
<i>Plantago subulata</i>	30
<i>Sedum brevifolium</i>	29
<i>Rumex acetosella</i>	27
<i>Poa bulbosa</i>	23
<i>Jasione crispa</i> aggr.	23
<i>Neoschischkinia truncatula</i>	21
<i>Koeleria crassipes</i>	21
<i>Filago minima</i>	21
<i>Festuca indigesta</i>	19
<i>Agrostis castellana</i>	19
<i>Arenaria querioides</i>	17
<i>Polytrichum piliferum</i>	16
<i>Festuca summilusitana</i>	16
<i>Tuberaria guttata</i>	14
<i>Neoschischkinia reuteri</i>	14
<i>Nardus stricta</i>	14
<i>Festuca iberica</i>	14
<i>Avenella flexuosa</i>	14
<i>Plantago holosteum</i>	13
<i>Pilosella officinarum</i>	13
<i>Paronychia polygonifolia</i>	13
<i>Molineriella laevis</i>	13
<i>Spergula morisonii</i>	11
<i>Helictochloa marginata</i>	11
<i>Corynephorus canescens</i>	11
<i>Cetraria aculeata</i>	11
<i>Cerastium gracile</i>	11
<i>Anthoxanthum aristatum</i>	11

Dominant species (percentage frequencies of occurrences with cover > 25%)

<i>Festuca indigesta</i>	17
<i>Nardus stricta</i>	6

## R1P – Oceanic to subcontinental inland sand grassland on dry acid and neutral soils

Moderately open to closed grassland on nutrient-poor sandy soils, mostly acid to neutral though sometimes calcareous, on plains, river terraces and cliffs through the lowlands and submontane belts of temperate Europe. Narrow-leaved, tussocky graminoids dominate, associated herbs can be numerous and more open swards can have rich annual and cryptogam floras. Across the wide range, there is considerable variety among the dominants and companions, and the extreme topoclimate can provide a western outpost for steppe elements.



### Corresponding alliances in EuroVegChecklist 2016

- > COR-01D *Armerion elongatae* Pötsch 1962
- <> SED-04D *Armerion juncea* Br.-Bl. ex Br.-Bl. et al. 1952
- > COR-01C *Sedo-Cerastion arvensis* Sissingh et Tideman 1960
- <> SED-04G *Sileno conicae-Cerastion semidecandri* Korneck 1974
- <> SED-03A *Thero-Airion* Tx. ex Oberd. 1957

### Characteristic species combination

Diagnostic species (phi coefficient \* 100)

<i>Festuca stricta</i> subsp. <i>trachyphylla</i>	21
<i>Brachythecium albicans</i>	19
<i>Trifolium arvense</i>	19
<i>Cerastium semidecandrum</i>	19
<i>Pilosella officinarum</i>	18

<i>Rumex acetosella</i>	18
<i>Jasione montana</i>	18
<i>Corynephorus canescens</i>	17
<i>Polytrichum piliferum</i>	16
<i>Ceratodon purpureus</i>	16
<i>Artemisia campestris</i>	15

Constant species (percentage frequencies)

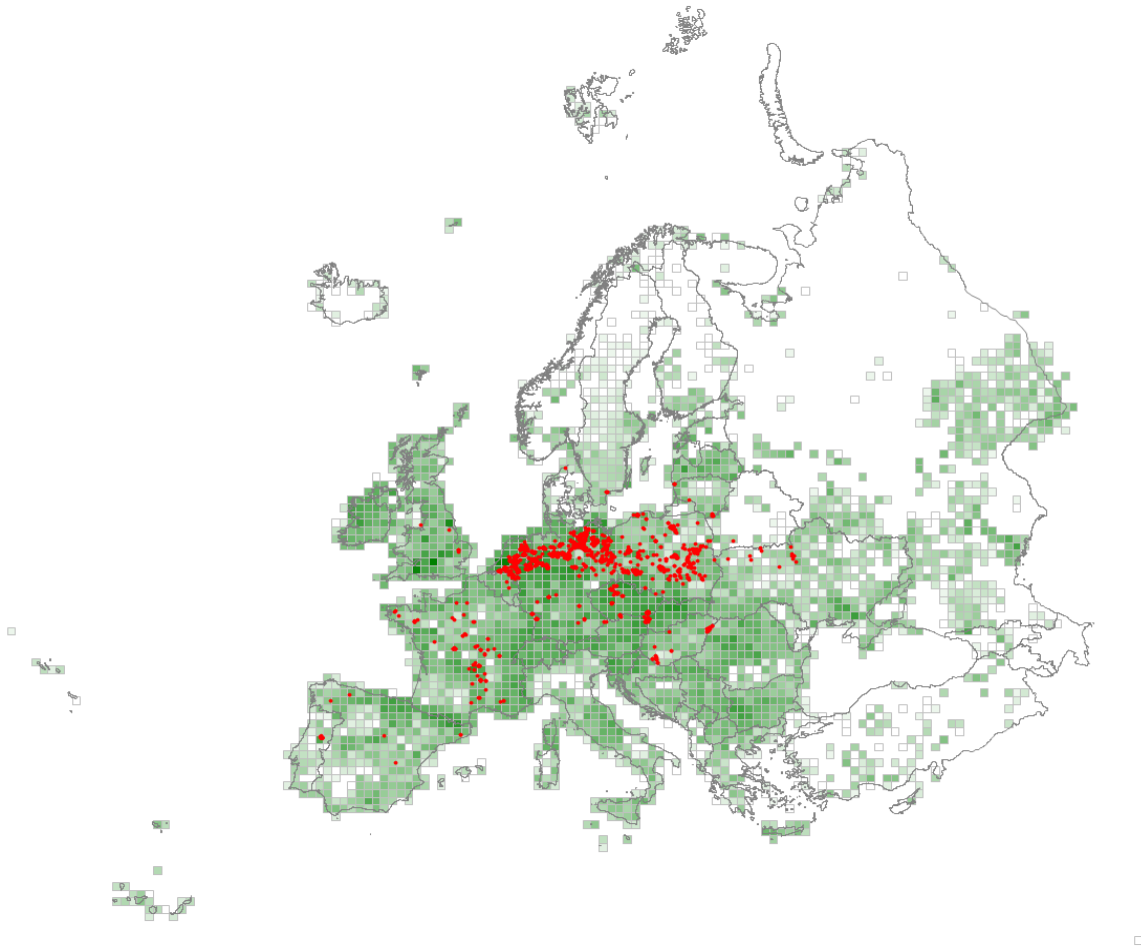
<i>Rumex acetosella</i>	56
<i>Pilosella officinarum</i>	53
<i>Agrostis capillaris</i>	40
<i>Trifolium arvense</i>	38
<i>Hypochaeris radicata</i>	37
<i>Jasione montana</i>	35
<i>Achillea millefolium</i> aggr.	35
<i>Ceratodon purpureus</i>	32
<i>Plantago lanceolata</i>	31
<i>Artemisia campestris</i>	30
<i>Corynephorus canescens</i>	29
<i>Festuca ovina</i>	28
<i>Polytrichum piliferum</i>	27
<i>Sedum acre</i>	26
<i>Cerastium semidecandrum</i>	26
<i>Potentilla argentea</i>	24
<i>Arenaria serpyllifolia</i>	24
<i>Hypericum perforatum</i>	23
<i>Thymus serpyllum</i>	22
<i>Poa pratensis</i> aggr.	20
<i>Euphorbia cyparissias</i>	19
<i>Brachythecium albicans</i>	19
<i>Trifolium campestre</i>	18
<i>Scleranthus perennis</i>	17
<i>Helichrysum arenarium</i>	17
<i>Erigeron canadensis</i>	17
<i>Filago minima</i>	16
<i>Ornithopus perpusillus</i>	15
<i>Luzula campestris</i> aggr.	14
<i>Hypnum cupressiforme</i> aggr.	14
<i>Festuca stricta</i> subsp. <i>trachyphylla</i>	14
<i>Draba verna</i> aggr.	14
<i>Aira praecox</i>	14
<i>Thymus pulegioides</i>	13
<i>Festuca rubra</i> aggr.	13
<i>Racomitrium canescens</i>	12
<i>Galium verum</i>	12
<i>Cerastium arvense</i>	12
<i>Armeria maritima</i>	12
<i>Aira caryophyllea</i>	12
<i>Agrostis vinealis</i>	12
<i>Veronica arvensis</i>	11
<i>Teesdalia nudicaulis</i>	11
<i>Sedum sexangulare</i>	11
<i>Cladonia furcata</i>	11
<i>Bromus hordeaceus</i>	11

Dominant species (percentage frequencies of occurrences with cover > 25%)

<i>Festuca ovina</i>	7
<i>Pilosella officinarum</i>	6
<i>Festuca stricta</i> subsp. <i>trachyphylla</i>	5

## R1Q – Inland sanddrift and dune with siliceous grassland

Usually sparse grasslands on sand drifts among inland dunes and other open landscapes, mainly in the northern Central European lowlands, where the nutrient-poor and highly acidic surface is prone to wind erosion and hot droughty summers, forming a highly distinctive shifting-dune landscape. Soil development is very slow, pioneer bryophyte vegetation succeeded by an open cover of small tussock grasses, often with rich contingents of lichens on the compacted surface. Military training zones and abandoned lignite areas provide a new environment for the development of these grasslands.



### Corresponding alliances in EuroVegChecklist 2016

- <> COR-01A *Corynephorion canescentis* Klika 1931
- <> COR-01B *Koelerion glaucae* Volk 1931
- <> SED-03A *Thero-Airion* Tx. ex Oberd. 1957

### Characteristic species combination

Diagnostic species (phi coefficient \* 100)

<i>Corynephorus canescens</i>	55
<i>Spergula morisonii</i>	55
<i>Polytrichum piliferum</i>	39
<i>Teesdalia nudicaulis</i>	34
<i>Cetraria aculeata</i>	24
<i>Rumex acetosella</i>	21
<i>Agrostis vinealis</i>	21
<i>Cladonia cervicornis</i>	18



<i>Filago minima</i>	18
<i>Cladonia glauca</i>	17
<i>Veronica dillenii</i>	17
<i>Jasione montana</i>	16
<i>Ceratodon purpureus</i>	16
<i>Cladonia zopfii</i>	16
<i>Cladonia subulata</i>	16

Constant species (percentage frequencies)

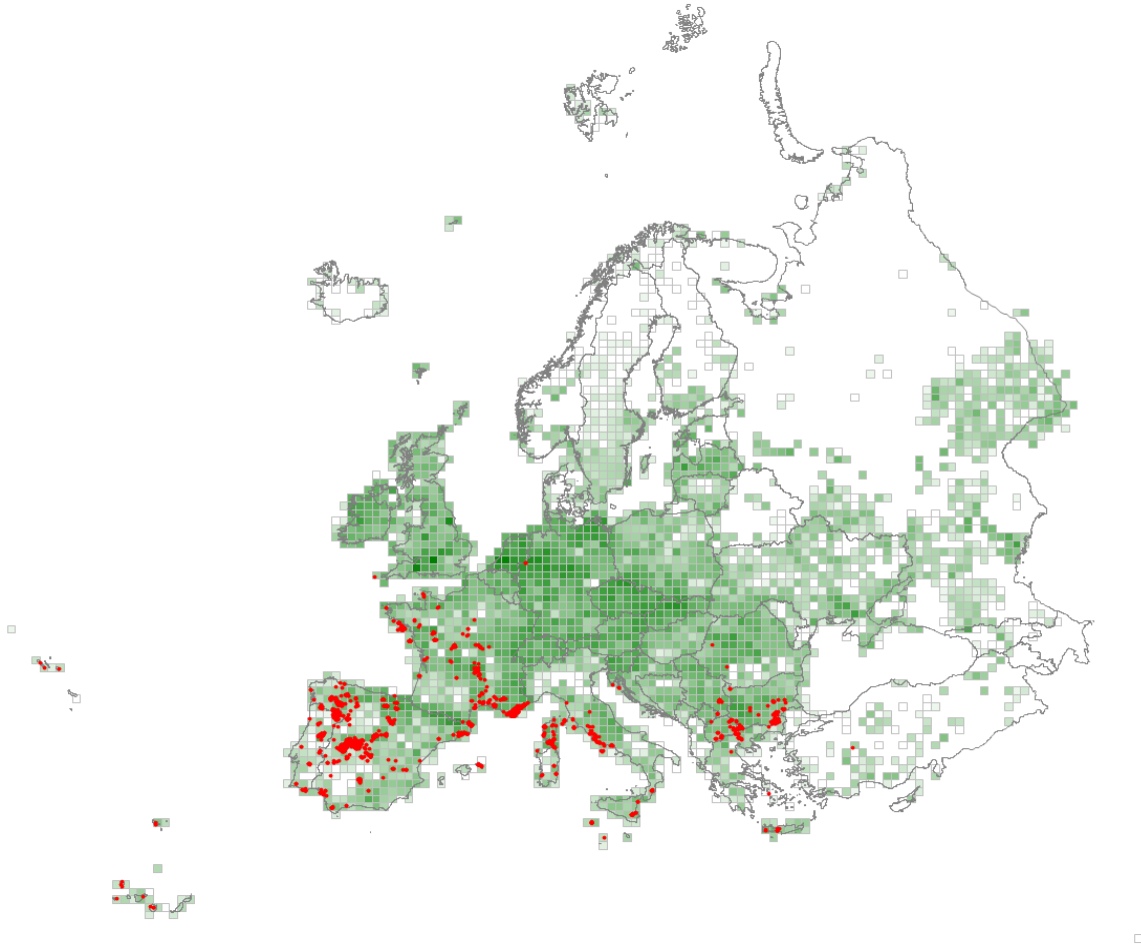
<i>Corynephorus canescens</i>	91
<i>Rumex acetosella</i>	66
<i>Polytrichum piliferum</i>	65
<i>Spergula morisonii</i>	57
<i>Teesdalia nudicaulis</i>	39
<i>Cetraria aculeata</i>	34
<i>Agrostis capillaris</i>	34
<i>Jasione montana</i>	33
<i>Ceratodon purpureus</i>	32
<i>Pilosella officinarum</i>	31
<i>Hypochaeris radicata</i>	23
<i>Filago minima</i>	23
<i>Festuca ovina</i>	21
<i>Cladonia pyxidata</i> aggr.	21
<i>Carex arenaria</i>	20
<i>Agrostis vinealis</i>	20
<i>Pinus sylvestris</i>	18
<i>Cladonia uncialis</i>	18
<i>Cladonia furcata</i>	18
<i>Scleranthus perennis</i>	16
<i>Thymus serpyllum</i>	13
<i>Erigeron canadensis</i>	13
<i>Cladonia glauca</i>	13
<i>Veronica dillenii</i>	12
<i>Ornithopus perpusillus</i>	12
<i>Cladonia mitis</i>	12
<i>Cladonia macilenta</i> aggr.	12
<i>Cladonia gracilis</i>	12
<i>Cladonia coccifera</i> aggr.	12
<i>Cladonia cervicornis</i>	12
<i>Cladonia arbuscula</i> aggr.	12
<i>Calluna vulgaris</i>	12
<i>Artemisia campestris</i>	12
<i>Racomitrium canescens</i>	11

Dominant species (percentage frequencies of occurrences with cover > 25%)

<i>Corynephorus canescens</i>	45
<i>Polytrichum piliferum</i>	20

## R1R – Mediterranean to Atlantic open, dry, acid and neutral grassland

Usually ephemeral vegetation related to the yearly cycle of spring rains and summer drought through the Western Mediterranean and more fragmentarily into the Atlantic and continental areas where a high diversity of small annual plants make a brief, colourful appearance on bare patches of nutrient-poor, acidic soils. Typically, the habitat occurs as small patches in intimate mosaics with heath and scrub and has provided a valuable supplementary resource for sheep at lambing time.



### Corresponding alliances in EuroVegChecklist 2016

- <> TUB-03A Anthyllido hamosae-Malcolmion lacerae Rivas Goday 1958
- > SAC-03A Armerio rumelicae-Potentillion Mitsevski 1978
- > TUB-03C Corynephorion maritimi Costa, Pinto-Gomes, Neto et Rivas-Mart. in J.C. Costa et al. 2012
- > TUB-03B Corynephoru articulati-Malcolmion patulae Rivas Goday 1958
- > TUB-01B Crassulo tillaeae-Sedion caespitosi de Foucault 1999
- > TUB-03E Filagini asterisciflorae-Linarion humilis Minissale et Sciandrello 2015
- > TUB-01A Helianthemion guttati Br.-Bl. in Br.-Bl. et al. 1940
- > TUB-01C Molinerion laevis Br.-Bl. et al. 1952
- > TUB-03D Ormenido multicaulis-Malcolmion broussonetii Br.-Bl. in Br.-Bl. et al. 1940
- > TUB-01H Ornithopodo pinnati-Gaudinicion coarctatae Fernández Prieto et Aguiar in Fernández Prieto et al. 2012
- > TUB-01F Sclerantho-Myositidion incrassatae S. Brullo et al. 2001
- > TUB-01D Sedion pedicellato-andegavensis Rivas-Mart. et al. 1986
- <> SED-03A Thero-Airion Tx. ex Oberd. 1957
- > TUB-01G Thymion micantis J.C. Costa et al. 2005
- > TUB-01E Trifolion cherleri Micevski 1972

## Characteristic species combination

### Diagnostic species (phi coefficient \* 100)

<i>Tuberaria guttata</i>	38
<i>Hypochaeris glabra</i>	34
<i>Ornithopus compressus</i>	30
<i>Filago minima</i>	29
<i>Tolpis barbata</i>	26
<i>Filago gallica</i>	25
<i>Galium divaricatum</i>	22
<i>Linaria pelisseriana</i>	22
<i>Vulpia myuros</i>	22
<i>Vulpia bromoides</i>	21
<i>Ornithopus pinnatus</i>	20
<i>Anthyllis lotoides</i>	20
<i>Aira cupaniana</i>	20
<i>Hispidella hispanica</i>	19
<i>Micropyrum tenellum</i>	19
<i>Moenchia erecta</i>	18
<i>Aira caryophyllea</i>	18
<i>Filago carpetana</i>	17
<i>Trifolium cherleri</i>	17
<i>Trifolium arvense</i>	17
<i>Vulpia ciliata</i>	17
<i>Teesdalia coronopifolia</i>	17
<i>Coronilla repanda</i>	17
<i>Plantago bellardii</i>	17
<i>Psilurus incurvus</i>	16
<i>Arnoseris minima</i>	16
<i>Rumex bucephalophorus</i>	16
<i>Silene gallica</i>	16
<i>Ornithopus perpusillus</i>	16
<i>Trifolium glomeratum</i>	16
<i>Crassula tillaea</i>	16
<i>Anthoxanthum aristatum</i>	16
<i>Molineriella laevis</i>	15

### Constant species (percentage frequencies)

<i>Tuberaria guttata</i>	55
<i>Hypochaeris glabra</i>	41
<i>Filago minima</i>	37
<i>Trifolium arvense</i>	35
<i>Ornithopus compressus</i>	29
<i>Trifolium campestre</i>	28
<i>Poa bulbosa</i>	26
<i>Vulpia myuros</i>	25
<i>Aira caryophyllea</i>	25
<i>Filago gallica</i>	23
<i>Vulpia bromoides</i>	21
<i>Rumex acetosella</i>	21
<i>Leontodon saxatilis</i>	20
<i>Tolpis barbata</i>	19
<i>Micropyrum tenellum</i>	19
<i>Vulpia ciliata</i>	18
<i>Rumex bucephalophorus</i>	18
<i>Briza maxima</i>	18
<i>Ornithopus perpusillus</i>	17
<i>Jasione montana</i>	17
<i>Psilurus incurvus</i>	16

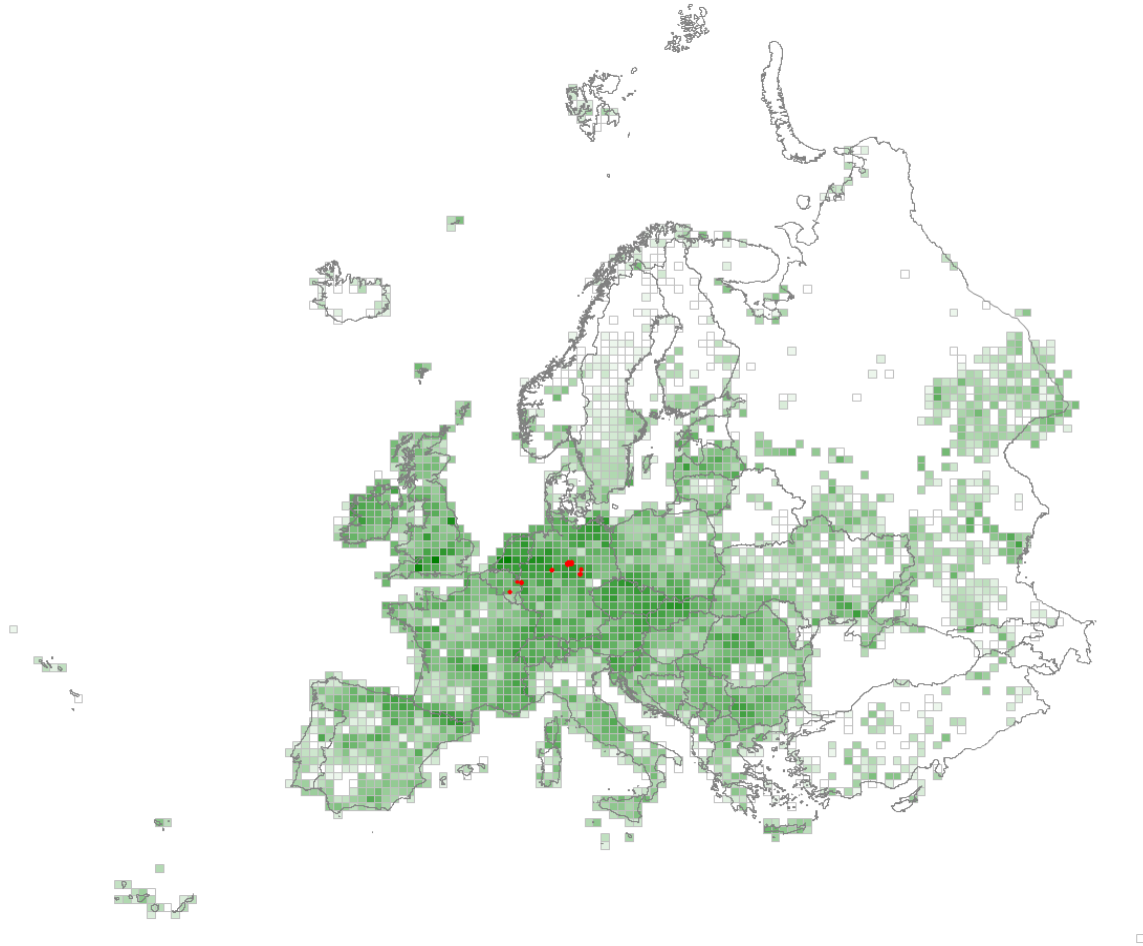
<i>Galium divaricatum</i>	16
<i>Erodium cicutarium</i>	16
<i>Trifolium glomeratum</i>	15
<i>Silene gallica</i>	15
<i>Plantago bellardii</i>	15
<i>Petrorhagia prolifera</i>	15
<i>Anthoxanthum aristatum</i>	15
<i>Trifolium angustifolium</i>	14
<i>Teesdalia nudicaulis</i>	14
<i>Aira elegantissima</i>	14
<i>Linaria pelisseriana</i>	13
<i>Trifolium cherleri</i>	12
<i>Sherardia arvensis</i>	12
<i>Plantago lanceolata</i>	12
<i>Eryngium campestre</i>	12
<i>Asterolinon linum-stellatum</i>	12
<i>Arnoseris minima</i>	12
<i>Aira cupaniana</i>	12
<i>Teesdalia coronopifolia</i>	11
<i>Aira praecox</i>	11

Dominant species (percentage frequencies of occurrences with cover > 25%)

<i>Tuberaria guttata</i>	6
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## R1S – Heavy-metal grassland in Western and Central Europe

Short open sward with a distinctive metallophyte component, occurring on shallow, skeletal soils over natural rock exposures with heavy metals in western and Central Europe, on mine spoil or ground contaminated by dust and waters from such sources. Typically it occurs in small patches in the landscapes, colonising slowly and sustained by the extreme environment. Sometimes it is dependent on grazing by wild herbivores that maintain early successional stages that are richer in cryptogams.



### Corresponding alliances in EuroVegChecklist 2016

- > THL-10B *Armerion halleri* Ernst 1965
- > THL-10A *Thlaspion calaminarii* Ernst 1965

### Characteristic species combination

Diagnostic species (phi coefficient \* 100)

<i>Armeria alpina</i> subsp. <i>halleri</i>	83
<i>Viola calaminaria</i>	55
<i>Noccaea caerulescens</i>	49
<i>Minuartia verna</i> aggr.	38
<i>Ptychostomum imbricatum</i>	29
<i>Micarea lignaria</i>	29
<i>Cornicularia normoerica</i>	29
<i>Cladonia furcata</i>	25
<i>Cladonia pyxidata</i> aggr.	24
<i>Weissia controversa</i>	24

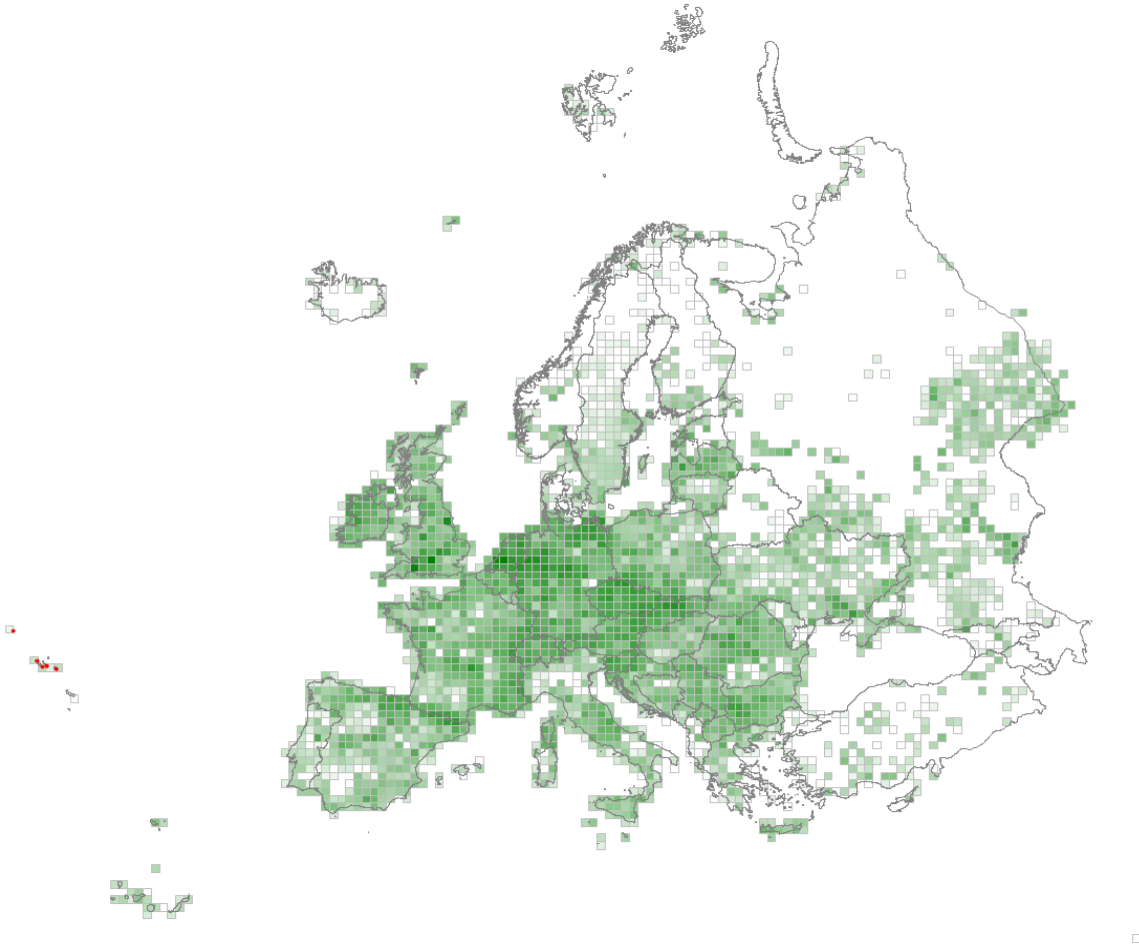
<i>Campanula rotundifolia</i>	22
<i>Silene vulgaris</i>	22
<i>Viola guestphalica</i>	21
<i>Pimpinella saxifraga</i>	21
<i>Microbryum curviculum</i>	21
<i>Arabidopsis halleri</i>	20
<i>Cladonia macilenta</i> aggr.	19
<i>Riccia ciliifera</i>	19
<i>Euphrasia stricta</i>	19
<i>Rumex acetosa</i>	18
<i>Diploschistes muscorum</i>	17
<i>Festuca ovina</i>	17
<i>Cladonia foliacea</i>	16
<i>Thymus pulegioides</i>	16
<i>Polygala vulgaris</i>	15
Constant species (percentage frequencies)	
<i>Armeria alpina</i> subsp. <i>halleri</i>	70
<i>Minuartia verna</i> aggr.	65
<i>Silene vulgaris</i>	52
<i>Festuca ovina</i>	52
<i>Campanula rotundifolia</i>	52
<i>Agrostis capillaris</i>	52
<i>Rumex acetosa</i>	48
<i>Cladonia pyxidata</i> aggr.	43
<i>Pimpinella saxifraga</i>	39
<i>Cladonia furcata</i>	35
<i>Viola calaminaria</i>	30
<i>Thymus pulegioides</i>	30
<i>Avenella flexuosa</i>	30
<i>Plantago lanceolata</i>	26
<i>Noccaea caerulescens</i>	26
<i>Ceratodon purpureus</i>	26
<i>Potentilla erecta</i>	22
<i>Polygala vulgaris</i>	22
<i>Molinia caerulea</i> aggr.	22
<i>Lotus corniculatus</i>	22
<i>Armeria maritima</i>	22
<i>Rumex acetosella</i>	17
<i>Galium pumilum</i>	17
<i>Euphrasia stricta</i>	17
<i>Cladonia rangiferina</i>	17
<i>Cladonia macilenta</i> aggr.	17
<i>Cladonia foliacea</i>	17
<i>Cetraria aculeata</i>	17
<i>Cerastium fontanum</i> subsp. <i>vulgare</i>	17
<i>Achillea millefolium</i> aggr.	17
<i>Ranunculus acris</i> aggr.	13
<i>Ptychostomum imbricatum</i>	13
<i>Koeleria macrantha</i>	13
<i>Hypnum cupressiforme</i> aggr.	13
<i>Holcus lanatus</i>	13
<i>Festuca rubra</i> aggr.	13
<i>Festuca pallens</i>	13
<i>Euphorbia cyparissias</i>	13
<i>Climacium dendroides</i>	13
<i>Calluna vulgaris</i>	13
<i>Asperula cynanchica</i>	13
<i>Arabidopsis halleri</i>	13

Dominant species (percentage frequencies of occurrences with cover > 25%)

<i>Festuca ovina</i>	39
<i>Armeria alpina</i> subsp. <i>halleri</i>	17
<i>Minuartia verna</i> aggr.	9

## R1T – Azorean open, dry, acid to neutral grassland

Ungrazed grassland, with mixtures of grasses, herbs and mat-formers, including many endemics which may dominate, confined to the Azores where it is characteristic of exposed or unstable rocky slopes, ledges and landslips with nutrient-poor acid soils. The species composition varies according to altitude and climate, rock type and terrain stability.



### Corresponding alliances in EuroVegChecklist 2016

- > TOL-01A Festucion francoi Lüpnitz 1976 corr. Fernández Prieto, Aguiar, J.C. Costa, Lousã et Rivas-Mart. in Fernández Prieto et al. 2012
- > TOL-01B Tolpido succulentae-Agrostion congestiflorae Aguiar et Fernández Prieto in Fernández Prieto et al. 2012

### Characteristic species combination

Diagnostic species (phi coefficient \* 100)

<i>Agrostis congestiflora</i>	53
<i>Brachypodium gaditanum</i>	48
<i>Holcus rigidus</i>	46
<i>Selaginella kraussiana</i>	44
<i>Luzula elegans</i>	43
<i>Festuca petraea</i>	41
<i>Diplazium caudatum</i>	40
<i>Deschampsia foliosa</i>	40
<i>Sibthorpia europaea</i>	38
<i>Rubus hochstetterorum</i>	38



<i>Carex peregrina</i>	38
<i>Woodwardia radicans</i>	38
<i>Festuca francoi</i>	37
<i>Juniperus brevifolia</i>	35
<i>Trichomanes speciosum</i>	34
<i>Sanicula azorica</i>	34
<i>Vaccinium cylindraceum</i>	33
<i>Lysimachia nemorum</i>	33
<i>Hedychium gardnerianum</i>	32
<i>Blechnum spicant</i>	32
<i>Carex vulcani</i>	32
<i>Culcita macrocarpa</i>	31
<i>Euphorbia azorica</i>	30
<i>Cardamine caldeiranum</i>	30
<i>Cyclosorus pozoi</i>	28
<i>Carex hochstetterana</i>	27
<i>Centaureum scilloides</i>	26
<i>Dryopteris intermedia</i>	25
<i>Corema album</i>	25
<i>Frangula azorica</i>	25
<i>Thymus caespititius</i>	21
<i>Huperzia dentata</i>	21
<i>Ilex perado</i>	19
<i>Osmunda regalis</i>	18
<i>Erica scoparia</i>	18

Constant species (percentage frequencies)

<i>Blechnum spicant</i>	57
<i>Lysimachia nemorum</i>	43
<i>Luzula elegans</i>	43
<i>Holcus rigidus</i>	43
<i>Woodwardia radicans</i>	29
<i>Vaccinium cylindraceum</i>	29
<i>Sibthorpia europaea</i>	29
<i>Selaginella kraussiana</i>	29
<i>Rubia peregrina</i>	29
<i>Juniperus brevifolia</i>	29
<i>Festuca petraea</i>	29
<i>Festuca francoi</i>	29
<i>Erica scoparia</i>	29
<i>Diplazium caudatum</i>	29
<i>Deschampsia foliosa</i>	29
<i>Daucus carota</i>	29
<i>Brachypodium gaditanum</i>	29
<i>Agrostis congestiflora</i>	29
<i>Agrostis castellana</i>	29
<i>Trichomanes speciosum</i>	14
<i>Thymus caespititius</i>	14
<i>Sphagnum palustre</i> aggr.	14
<i>Sanicula azorica</i>	14
<i>Rubus hochstetterorum</i>	14
<i>Potentilla erecta</i>	14
<i>Plantago lanceolata</i>	14
<i>Osmunda regalis</i>	14
<i>Lotus pedunculatus</i>	14
<i>Laurus azorica</i>	14
<i>Juncus effusus</i>	14
<i>Ilex perado</i>	14
<i>Huperzia dentata</i>	14

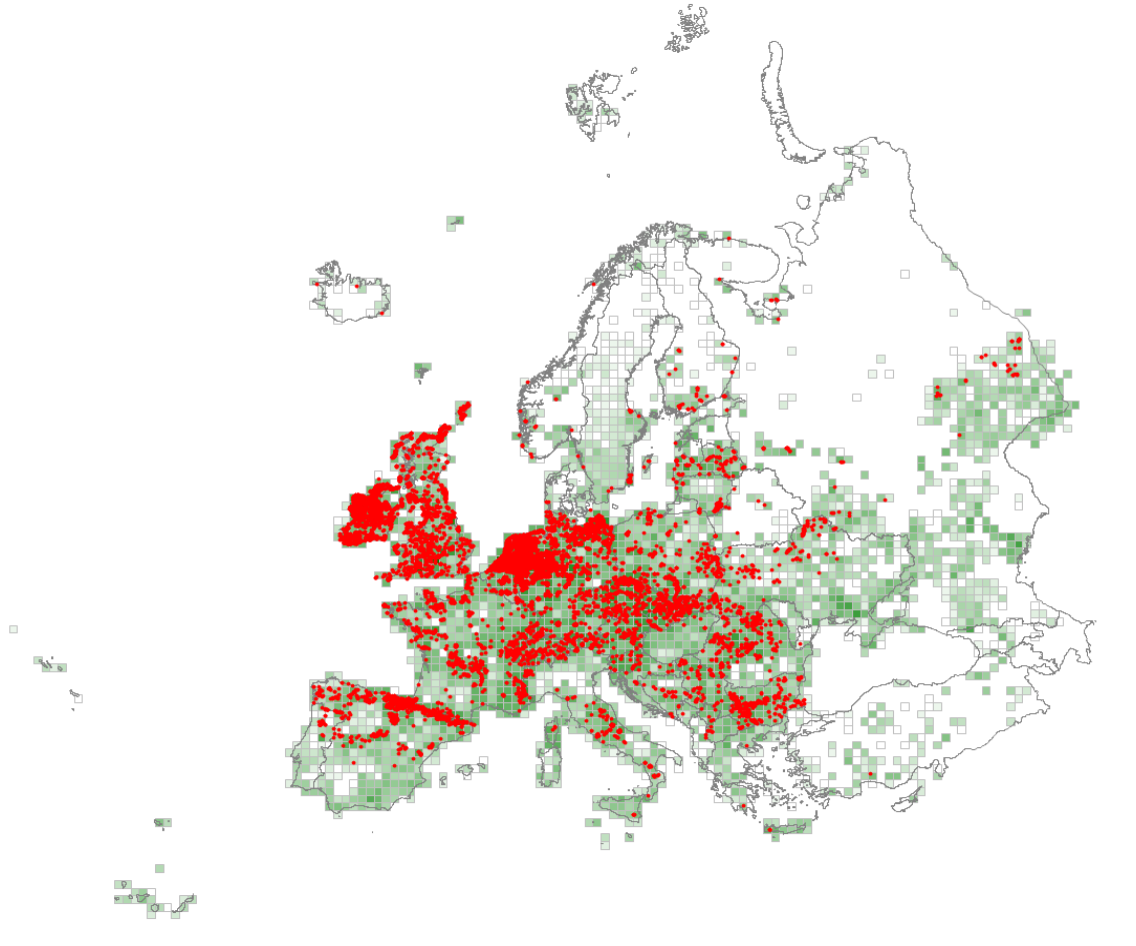
<i>Hedychium gardnerianum</i>	14
<i>Hedera helix</i> aggr.	14
<i>Frangula azorica</i>	14
<i>Euphorbia azorica</i>	14
<i>Dryopteris intermedia</i>	14
<i>Cyclosorus pozoi</i>	14
<i>Culcita macrocarpa</i>	14
<i>Crithmum maritimum</i>	14
<i>Corema album</i>	14
<i>Clinopodium vulgare</i>	14
<i>Centaurium scilloides</i>	14
<i>Carex vulcani</i>	14
<i>Carex peregrina</i>	14
<i>Carex hochstetterana</i>	14
<i>Carex echinata</i>	14
<i>Cardamine caldeiranum</i>	14
<i>Athyrium filix-femina</i>	14

Dominant species (percentage frequencies of occurrences with cover > 25%)

<i>Woodwardia radicans</i>	29
<i>Selaginella kraussiana</i>	14
<i>Holcus rigidus</i>	14
<i>Dryopteris intermedia</i>	14
<i>Deschampsia foliosa</i>	14
<i>Corema album</i>	14
<i>Brachypodium gaditanum</i>	14

## R21 – Mesic permanent pasture of lowlands and mountains

The most common and widespread kind of traditionally managed pasture on deeper, well-drained mesic soils throughout temperate Europe, with many local types related to regional climate, terrain and pastoral traditions. Typically dominated by mixtures of productive grasses and herbs, it can be species-rich with distinctive scarce and rare plants where low input grazing and manuring are maintained. Often once part of wider pastoral landscapes with associated meadows, it is now widely transformed by intensive grazing.



### Corresponding alliances in EuroVegChecklist 2016

- <> MOL-01C *Cynosurion cristati* Tx. 1947
- <> MOL-03B *Poion alpinae* Gams ex Oberd. 1950
- <> MOL-03C *Poion supinae* Rivas-Mart. et Géhu 1978

### Characteristic species combination

Diagnostic species (phi coefficient \* 100)

<i>Trifolium repens</i>	26
<i>Lolium perenne</i>	25
<i>Cynosurus cristatus</i>	23
<i>Cerastium fontanum</i> subsp. <i>vulgare</i>	23
<i>Scorzoneroides autumnalis</i>	22
<i>Bellis perennis</i>	22
<i>Phleum pratense</i>	18

Constant species (percentage frequencies)

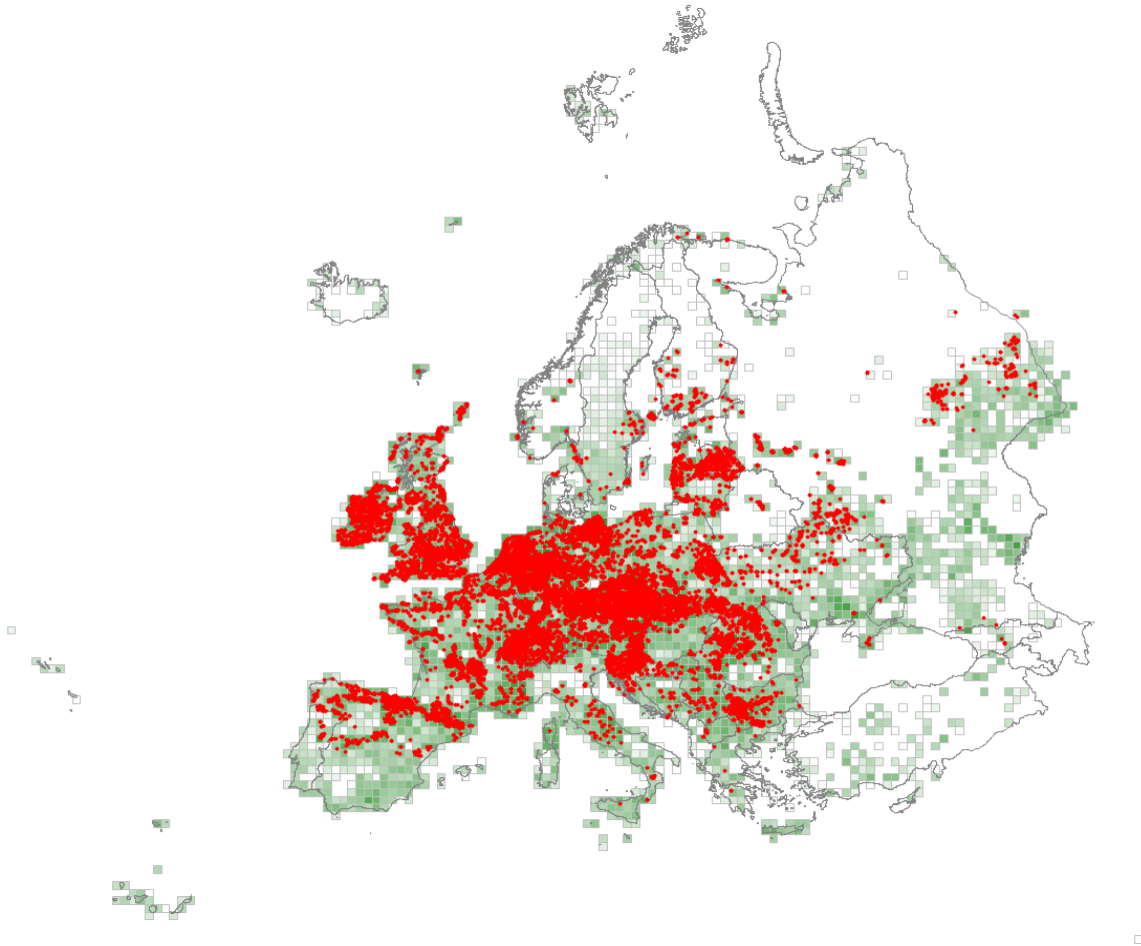
<i>Trifolium repens</i>	76
<i>Festuca rubra</i> aggr.	57
<i>Plantago lanceolata</i>	53
<i>Lolium perenne</i>	51
<i>Agrostis capillaris</i>	49
<i>Cerastium fontanum</i> subsp. <i>vulgare</i>	47
<i>Achillea millefolium</i> aggr.	43
<i>Taraxacum</i> sect. <i>Taraxacum</i>	41
<i>Trifolium pratense</i>	40
<i>Ranunculus repens</i>	39
<i>Poa pratensis</i> aggr.	39
<i>Bellis perennis</i>	37
<i>Scorzoneroides autumnalis</i>	36
<i>Holcus lanatus</i>	36
<i>Cynosurus cristatus</i>	35
<i>Anthoxanthum odoratum</i> aggr.	34
<i>Agrostis stolonifera</i>	31
<i>Poa trivialis</i>	30
<i>Lotus corniculatus</i>	29
<i>Dactylis glomerata</i>	28
<i>Ranunculus acris</i> aggr.	27
<i>Prunella vulgaris</i>	26
<i>Hypochaeris radicata</i>	26
<i>Phleum pratense</i>	25
<i>Plantago major</i>	24
<i>Schedonorus pratensis</i>	22
<i>Rumex acetosa</i>	22
<i>Ochlopoa annua</i>	19
<i>Cirsium arvense</i>	15
<i>Ranunculus bulbosus</i>	13
<i>Luzula campestris</i> aggr.	13
<i>Elytrigia repens</i> aggr.	13
<i>Cardamine pratensis</i>	13
<i>Bromus hordeaceus</i>	12
<i>Veronica chamaedrys</i> aggr.	11
<i>Trifolium dubium</i>	11
<i>Rhynchospora squarrosus</i>	11
<i>Plantago media</i>	11
<i>Pilosella officinarum</i>	11
<i>Medicago lupulina</i>	11
<i>Galium verum</i>	11

Dominant species (percentage frequencies of occurrences with cover > 25%)

<i>Festuca rubra</i> aggr.	19
<i>Lolium perenne</i>	16
<i>Trifolium repens</i>	13
<i>Agrostis capillaris</i>	13
<i>Agrostis stolonifera</i>	6
<i>Cynosurus cristatus</i>	5

## R22 – Low and medium altitude hay meadow

The most common and widespread kind of traditionally managed meadow in deeper, well-drained mesic soils throughout the lowlands and foothills of temperate Europe, with many local types differing according to regional climate, terrain and mowing traditions. Typically dominated by mixtures of productive grasses and herbs, it can be very species-rich with distinctive scarce and rare plants where traditional regimes of mowing, grazing and manuring are maintained. Often once part of wider agricultural landscapes with associated pastures, it is now widely transformed by shifts to silage production and transitions to intensive silage grasslands are commonplace.



### Corresponding alliances in EuroVegChecklist 2016

- > MOL-02A *Agrostion vinealis* Sipailova et al. 1985
- > MOL-01A *Arrhenatherion elatioris* Luquet 1926
- > MOL-01E *Brachypodio-Centaureion nemoralis* Br.-Bl. 1967
- <> MOL-01C *Cynosurion cristati* Tx. 1947
- > DRY-02B *Gypsophilo glomeratae-Cephalarion coriaceae* Ryff in Golub et al. 2011
- > MOL-01G *Rumicion thyrsoflori* Micevski 1994
- > MOL-01F *Salvio pratensis-Dactylidion glomeratae* Ubaldi et al. in Ubaldi 2003
- > MOL-01H *Trifolium pratensis-Brizion elatioris* Didukh et Kuzemko 2009
- > MOL-02C *Trifolium montani* Naumova 1986

### Characteristic species combination

Diagnostic species (phi coefficient \* 100)

*Trisetum flavescens*

<i>Schedonorus pratensis</i>	23
<i>Ranunculus acris</i> aggr.	22
<i>Cerastium fontanum</i> subsp. <i>vulgare</i>	21
<i>Rumex acetosa</i>	21
<i>Crepis biennis</i>	21
<i>Leucanthemum vulgare</i> aggr.	20
<i>Trifolium pratense</i>	19
<i>Arrhenatherum elatius</i>	19
<i>Plantago lanceolata</i>	18
<i>Achillea millefolium</i> aggr.	17
<i>Holcus lanatus</i>	17
<i>Poa pratensis</i> aggr.	16
<i>Alopecurus pratensis</i>	16
<i>Lathyrus pratensis</i>	15
<i>Centaurea jacea</i>	15

Constant species (percentage frequencies)

<i>Plantago lanceolata</i>	66
<i>Dactylis glomerata</i>	64
<i>Festuca rubra</i> aggr.	61
<i>Achillea millefolium</i> aggr.	60
<i>Holcus lanatus</i>	54
<i>Trifolium pratense</i>	53
<i>Rumex acetosa</i>	53
<i>Anthoxanthum odoratum</i> aggr.	51
<i>Ranunculus acris</i> aggr.	50
<i>Poa pratensis</i> aggr.	50
<i>Cerastium fontanum</i> subsp. <i>vulgare</i>	44
<i>Trifolium repens</i>	43
<i>Arrhenatherum elatius</i>	43
<i>Agrostis capillaris</i>	42
<i>Taraxacum</i> sect. <i>Taraxacum</i>	39
<i>Veronica chamaedrys</i> aggr.	38
<i>Lotus corniculatus</i>	38
<i>Leucanthemum vulgare</i> aggr.	38
<i>Schedonorus pratensis</i>	35
<i>Galium mollugo</i> aggr.	32
<i>Trisetum flavescens</i>	29
<i>Luzula campestris</i> aggr.	28
<i>Lathyrus pratensis</i>	28
<i>Vicia cracca</i>	27
<i>Poa trivialis</i>	27
<i>Centaurea jacea</i>	26
<i>Heracleum sphondylium</i>	25
<i>Briza media</i>	24
<i>Stellaria graminea</i>	23
<i>Prunella vulgaris</i>	23
<i>Cynosurus cristatus</i>	23
<i>Alopecurus pratensis</i>	23
<i>Ranunculus repens</i>	22
<i>Leontodon hispidus</i>	22
<i>Galium verum</i>	21
<i>Knautia arvensis</i>	20
<i>Daucus carota</i>	20
<i>Lolium perenne</i>	19
<i>Phleum pratense</i>	18
<i>Bromus hordeaceus</i>	17
<i>Pimpinella saxifraga</i>	16
<i>Medicago lupulina</i>	16

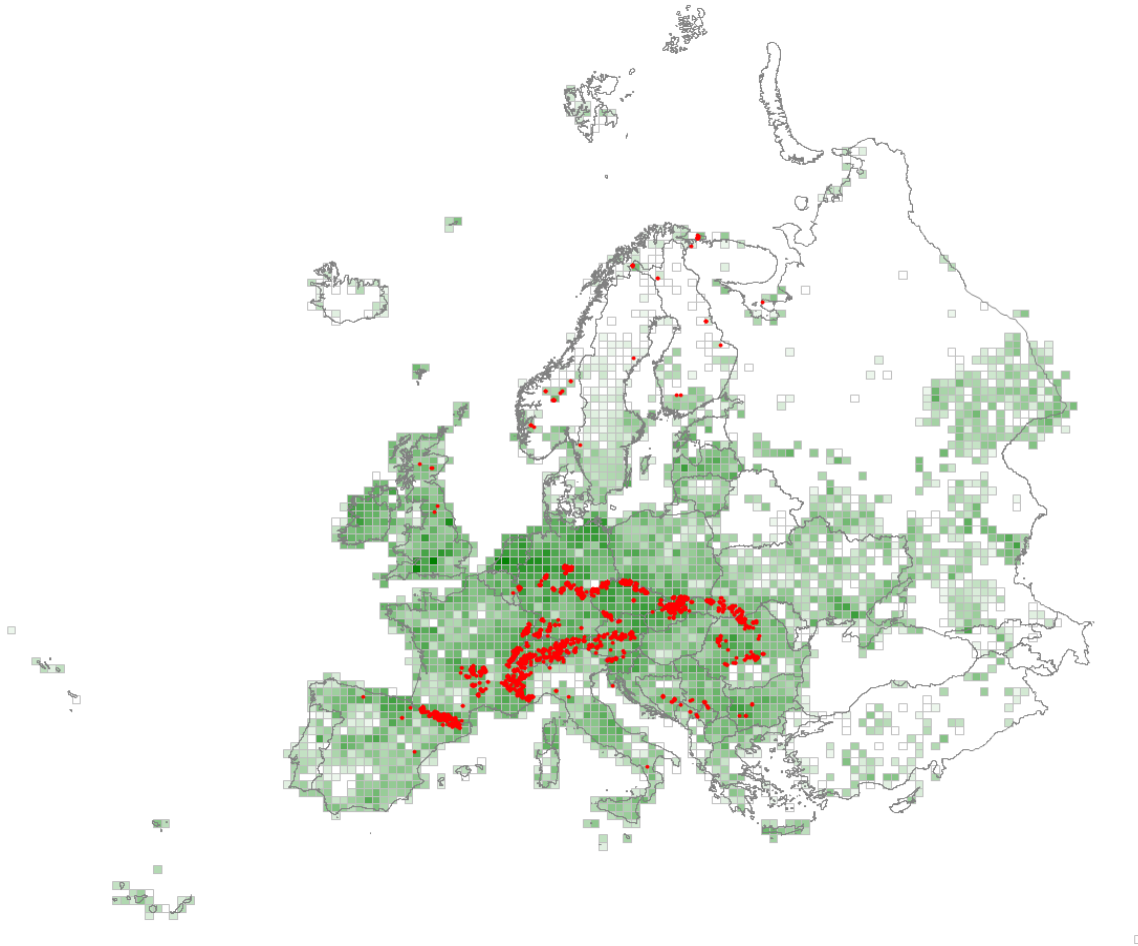
<i>Bellis perennis</i>	16
<i>Plantago media</i>	15
<i>Hypochaeris radicata</i>	15
<i>Elytrigia repens</i> aggr.	15
<i>Cirsium arvense</i>	15
<i>Campanula patula</i> aggr.	15
<i>Avenula pubescens</i>	15
<i>Silene flos-cuculi</i>	14
<i>Rhinanthus minor</i>	14
<i>Ranunculus bulbosus</i>	14
<i>Crepis biennis</i>	14
<i>Anthriscus sylvestris</i>	14
<i>Trifolium dubium</i>	13
<i>Scorzoneroides autumnalis</i>	13
<i>Deschampsia cespitosa</i> aggr.	13
<i>Tragopogon pratensis</i>	12
<i>Potentilla erecta</i>	12
<i>Hypericum perforatum</i>	12
<i>Equisetum arvense</i>	12
<i>Cardamine pratensis</i>	12
<i>Rhytiadelphus squarrosus</i>	11
<i>Glechoma hederacea</i>	11
<i>Ajuga reptans</i>	11

Dominant species (percentage frequencies of occurrences with cover > 25%)

<i>Festuca rubra</i> aggr.	15
<i>Arrhenatherum elatius</i>	14
<i>Agrostis capillaris</i>	10
<i>Holcus lanatus</i>	7

## R23 – Mountain hay meadow

The typical kind of traditionally-managed meadow on deep, well-drained, mesic soils throughout the mountains of Northern and Central Europe where there is a short cool growing season. There are many local types differing according to regional climate, terrain and farming traditions but the vegetation is typically dominated by mixtures of productive grasses and herbs and can be species-rich with distinctive scarce and rare plants where traditional regimes of mowing, grazing and dunging are maintained. Often once part of wider agricultural landscapes with associated pastures, good examples of the habitat now often survive more fragmentarily and transitions to silage grassland are widespread.



### Corresponding alliances in EuroVegChecklist 2016

- <> MOL-03G *Astrantion maximae* Korotkov 2013
- <> MOL-03F *Helictotricho compressi-Bistortion officinalis* Didukh et Kuzemko 2009
- <> MOL-03E *Pancicion serbicae* Lakušić 1966
- > MOL-01B *Phyteumato-Trisetion* Ellmauer et Mucina 1993
- > MOL-04A *Polygonion krascheninnikovii* Kashapov 1985
- <> MOL-03A *Trisetio flavescens-Polygonion bistortae* Br.-Bl. et Tx. ex Marschall 1947
- <> MOL-03D *Violion cornutae* Nègre 1972

### Characteristic species combination

Diagnostic species (phi coefficient \* 100)

<i>Crepis mollis</i>	32
<i>Meum athamanticum</i>	31
<i>Poa chaixii</i>	30



<i>Astrantia major</i>	28
<i>Hypericum maculatum</i> aggr.	27
<i>Geranium sylvaticum</i> aggr.	26
<i>Phyteuma spicatum</i>	26
<i>Crepis pyrenaica</i>	23
<i>Trisetum flavescens</i>	23
<i>Crocus vernus</i>	23
<i>Phleum alpinum</i> aggr.	22
<i>Trollius europaeus</i>	22
<i>Alchemilla vulgaris</i> aggr.	21
<i>Leucanthemum vulgare</i> aggr.	21
<i>Bistorta officinalis</i>	21
<i>Arabidopsis halleri</i>	21
<i>Pimpinella major</i>	19
<i>Trifolium pratense</i>	18
<i>Campanula serrata</i>	18
<i>Ranunculus acris</i> aggr.	17
<i>Leontodon hispidus</i>	16
<i>Anthoxanthum odoratum</i> aggr.	16
<i>Festuca rubra</i> aggr.	16
<i>Viola lutea</i>	15
<i>Agrostis capillaris</i>	15
<i>Alchemilla monticola</i>	15

Constant species (percentage frequencies)

<i>Festuca rubra</i> aggr.	66
<i>Anthoxanthum odoratum</i> aggr.	63
<i>Agrostis capillaris</i>	56
<i>Geranium sylvaticum</i> aggr.	54
<i>Trifolium pratense</i>	50
<i>Achillea millefolium</i> aggr.	44
<i>Potentilla erecta</i>	42
<i>Hypericum maculatum</i> aggr.	42
<i>Dactylis glomerata</i>	40
<i>Rumex acetosa</i>	39
<i>Ranunculus acris</i> aggr.	39
<i>Leucanthemum vulgare</i> aggr.	39
<i>Veronica chamaedrys</i> aggr.	38
<i>Phyteuma spicatum</i>	35
<i>Briza media</i>	34
<i>Luzula campestris</i> aggr.	33
<i>Leontodon hispidus</i>	33
<i>Lotus corniculatus</i>	32
<i>Plantago lanceolata</i>	30
<i>Nardus stricta</i>	30
<i>Trisetum flavescens</i>	29
<i>Deschampsia cespitosa</i> aggr.	29
<i>Bistorta officinalis</i>	29
<i>Phleum alpinum</i> aggr.	28
<i>Poa chaixii</i>	27
<i>Trollius europaeus</i>	26
<i>Trifolium repens</i>	26
<i>Astrantia major</i>	26
<i>Meum athamanticum</i>	25
<i>Heracleum sphondylium</i>	25
<i>Alchemilla vulgaris</i> aggr.	24
<i>Cerastium fontanum</i> subsp. <i>vulgare</i>	23
<i>Vicia cracca</i>	22
<i>Stellaria graminea</i>	22

<i>Silene vulgaris</i>	22
<i>Ranunculus polyanthemos</i>	22
<i>Lathyrus pratensis</i>	22
<i>Vaccinium myrtillus</i>	20
<i>Carlina acaulis</i>	20
<i>Campanula rotundifolia</i>	20
<i>Avenella flexuosa</i>	20
<i>Potentilla aurea</i>	19
<i>Luzula luzuloides</i>	19
<i>Taraxacum</i> sect. <i>Taraxacum</i>	18
<i>Pimpinella major</i>	18
<i>Rumex arifolius</i>	16
<i>Poa pratensis</i> aggr.	16
<i>Crepis mollis</i>	16
<i>Campanula scheuchzeri</i>	16
<i>Campanula patula</i> aggr.	16
<i>Veratrum album</i>	15
<i>Prunella vulgaris</i>	15
<i>Knautia arvensis</i>	15
<i>Galium pumilum</i>	15
<i>Cruciata glabra</i>	15
<i>Ajuga reptans</i>	15
<i>Vicia sepium</i>	14
<i>Thymus pulegioides</i>	14
<i>Solidago virgaurea</i>	14
<i>Rhinanthus minor</i>	14
<i>Primula elatior</i>	14
<i>Polygala vulgaris</i>	14
<i>Helianthemum nummularium</i>	14
<i>Gymnadenia conopsea</i>	14
<i>Galium mollugo</i> aggr.	14
<i>Carex pallescens</i>	14
<i>Rhynchospora squarrosus</i>	13
<i>Phyteuma orbiculare</i>	13
<i>Holcus lanatus</i>	13
<i>Galium verum</i>	13
<i>Crocus vernus</i>	13
<i>Centaurea jacea</i>	13
<i>Carex sempervirens</i>	13
<i>Avenula pubescens</i>	13
<i>Arabidopsis halleri</i>	13
<i>Tragopogon pratensis</i>	12
<i>Poa alpina</i>	12
<i>Plantago media</i>	12
<i>Pimpinella saxifraga</i>	12
<i>Pilosella officinarum</i>	12
<i>Gentiana lutea</i>	12
<i>Cynosurus cristatus</i>	12
<i>Crepis pyrenaica</i>	12
<i>Cirsium heterophyllum</i> aggr.	12
<i>Carduus defloratus</i> aggr.	12
<i>Bistorta vivipara</i>	12
<i>Arnica montana</i>	12
<i>Anthyllis vulneraria</i>	12
<i>Veronica officinalis</i>	11
<i>Poa trivialis</i>	11
<i>Lathyrus linifolius</i>	11
<i>Chaerophyllum hirsutum</i>	11
<i>Gentiana asclepiadea</i>	11

*Alopecurus pratensis* 11

Dominant species (percentage frequencies of occurrences with cover > 25%)

*Festuca rubra* aggr. 17

*Agrostis capillaris* 9

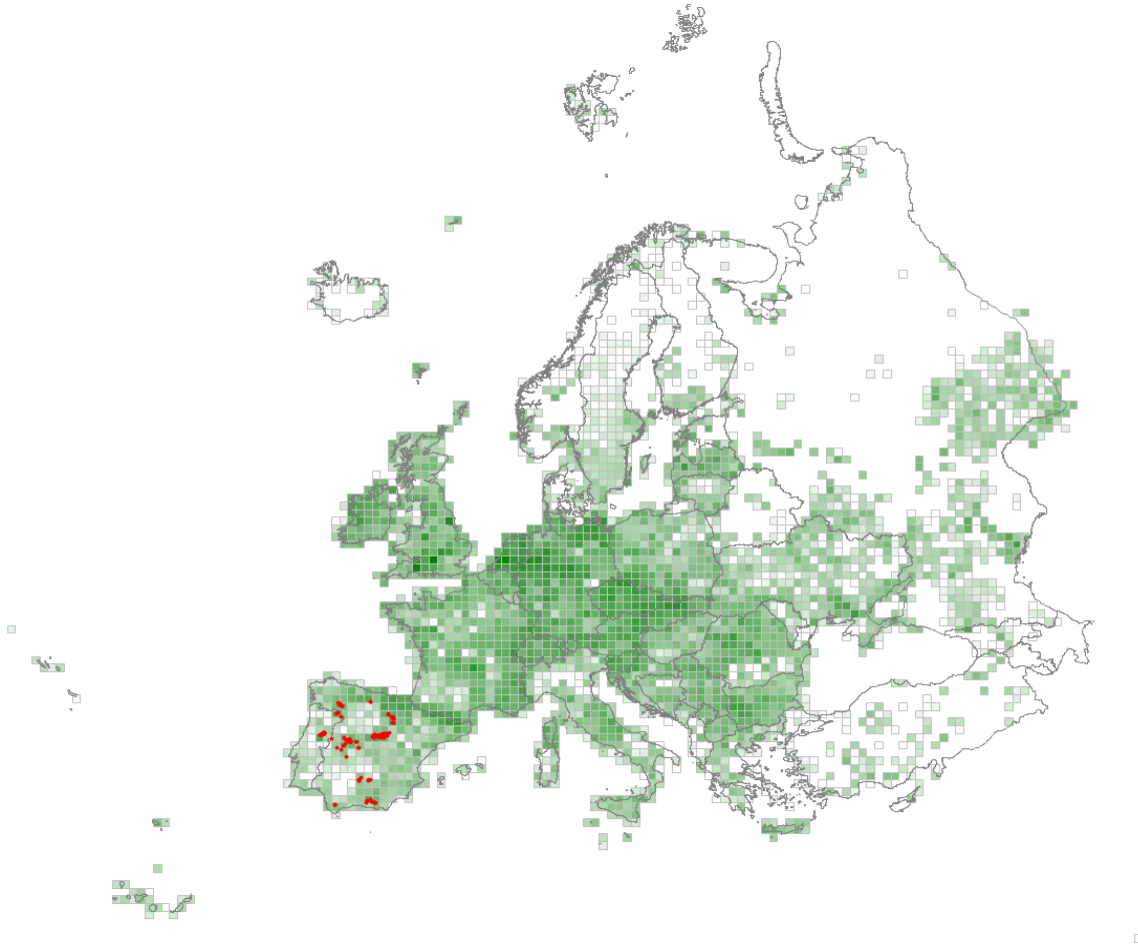
*Nardus stricta* 8

*Meum athamanticum* 7

*Geranium sylvaticum* aggr. 7

## R24 – Iberian summer pasture (vallicar)

Highly distinctive tall grass pasture and meadow associated with traditional cattle rearing in the lowlands and foothills of western Iberia where a mediterranean or submediterranean climate and the long-established grazing and occasional mowing regimes sustain a striking contingent of regional plants and association with dehesa. The substrate is sandy or clayey, often subject to temporary flooding with rapid desiccation, conditions which affect the pattern of grass dominance.



### Corresponding alliances in EuroVegChecklist 2016

- > SAC-01C Agrostio castellanae-Stipion giganteae Rivas Goday ex Rivas-Mart. et Fernández-González 1991
- > SAC-01B Festucion merinoi Rivas-Mart. et Sánchez-Mata in Rivas-Mart. et al. 1986 corr. Rivas-Mart. et Sánchez-Mata in Rivas-Mart. et al. 2002
- > SAC-01A Festuco amplae-Agrostion castellanae Theurillat in Di Pietro et al. 2015

### Characteristic species combination

Diagnostic species (phi coefficient \* 100)

<i>Festuca ampla</i>	81
<i>Agrostis castellana</i>	50
<i>Trifolium strictum</i>	32
<i>Anthoxanthum aristatum</i>	30
<i>Hypochaeris radicata</i>	23
<i>Armeria transmontana</i>	23
<i>Trifolium striatum</i>	21

<i>Chamaemelum nobile</i>	20
<i>Ctenopsis delicatula</i>	19
<i>Crepis capillaris</i>	19
<i>Briza minor</i>	19
<i>Gaudinia fragilis</i>	18
<i>Festuca elegans</i>	18
<i>Armeria lacaitae</i>	16
<i>Holcus annuus</i>	16
<i>Trifolium cernuum</i>	16
<i>Holcus lanatus</i>	15

Constant species (percentage frequencies)

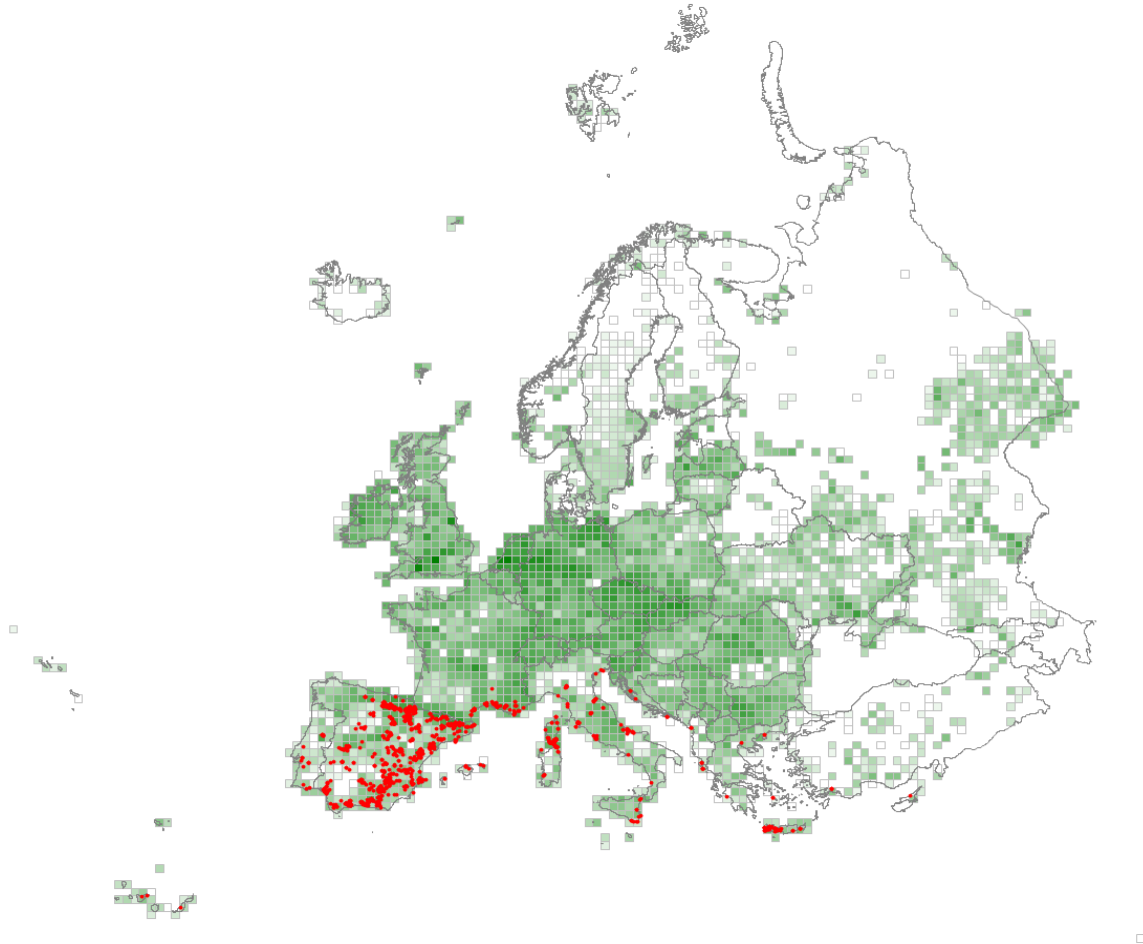
<i>Agrostis castellana</i>	94
<i>Festuca ampla</i>	71
<i>Hypochaeris radicata</i>	57
<i>Plantago lanceolata</i>	48
<i>Holcus lanatus</i>	48
<i>Daucus carota</i>	31
<i>Anthoxanthum aristatum</i>	29
<i>Pilosella officinarum</i>	27
<i>Trifolium pratense</i>	26
<i>Bromus hordeaceus</i>	25
<i>Trifolium strictum</i>	22
<i>Galium verum</i>	22
<i>Trifolium striatum</i>	21
<i>Trifolium campestre</i>	18
<i>Crepis capillaris</i>	18
<i>Jasione montana</i>	17
<i>Dactylis glomerata</i>	17
<i>Trifolium dubium</i>	16
<i>Ranunculus bulbosus</i>	16
<i>Gaudinia fragilis</i>	16
<i>Eryngium campestre</i>	16
<i>Trifolium repens</i>	14
<i>Cynosurus cristatus</i>	14
<i>Briza minor</i>	14
<i>Vulpia bromoides</i>	13
<i>Sanguisorba minor</i> aggr.	13
<i>Nardus stricta</i>	13
<i>Juncus squarrosus</i>	13
<i>Danthonia decumbens</i>	13
<i>Aira caryophylla</i>	13
<i>Poa bulbosa</i>	12
<i>Linum bienne</i>	12
<i>Chamaemelum nobile</i>	12
<i>Festuca rothmaleri</i>	12
<i>Convolvulus arvensis</i>	12

Dominant species (percentage frequencies of occurrences with cover > 25%)

<i>Agrostis castellana</i>	64
<i>Festuca ampla</i>	32
<i>Gaudinia fragilis</i>	5
<i>Anthoxanthum aristatum</i>	5

## R31 – Mediterranean tall humid inland grassland

Rush- and tall grass-dominated vegetation of seasonally waterlogged soils, mostly acidic and slightly saline, occurring in depressions throughout the Mediterranean Basin. Though not dependent on grazing, it can be a valuable source of fodder for cattle and sheep in traditional pastoral systems during summer when other pastures are dried up.



### Corresponding alliances in EuroVegChecklist 2016

- > MOL-07F *Brachypodio sylvatici-Holoschoenion romani* Gradstein et Smittenberg 1977
- > MOL-07C *Dactylorhizo-Juncion striati* S. Brullo et Grillo 1978
- <> MOL-07A *Molinio-Holoschoenion* Br.-Bl. ex Tchou 1948

### Characteristic species combination

Diagnostic species (phi coefficient \* 100)

<i>Cirsium monspessulanum</i>	43
<i>Scirpoides holoschoenus</i>	42
<i>Cirsium pyrenaicum</i>	36
<i>Lysimachia ephemerum</i>	32
<i>Sonchus maritimus</i>	28
<i>Carex mairei</i>	27
<i>Lotus maritimus</i>	23
<i>Hypericum caprifolium</i>	23
<i>Senecio doria</i> aggr.	21
<i>Mentha suaveolens</i>	20
<i>Pulicaria dysenterica</i>	19

<i>Juncus inflexus</i>	18
<i>Dactylorhiza elata</i>	18
<i>Peucedanum hispanicum</i>	17
<i>Euphorbia hirsuta</i>	16
<i>Schoenus nigricans</i>	16
<i>Thalictrum speciosissimum</i>	15
<i>Oenanthe lachenalii</i>	15

Constant species (percentage frequencies)

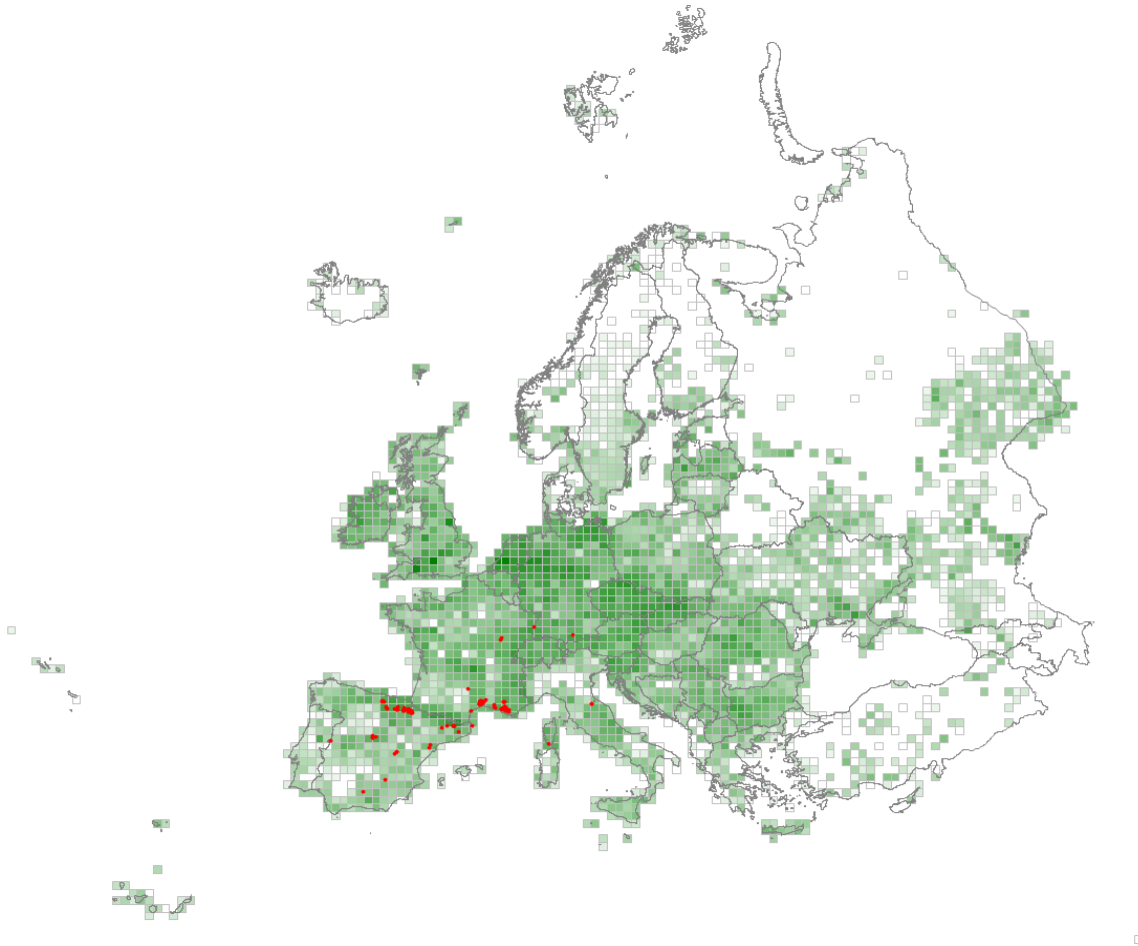
<i>Scirpoides holoschoenus</i>	70
<i>Agrostis stolonifera</i>	29
<i>Schoenus nigricans</i>	27
<i>Dittrichia viscosa</i>	27
<i>Cirsium monspessulanum</i>	24
<i>Molinia caerulea</i> aggr.	23
<i>Sonchus maritimus</i>	21
<i>Potentilla reptans</i>	21
<i>Holcus lanatus</i>	21
<i>Brachypodium phoenicoides</i>	21
<i>Juncus inflexus</i>	20
<i>Cirsium pyrenaicum</i>	19
<i>Mentha suaveolens</i>	18
<i>Pulicaria dysenterica</i>	17
<i>Carex flacca</i>	17
<i>Schedonorus arundinaceus</i>	16
<i>Mentha longifolia</i>	16
<i>Phragmites australis</i>	15
<i>Lythrum salicaria</i>	14
<i>Trifolium pratense</i>	13
<i>Samolus valerandi</i>	13
<i>Lotus maritimus</i>	13
<i>Equisetum ramosissimum</i>	12
<i>Daucus carota</i>	12
<i>Verbena officinalis</i>	11
<i>Lysimachia ephemerum</i>	11
<i>Juncus maritimus</i>	11
<i>Juncus articulatus</i>	11
<i>Juncus acutus</i>	11
<i>Blackstonia perfoliata</i>	11

Dominant species (percentage frequencies of occurrences with cover > 25%)

<i>Scirpoides holoschoenus</i>	34
<i>Schoenus nigricans</i>	16
<i>Molinia caerulea</i> aggr.	12

## R32 – Mediterranean short moist grassland of lowlands

Short species-rich swards dominated by graminoids, traditionally sustained by heavy grazing, on clay soils through the Mediterranean region where there is winter waterlogging and distinctive surface cracking in the droughty summer.



### Corresponding alliances in EuroVegChecklist 2016

- > MOL-07D *Deschampsion mediae* Br.-Bl. et al. 1952 nom. conserv. propos.
- > MOL-07E *Gaudinio fragilis-Hordeion bulbosi* Galán de Mera et al. 1997
- > MOL-10C *Trifolion maritimi* Br.-Bl. ex Br.-Bl. et al. 1952

### Characteristic species combination

Diagnostic species (phi coefficient \* 100)

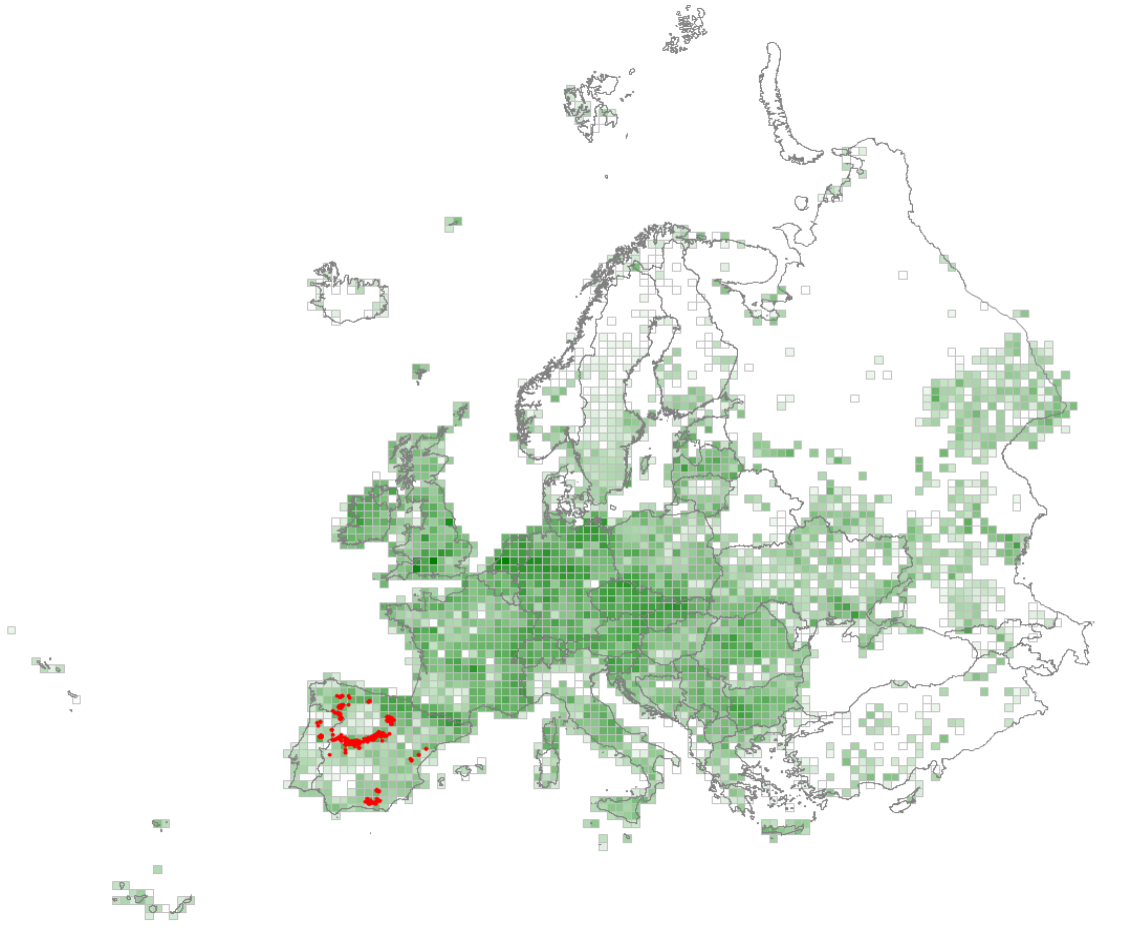
<i>Prunella hyssopifolia</i>	76
<i>Jasonia tuberosa</i>	65
<i>Deschampsia media</i>	59
<i>Plantago maritima</i> subsp. <i>serpentina</i>	50
<i>Centaurium pulchellum</i>	37
<i>Leontodon hirtus</i>	35
<i>Carex flacca</i>	30
<i>Seseli longifolium</i>	27
<i>Lotus tenuis</i>	25
<i>Achillea ageratum</i>	22
<i>Blackstonia perfoliata</i>	17
<i>Neoschischkinia nebulosa</i>	17



<i>Brachypodium phoenicoides</i>	17
<i>Carduncellus cuatrecasassi</i>	16
<i>Thymelaea passerina</i>	16
Constant species (percentage frequencies)	
<i>Carex flacca</i>	83
<i>Prunella hyssopifolia</i>	71
<i>Plantago maritima</i> subsp. <i>serpentina</i>	60
<i>Jasonia tuberosa</i>	52
<i>Deschampsia media</i>	44
<i>Agrostis stolonifera</i>	36
<i>Centaureum pulchellum</i>	35
<i>Lotus tenuis</i>	29
<i>Deschampsia cespitosa</i> aggr.	28
<i>Lotus corniculatus</i>	27
<i>Briza media</i>	27
<i>Brachypodium phoenicoides</i>	27
<i>Leontodon hirtus</i>	25
<i>Centaurea jacea</i>	25
<i>Juncus articulatus</i>	23
<i>Blackstonia perfoliata</i>	23
<i>Koeleria vallesiana</i>	20
<i>Festuca rubra</i> aggr.	19
<i>Dorycnium pentaphyllum</i>	19
<i>Schoenus nigricans</i>	17
<i>Schedonorus arundinaceus</i>	17
<i>Juncus bufonius</i> aggr.	17
<i>Sanguisorba minor</i> aggr.	16
<i>Plantago lanceolata</i>	15
<i>Pilosella officinarum</i>	13
<i>Phleum nodosum</i>	13
<i>Leontodon saxatilis</i>	13
<i>Daucus carota</i>	13
<i>Potentilla tabernaemontani</i>	12
<i>Bromopsis erecta</i>	12
<i>Seseli longifolium</i>	11
<i>Scirpoides holoschoenus</i>	11
<i>Linum suffruticosum</i> aggr.	11
<i>Leucanthemum vulgare</i> aggr.	11
<i>Festuca ovina</i>	11
<i>Dactylis glomerata</i>	11
Dominant species (percentage frequencies of occurrences with cover > 25%)	
<i>Deschampsia media</i>	25
<i>Plantago maritima</i> subsp. <i>serpentina</i>	23
<i>Prunella hyssopifolia</i>	17
<i>Carex flacca</i>	12
<i>Jasonia tuberosa</i>	8
<i>Deschampsia cespitosa</i> aggr.	7

## R33 – Mediterranean short moist grassland of mountains

Closed tussocky grassland of moist ground at high altitudes in the Western Mediterranean which, remaining green through the summer, provide valuable grazing for transhumant cattle and sheep.



### Corresponding alliances in EuroVegChecklist 2016

- > GEN-01B Plantaginion insularis Klein 1972
- > TRI-06B Plantaginion thalackeri Quézel 1953
- > MOL-07B Sieglingion decumbentis Gamisans 1976

### Characteristic species combination

Diagnostic species (phi coefficient \* 100)

<i>Festuca rothmaleri</i>	59
<i>Narcissus bulbocodium</i> aggr.	37
<i>Carum verticillatum</i>	35
<i>Festuca iberica</i>	32
<i>Scorzoneroides carpetana</i>	31
<i>Campanula herminii</i>	31
<i>Juncus squarrosus</i>	28
<i>Ranunculus bulbosus</i>	25
<i>Nardus stricta</i>	23
<i>Carex leporina</i>	23
<i>Poa legionensis</i>	19
<i>Plantago nivalis</i>	17

<i>Agrostis castellana</i>	17
<i>Jasione laevis</i>	17
<i>Cynosurus cristatus</i>	16
<i>Pedicularis sylvatica</i>	16

Constant species (percentage frequencies)

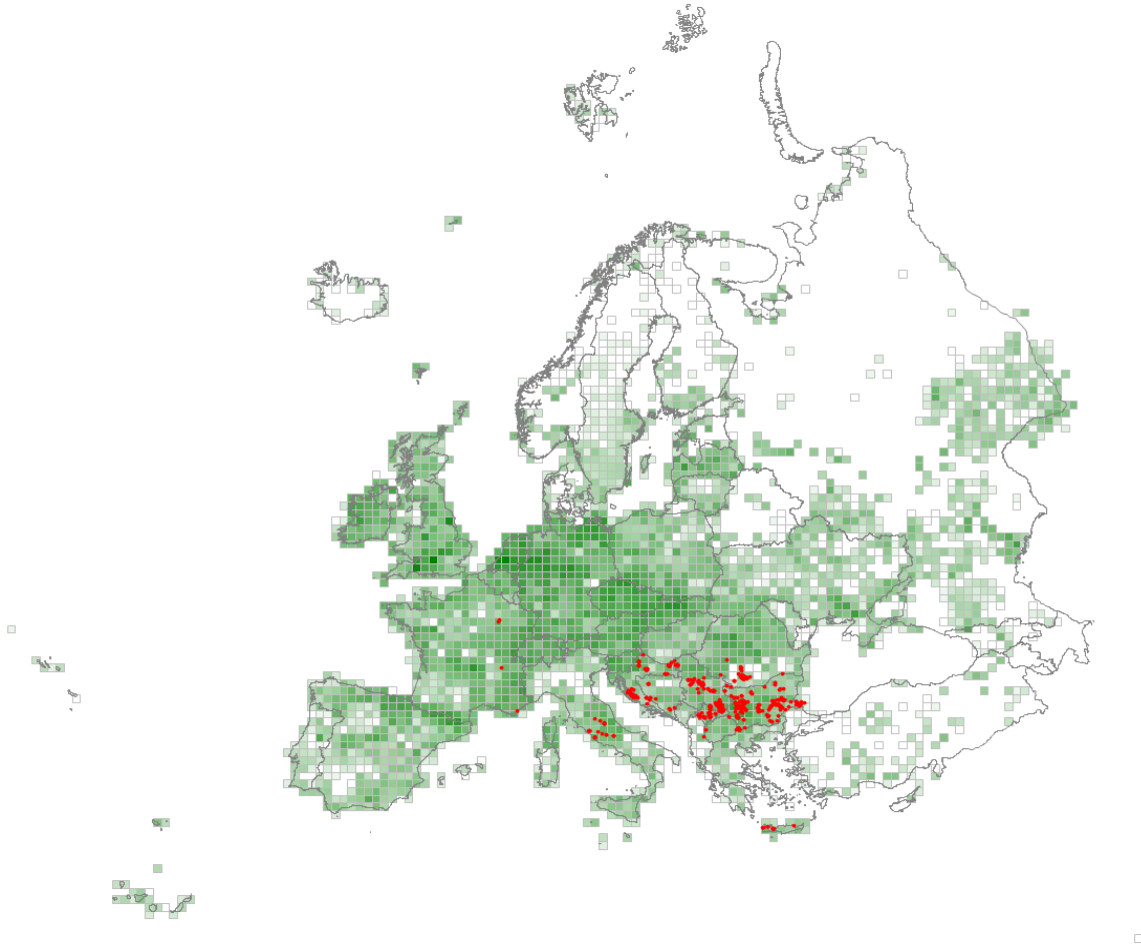
<i>Nardus stricta</i>	65
<i>Festuca rothmaleri</i>	49
<i>Ranunculus bulbosus</i>	41
<i>Juncus squarrosus</i>	36
<i>Agrostis castellana</i>	32
<i>Trifolium repens</i>	31
<i>Carum verticillatum</i>	31
<i>Hypochaeris radicata</i>	29
<i>Pilosella officinarum</i>	27
<i>Luzula campestris</i> aggr.	27
<i>Holcus lanatus</i>	27
<i>Festuca iberica</i>	26
<i>Carex leporina</i>	26
<i>Trifolium pratense</i>	25
<i>Danthonia decumbens</i>	25
<i>Cynosurus cristatus</i>	25
<i>Anthoxanthum odoratum</i> aggr.	23
<i>Potentilla erecta</i>	22
<i>Narcissus bulbocodium</i> aggr.	20
<i>Lotus corniculatus</i>	20
<i>Scorzoneroides carpetana</i>	17
<i>Juncus acutiflorus</i>	17
<i>Pedicularis sylvatica</i>	16
<i>Briza media</i>	16
<i>Plantago lanceolata</i>	15
<i>Carex caryophyllea</i>	15
<i>Campanula herminii</i>	15
<i>Jasione laevis</i>	14
<i>Galium verum</i>	14
<i>Galium saxatile</i>	14
<i>Anthoxanthum aristatum</i>	13
<i>Prunella vulgaris</i>	12
<i>Juncus effusus</i>	12
<i>Deschampsia cespitosa</i> aggr.	12
<i>Trifolium dubium</i>	11
<i>Rhinanthus minor</i>	11

Dominant species (percentage frequencies of occurrences with cover > 25%)

<i>Nardus stricta</i>	39
<i>Festuca rothmaleri</i>	15
<i>Agrostis castellana</i>	14
<i>Festuca iberica</i>	9
<i>Juncus squarrosus</i>	8
<i>Juncus acutiflorus</i>	7

## R34 – Submediterranean moist meadow

Moist meadows of sandy to clayey, mesotrophic to eutrophic soils on riverside terraces and gentle slopes, mainly in the lowland to submontane belts of South-Eastern Europe, extending westwards to central Italy. Winter and spring flooding is common, but later in the season the ground may dry up and become locally saline. The species composition reflects regional differences in temperature and rainfall, but patterns of mowing and grazing can also affect the species composition.



### Corresponding alliances in EuroVegChecklist 2016

- > MOL-06A Molinio-Hordeion secalini Horvatić 1934
- > MOL-06E Ranunculion velutini Pedrotti 1978
- > MOL-06D Trifolion pallidi Iljanić 1969
- > MOL-06B Trifolion resupinati Micevski 1957
- > MOL-06C Trifolio-Ranunculion pedati Slavnić 1948

### Characteristic species combination

Diagnostic species (phi coefficient \* 100)

<i>Alopecurus rendlei</i>	65
<i>Trifolium patens</i>	59
<i>Moenchia mantica</i>	56
<i>Bromus racemosus</i>	49
<i>Trifolium pallidum</i>	47
<i>Trifolium resupinatum</i>	47
<i>Crepis setosa</i>	45

<i>Bromus commutatus</i>	41
<i>Oenanthe silaifolia</i>	36
<i>Hordeum secalinum</i>	33
<i>Trifolium michelianum</i>	32
<i>Ranunculus velutinus</i>	32
<i>Ranunculus sardous</i>	31
<i>Schedonorus pratensis</i>	30
<i>Alopecurus pratensis</i>	29
<i>Scilla litardierei</i>	26
<i>Cynosurus cristatus</i>	25
<i>Anacamptis palustris</i> aggr.	24
<i>Lolium perenne</i>	24
<i>Trifolium fragiferum</i>	23
<i>Trifolium incarnatum</i>	23
<i>Oenanthe banatica</i>	23
<i>Rhinanthus rumelicus</i>	23
<i>Trifolium cinctum</i>	22
<i>Potentilla reptans</i>	21
<i>Poa trivialis</i>	20
<i>Galium debile</i>	20
<i>Trifolium hybridum</i>	20
<i>Leucojum aestivum</i>	19
<i>Hordeum geniculatum</i>	19
<i>Medicago arabica</i>	19
<i>Gratiola officinalis</i>	19
<i>Cirsium canum</i>	19
<i>Trifolium pratense</i>	19
<i>Silene flos-cuculi</i>	18
<i>Carex cuprina</i>	17
<i>Carex hirta</i>	17
<i>Tragopogon pratensis</i>	16
<i>Plantago lanceolata</i>	16
<i>Oenanthe peucedanifolia</i>	16
<i>Trifolium repens</i>	15
<i>Cichorium intybus</i>	15

Constant species (percentage frequencies)

<i>Plantago lanceolata</i>	60
<i>Poa trivialis</i>	58
<i>Trifolium pratense</i>	51
<i>Lolium perenne</i>	49
<i>Trifolium repens</i>	47
<i>Lotus corniculatus</i>	47
<i>Trifolium resupinatum</i>	45
<i>Schedonorus pratensis</i>	45
<i>Alopecurus rendlei</i>	44
<i>Alopecurus pratensis</i>	42
<i>Moenchia mantica</i>	41
<i>Crepis setosa</i>	40
<i>Anthoxanthum odoratum</i> aggr.	39
<i>Trifolium patens</i>	38
<i>Cynosurus cristatus</i>	38
<i>Ranunculus acris</i> aggr.	35
<i>Potentilla reptans</i>	35
<i>Poa pratensis</i> aggr.	34
<i>Bromus racemosus</i>	34
<i>Taraxacum</i> sect. <i>Taraxacum</i>	31
<i>Convolvulus arvensis</i>	28
<i>Silene flos-cuculi</i>	27

<i>Ranunculus sardous</i>	27
<i>Bromus commutatus</i>	27
<i>Trifolium pallidum</i>	26
<i>Rumex crispus</i>	26
<i>Cichorium intybus</i>	25
<i>Trifolium fragiferum</i>	24
<i>Achillea millefolium</i> aggr.	24
<i>Oenanthe silaifolia</i>	22
<i>Leucanthemum vulgare</i> aggr.	22
<i>Carex hirta</i>	22
<i>Elytrigia repens</i> aggr.	21
<i>Prunella vulgaris</i>	20
<i>Galium verum</i>	20
<i>Daucus carota</i>	20
<i>Cynodon dactylon</i>	20
<i>Rumex acetosa</i>	19
<i>Ranunculus repens</i>	19
<i>Holcus lanatus</i>	18
<i>Agrostis stolonifera</i>	18
<i>Tragopogon pratensis</i>	17
<i>Trifolium hybridum</i>	16
<i>Hordeum secalinum</i>	16
<i>Carex distans</i>	16
<i>Bromus hordeaceus</i>	16
<i>Trifolium striatum</i>	15
<i>Trifolium incarnatum</i>	15
<i>Lysimachia nummularia</i>	15
<i>Gratiola officinalis</i>	15
<i>Centaurea jacea</i>	15
<i>Anacamptis palustris</i> aggr.	15
<i>Trifolium dubium</i>	14
<i>Verbena officinalis</i>	13
<i>Trifolium michelianum</i>	13
<i>Rhinanthus rumelicus</i>	13
<i>Ranunculus velutinus</i>	13
<i>Lathyrus pratensis</i>	13
<i>Hordeum geniculatum</i>	13
<i>Festuca valesiaca</i> aggr.	13
<i>Trifolium campestre</i>	12
<i>Rorippa sylvestris</i>	12
<i>Rhinanthus minor</i>	12
<i>Ononis spinosa</i>	12
<i>Medicago arabica</i>	12
<i>Galium palustre</i> aggr.	12
<i>Rumex acetosella</i>	11
<i>Plantago major</i>	11
<i>Medicago lupulina</i>	11
<i>Lotus tenuis</i>	11
<i>Filipendula vulgaris</i>	11
<i>Cirsium canum</i>	11
<i>Carex cuprina</i>	11

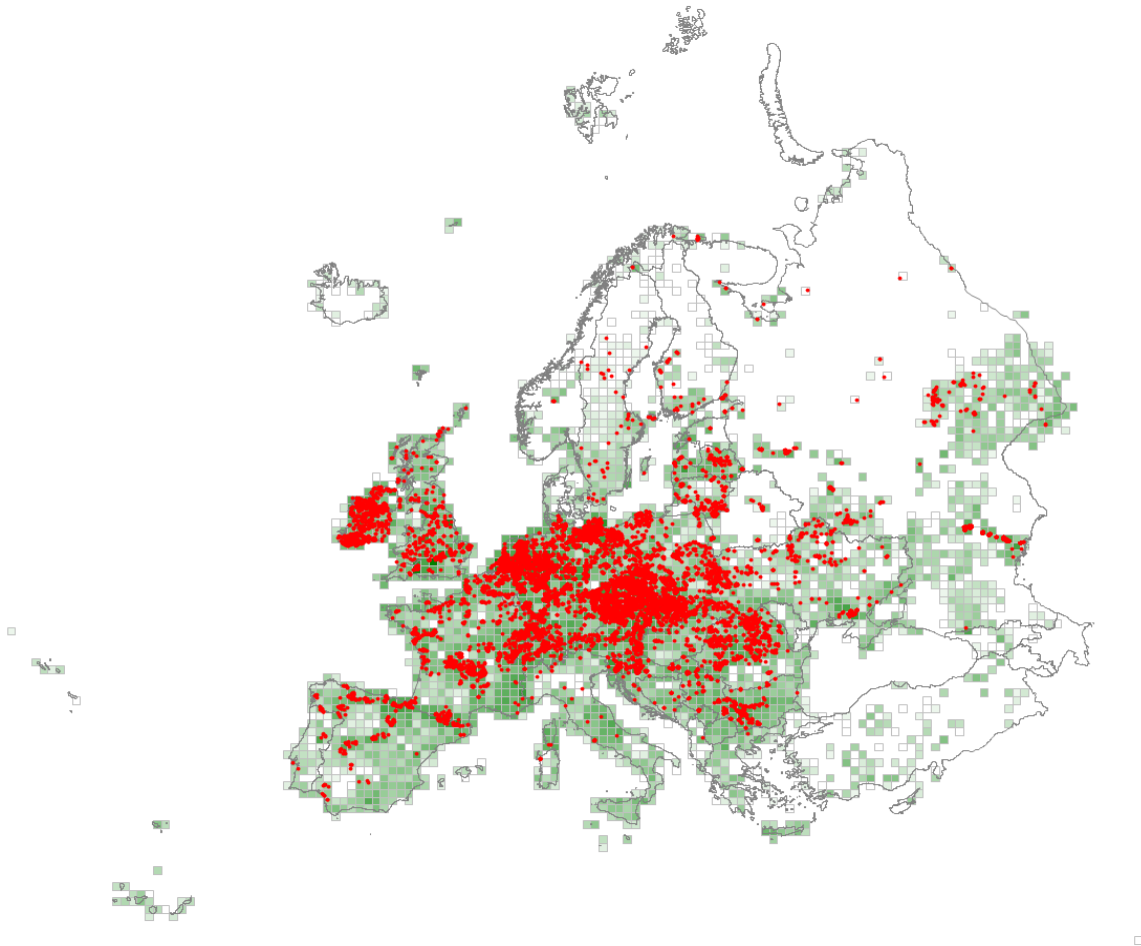
Dominant species (percentage frequencies of occurrences with cover > 25%)

<i>Poa trivialis</i>	17
<i>Alopecurus rendlei</i>	11
<i>Trifolium patens</i>	9
<i>Trifolium resupinatum</i>	8
<i>Bromus racemosus</i>	8
<i>Trifolium pallidum</i>	6

<i>Schedonorus pratensis</i>	6
<i>Lolium perenne</i>	6
<i>Hordeum secalinum</i>	5

## R35 – Moist or wet mesotrophic to eutrophic hay meadow

Meadows of moist, sometimes seasonally flooded, nutrient-rich soils on floodplains and in brook-valleys throughout the lowland to submontane belts of Europe. Traditionally cut for hay, though sometimes also lightly grazed in late summer and autumn, the vegetation is often species-rich with a diverse associated invertebrate fauna attracted by the abundance of flowers. Often once part of wider agricultural landscapes with associated pastures, good examples of the habitat now often survive more fragmentarily, and transitions to improved silage grassland on flood-protected land are widespread.



### Corresponding alliances in EuroVegChecklist 2016

- > MOL-02B Artemision ponticae Golub et Saveleva in Golub 1995
- > MOL-05C Bromion racemosi Tx. In Tx. et Preising ex de Foucault 2009
- > MOL-05B Calthion palustris Tx. 1937
- > MOL-05D Deschampsion cespitosae Horvatić 1930
- > MOL-05G Eleocharition palustris Mirkin et Naumova 1986
- > MOL-05F Oenanthion fistulosae de Foucault 2009

### Characteristic species combination

Diagnostic species (phi coefficient \* 100)

<i>Silene flos-cuculi</i>	27
<i>Scirpus sylvaticus</i>	26
<i>Caltha palustris</i>	20
<i>Juncus effusus</i>	20
<i>Filipendula ulmaria</i>	20



<i>Cardamine pratensis</i>	19
<i>Myosotis scorpioides</i> aggr.	19
<i>Galium uliginosum</i>	19
<i>Lotus pedunculatus</i>	18
<i>Ranunculus acris</i> aggr.	18
<i>Alopecurus pratensis</i>	18
<i>Cirsium palustre</i>	16
<i>Lathyrus pratensis</i>	16
<i>Equisetum palustre</i>	16
<i>Cirsium rivulare</i>	16

Constant species (percentage frequencies)

<i>Juncus effusus</i>	47
<i>Holcus lanatus</i>	46
<i>Filipendula ulmaria</i>	45
<i>Ranunculus repens</i>	43
<i>Ranunculus acris</i> aggr.	42
<i>Caltha palustris</i>	41
<i>Silene flos-cuculi</i>	40
<i>Deschampsia cespitosa</i> aggr.	40
<i>Myosotis scorpioides</i> aggr.	38
<i>Galium palustre</i> aggr.	38
<i>Rumex acetosa</i>	36
<i>Equisetum palustre</i>	34
<i>Cirsium palustre</i>	33
<i>Poa trivialis</i>	32
<i>Cardamine pratensis</i>	32
<i>Scirpus sylvaticus</i>	30
<i>Lotus pedunculatus</i>	30
<i>Lathyrus pratensis</i>	30
<i>Agrostis stolonifera</i>	29
<i>Festuca rubra</i> aggr.	28
<i>Galium uliginosum</i>	27
<i>Carex nigra</i>	27
<i>Anthoxanthum odoratum</i> aggr.	27
<i>Alopecurus pratensis</i>	26
<i>Lysimachia vulgaris</i>	25
<i>Angelica sylvestris</i>	24
<i>Lythrum salicaria</i>	23
<i>Lysimachia nummularia</i>	21
<i>Poa pratensis</i> aggr.	20
<i>Carex panicea</i>	20
<i>Calliergonella cuspidata</i>	19
<i>Schedonorus pratensis</i>	18
<i>Potentilla erecta</i>	18
<i>Bistorta officinalis</i>	17
<i>Vicia cracca</i>	16
<i>Sanguisorba officinalis</i>	16
<i>Crepis paludosa</i>	16
<i>Cirsium oleraceum</i>	16
<i>Ranunculus flammula</i>	15
<i>Juncus conglomeratus</i>	15
<i>Geum rivale</i>	15
<i>Cerastium fontanum</i> subsp. <i>vulgare</i>	15
<i>Carex acuta</i>	15
<i>Trifolium repens</i>	13
<i>Agrostis canina</i>	13
<i>Valeriana dioica</i>	12
<i>Plantago lanceolata</i>	12

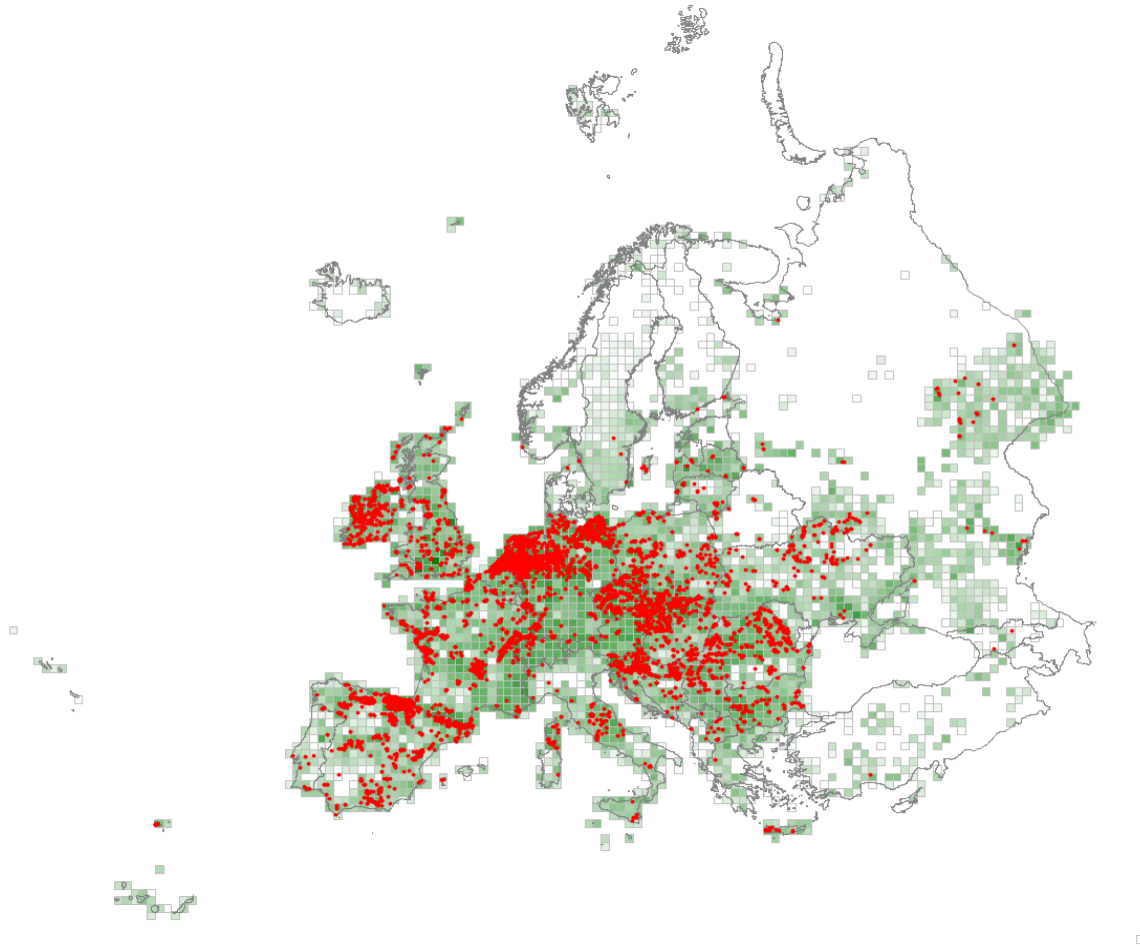
<i>Mentha aquatica</i>	12
<i>Juncus articulatus</i>	12
<i>Epilobium palustre</i>	12
<i>Trifolium pratense</i>	11
<i>Prunella vulgaris</i>	11
<i>Molinia caerulea</i> aggr.	11
<i>Equisetum fluviatile</i>	11
<i>Cirsium rivulare</i>	11
<i>Carex hirta</i>	11

Dominant species (percentage frequencies of occurrences with cover > 25%)

<i>Juncus effusus</i>	12
<i>Scirpus sylvaticus</i>	10
<i>Deschampsia cespitosa</i> aggr.	5

## R36 – Moist or wet mesotrophic to eutrophic pasture

Pastures of moist to wet, mesotrophic to eutrophic soils, generally inundated during winter and spring, on floodplains, lake shores and ditch sides throughout temperate Europe, sometimes with a brackish influence. Grazing is mostly by cattle which can strongly affect the nutrient status, and compaction of the soil and plants tolerant of inundation and trampling dominate here with a paucity of attractive flowers and a poor associated invertebrate fauna.



### Corresponding alliances in EuroVegChecklist 2016

- <> MOL-05E Conioselinion tatarici Golub et al. 2003
- > MOL-08E Mentho longifoliae-Juncion inflexi T. Müller et Görs ex de Foucault 2009
- <> MOL-10A Potentillion anserinae Tx. 1947

### Characteristic species combination

Diagnostic species (phi coefficient \* 100)

<i>Alopecurus geniculatus</i>	24
<i>Argentina anserina</i>	21
<i>Ranunculus repens</i>	20
<i>Plantago major</i>	18
<i>Juncus inflexus</i>	17
<i>Agrostis stolonifera</i>	17
<i>Carex hirta</i>	15

Constant species (percentage frequencies)

<i>Agrostis stolonifera</i>	61
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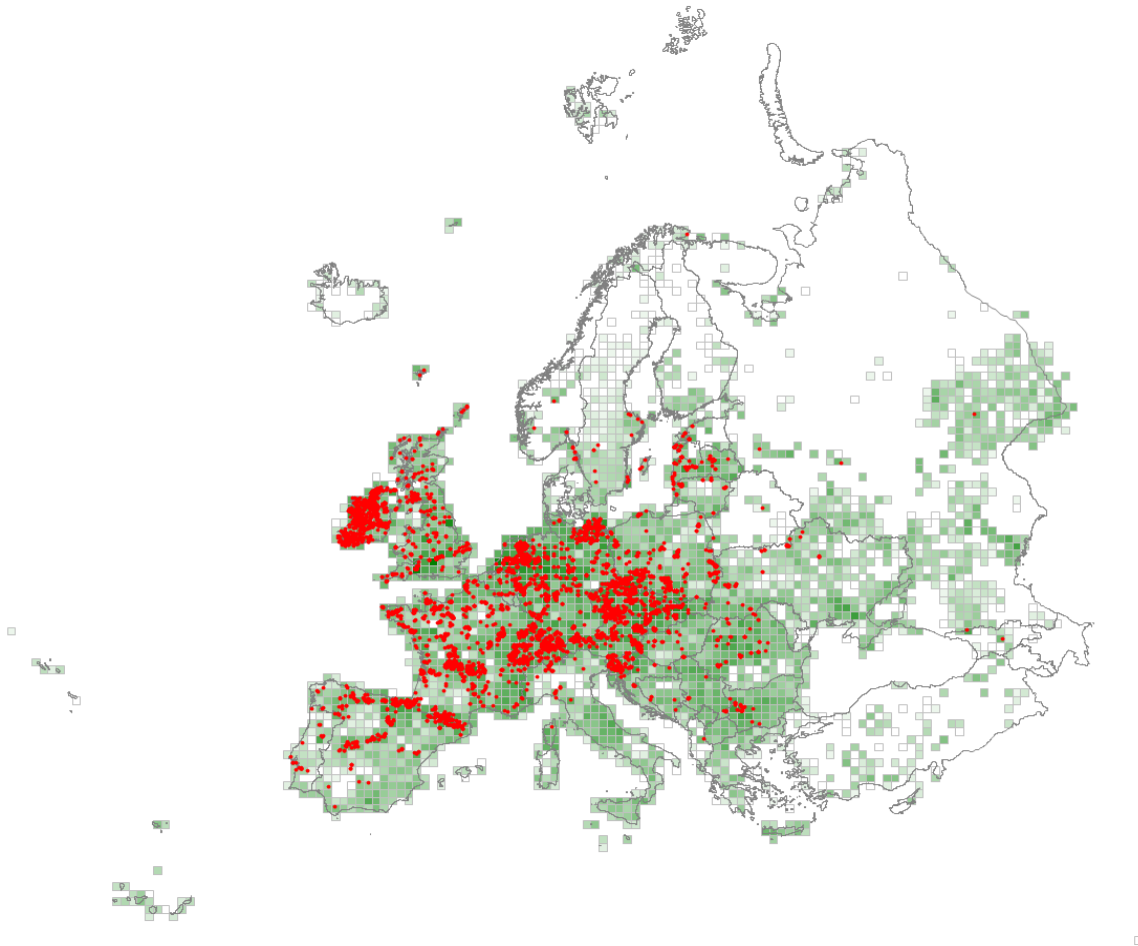
<i>Ranunculus repens</i>	57
<i>Plantago major</i>	44
<i>Trifolium repens</i>	43
<i>Argentina anserina</i>	38
<i>Poa trivialis</i>	31
<i>Juncus articulatus</i>	28
<i>Rumex crispus</i>	26
<i>Lolium perenne</i>	26
<i>Juncus effusus</i>	25
<i>Alopecurus geniculatus</i>	23
<i>Holcus lanatus</i>	20
<i>Carex hirta</i>	20
<i>Potentilla reptans</i>	19
<i>Ochlopoa annua</i>	19
<i>Juncus inflexus</i>	19
<i>Galium palustre</i> aggr.	19
<i>Taraxacum</i> sect. <i>Taraxacum</i>	16
<i>Glyceria fluitans</i> aggr.	16
<i>Eleocharis palustris</i>	16
<i>Polygonum aviculare</i> aggr.	14
<i>Rorippa sylvestris</i>	13
<i>Ranunculus flammula</i>	13
<i>Lythrum salicaria</i>	13
<i>Elytrigia repens</i> aggr.	13
<i>Schedonorus arundinaceus</i>	12
<i>Plantago lanceolata</i>	12
<i>Myosotis scorpioides</i> aggr.	12
<i>Cardamine pratensis</i>	12
<i>Trifolium fragiferum</i>	11
<i>Scorzoneroides autumnalis</i>	11
<i>Prunella vulgaris</i>	11
<i>Phalaroides arundinacea</i>	11

Dominant species (percentage frequencies of occurrences with cover > 25%)

<i>Agrostis stolonifera</i>	20
<i>Argentina anserina</i>	9
<i>Juncus inflexus</i>	7
<i>Lolium perenne</i>	6
<i>Juncus effusus</i>	6
<i>Ranunculus repens</i>	5
<i>Alopecurus geniculatus</i>	5

## R37 – Temperate and boreal moist or wet oligotrophic grassland

Meadows and pastures of less nutrient-rich soils, wet for much of the year, though not inundated by flood-waters and drying out in summer, especially in more continental regions. The soils may be somewhat acidic to base-rich, sometimes peaty above, and through the lowland to submontane belts of Europe, they have been part of wider landscapes among fens and drier grasslands. Less productive than flood meadows, they are mown just once a year, and towards the west of the range, often just lightly grazed, but they can be species-rich with some characteristic and striking species.



### Corresponding alliances in EuroVegChecklist 2016

- > MOL-05A Molinion caeruleae Koch 1926

### Characteristic species combination

Diagnostic species (phi coefficient \* 100)

<i>Succisa pratensis</i>	28
<i>Carex panicea</i>	24
<i>Molinia caerulea</i> aggr.	20
<i>Potentilla erecta</i>	20
<i>Juncus acutiflorus</i>	20
<i>Selinum carvifolia</i>	18
<i>Sanguisorba officinalis</i>	18
<i>Scorzonera humilis</i>	18
<i>Cirsium dissectum</i>	18
<i>Ranunculus acris</i> aggr.	16

<i>Galium uliginosum</i>	16
<i>Juncus conglomeratus</i>	15
<i>Cirsium palustre</i>	15
Constant species (percentage frequencies)	
<i>Potentilla erecta</i>	79
<i>Molinia caerulea</i> aggr.	73
<i>Carex panicea</i>	56
<i>Succisa pratensis</i>	53
<i>Anthoxanthum odoratum</i> aggr.	48
<i>Holcus lanatus</i>	46
<i>Ranunculus acris</i> aggr.	38
<i>Festuca rubra</i> aggr.	36
<i>Briza media</i>	35
<i>Cirsium palustre</i>	31
<i>Luzula campestris</i> aggr.	30
<i>Carex flacca</i>	28
<i>Carex nigra</i>	25
<i>Lotus pedunculatus</i>	23
<i>Galium uliginosum</i>	23
<i>Juncus acutiflorus</i>	22
<i>Filipendula ulmaria</i>	22
<i>Sanguisorba officinalis</i>	21
<i>Plantago lanceolata</i>	21
<i>Agrostis canina</i>	21
<i>Rumex acetosa</i>	20
<i>Deschampsia cespitosa</i> aggr.	20
<i>Agrostis capillaris</i>	20
<i>Prunella vulgaris</i>	19
<i>Juncus effusus</i>	19
<i>Nardus stricta</i>	18
<i>Calliargonella cuspidata</i>	18
<i>Angelica sylvestris</i>	18
<i>Silene flos-cuculi</i>	17
<i>Rhynchospora squarrosus</i>	17
<i>Lysimachia vulgaris</i>	17
<i>Juncus conglomeratus</i>	17
<i>Danthonia decumbens</i>	17
<i>Carex echinata</i>	17
<i>Vicia cracca</i>	16
<i>Stachys officinalis</i>	16
<i>Lotus corniculatus</i>	16
<i>Lathyrus pratensis</i>	16
<i>Galium palustre</i> aggr.	16
<i>Equisetum palustre</i>	16
<i>Centaurea jacea</i>	16
<i>Valeriana dioica</i>	15
<i>Dactylorhiza maculata</i> aggr.	15
<i>Trifolium pratense</i>	14
<i>Galium boreale</i>	14
<i>Calluna vulgaris</i>	14
<i>Scorzonera humilis</i>	13
<i>Carex pallescens</i>	13
<i>Cardamine pratensis</i>	13
<i>Achillea millefolium</i> aggr.	13
<i>Agrostis stolonifera</i>	13
<i>Serratula tinctoria</i>	12
<i>Selinum carvifolia</i>	12
<i>Ranunculus flammula</i>	12

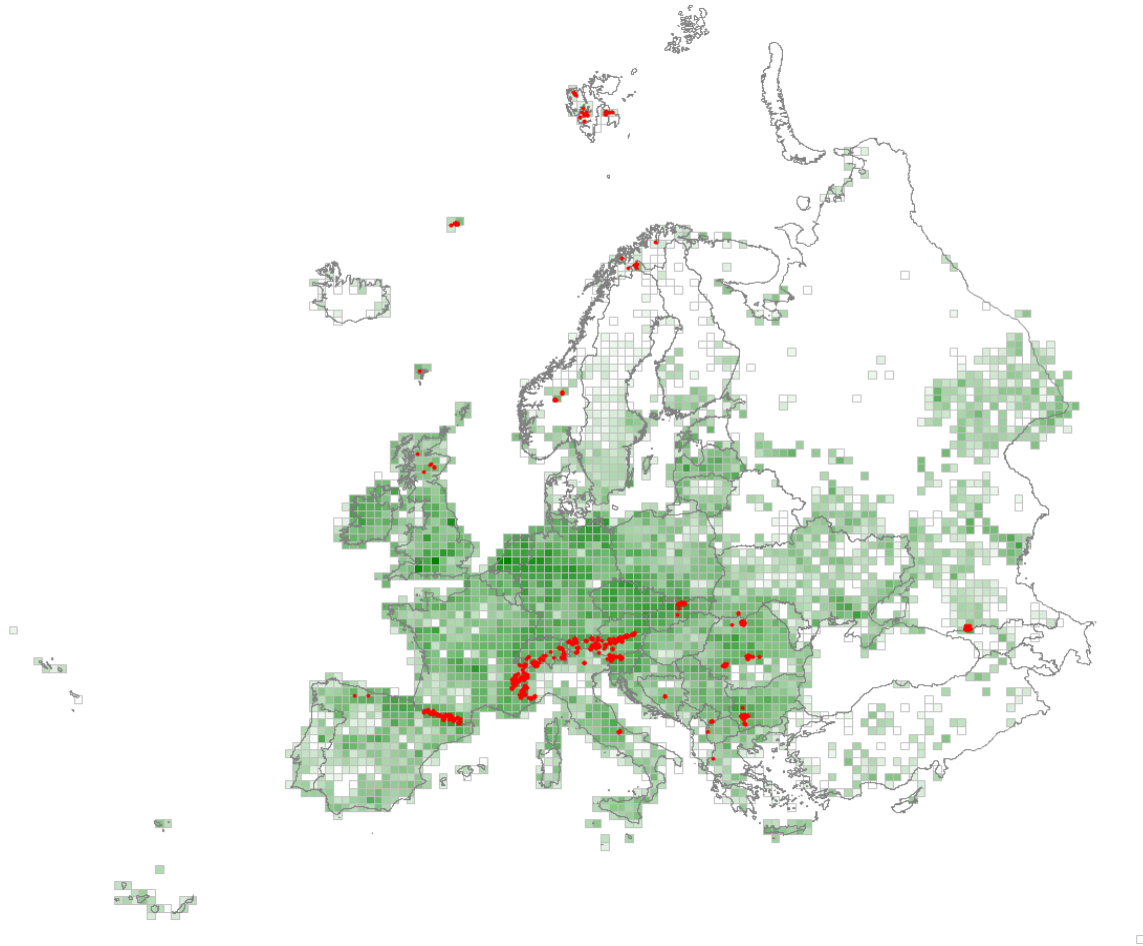
<i>Phragmites australis</i>	12
<i>Parnassia palustris</i>	12
<i>Lythrum salicaria</i>	12
<i>Trifolium repens</i>	11
<i>Ranunculus repens</i>	11
<i>Juncus subnodulosus</i>	11
<i>Galium verum</i>	11
<i>Cirsium dissectum</i>	11

Dominant species (percentage frequencies of occurrences with cover > 25%)

<i>Molinia caerulea</i> aggr.	47
<i>Juncus acutiflorus</i>	11
<i>Carex panicea</i>	5

## R41 – Snow-bed vegetation

Vegetation on skeletal, sometimes humic, soils developed beneath late-lying snow patches in Arctic and subarctic lowlands, boreal mountains and temperate high mountains of Central and Southern Europe. Dominated by grasses, sedges, herbs and cryptogams, the species composition depends on regional climate, altitude, bedrock and soil type, and sometimes includes endemics, particularly in Southern Europe.



### Corresponding alliances in EuroVegChecklist 2016

- > THL-02C Arabidion caeruleae Br.-Bl. in Br.-Bl. et Jenny 1926
- <> HER-01H Cassiopo-Salicion herbaceae Nordhagen 1943
- > HER-01I Deschampsio-Anthoxanthion Gjaerevoll 1950
- > HER-01D Festucion picturatae Krajina 1933 corr. Dúbravcová 2007
- > HER-01G Hyalopoion ponticae Rabotnova et Onipchenko in Onipchenko 2002
- > HER-01E Ranunculion crenati Lakušić 1968
- > THL-02B Ranunculo-Poion alpinae Gjaerevoll ex Daniëls in Mucina et al. 2016
- <> HER-01B Salici herbaceae-Arabidion caeruleae Englisch 1999
- > HER-01C Salici herbaceae-Caricion lachenalii Béguin et Theurillat 1982
- <> HER-01A Salicion herbaceae Br.-Bl. in Br.-Bl. et Jenny 1926
- > THL-02A Saxifrago oppositifoliae-Oxyrion digynae Gjaerevoll 1950
- > HER-01J Saxifrago stellaris-Oxyrion digynae Gjaerevoll 1950
- > HER-01F Sedion candollei Rivas-Mart., Fernández-González et Loidi in Rivas-Mart. et al. 2011



## Characteristic species combination

### Diagnostic species (phi coefficient \* 100)

<i>Veronica alpina</i>	36
<i>Gnaphalium supinum</i>	31
<i>Salix herbacea</i>	27
<i>Sibbaldia procumbens</i>	27
<i>Saxifraga androsacea</i>	26
<i>Gnaphalium hoppeanum</i>	25
<i>Hornungia alpina</i>	25
<i>Cardamine alpina</i>	25
<i>Carex pyrenaica</i>	23
<i>Cerastium cerastoides</i>	23
<i>Luzula alpinopilosa</i>	23
<i>Poa alpina</i>	22
<i>Alchemilla pentaphyllea</i>	22
<i>Ranunculus alpestris</i>	21
<i>Potentilla brauneana</i>	21
<i>Taraxacum sect. Alpina</i>	20
<i>Sedum alpestre</i>	20
<i>Leucanthemopsis alpina</i>	19
<i>Ranunculus crenatus</i>	18
<i>Alchemilla fissa</i>	18
<i>Saxifraga cernua</i>	18
<i>Achillea clusiana</i>	17
<i>Polytrichastrum sexangulare</i>	17
<i>Achillea atrata</i>	17
<i>Arabis caerulea</i>	16
<i>Silene acaulis</i>	15

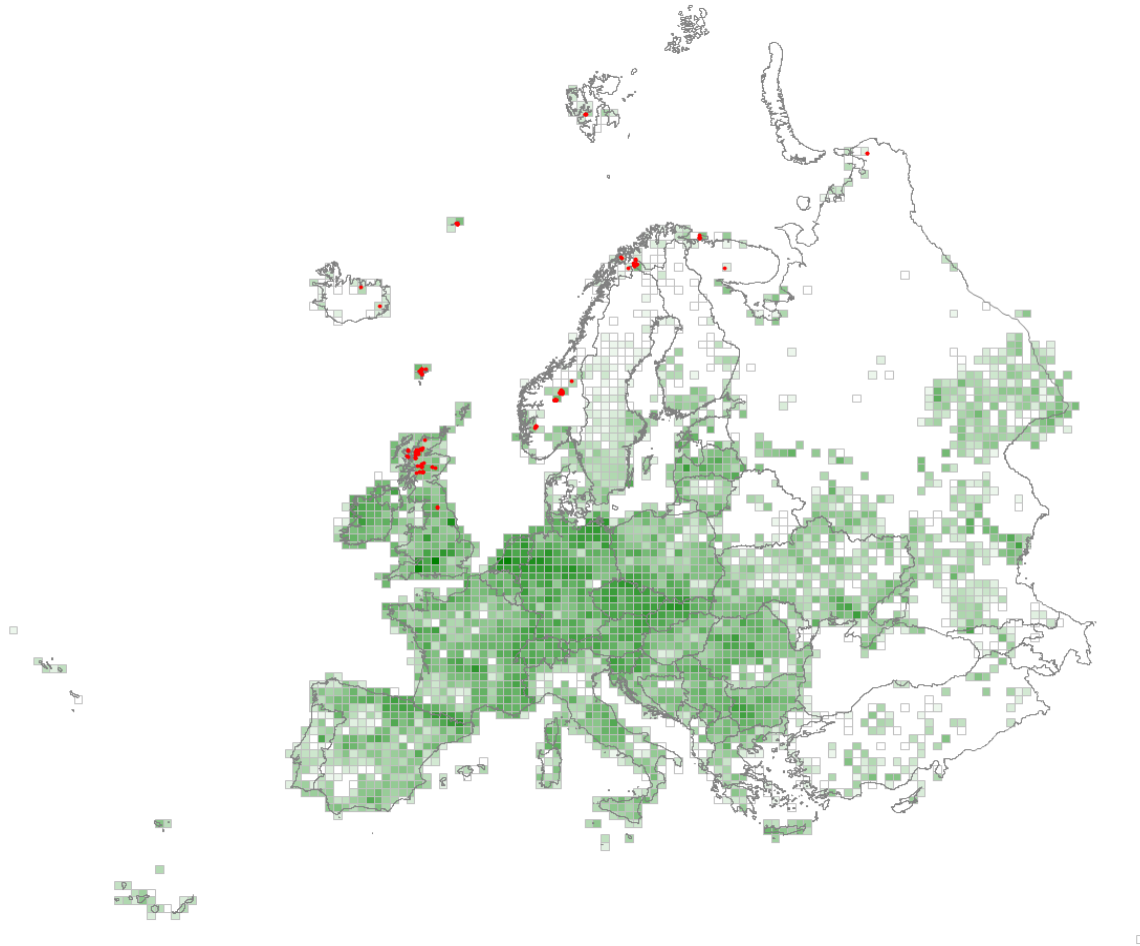
### Constant species (percentage frequencies)

<i>Poa alpina</i>	49
<i>Salix herbacea</i>	37
<i>Gnaphalium supinum</i>	34
<i>Veronica alpina</i>	33
<i>Bistorta vivipara</i>	31
<i>Sibbaldia procumbens</i>	26
<i>Hornungia alpina</i>	26
<i>Silene acaulis</i>	22
<i>Luzula alpinopilosa</i>	22
<i>Leucanthemopsis alpina</i>	20
<i>Ranunculus alpestris</i>	19
<i>Saxifraga oppositifolia</i>	18
<i>Cerastium cerastoides</i>	18
<i>Saxifraga stellaris</i>	17
<i>Saxifraga androsacea</i>	17
<i>Sedum alpestre</i>	16
<i>Myosotis alpestris</i>	15
<i>Geum montanum</i>	15
<i>Ranunculus glacialis</i>	14
<i>Arabis alpina</i>	14
<i>Taraxacum sect. Alpina</i>	13
<i>Ligusticum mutellina</i>	13
<i>Soldanella alpina</i>	12
<i>Plantago alpina</i>	12
<i>Oxyria digyna</i>	12
<i>Gnaphalium hoppeanum</i>	11
<i>Cardamine alpina</i>	11
<i>Campanula scheuchzeri</i>	11



## R42 – Boreal and Arctic acidophilous alpine grassland

Boreal and Arctic acidophilous alpine grasslands, dominated by low graminoids and herbs, characteristic of shallow mostly base-poor soils with thick late snow-lie, occurring through the high mountains of Fennoscandia, Iceland and Scotland.



### Corresponding alliances in EuroVegChecklist 2016

- > TRI-01A Carici-Juncion trifidi Nordhagen 1943
- > TRI-01C Cladonio-Viscarion alpinae Daniëls 1982
- <> TRI-01B Nardo-Caricion rigidae Nordhagen 1943

### Characteristic species combination

Diagnostic species (phi coefficient \* 100)

<i>Carex bigelowii</i>	54
<i>Alchemilla alpina</i>	41
<i>Sibbaldia procumbens</i>	32
<i>Festuca vivipara</i>	31
<i>Oligotrichum hercynicum</i>	30
<i>Bistorta vivipara</i>	30
<i>Nardia scalaris</i>	26
<i>Thalictrum alpinum</i>	25
<i>Salix herbacea</i>	25
<i>Euphrasia officinalis</i> aggr.	24
<i>Gnaphalium supinum</i>	23
<i>Carex brunnescens</i>	23

<i>Cassiope hypnoides</i>	23
<i>Racomitrium fasciculare</i>	22
<i>Kiaeria starkei</i>	22
<i>Polytrichastrum alpinum</i>	21
<i>Saussurea alpina</i> aggr.	21
<i>Racomitrium heterostichum</i>	20
<i>Cerastium alpinum</i>	20
<i>Pogonatum urnigerum</i>	19
<i>Antennaria alpina</i>	19
<i>Euphrasia frigida</i>	19
<i>Cassiope tetragona</i>	19
<i>Agrostis mertensii</i>	18
<i>Taraxacum croceum</i>	18
<i>Gymnomitrium concinnatum</i>	18
<i>Moerckia blyttii</i>	17
<i>Carex vaginata</i>	17
<i>Phyllodoce caerulea</i>	17
<i>Stereocaulon vesuvianum</i>	16
<i>Alchemilla filicaulis</i>	16
<i>Luzula spicata</i>	15

Constant species (percentage frequencies)

<i>Bistorta vivipara</i>	68
<i>Carex bigelowii</i>	65
<i>Alchemilla alpina</i>	44
<i>Anthoxanthum odoratum</i> aggr.	35
<i>Salix herbacea</i>	34
<i>Avenella flexuosa</i>	32
<i>Sibbaldia procumbens</i>	31
<i>Festuca ovina</i>	31
<i>Deschampsia cespitosa</i> aggr.	31
<i>Nardus stricta</i>	28
<i>Festuca vivipara</i>	28
<i>Agrostis capillaris</i>	28
<i>Thalictrum alpinum</i>	26
<i>Gnaphalium supinum</i>	26
<i>Polytrichastrum alpinum</i>	25
<i>Galium saxatile</i>	25
<i>Vaccinium myrtillus</i>	24
<i>Thymus praecox</i>	24
<i>Racomitrium lanuginosum</i>	24
<i>Saussurea alpina</i> aggr.	22
<i>Rumex acetosa</i>	21
<i>Luzula campestris</i> aggr.	21
<i>Silene acaulis</i>	20
<i>Selaginella selaginoides</i>	20
<i>Rhytidiadelphus squarrosus</i>	20
<i>Luzula spicata</i>	20
<i>Juncus trifidus</i>	20
<i>Hylocomium splendens</i>	20
<i>Empetrum nigrum</i> aggr.	18
<i>Solidago virgaurea</i>	16
<i>Ranunculus acris</i> aggr.	16
<i>Huperzia selago</i>	16
<i>Cetraria islandica</i>	16
<i>Vaccinium vitis-idaea</i>	15
<i>Pleurozium schreberi</i>	15
<i>Euphrasia officinalis</i> aggr.	15
<i>Cerastium alpinum</i>	15

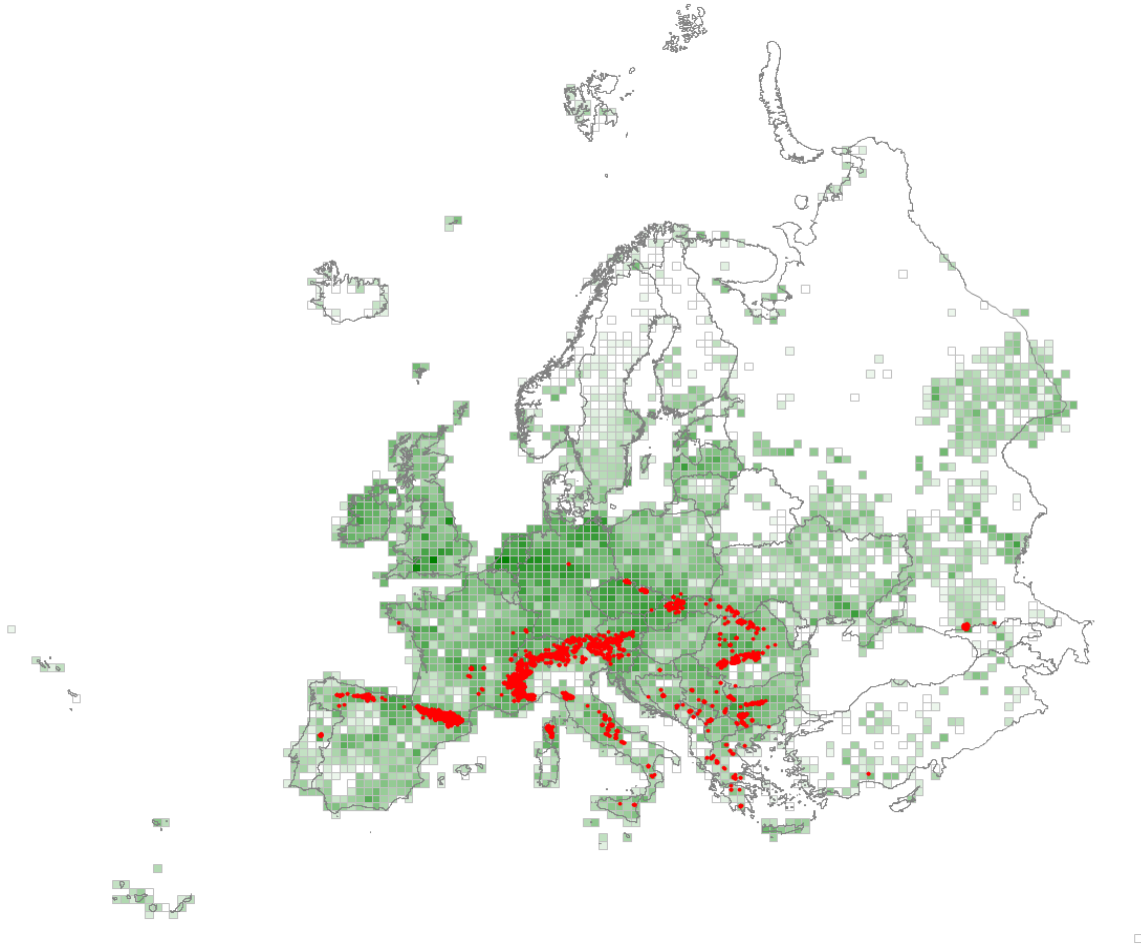
<i>Carex vaginata</i>	15
<i>Campanula rotundifolia</i>	15
<i>Ptilidium ciliare</i>	14
<i>Oligotrichum hercynicum</i>	14
<i>Sanionia uncinata</i>	12
<i>Potentilla erecta</i>	12
<i>Potentilla crantzii</i>	12
<i>Polytrichum piliferum</i>	12
<i>Oxyria digyna</i>	12
<i>Nardia scalaris</i>	12
<i>Viola palustris</i>	11
<i>Racomitrium canescens</i>	11
<i>Phyllodoce caerulea</i>	11
<i>Euphrasia frigida</i>	11
<i>Dicranum scoparium</i>	11
<i>Betula nana</i>	11
<i>Armeria maritima</i>	11
<i>Achillea millefolium</i> aggr.	11
<i>Agrostis canina</i>	11

Dominant species (percentage frequencies of occurrences with cover > 25%)

<i>Nardus stricta</i>	8
<i>Carex bigelowii</i>	6
<i>Alchemilla alpina</i>	6
<i>Sanionia uncinata</i>	5
<i>Racomitrium lanuginosum</i>	5
<i>Festuca ovina</i>	5

## R43 – Temperate acidophilous alpine grassland

Grassland and dwarf chamaephyte vegetation on skeletal and shallow soils over predominantly siliceous bedrocks in the alpine belt throughout the temperate mountains of Europe, typical of the highest summits and ridges, often very exposed to strong winds and largely blown clear of snow in the winter.



### Corresponding alliances in EuroVegChecklist 2016

- > TRI-03E *Agrostion schraderianae* Grabherr 1993
- > TRI-02D *Anemonion speciosae* Minaeva ex Onipchenko 2002
- > TRI-07C *Campanulion albanicae* Lakušić 1966
- > TRI-06A *Campanulo herminii-Nardion strictae* Rivas-Mart. 1964
- > NAR-01E *Campanulo-Nardion* Rivas-Mart. 1964
- > TRI-03A *Carici macrostylidi-Nardion* (Rivas-Mart. et al. 1984) de Foucault 1994
- > TRI-02A *Caricion curvulae* Br.-Bl. 1925
- > TRI-03F *Festucion eskiae* Br.-Bl. 1948
- > TRI-02C *Festucion supinae* Br.-Bl. 1948
- > TRI-03D *Festucion variae* Br.-Bl. ex Guinochet 1938
- > TRI-05A *Festucion woronowii* Tsepkova 1987
- > TRI-04A *Festuco italicae-Nardion strictae* Di Pietro, Terzi et Fortini ined.
- > TRI-02B *Juncion trifidi* Krajina 1933
- > TRI-01D *Lagotido uralensis-Caricion ensifoliae* Chytrý et Mucina in Chytrý et al. 2015
- > TRI-03B *Nardion strictae* Br.-Bl. 1926
- ↔ TRI-01B *Nardo-Caricion rigidae* Nordhagen 1943
- > TRI-07A *Poion violaceae* Horvat et al. 1937
- > NAR-01I *Potentillo montenegrinae-Festucion paniculatae* Redžić ex Čarni et Mucina 2015

- > TRI-03C Potentillo ternatae-Nardion Simon 1958
- > TRI-04B Ranunculo-Nardion strictae Bonin 1972
- > TRI-07B Seslerion comosae Horvat et al. 1937

### Characteristic species combination

#### Diagnostic species (phi coefficient \* 100)

<i>Trifolium alpinum</i>	28
<i>Potentilla aurea</i>	26
<i>Geum montanum</i>	25
<i>Carex curvula</i>	21
<i>Agrostis rupestris</i>	21
<i>Helictochloa versicolor</i>	19
<i>Scorzoneroides helvetica</i>	19
<i>Poa alpina</i>	18
<i>Veronica bellidioides</i>	18
<i>Festuca airoides</i>	17
<i>Euphrasia minima</i>	16
<i>Gentiana acaulis</i>	16
<i>Campanula scheuchzeri</i>	16
<i>Hieracium alpinum</i>	15

#### Constant species (percentage frequencies)

<i>Nardus stricta</i>	43
<i>Poa alpina</i>	39
<i>Potentilla aurea</i>	33
<i>Anthoxanthum odoratum</i> aggr.	31
<i>Geum montanum</i>	28
<i>Festuca rubra</i> aggr.	25
<i>Homogyne alpina</i>	24
<i>Agrostis rupestris</i>	24
<i>Campanula scheuchzeri</i>	23
<i>Avenella flexuosa</i>	23
<i>Vaccinium myrtillus</i>	22
<i>Helictochloa versicolor</i>	22
<i>Carex sempervirens</i>	22
<i>Trifolium alpinum</i>	21
<i>Scorzoneroides helvetica</i>	19
<i>Luzula spicata</i>	18
<i>Juncus trifidus</i>	18
<i>Ligusticum mutellina</i>	17
<i>Phleum alpinum</i> aggr.	16
<i>Euphrasia minima</i>	16
<i>Carex curvula</i>	16
<i>Bistorta vivipara</i>	16
<i>Vaccinium uliginosum</i>	15
<i>Luzula campestris</i> aggr.	15
<i>Festuca airoides</i>	15
<i>Plantago alpina</i>	14
<i>Phyteuma hemisphaericum</i>	14
<i>Antennaria dioica</i>	14
<i>Vaccinium vitis-idaea</i>	12
<i>Trifolium pratense</i>	12
<i>Silene acaulis</i>	12
<i>Leucanthemopsis alpina</i>	12
<i>Cetraria islandica</i>	12
<i>Cerastium arvense</i>	12
<i>Myosotis alpestris</i>	11

<i>Minuartia sedoides</i>	11
<i>Lotus corniculatus</i>	11
<i>Lotus alpinus</i>	11
<i>Gentiana acaulis</i>	11

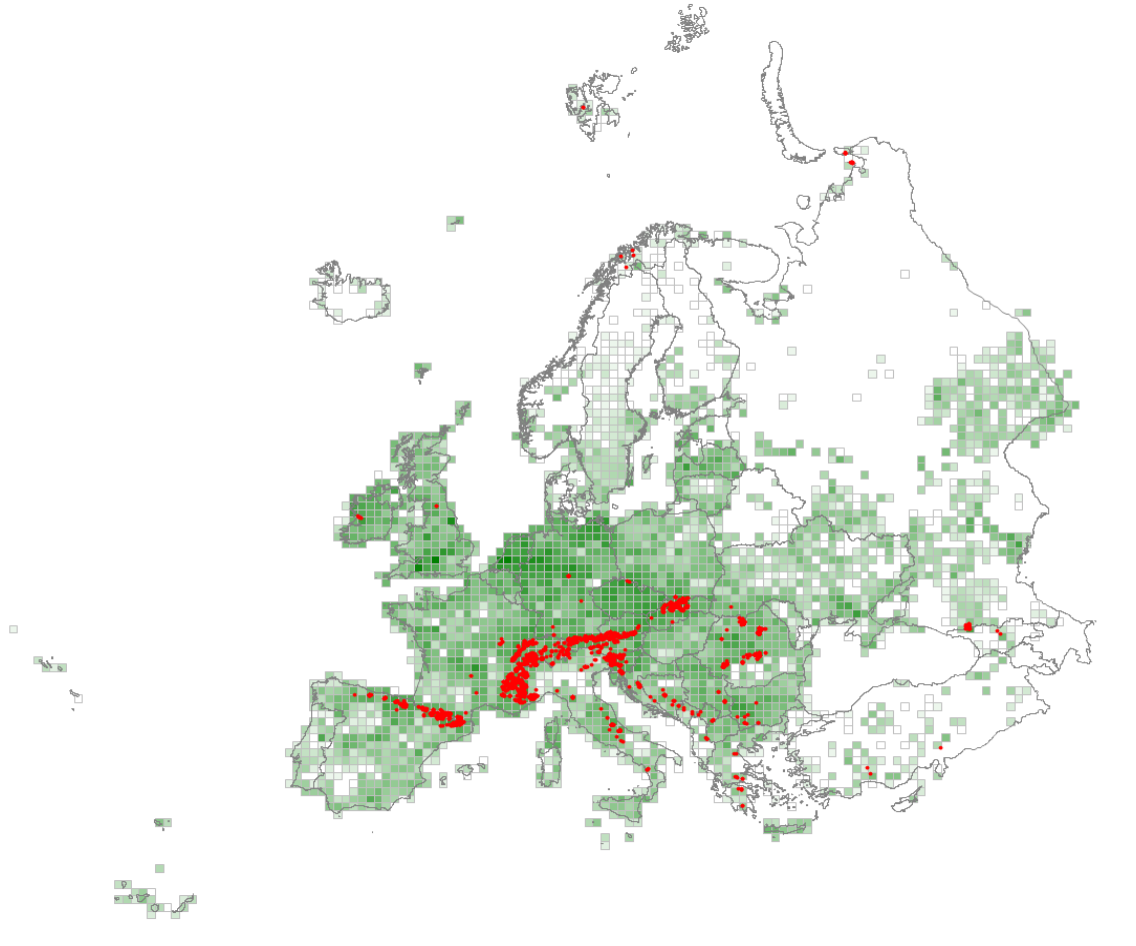
Dominant species (percentage frequencies of occurrences with cover > 25%)

<i>Nardus stricta</i>	23
<i>Carex curvula</i>	9
<i>Festuca eskia</i>	6



## R44 – Arctic-alpine calcareous grassland

Grasslands on usually shallow, highly calcareous soils on limestone or dolomite slopes and ridges in the alpine or subalpine belts of the high mountains of the temperate zone, being best developed in the Alps, but occurring also in the Carpathians and Pyrenees, with small fragmentary stands also in the Sudetes and in Scotland. Grasses and sedges dominate, along with numerous small herbs, the cover varying from sparse to complete according to the soil depth.



### Corresponding alliances in EuroVegChecklist 2016

- > KOB-02D *Agrostion alpinae* Jeník et al. 1980
- > SES-01I *Armerion cantabricae* Rivas-Mart. et al. 1984
- > SES-01E *Astero alpini-Seslerion calcariae* Hadač in Hadač et al. 1969 nom. invers. propos.
- > SES-01B *Caricion austroalpinae* Sutter 1962
- > SES-01C *Caricion ferrugineae* G. Br.-Bl. et Br.-Bl. in G. Br.-Bl. 1931
- > SES-01D *Caricion firmae* Gams 1936
- ◁> KOB-01C *Dryadion integrifoliae* Ohba ex Daniëls 1982
- > KOB-02C *Festucion versicoloris* Krajina 1933
- > SES-01G *Festuco saxatilis-Seslerion bielzii* (Pawłowski et Walas 1949) Coldea 1984
- ◁> KOB-01A *Kobresio-Dryadion* Nordhagen 1943
- > KOB-03A *Kobresion capilliformis* Tsepikova 1987
- > KOB-02B *Leontopodio nivalis-Elytion myosuroidis* (Blasi et al. 2003) Di Pietro et Mucina in Chytrý et al. 2015
- > KOB-02A *Oxytropido-Elytion myosuroidis* Br.-Bl. 1950
- > SES-01H *Primulion intricatae* Br.-Bl. ex Vigo 1972
- > SES-01A *Seslerion caeruleae* Br.-Bl. in Br.-Bl. et Jenny 1926

> SES-01F Seslerion tatrae Pawłowski 1935 corr. Klika 1955

### Characteristic species combination

#### Diagnostic species (phi coefficient \* 100)

<i>Carex sempervirens</i>	24
<i>Sesleria caerulea</i>	23
<i>Bellidiastrum michelii</i>	19
<i>Gentiana clusii</i>	18
<i>Dryas octopetala</i>	18
<i>Helianthemum alpestre</i>	17
<i>Phyteuma orbiculare</i>	17
<i>Galium anisophyllum</i>	16
<i>Saxifraga paniculata</i>	15

#### Constant species (percentage frequencies)

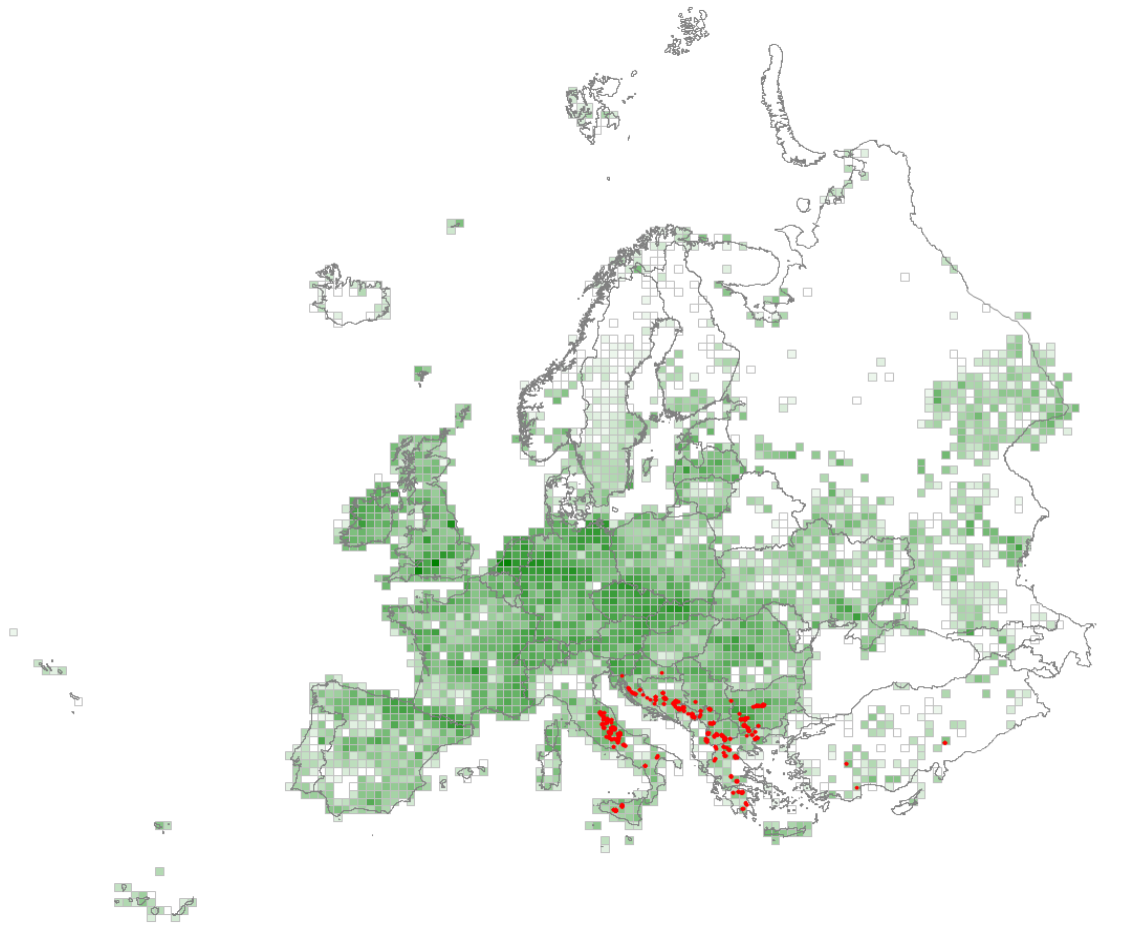
<i>Sesleria caerulea</i>	55
<i>Carex sempervirens</i>	37
<i>Anthyllis vulneraria</i>	28
<i>Bellidiastrum michelii</i>	27
<i>Dryas octopetala</i>	23
<i>Phyteuma orbiculare</i>	22
<i>Helianthemum nummularium</i>	22
<i>Bistorta vivipara</i>	22
<i>Galium anisophyllum</i>	21
<i>Saxifraga paniculata</i>	19
<i>Poa alpina</i>	19
<i>Carduus defloratus</i> aggr.	18
<i>Lotus corniculatus</i>	17
<i>Helianthemum alpestre</i>	17
<i>Thymus praecox</i>	16
<i>Gentiana verna</i>	16
<i>Silene acaulis</i>	15
<i>Globularia cordifolia</i>	15
<i>Campanula cochleariifolia</i>	15
<i>Tortella tortuosa</i>	14
<i>Scabiosa lucida</i>	14
<i>Myosotis alpestris</i>	14
<i>Euphrasia salisburgensis</i>	14
<i>Primula auricula</i>	13
<i>Minuartia verna</i> aggr.	13
<i>Carex firma</i>	13
<i>Helictotrichon sedenense</i>	12
<i>Gentiana clusii</i>	12
<i>Clinopodium alpinum</i>	12
<i>Biscutella laevigata</i>	12
<i>Thesium alpinum</i>	11
<i>Saxifraga oppositifolia</i>	11
<i>Linum catharticum</i>	11
<i>Carlina acaulis</i>	11
<i>Campanula rotundifolia</i>	11
<i>Bartsia alpina</i>	11
<i>Aster alpinus</i>	11

#### Dominant species (percentage frequencies of occurrences with cover > 25%)

<i>Sesleria caerulea</i>	12
<i>Carex sempervirens</i>	9

## R45 – Alpine and subalpine calcareous grassland of the Balkans and Apennines

Grass-dominated vegetation of base-rich soils in the high mountains in the Balkans and Apennines including both primary vegetation above the tree line but also secondary grasslands maintained by grazing at lower altitudes.



### Corresponding alliances in EuroVegChecklist 2016

- > SES-03B Anthyllido-Seslerion klasterskyi Simon 1958
- > SES-02C Festucion pungentis Horvat 1930
- > SES-03E Festucion xanthinae Lakušić et al. 1969
- > SES-03D Festuco-Knaution longifoliae Jovanović-Dunjić 1955
- > SES-03A Oxytropidion dinaricae Lakušić 1966
- > SES-02B Seslerio juncifoliae-Caricion firmæ Trinajstić 2005
- > SES-03C Seslerio-Festucion xanthinae Horvat in Horvat et al. 1974
- > SES-02D Seslerion apenninae Furnari in Bruno et Furnari 1966
- > SES-03F Seslerion nitidae Horvat 1936
- > SES-02A Seslerion tenuifoliae Horvat 1930

### Characteristic species combination

Diagnostic species (phi coefficient \* 100)

<i>Carex kitaibeliana</i>	59
<i>Edraianthus graminifolius</i>	41
<i>Sesleria juncifolia</i>	33
<i>Trinia dalechampii</i>	28
<i>Oxytropis dinarica</i>	28

<i>Scabiosa silenifolia</i>	24
<i>Asyneuma limonifolium</i>	23
<i>Sesleria nitida</i>	23
<i>Pedicularis brachyodonta</i>	22
<i>Achillea ageratifolia</i>	21
<i>Helianthemum alpestre</i>	20
<i>Dianthus haematocalyx</i>	19
<i>Anthyllis aurea</i>	19
<i>Globularia meridionalis</i>	19
<i>Pedicularis elegans</i>	18
<i>Euphrasia dinarica</i>	18
<i>Galium oreophilum</i>	17
<i>Paronychia macedonica</i>	17
<i>Minuartia verna</i> aggr.	17
<i>Androsace villosa</i>	17
<i>Arabis scopoliana</i>	17
<i>Gentiana verna</i>	16
<i>Thymus praecox</i>	16
<i>Dianthus tristis</i>	16
<i>Helianthemum canum</i>	15

Constant species (percentage frequencies)

<i>Carex kitaibeliana</i>	67
<i>Anthyllis vulneraria</i>	41
<i>Thymus praecox</i>	36
<i>Sesleria juncifolia</i>	34
<i>Minuartia verna</i> aggr.	30
<i>Edraianthus graminifolius</i>	30
<i>Helianthemum canum</i>	26
<i>Clinopodium alpinum</i>	26
<i>Teucrium montanum</i>	20
<i>Poa alpina</i>	20
<i>Helianthemum alpestre</i>	20
<i>Dianthus sylvestris</i>	20
<i>Bromopsis erecta</i>	20
<i>Gentiana verna</i>	19
<i>Asperula aristata</i>	19
<i>Saxifraga paniculata</i>	18
<i>Helianthemum nummularium</i>	18
<i>Asyneuma limonifolium</i>	18
<i>Koeleria lobata</i>	17
<i>Juniperus communis</i> subsp. <i>nana</i>	16
<i>Globularia meridionalis</i>	16
<i>Anthyllis montana</i>	16
<i>Trinia dalechampii</i>	14
<i>Hippocrepis comosa</i>	14
<i>Sesleria nitida</i>	13
<i>Helictochloa versicolor</i>	13
<i>Cerastium arvense</i>	13
<i>Asperula cynanchica</i>	13
<i>Armeria canescens</i>	13
<i>Trinia glauca</i>	12
<i>Thymus longicaulis</i>	12
<i>Pilosella officinarum</i>	12
<i>Lotus corniculatus</i>	12
<i>Galium lucidum</i>	12
<i>Cyanus triumfettii</i> aggr.	12
<i>Androsace villosa</i>	12
<i>Teucrium chamaedrys</i>	11

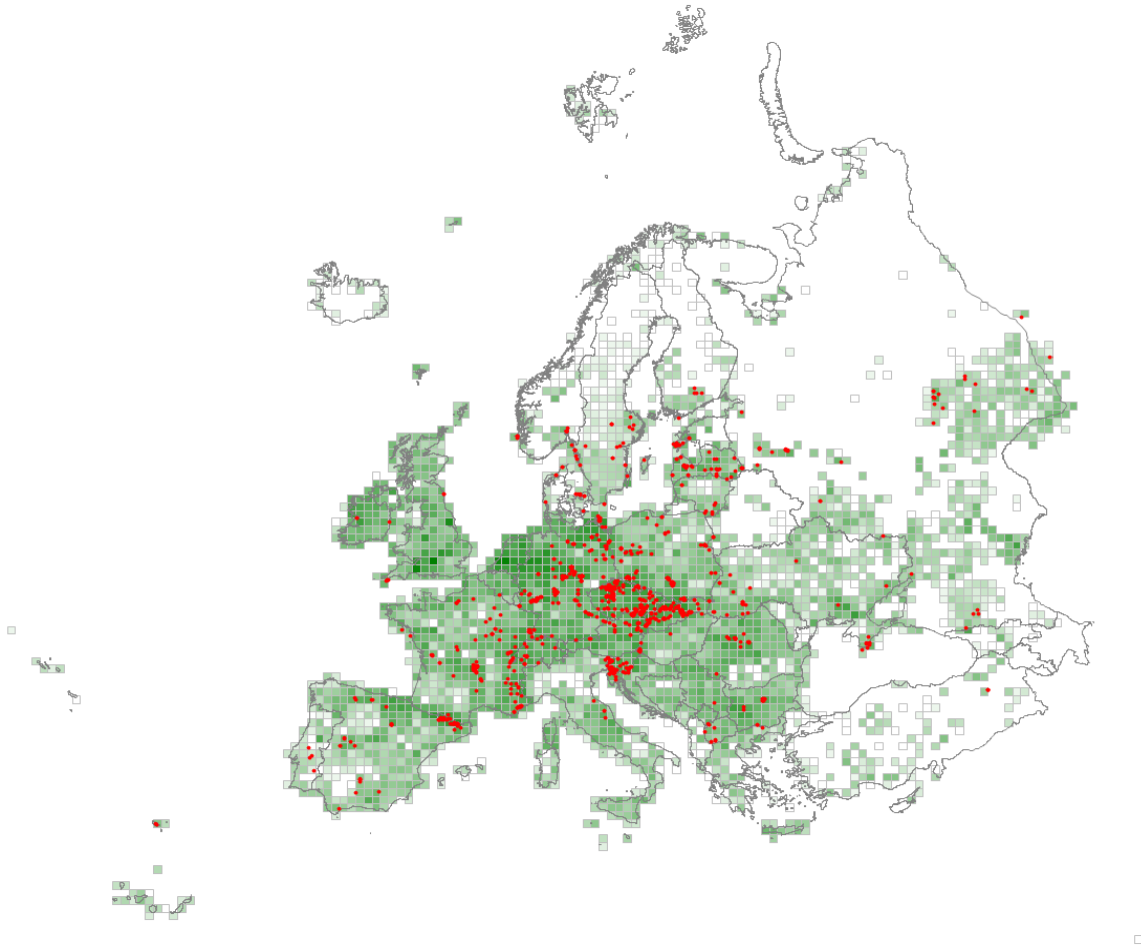
<i>Stipa pulcherrima</i>	11
<i>Leontodon crispus</i> aggr.	11
<i>Koeleria splendens</i>	11
<i>Cetraria islandica</i>	11
<i>Carex humilis</i>	11

Dominant species (percentage frequencies of occurrences with cover > 25%)

<i>Sesleria juncifolia</i>	13
<i>Carex kitaibeliana</i>	12
<i>Sesleria nitida</i>	5

## R51 – Thermophilous forest fringe of base-rich soils

Fringe communities on neutral to base-rich, only moderately nutrient-rich soils in the transition zone between forests or scrub and open habitats or in similar situations alongside cliffs and on roadsides. They occur across large parts of lowland North-Western Europe, but also extending into more continental regions where they fringe more open thermophilous forests, and into cooler montane levels to the south and south-east. Typically comprising half-shade plants, other species of neighbouring habitats can also find a place and, in calcareous landscapes, the vegetation can be very species-rich, harbouring many rare and/or endangered species. This vegetation depends on grazing or mowing to prevent succession.



### Corresponding alliances in EuroVegChecklist 2016

- > GER-02E *Asparago acutifolii*-*Teucrium chamaedryos* Ubaldi 2011
- > GER-03C *Cyano triumfetti*-*Asphodelion macrocarpae* Biondi et Allegrezza in Biondi et al. 2014
- > GER-02C *Dictamnus albi*-*Ferulagium galbaniferae* (van Gils et al. 1975) de Foucault et al. ex Čarni et Dengler in Mucina et al. 2009
- > GER-02B *Galium littoralis*-*Geranium sanguineum* Géhu et Géhu-Franck in de Foucault et al. 1983
- > GER-02A *Geranium sanguineum* Tx. in T. Müller 1962
- > GER-01A *Knautia dipsacifoliae* Julve ex Dengler et Boch 2008
- > GER-02D *Lathyrus laxiflorus*-*Trifolium velenovskyi* (Čarni et al. 2000) Čarni 2005
- > GER-03A *Stachys lusitanicae*-*Cheiranthus sempervirens* (Capelo 1996) Capelo in Di Pietro et al. 2015
- > GER-03B *Thalictrum aquilegifolium*-*Asphodelion macrocarpi* Allegrezza et al. 2015
- > GER-01B *Trifolium medii* T. Müller 1962
- > GER-01C *Viola kitaibeliana* Ubaldi 2011

## Characteristic species combination

### Diagnostic species (phi coefficient \* 100)

<i>Geranium sanguineum</i>	29
<i>Trifolium medium</i>	29
<i>Peucedanum cervaria</i>	19
<i>Origanum vulgare</i>	17

### Constant species (percentage frequencies)

<i>Dactylis glomerata</i>	37
<i>Geranium sanguineum</i>	36
<i>Achillea millefolium</i> aggr.	35
<i>Trifolium medium</i>	34
<i>Origanum vulgare</i>	32
<i>Poa pratensis</i> aggr.	31
<i>Euphorbia cyparissias</i>	31
<i>Galium mollugo</i> aggr.	29
<i>Vincetoxicum hirundinaria</i>	28
<i>Hypericum perforatum</i>	28
<i>Brachypodium pinnatum</i>	25
<i>Galium verum</i>	24
<i>Clinopodium vulgare</i>	24
<i>Fragaria vesca</i>	22
<i>Arrhenatherum elatius</i>	22
<i>Veronica chamaedrys</i> aggr.	21
<i>Polygonatum odoratum</i>	21
<i>Festuca rubra</i> aggr.	20
<i>Teucrium chamaedrys</i>	19
<i>Agrimonia eupatoria</i>	19
<i>Pimpinella saxifraga</i>	18
<i>Agrostis capillaris</i>	18
<i>Lotus corniculatus</i>	17
<i>Viola hirta</i>	16
<i>Tanacetum corymbosum</i>	16
<i>Peucedanum cervaria</i>	16
<i>Helianthemum nummularium</i>	16
<i>Centaurea scabiosa</i>	16
<i>Vicia cracca</i>	15
<i>Lathyrus pratensis</i>	15
<i>Knautia arvensis</i>	15
<i>Fragaria viridis</i>	15
<i>Stachys recta</i>	14
<i>Stachys officinalis</i>	14
<i>Filipendula vulgaris</i>	14
<i>Centaurea jacea</i>	14
<i>Bupleurum falcatum</i>	14
<i>Securigera varia</i>	13
<i>Solidago virgaurea</i>	12
<i>Silene nutans</i>	12
<i>Primula veris</i>	12
<i>Poa nemoralis</i>	12
<i>Sanguisorba minor</i> aggr.	11
<i>Salvia pratensis</i>	11
<i>Plantago lanceolata</i>	11
<i>Laserpitium latifolium</i>	11
<i>Campanula persicifolia</i>	11
<i>Calamagrostis epigejos</i>	11

<i>Briza media</i>	11
<i>Astragalus glycyphyllos</i>	11

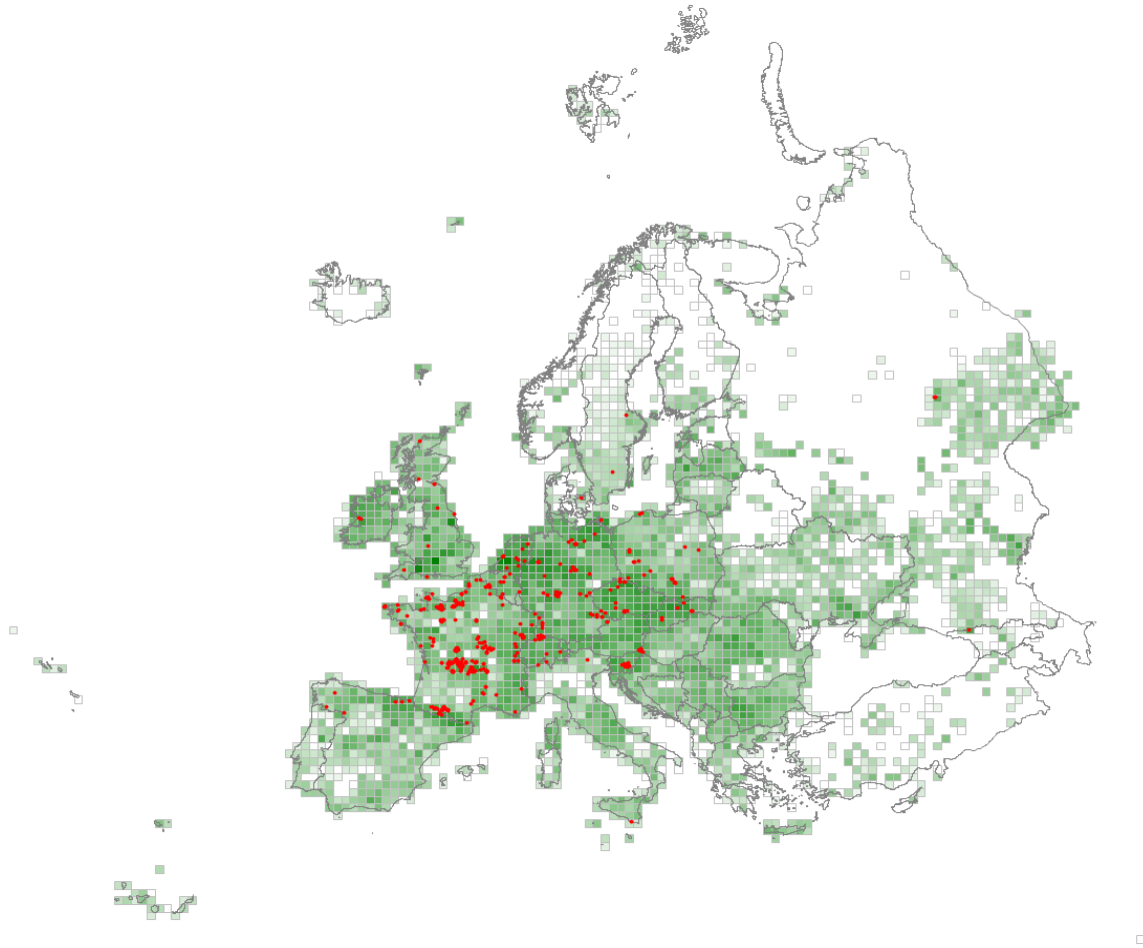
Dominant species (percentage frequencies of occurrences with cover > 25%)

<i>Trifolium medium</i>	22
<i>Geranium sanguineum</i>	20
<i>Vincetoxicum hirundinaria</i>	7
<i>Peucedanum cervaria</i>	7



## R52 – Forest fringe of acidic nutrient-poor soils

Fringe vegetation of semi-shaded forest margins and similar situations on acidic, nutrient-poor soils in the cooler Atlantic, subatlantic and subcontinental regions of Europe, becoming rare and more species-poor in Eastern Europe. It is generally dominated by bulky grasses and tall forbs, rather species-poor, and ultimately dependent on extensive grazing or occasional mowing to prevent encroachment by shrubs and trees that threaten denser shade.



### Corresponding alliances in EuroVegChecklist 2016

- > GER-03D *Hyperico calabricae-Asphodelion macrocarpi* Biondi, Gangale et Uzunov in Biondi et al. 2014
- > GER-05E *Linarion triornithophorae* Rivas-Mart. et al. 1984
- > GER-05G *Luzulo sieberi-Brachypodium genuensis* Allegrezza et Biondi in Biondi et al. 2015
- > GER-05A *Melampyrion pratensis* Passarge 1979
- > GER-05F *Origanion virentis* Rivas-Mart. et O. de Bolòs in Rivas-Mart. et al. 1984
- > GER-05C *Poion nemoralis* Dengler et al. 2006
- > GER-05D *Teucrium scorodoniae* de Foucault et al. 1983
- > GER-05B *Violo riviniana-Stellarion holostea* Passarge 1994

### Characteristic species combination

Diagnostic species (phi coefficient \* 100)

<i>Teucrium scorodonia</i>	31
<i>Holcus mollis</i>	30
<i>Hypericum pulchrum</i>	19

<i>Lonicera periclymenum</i>	16
<i>Melampyrum pratense</i>	16

Constant species (percentage frequencies)

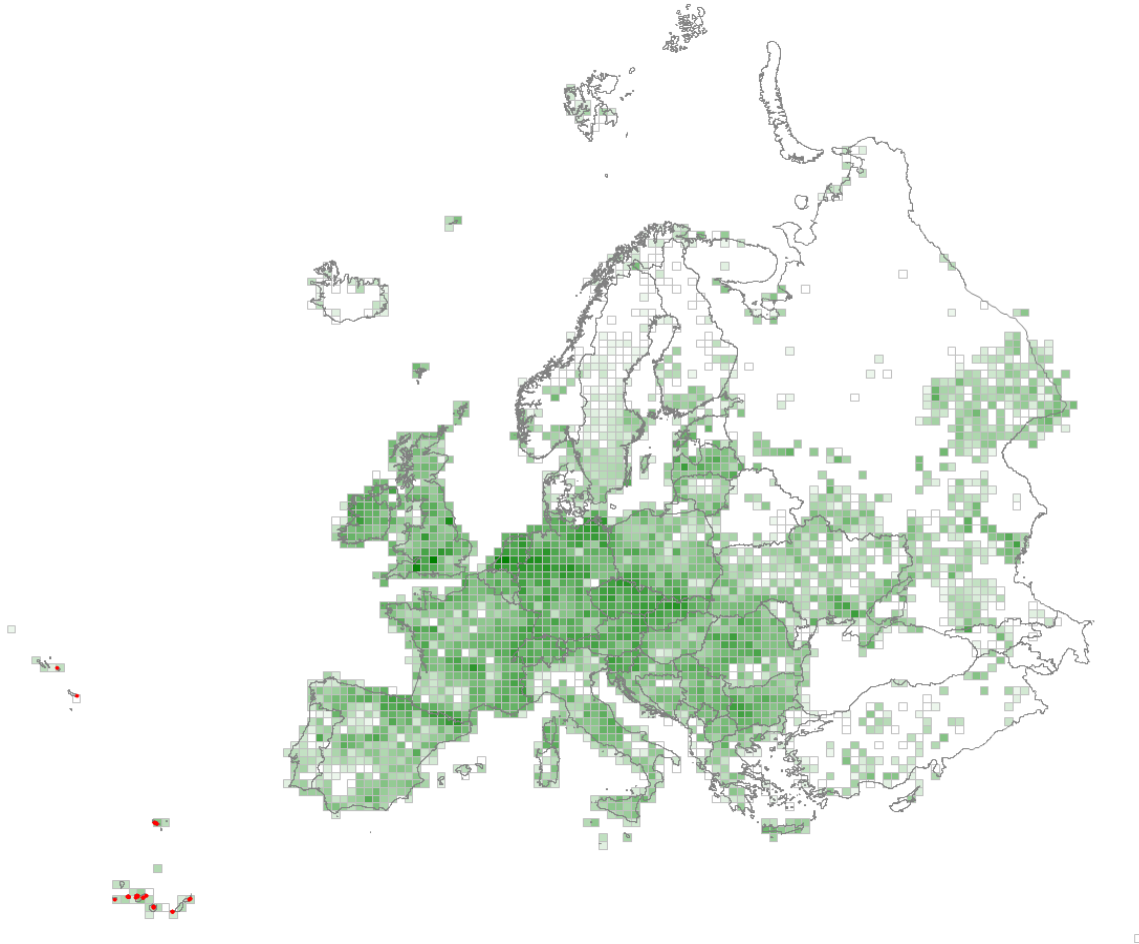
<i>Teucrium scorodonia</i>	67
<i>Holcus mollis</i>	55
<i>Avenella flexuosa</i>	42
<i>Agrostis capillaris</i>	40
<i>Lonicera periclymenum</i>	38
<i>Melampyrum pratense</i>	36
<i>Pteridium aquilinum</i>	33
<i>Solidago virgaurea</i>	27
<i>Quercus robur</i>	24
<i>Hedera helix</i> aggr.	22
<i>Vaccinium myrtillus</i>	21
<i>Stellaria holostea</i>	20
<i>Hieracium murorum</i>	20
<i>Fragaria vesca</i>	19
<i>Anthoxanthum odoratum</i> aggr.	19
<i>Potentilla erecta</i>	18
<i>Hypericum pulchrum</i>	18
<i>Dactylis glomerata</i>	18
<i>Calluna vulgaris</i>	18
<i>Viola riviniana</i>	17
<i>Cytisus scoparius</i>	16
<i>Sorbus aucuparia</i>	15
<i>Galium mollugo</i> aggr.	15
<i>Hypericum perforatum</i>	14
<i>Festuca rubra</i> aggr.	14
<i>Veronica officinalis</i>	13
<i>Hieracium lachenalii</i>	13
<i>Digitalis purpurea</i>	13
<i>Veronica chamaedrys</i> aggr.	12
<i>Rubus fruticosus</i> aggr.	12
<i>Poa nemoralis</i>	12
<i>Luzula campestris</i> aggr.	12
<i>Lathyrus linifolius</i>	12
<i>Carex pilulifera</i>	12
<i>Achillea millefolium</i> aggr.	12
<i>Quercus petraea</i>	11
<i>Polytrichastrum formosum</i>	11
<i>Luzula luzuloides</i>	11
<i>Galium saxatile</i>	11
<i>Campanula rotundifolia</i>	11

Dominant species (percentage frequencies of occurrences with cover > 25%)

<i>Teucrium scorodonia</i>	18
<i>Holcus mollis</i>	17
<i>Melampyrum pratense</i>	13

## R53 – Macaronesian thermophilous forest fringe

Perennial herbaceous communities of the warm half-shade of forest fringes and clearings of Macaronesian laurel forests in the Canary Islands, Madeira and Azores. It is found as sunnier micro-sites in or along humid woodland edges but is dependent on forest litter producing somewhat mesotrophic conditions.



### Corresponding alliances in EuroVegChecklist 2016

- > GER-04B *Pericallion malvifoliae* Fernández Prieto, Dias et Aguiar in Fernández Prieto et al. 2012
- > GER-04A *Ranunculo cortusifolii*-*Geranion canariensis* Rivas-Mart. et al. 1993

### Characteristic species combination

Diagnostic species (phi coefficient \* 100)

<i>Ranunculus cortusifolius</i>	55
<i>Helichrysum gossypinum</i>	38
<i>Ferula lancerotensis</i>	35
<i>Pericallis cruenta</i>	34
<i>Andryala pinnatifida</i>	33
<i>Thymus origanoides</i>	32
<i>Pimpinella dendrotragium</i>	32
<i>Bystropogon punctatus</i>	32
<i>Aichryson tortuosum</i>	30
<i>Monanthes laxiflora</i>	30
<i>Reichardia famarae</i>	27

<i>Athamanta cervariifolia</i>	27
<i>Aeonium lancerottense</i>	24
<i>Polypodium cambricum</i> subsp. <i>macaronesicum</i>	23
<i>Sonchus fruticosus</i>	22
<i>Pericallis malvifolia</i>	22
<i>Musschia wollastonii</i>	22
<i>Monanthes muralis</i>	22
<i>Melanoselinum decipiens</i>	22
<i>Lolium saxatile</i>	22
<i>Limonium bourgeaui</i>	22
<i>Echium handiense</i>	22
<i>Crambe strigosa</i>	22
<i>Crambe scaberrima</i>	22
<i>Arachniodes webbiana</i>	22
<i>Angelica lignescens</i>	22
<i>Ammi huntii</i>	22
<i>Aichryson pachycaulon</i>	22
<i>Aeonium cuneatum</i>	22
<i>Aichryson laxum</i>	22
<i>Isoplexis sceptrum</i>	22
<i>Geranium palmatum</i>	22
<i>Hypericum coadunatum</i>	21
<i>Sideritis dasygnaphala</i>	21
<i>Sideritis pumila</i>	21
<i>Crepis canariensis</i>	20
<i>Genista maderensis</i>	20
<i>Ageratina adenophora</i>	19
<i>Asteriscus intermedius</i>	19
<i>Genista stenopetala</i>	18
<i>Aeonium aureum</i>	18
<i>Pericallis webbii</i>	18
<i>Clethra arborea</i>	18
<i>Carlina salicifolia</i>	18
<i>Argyranthemum webbii</i>	17
<i>Senecio bollei</i>	17
<i>Ononis christii</i>	17
<i>Minuartia platyphylla</i>	17
<i>Salix canariensis</i>	17
<i>Sonchus gummifer</i>	17
<i>Orchis patens</i>	17
<i>Aeonium diplocyclum</i>	17
<i>Allium roseum</i>	17
<i>Echium virescens</i>	17
<i>Petroselinum crispum</i>	16
<i>Ceratochloa cathartica</i>	16
<i>Teucrium francoi</i>	16
<i>Festuca agustinii</i>	16
<i>Salvia canariensis</i>	15
<i>Genista microphylla</i>	15
Constant species (percentage frequencies)	
<i>Ranunculus cortusifolius</i>	60
<i>Andryala pinnatifida</i>	30
<i>Polypodium cambricum</i> subsp. <i>macaronesicum</i>	20
<i>Carlina salicifolia</i>	20
<i>Phyllis nobla</i>	15
<i>Pericallis cruenta</i>	15
<i>Monanthes laxiflora</i>	15
<i>Helichrysum gossypinum</i>	15

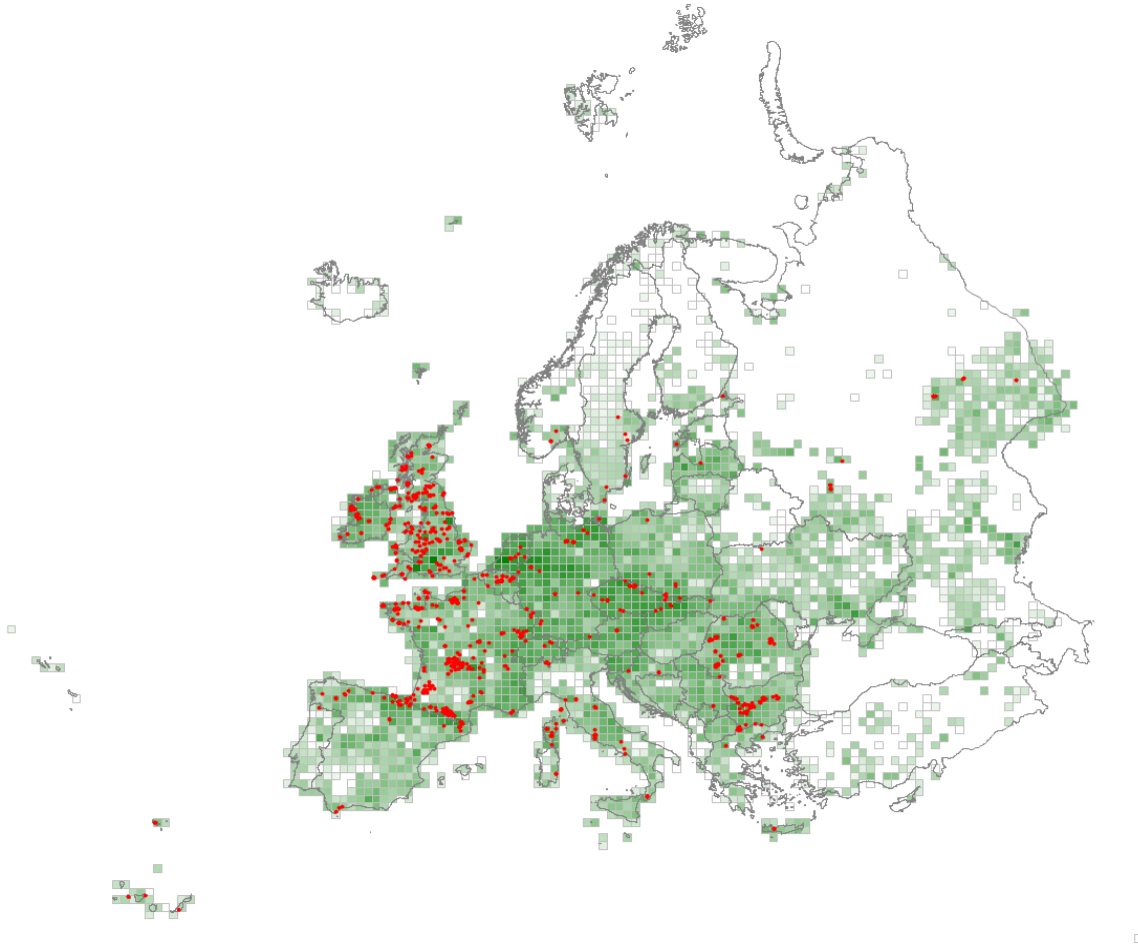
<i>Ferula lancerotensis</i>	15
<i>Euphorbia regis-jubae</i>	15
<i>Davallia canariensis</i>	15
<i>Aichryson laxum</i>	15
<i>Ageratina adenophora</i>	15

Dominant species (percentage frequencies of occurrences with cover > 25%)

<i>Polypodium cambricum</i> subsp. <i>macaronesicum</i>	10
<i>Helichrysum gossypinum</i>	10
<i>Teucrium francoi</i>	5
<i>Sonchus fruticosus</i>	5
<i>Sideritis syriaca</i>	5
<i>Salix canariensis</i>	5
<i>Rumex maderensis</i>	5
<i>Ranunculus cortusifolius</i>	5
<i>Pimpinella dendrotragium</i>	5
<i>Pericallis malvifolia</i>	5
<i>Origanum vulgare</i>	5
<i>Monanthes laxiflora</i>	5
<i>Lolium saxatile</i>	5
<i>Geranium reuteri</i>	5
<i>Genista stenopetala</i>	5
<i>Genista maderensis</i>	5
<i>Ferula lancerotensis</i>	5
<i>Echium handiense</i>	5
<i>Angelica lignescens</i>	5
<i>Aichryson laxum</i>	5
<i>Aeonium lancerottense</i>	5
<i>Aeonium cuneatum</i>	5
<i>Adenocarpus foliolosus</i>	5

## R54 – *Pteridium aquilinum* vegetation

Dense species-poor stands of bracken (*Pteridium aquilinum*), naturally a lowland European forest fern which, when not held in check by dense shade and lacking the traditional management of cutting and trampling by cattle, readily establishes itself as a dominant in non-forest land. It spreads vigorously by rhizome extension and produces a deep litter layer. It is common in many pastoral landscapes that are less traditionally managed than before. It can also dominate in areas of burned forest.



### Corresponding alliances in EuroVegChecklist 2016

- > GER-05H Digitalidi ferrugineae-Pteridion aquilini Biondi et Casavecchia in Biondi et al. 2014
- <> EPI-01A Epilobion angustifolii Oberd. 1957
- <> LON-01A Lonicero-Rubion silvatici Tx. et Neumann ex Wittig 1977

### Characteristic species combination

Diagnostic species (phi coefficient \* 100)

*Pteridium aquilinum* 28

Constant species (percentage frequencies)

*Pteridium aquilinum* 100

*Agrostis capillaris* 35

*Potentilla erecta* 33

*Avenella flexuosa* 21

*Anthoxanthum odoratum* aggr. 21

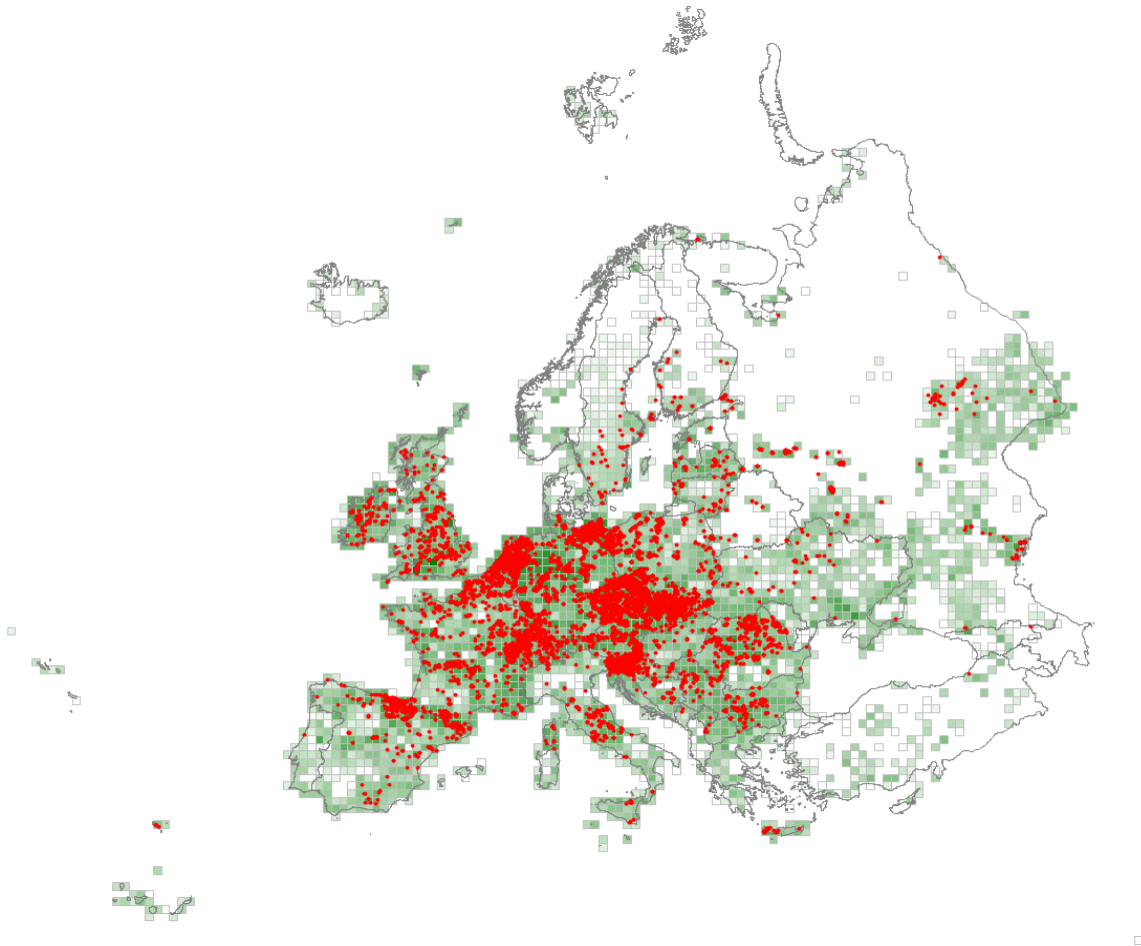
<i>Calluna vulgaris</i>	20
<i>Holcus lanatus</i>	19
<i>Galium saxatile</i>	17
<i>Teucrium scorodonia</i>	16
<i>Rubus fruticosus</i> aggr.	16
<i>Molinia caerulea</i> aggr.	16
<i>Festuca rubra</i> aggr.	15
<i>Dactylis glomerata</i>	15
<i>Vaccinium myrtillus</i>	14
<i>Holcus mollis</i>	14
<i>Viola riviniana</i>	13
<i>Achillea millefolium</i> aggr.	13
<i>Rumex acetosa</i>	12

Dominant species (percentage frequencies of occurrences with cover > 25%)

<i>Pteridium aquilinum</i>	99
<i>Agrostis capillaris</i>	6

## R55 – Lowland moist or wet tall-herb and fern fringe

Tall-herb and fern-dominated communities of moist, sometimes flooded nutrient-rich soils in the lowlands and low mountain areas of Europe, up to the subalpine zone, through the temperate, boreal and submediterranean regions. The relatively species-rich vegetation may be found in river floodplains, along smaller watercourses, in the shade at the edge of forests, often as narrow strips, and, as secondary vegetation after the abandonment of pastures and especially meadows. The species composition is quite diverse, depending on the altitude, geographic distribution and location in the landscape.



### Corresponding alliances in EuroVegChecklist 2016

- <> EPI-02C *Aegopodium podagrariae* Tx. 1967 nom. conserv. propos.
- > MOL-09A *Althaeion officinalis* Golub et Mirkin in Golub 1995
- > EPI-05B *Archangelicion litoralis* Scamoni et Passarge 1963
- <> MOL-05E *Conioselinion tatarici* Golub et al. 2003
- > EPI-05D *Cynancho-Convulvion sepium* Rivas Goday et Rivas-Mart. ex Rivas-Mart.
- > EPI-05E *Dorycnio recti-Rumicion conglomerati* Gradstein et Smittenberg 1977
- > MOL-09B *Euphorbion palustris* Ageleulov et Golub in Golub 1995
- > MOL-08D *Filipendulion ulmariae* Segal ex Westhoff et Den Held 1969
- > MOL-08A *Filipendulo-Petasion* Br.-Bl. ex Duvigneaud 1949
- > EPI-02B *Impatienti noli-tangere-Stachyion sylvaticae* Görs ex Mucina 1993
- > EPI-05F *Ipomoeo acuminatae-Ageratinion adenophorae* Espírito-Santo et al. 2004
- > MOL-09C *Lythro-Euphorbion* Mirkin et Naumova 1986
- > EPI-05C *Nardosmion laevigatae* Klotz et Köck 1986
- > MOL-08B *Rumicion balcanici* Lakušić ex D. Lakušić et al. 2015
- > EPI-05A *Senecionion fluviatilis* Tx. ex Moor 1958
- > MOL-08C *Veronico longifoliae-Lysimachion vulgaris* (Passarge 1977) Bal.-Tul. 1981



## Characteristic species combination

### Diagnostic species (phi coefficient \* 100)

*Urtica dioica* 16

### Constant species (percentage frequencies)

*Urtica dioica* 59

*Poa trivialis* 33

*Filipendula ulmaria* 31

*Galium aparine* 29

*Ranunculus repens* 26

*Dactylis glomerata* 23

*Calystegia sepium* 21

*Phalaroides arundinacea* 19

*Angelica sylvestris* 19

*Aegopodium podagraria* 19

*Glechoma hederacea* 18

*Heracleum sphondylium* 17

*Elytrigia repens* aggr. 17

*Cirsium arvense* 17

*Agrostis stolonifera* 16

*Lythrum salicaria* 15

*Anthriscus sylvestris* 14

*Rumex obtusifolius* 13

*Lysimachia vulgaris* 13

*Deschampsia cespitosa* aggr. 13

*Cirsium oleraceum* 13

*Caltha palustris* 13

*Symphytum officinale* 12

*Chaerophyllum hirsutum* 12

*Geranium robertianum* 12

*Taraxacum* sect. *Taraxacum* 11

*Phragmites australis* 11

*Myosotis scorpioides* aggr. 11

*Mentha longifolia* 11

*Holcus lanatus* 11

*Eupatorium cannabinum* 11

*Epilobium hirsutum* 11

### Dominant species (percentage frequencies of occurrences with cover > 25%)

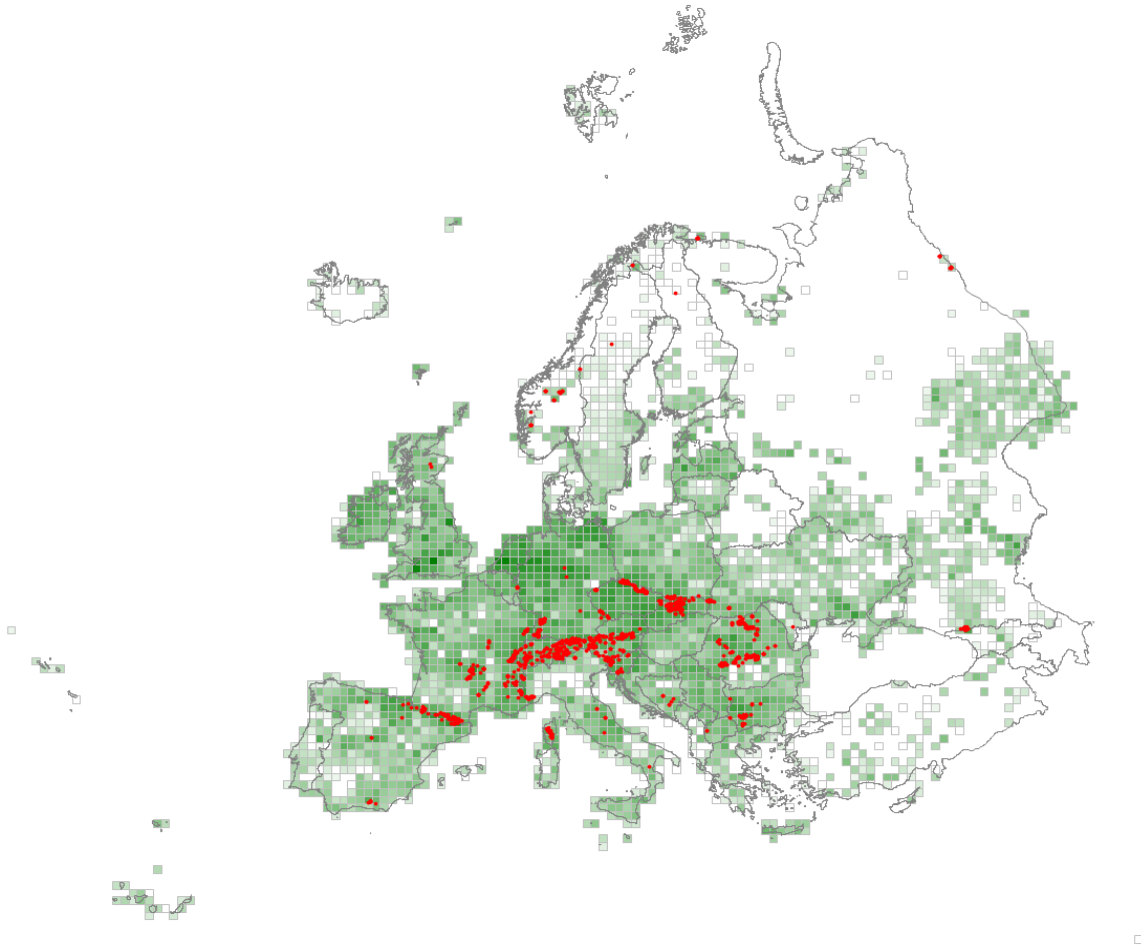
*Urtica dioica* 16

*Filipendula ulmaria* 15

*Petasites hybridus* 8

## R56 – Montane to subalpine moist or wet tall-herb and fern fringe

Tall forb and fern vegetation of moist, fertile soils in relatively cool and humid conditions through high levels of the mountain ranges of Europe, having its optimum in the subalpine zone but also occurring in the Arctic lowlands of Scandinavia. Typically found as strips along streams and on the edges of forests, in the shelter of large rocks, on mountain ledges and under scrub, sometimes also fringing snowbeds where it benefits from protection from winter frosts. The vegetation is often very rich in species and hosts many local and regional endemics, as well as widespread montane plants. Vulnerable to grazing by wild herbivores and stock, but often protected by its remoteness.



### Corresponding alliances in EuroVegChecklist 2016

- > MUL-01A *Adenostylion alliariae* Br.-Bl. 1926 nom. conserv. propos.
- > MUL-03B *Arunco-Petasion albi* Br.-Bl. et Sutter 1977
- > MUL-02C *Calamagrostion arundinaceae* (Luquet 1926) Oberd. 1957
- > MUL-02A *Calamagrostion villosae* Pawłowski et al. 1928
- > MUL-01F *Cirsion appendiculati* Horvat et al. 1937
- > MUL-01D *Cirsion flavispinae* Quézel 1953
- > MUL-01C *Delphinion elati* Hadač in Hadač et al. 1969
- > MUL-01E *Doronicion corsici* Gamisans 1975
- > MUL-01B *Dryopterido filicis-maris-Athyrium distentifolii* (Holub ex Sýkora et Štursa 1973) Jeník et al. 1980
- > MUL-05A *Mulgedion alpini* Nordhagen 1943
- > MUL-03A *Petasion officinalis* Sillinger 1933
- > MUL-06A *Polemonio acutiflori-Veratrimon lobeliani* Telyatnikov 2012
- > MUL-04A *Rumicion alpini* Scharfetter 1938
- > MUL-03C *Senecionion samniti* Bonin 1978

- > MUL-02B Trisetion fusci Krajina 1933
- > MUL-07A Triseto sibirici-Aconition septentrionalis Ermakov et al. 2000

### Characteristic species combination

#### Diagnostic species (phi coefficient \* 100)

<i>Rumex alpinus</i>	42
<i>Rumex arifolius</i>	28
<i>Adenostyles alliariae</i>	27
<i>Carduus personata</i>	22
<i>Chaerophyllum hirsutum</i>	21
<i>Peucedanum ostruthium</i>	21
<i>Doronicum austriacum</i>	20
<i>Stellaria nemorum</i>	20
<i>Aconitum napellus</i> aggr.	19
<i>Epilobium alpestre</i>	19
<i>Veratrum album</i>	18
<i>Athyrium distentifolium</i>	17
<i>Ranunculus platanifolius</i>	17
<i>Saxifraga rotundifolia</i>	16
<i>Ranunculus aconitifolius</i>	16
<i>Jacobaea alpina</i>	16
<i>Geranium sylvaticum</i> aggr.	15

#### Constant species (percentage frequencies)

<i>Rumex arifolius</i>	34
<i>Geranium sylvaticum</i> aggr.	32
<i>Adenostyles alliariae</i>	32
<i>Stellaria nemorum</i>	31
<i>Rumex alpinus</i>	31
<i>Chaerophyllum hirsutum</i>	31
<i>Urtica dioica</i>	30
<i>Deschampsia cespitosa</i> aggr.	29
<i>Viola biflora</i>	27
<i>Veratrum album</i>	24
<i>Senecio nemorensis</i> aggr.	21
<i>Rubus idaeus</i>	21
<i>Saxifraga rotundifolia</i>	19
<i>Peucedanum ostruthium</i>	19
<i>Silene dioica</i>	18
<i>Heracleum sphondylium</i>	18
<i>Athyrium filix-femina</i>	18
<i>Aconitum napellus</i> aggr.	18
<i>Oxalis acetosella</i>	17
<i>Hypericum maculatum</i> aggr.	17
<i>Dactylis glomerata</i>	15
<i>Athyrium distentifolium</i>	15
<i>Alchemilla vulgaris</i> aggr.	15
<i>Ranunculus repens</i>	14
<i>Doronicum austriacum</i>	14
<i>Solidago virgaurea</i>	13
<i>Carduus personata</i>	13
<i>Aconitum lycoctonum</i>	13
<i>Silene vulgaris</i>	12
<i>Ranunculus platanifolius</i>	12
<i>Poa alpina</i>	12
<i>Lactuca alpina</i>	12
<i>Geum rivale</i>	12

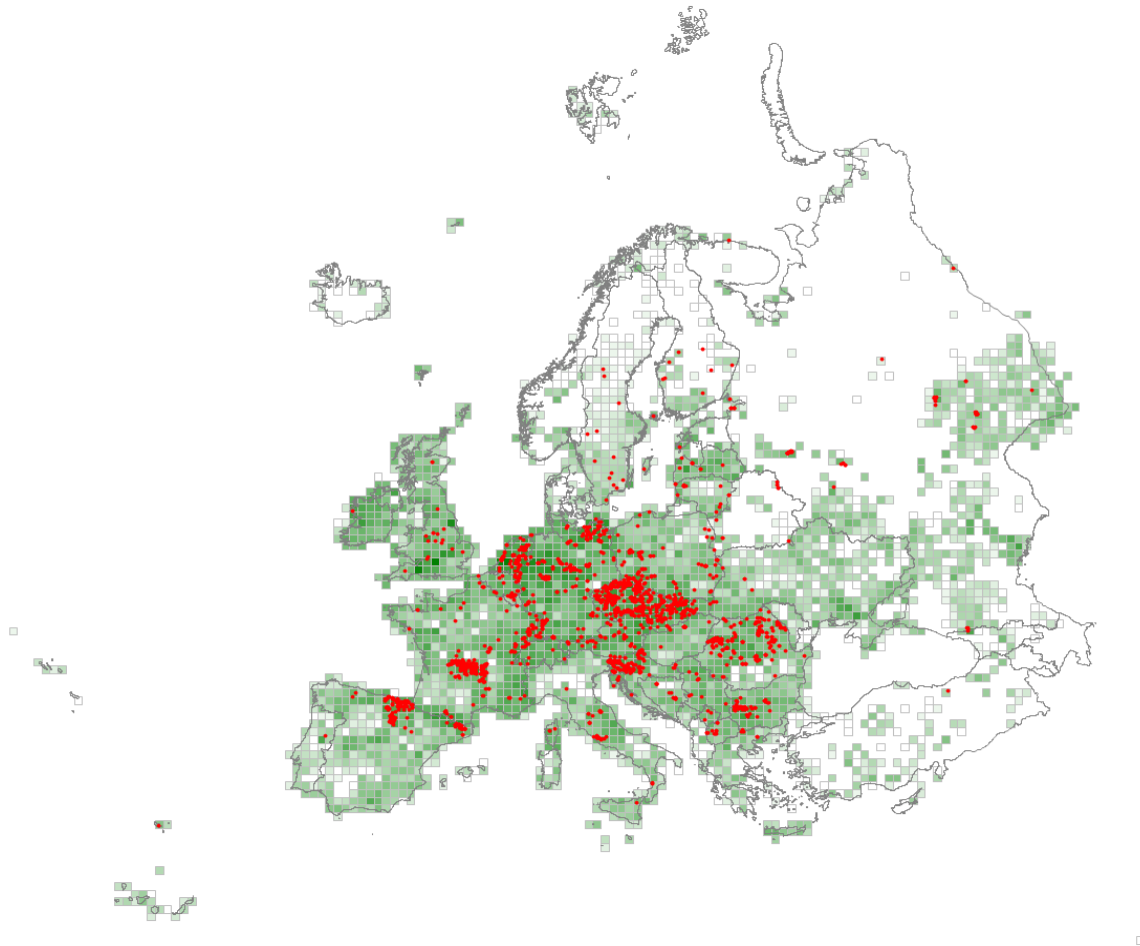
<i>Veronica chamaedrys</i> aggr.	11
<i>Vaccinium myrtillus</i>	11
<i>Thalictrum aquilegiifolium</i>	11
<i>Ranunculus aconitifolius</i>	11
<i>Luzula sylvatica</i>	11
<i>Chrysosplenium alternifolium</i>	11
<i>Dryopteris filix-mas</i>	11

Dominant species (percentage frequencies of occurrences with cover > 25%)

<i>Rumex alpinus</i>	19
<i>Adenostyles alliariae</i>	12

## R57 – Herbaceous forest clearing vegetation

Tall forb and fern-rich as well as low-grown short-lived herblands forming seral vegetation complexes in woodland and forest clearings in various forest zones of Europe.



### Corresponding alliances in EuroVegChecklist 2016

- ◁ EPI-01A Epilobion angustifolii Oberd. 1957
- > EPI-02A Fragarion vescae Tx. ex von Rochow 1951 nom. conserv. propos.
- > EPI-01B Linarion niveae Rivas-Mart. 1964

### Characteristic species combination

Diagnostic species (phi coefficient \* 100)

<i>Sambucus ebulus</i>	27
<i>Senecio sylvaticus</i>	15

Constant species (percentage frequencies)

<i>Urtica dioica</i>	55
<i>Epilobium angustifolium</i>	33
<i>Galium aparine</i>	32
<i>Rubus idaeus</i>	30
<i>Galeopsis tetrahit</i> aggr.	27
<i>Sambucus ebulus</i>	22
<i>Avenella flexuosa</i>	22
<i>Senecio nemorensis</i> aggr.	20
<i>Fragaria vesca</i>	20

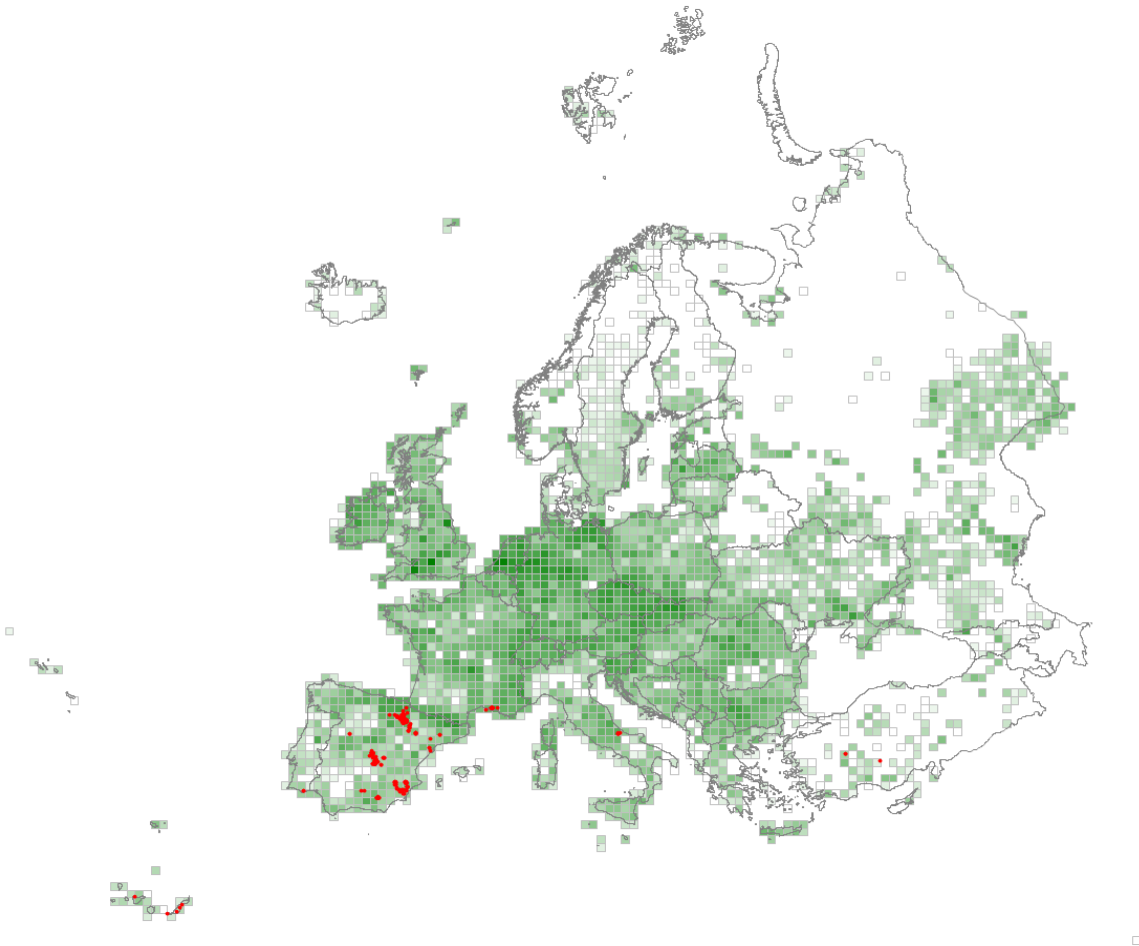
<i>Geranium robertianum</i>	19
<i>Calamagrostis epigejos</i>	19
<i>Poa nemoralis</i>	17
<i>Dactylis glomerata</i>	17
<i>Agrostis capillaris</i>	17
<i>Cirsium arvense</i>	16
<i>Rubus fruticosus</i> aggr.	15
<i>Lactuca muralis</i>	15
<i>Senecio sylvaticus</i>	13
<i>Elytrigia repens</i> aggr.	13
<i>Taraxacum</i> sect. <i>Taraxacum</i>	12
<i>Sorbus aucuparia</i>	12
<i>Rumex acetosella</i>	12
<i>Digitalis purpurea</i>	12
<i>Betula pendula</i>	12
<i>Geum urbanum</i>	11
<i>Galium mollugo</i> aggr.	11
<i>Epilobium montanum</i>	11
<i>Artemisia vulgaris</i>	11

Dominant species (percentage frequencies of occurrences with cover > 25%)

<i>Sambucus ebulus</i>	19
<i>Urtica dioica</i>	9
<i>Epilobium angustifolium</i>	9
<i>Calamagrostis epigejos</i>	8

## R61 – Mediterranean inland salt steppe

Halophyte vegetation of inland situations in the Mediterranean region where the soils of flats or gentle hollows are permeated by waters laden with soluble salts from underlying substrates, and are then subject to extreme summer drought, with a surface efflorescence of crystalline deposits. The vegetation can be rich in endemics, but the particular species composition depends on the regional climate and local soil conditions, and there is often a distinctive seasonal pattern of growth and zonation around the hollows. In some regions, the vegetation has provided valuable grazing for sheep and goats in summer drought.



### Corresponding alliances in EuroVegChecklist 2016

- > SAG-02A *Frankenion pulverulentae* Rivas-Mart. ex Castroviejo et Porta 1976
- > SAG-02C *Gaudinio-Podospermion cani* S. Brullo et Siracusa 2000
- > FEP-02A *Halo-Artemision* Pignatti 1953
- > SAL-03B *Halocnemion cruciati* Biondi et al. 2013
- > SAL-03A *Limoniastrion monopetali* Pignatti 1952
- > SAL-02D *Limonion algarvensi-lanceolati* J.C. Costa et al. 2012
- > SAL-02C *Limonion catalaunico-viciosoi* Rivas-Mart. et M. Costa 1984
- > SAL-02E *Limonion confusi* (Br.-Bl. 1933) Rivas-Mart. et M. Costa 1984
- > SAL-02B *Lygeo sparti-Limonion furfuracei* Rigual 1972
- > SAL-02A *Lygeo-Lepidion cardaminis* Rivas Goday et Rivas-Mart. in Rivas-Mart. et M. Costa 1984
- > SAG-02F *Mesembryanthemion crystallini* Rivas-Mart. et al. 1993
- > SAG-02E *Mesembryanthemion nodiflora* Nègre 1959
- > THE-02C *Microcnemion coralloidis* Rivas-Mart. et Géhu in Rivas-Mart. 1984
- > SAG-02D *Pholiuro-Spergularion* Pignatti 1952
- > SAG-02B *Polypogonion subspathacei* Gamisans 1990

- > FEP-01D Puccinellion convolutae Micevski 1965
- > FEP-01E Puccinellion lagascanae Rivas-Mart. in Rivas-Mart. et M. Costa 1976 corr. Alonso et De la Torre 2004
- <> SAL-01A Salicornion fruticosae Br.-Bl. 1933
- > SAL-02F Triglochino barrelieri-Limonion glomerati Biondi et al. 2001

### Characteristic species combination

Diagnostic species (phi coefficient \* 100)

<i>Suaeda vera</i>	42
<i>Limonium delicatulum</i>	36
<i>Sphenopus divaricatus</i>	35
<i>Limonium caesium</i>	35
<i>Elytrigia curvifolia</i>	33
<i>Limonium dichotomum</i>	33
<i>Lygeum spartum</i>	29
<i>Puccinellia caespitosa</i>	28
<i>Frankenia pulverulenta</i>	27
<i>Sonchus crassifolius</i>	27
<i>Limonium costae</i>	26
<i>Lepidium cardamines</i>	26
<i>Limonium supinum</i>	25
<i>Limonium cossonianum</i>	25
<i>Hornungia procumbens</i>	25
<i>Limonium latebracteatum</i>	24
<i>Frankenia corymbosa</i>	22
<i>Hordeum marinum</i>	22
<i>Limonium viciosoi</i>	22
<i>Artemisia barrelieri</i>	19
<i>Puccinellia fasciculata</i>	19
<i>Limbarda crithmoides</i>	18
<i>Microcnemum coralloides</i>	17
<i>Jacobaea auricula</i>	17
<i>Limonium tournefortii</i>	16
<i>Limonium angustebracteatum</i>	16
<i>Suaeda spicata</i>	16
<i>Arthrocnemum macrostachyum</i>	16

Constant species (percentage frequencies)

<i>Suaeda vera</i>	53
<i>Lygeum spartum</i>	30
<i>Limbarda crithmoides</i>	18
<i>Plantago maritima</i>	16
<i>Plantago coronopus</i> aggr.	16
<i>Limonium delicatulum</i>	16
<i>Limonium caesium</i>	16
<i>Sphenopus divaricatus</i>	15
<i>Phragmites australis</i>	13
<i>Hordeum marinum</i>	13
<i>Hornungia procumbens</i>	12
<i>Frankenia pulverulenta</i>	12
<i>Elytrigia curvifolia</i>	12
<i>Puccinellia caespitosa</i>	11
<i>Limonium dichotomum</i>	11
<i>Artemisia herba-alba</i>	11

Dominant species (percentage frequencies of occurrences with cover > 25%)

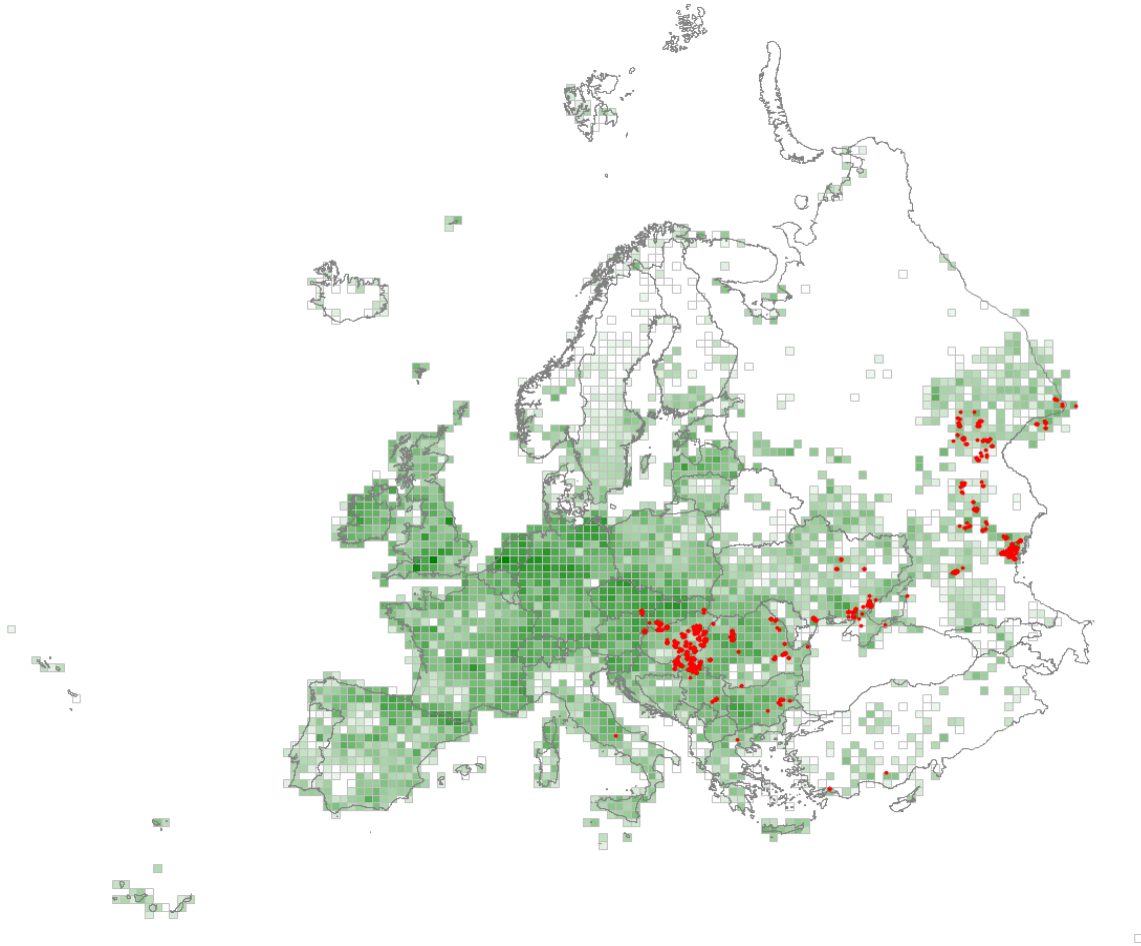
<i>Lygeum spartum</i>	10
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<i>Limonium caesium</i>	6
<i>Limbarda crithmoides</i>	6
<i>Puccinellia caespitosa</i>	5
<i>Limonium delicatulum</i>	5
<i>Limonium cossonianum</i>	5
<i>Frankenia pulverulenta</i>	5

## R62 – Continental inland salt steppe

Salt steppe of the Pannonian and Pontic regions, characteristic of solonetz soils, saturated, even shallow flooded, by soluble carbonates in spring, then drying in summer with surface cracking. According to variations in salinity, slope and erosion by spring floods, the vegetation is a complex mosaic of grasslands and more halophytic herb communities, rich in endemic species and plant communities. Traditionally part of the pastoral landscape of older breeds of cattle.



### Corresponding alliances in EuroVegChecklist 2016

- > FEP-02B *Artemision maritimae* Micevski 1970
- > FEP-02C *Atraphaxo-Capparion Korzhenevskii* 1992
- > FEP-03F *Diantho guttati-Milion vernalis* Umanets et V. Solomakha 1998
- > FEP-01A *Festucion pseudovinae* Soó 1933
- > FEP-03E *Festuco valesiaca-Limonion gmelinii* Mirkin in Golub et V. Solomakha 1988
- > FEP-03B *Limonion sareptani* Golub 1994
- > FEP-03C *Limonion tomentelli* Agafonov et Golub in Golub 1994
- > FEP-01B *Peucedano officinalis-Asterion sedifolii* Borhidi 1996
- > FEP-03A *Plantagini salsae-Artemision santonici* Lysenko et Mucina in Lysenko et al. 2011
- <> FEP-03D *Puccinellion giganteae* Dubyna et Neuhäuslová 2000
- > FEP-01C *Puccinellion limosae* Soó 1933
- > THE-02D *Thero-Camphorosmion annuae* Vicherek 1973

## Characteristic species combination

### Diagnostic species (phi coefficient \* 100)

<i>Camphorosma annua</i>	41
<i>Artemisia santonicum</i>	30
<i>Limonium gmelinii</i>	28
<i>Puccinellia distans</i>	28
<i>Trifolium angulatum</i>	24
<i>Podospermum canum</i>	23
<i>Plantago tenuiflora</i>	22
<i>Lepidium cartilagineum</i>	21
<i>Pholiurus pannonicus</i>	20
<i>Puccinellia distans</i> aggr.	17
<i>Trifolium retusum</i>	17
<i>Plantago schwarzenbergiana</i>	16

### Constant species (percentage frequencies)

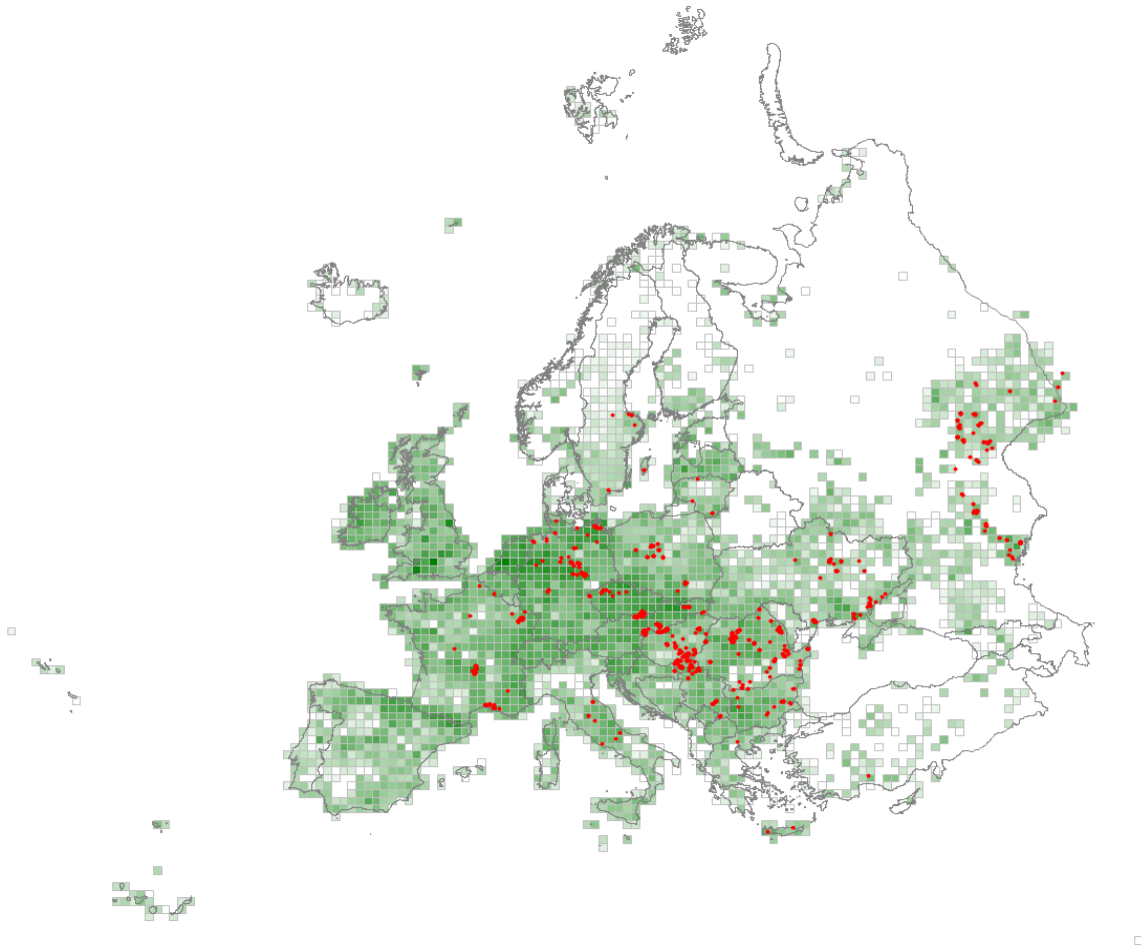
<i>Artemisia santonicum</i>	49
<i>Puccinellia distans</i>	36
<i>Festuca valesiaca</i> aggr.	29
<i>Limonium gmelinii</i>	26
<i>Camphorosma annua</i>	21
<i>Poa bulbosa</i>	18
<i>Suaeda maritima</i> aggr.	17
<i>Polygonum aviculare</i> aggr.	17
<i>Podospermum canum</i>	17
<i>Plantago maritima</i>	16
<i>Tripolium pannonicum</i>	15
<i>Elytrigia repens</i> aggr.	15
<i>Matricaria chamomilla</i>	14
<i>Cynodon dactylon</i>	12
<i>Plantago tenuiflora</i>	11
<i>Lepidium ruderale</i>	11

### Dominant species (percentage frequencies of occurrences with cover > 25%)

<i>Artemisia santonicum</i>	16
<i>Camphorosma annua</i>	9
<i>Puccinellia distans</i>	7
<i>Festuca valesiaca</i> aggr.	6
<i>Suaeda maritima</i> aggr.	5

## R63 – Temperate inland salt marsh

Inland salt marsh and meadow of temperate and continental regions, characteristic of situations where fossil salt lies close to the surface or where relict seawater is present, resulting in brackish or saline ground and surface water. In more continental regions inland salt pans are more common, where the habitat is found in depressions within a matrix of salt steppes and as sub-halophytic meadows. Elsewhere in Europe, the habitat can be found in association with a variety of salty bedrocks and also on abandoned salt workings. The species composition is very varied according to the regional climate and particular site conditions.



### Corresponding alliances in EuroVegChecklist 2016

- > FEP-05D *Agrostio stoloniferae-Beckmannion eruciformis* Mirkin in Barabash et al. 1989
- <> JUN-03C *Armerion maritimae* Br.-Bl. et De Leeuw 1936
- > FEP-05B *Beckmannion eruciformis* Soó 1933
- > FEP-05C *Carici dilutae-Juncion gerardi* Lysenko et Mucina 2015
- > FEP-05E *Cirsion esculenti* Golub 1994
- <> JUN-03A *Festucion maritimae* Christiansen 1927
- > FEP-05A *Juncion gerardi* Wendelberger 1943
- <> MOL-10B *Loto tenuis-Trifolion fragiferi* Westhoff et Den Held ex de Foucault 2009
- <> JUN-03B *Puccinellio maritimae-Spergularion salinae* Beeftink 1965
- <> THE-02A *Salicornion prostratae* Géhu 1992
- <> THE-02B *Suaedion acuminatae* Golub et Tsorbadze in Golub 1995 corr. Lysenko et Mucina 2015
- <> THE-01A *Therosalicornion* Br.-Bl. 1933

## Characteristic species combination

### Diagnostic species (phi coefficient \* 100)

<i>Puccinellia distans</i>	32
<i>Taraxacum besarabicum</i>	30
<i>Tripolium pannonicum</i>	29
<i>Juncus gerardi</i>	23
<i>Lotus tenuis</i>	21
<i>Hordeum geniculatum</i>	17
<i>Trifolium fragiferum</i>	16

### Constant species (percentage frequencies)

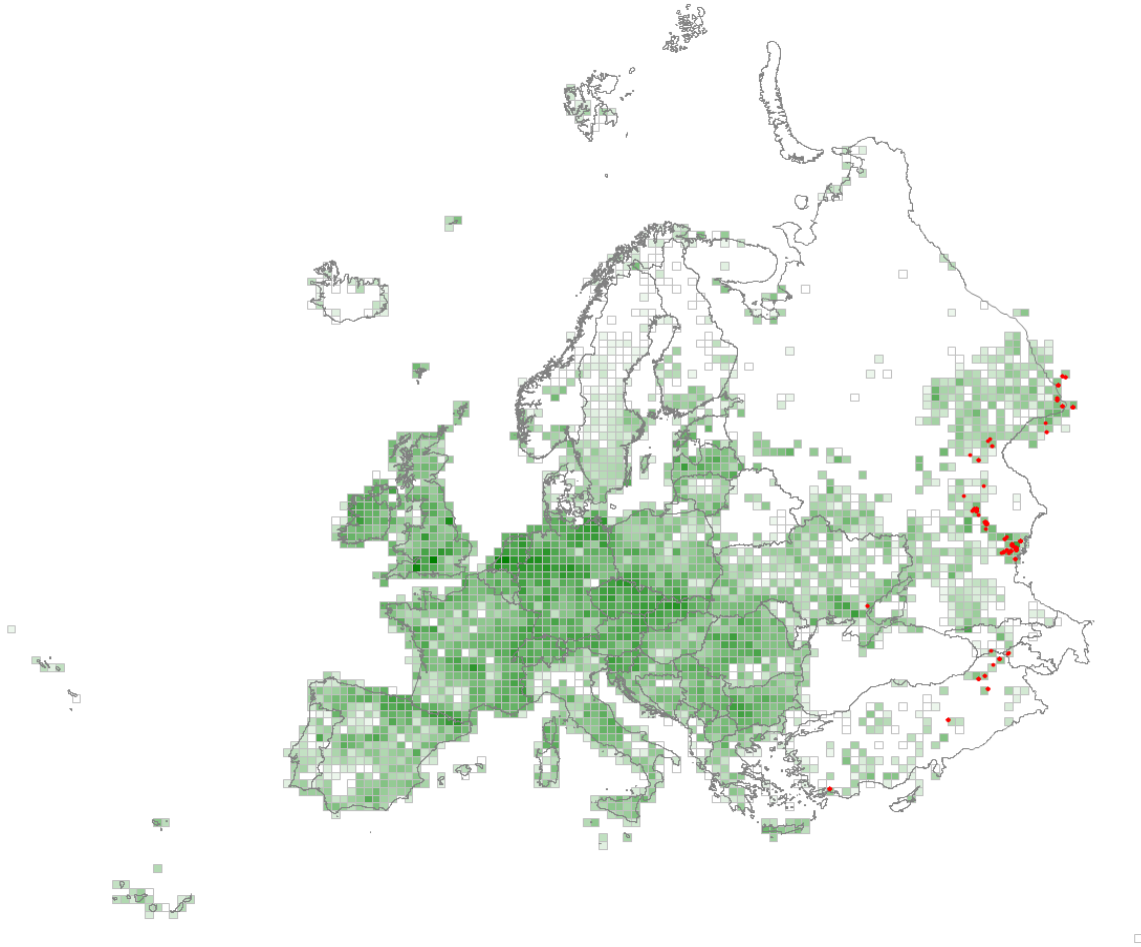
<i>Tripolium pannonicum</i>	45
<i>Puccinellia distans</i>	41
<i>Juncus gerardi</i>	38
<i>Agrostis stolonifera</i>	26
<i>Plantago maritima</i>	24
<i>Lotus tenuis</i>	24
<i>Triglochin maritima</i>	19
<i>Salicornia europaea</i> aggr.	18
<i>Phragmites australis</i>	17
<i>Bolboschoenus maritimus</i>	17
<i>Trifolium fragiferum</i>	16
<i>Taraxacum besarabicum</i>	15
<i>Plantago major</i>	15
<i>Glaux maritima</i>	15
<i>Carex distans</i>	15
<i>Polygonum aviculare</i> aggr.	14
<i>Atriplex prostrata</i>	14
<i>Artemisia santonicum</i>	13
<i>Spergularia marina</i>	12
<i>Hordeum geniculatum</i>	12
<i>Elytrigia repens</i> aggr.	12
<i>Argentina anserina</i>	12
<i>Spergularia media</i>	11
<i>Podospermum canum</i>	11

### Dominant species (percentage frequencies of occurrences with cover > 25%)

<i>Puccinellia distans</i>	15
<i>Juncus gerardi</i>	9
<i>Tripolium pannonicum</i>	7
<i>Salicornia europaea</i> aggr.	6

## R64 – Semi-desert salt pan

Azonal, mosaic habitat of halophytic chenopod scrub and saline grassland in the semi-desert zones of South-Eastern Europe. Vegetation is a combination of open annual and perennial halophytic communities and more closed grassland. It occurs on solonchak soils, in poorly drained, saline or hypersaline depressions and on shores of rivers and lakes.



### Corresponding alliances in EuroVegChecklist 2016

- > FEP-04B *Alhagion pseudalhagi* Golub et Czorbadze in Golub 1994
- > FEP-04A *Artemisio pauciflorae*-*Camphorosmion monspeliacae* Karpov 2001
- > KAL-02A *Artemisio santonicae*-*Puccinellion fominii* Shelyag-Sosonko et al. 1989
- > THE-02E *Camphorosmo songoricae*-*Suaedion corniculatae* Freitag et al. 2001
- > KAL-02B *Camphorosmo*-*Agropyron desertorum* Korzhenevsky et Klyukin ex Golub et al. 2006
- > KAL-01B *Climacoptero crassae*-*Suaedion acuminatae* Golub et Čorbadze 1989 corr. Lysenko et Mucina 2015
- > AEL-01A *Elytrigio*-*Aeluropodion* Ageleulov et Golub in Golub 1995
- > KAL-01A *Kalidion caspici* Golub et al. 2001
- <> THE-02A *Salicornion prostratae* Géhu 1992
- <> THE-02B *Suaedion acuminatae* Golub et Tsorbadze in Golub 1995 corr. Lysenko et Mucina 2015

### Characteristic species combination

Diagnostic species (phi coefficient \* 100)

*Limonium suffruticosum*

<i>Halocnemum strobilaceum</i>	40
<i>Halimione verrucifera</i>	37
<i>Artemisia nitrosa</i>	27
<i>Limonium gmelinii</i>	27
<i>Puccinellia dolicholepis</i>	24
<i>Climacoptera crassa</i>	24
<i>Kalidium caspicum</i>	22
<i>Ofaiston monandrum</i>	21
<i>Minuartia isaurica</i>	21
<i>Paronychia beauverdii</i>	20
<i>Petrosimonia litwinowii</i>	20
<i>Atriplex aucheri</i>	19
<i>Petrosimonia oppositifolia</i>	18
<i>Silene idaea</i>	18
<i>Erysimum lycaonicum</i>	18
<i>Arenaria speluncarum</i>	18
<i>Cochleria amana</i>	18
<i>Noccaea violascens</i>	18
<i>Salsola nitraria</i>	18
<i>Sphaerophysa kotschyana</i>	18
<i>Astracantha garaensis</i>	18
<i>Eremopyrum orientale</i>	18
<i>Eremopyrum triticeum</i>	17
<i>Astragalus pinetorum</i>	17
<i>Salsola acutifolia</i>	17
<i>Limonium bellidifolium</i>	16
<i>Salsola laricina</i>	16
<i>Arenaria pamphylica</i>	15

Constant species (percentage frequencies)

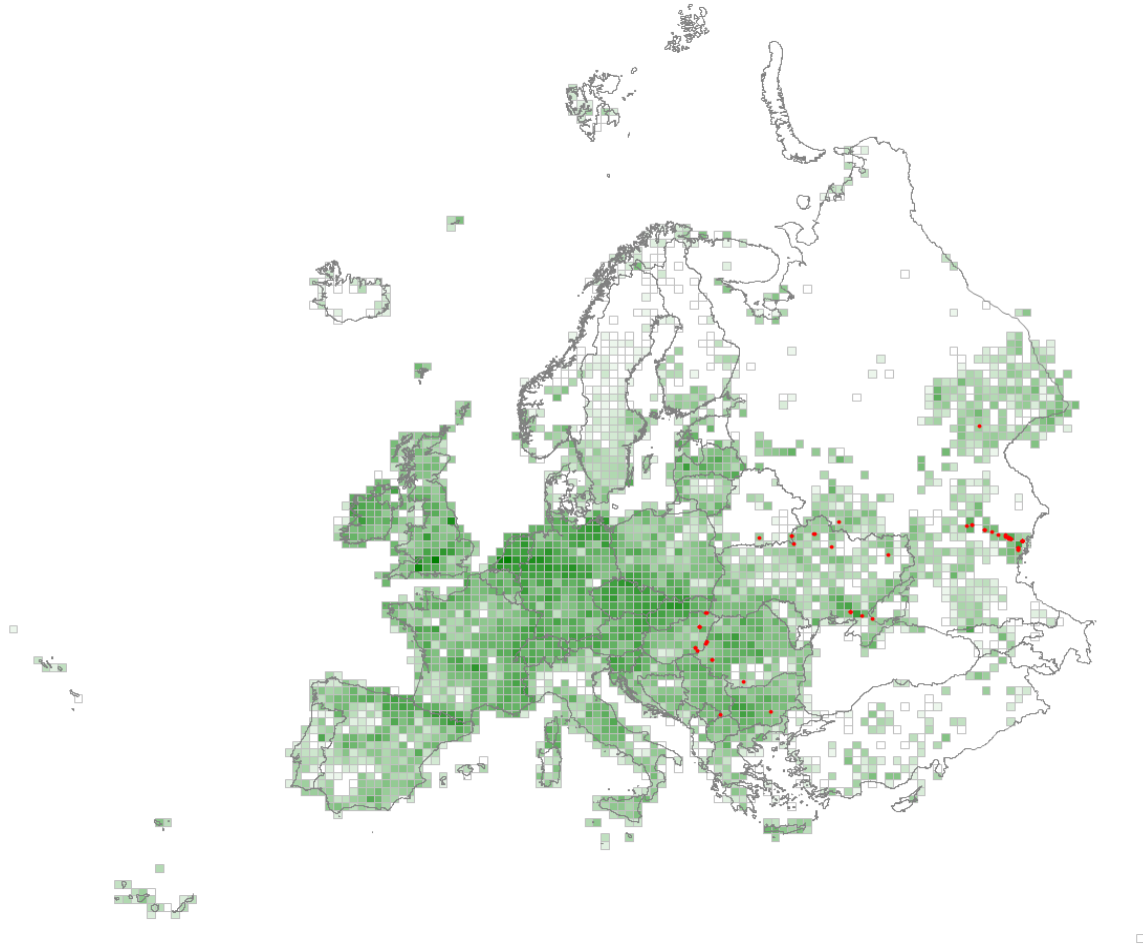
<i>Halimione verrucifera</i>	28
<i>Eremopyrum triticeum</i>	26
<i>Limonium suffruticosum</i>	25
<i>Limonium gmelinii</i>	25
<i>Halocnemum strobilaceum</i>	21
<i>Eremopyrum orientale</i>	18
<i>Artemisia santonicum</i>	18
<i>Atriplex aucheri</i>	16
<i>Descurainia sophia</i>	15
<i>Poa bulbosa</i>	13
<i>Petrosimonia oppositifolia</i>	13
<i>Camphorosma monspeliaca</i>	13
<i>Artemisia nitrosa</i>	13
<i>Puccinellia dolicholepis</i>	11

Dominant species (percentage frequencies of occurrences with cover > 25%)

<i>Halocnemum strobilaceum</i>	10
<i>Halimione verrucifera</i>	10

## R65 – Continental subsaline alluvial pasture and meadow

Subsaline, perennial grassland of river valleys and other depressions in the steppe, forest-steppe, and semi-desert zones. It occurs on terraces and elevations in river valleys where this grassland is flooded for a short period in some years and on non-alluvial soils that are temporarily wet.



### Corresponding alliances in EuroVegChecklist 2016

- <> SIS-01B Cannabion sativae Golub et al. 2012
- > FEP-06A Glycyrrhizon echinatae Golub et Saveleva in Golub 1995
- > FEP-06C Glycyrrhizon glabrae Golub et Mirkin in Golub 1995
- > FEP-06B Glycyrrhizon korshinskyi Lysenko 2010

### Characteristic species combination

Diagnostic species (phi coefficient \* 100)

<i>Beckmannia eruciformis</i>	68
<i>Rhaponticum repens</i>	46
<i>Dodartia orientalis</i>	39
<i>Eryngium planum</i>	29
<i>Lythrum virgatum</i>	29
<i>Achillea salicifolia</i>	24
<i>Inula britannica</i>	23
<i>Carex melanostachya</i>	20
<i>Glycyrrhiza echinata</i>	19
<i>Rorippa brachycarpa</i>	19



<i>Ranunculus lateriflorus</i>	17
<i>Juncus atratus</i>	17
<i>Chaiturus marrubiastrum</i>	17
<i>Gratiola officinalis</i>	16
<i>Rumex confertus</i>	16
<i>Euphorbia esula</i>	16
<i>Hierochloe repens</i>	16
<i>Carex praecox</i>	15

Constant species (percentage frequencies)

<i>Beckmannia eruciformis</i>	55
<i>Rhaponticum repens</i>	40
<i>Elytrigia repens</i> aggr.	30
<i>Agrostis stolonifera</i>	30
<i>Eleocharis palustris</i>	28
<i>Dodartia orientalis</i>	28
<i>Convolvulus arvensis</i>	28
<i>Inula britannica</i>	22
<i>Eryngium planum</i>	22
<i>Lythrum virgatum</i>	20
<i>Euphorbia esula</i>	18
<i>Glycyrrhiza glabra</i>	15
<i>Carex praecox</i>	15
<i>Poa pratensis</i> aggr.	12
<i>Poa palustris</i>	12
<i>Lactuca serriola</i>	12
<i>Gratiola officinalis</i>	12
<i>Carex melanostachya</i>	12
<i>Calamagrostis epigejos</i>	12
<i>Bromopsis inermis</i>	12
<i>Artemisia austriaca</i>	12

Dominant species (percentage frequencies of occurrences with cover > 25%)

<i>Beckmannia eruciformis</i>	55
<i>Rhaponticum repens</i>	10

## **R71 – Temperate wooded pasture and meadow**

[This habitat could not be formally defined in the expert system, because it constitutes a mosaic of different habitats.]

A very diverse landscape-scale habitat occurring across the temperate zone of Europe where different traditions of grazing, mowing and silviculture have together created distinctive associations of trees growing among pastures and meadows. Such wood-pastures, wooded steppes, park meadows, grazed orchards, parklands and open hunting forests, variously managed for stock rearing, hay production, coppice and timber products, represent highly distinctive social and economic histories and can express great cultural traditions. Species-rich types occur, including contingents of epiphytic plants growing on veteran trees, but, even where the components are more commonplace, the combinations of floristic and structural elements are striking.

## **R72 – Hemiboreal and boreal wooded pasture and meadow**

[This habitat could not be formally defined in the expert system, because it constitutes a mosaic of different habitats.]

Open wooded landscapes of the lowlands, foothills and mountains of the boreal zone, traditionally managed for grazing, hay-making and forest products, mainly by pollarding. Diverse very open canopies of broadleaved and coniferous trees, including veterans sometimes with rich epiphytic cryptogam floras, often with few or no associated shrubs, occur scattered over pasture and meadow vegetation. Long traditions of complex interactions and cultural associations make these landscapes both dynamic and distinctive.

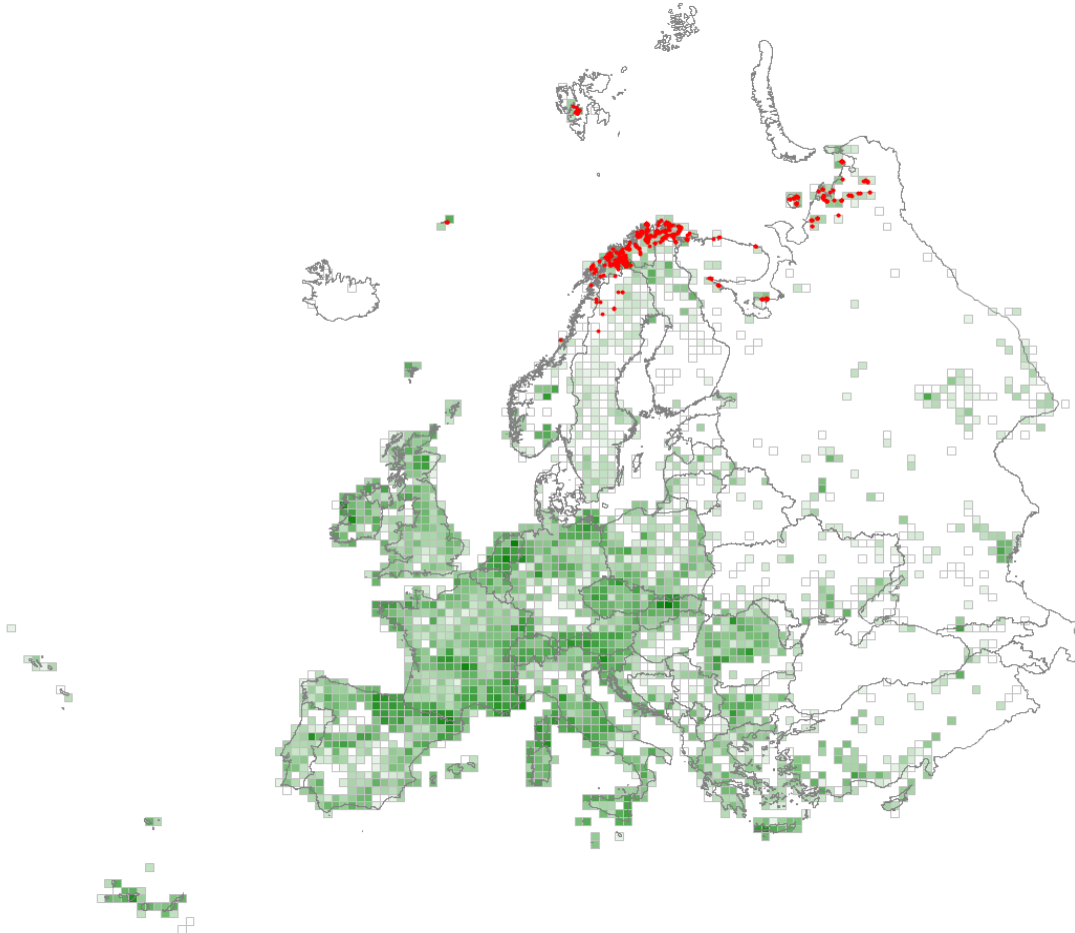
## **R73 – Mediterranean wooded pasture and meadow**

[This habitat could not be formally defined in the expert system, because it constitutes a mosaic of different habitats.]

Open wooded landscapes created and maintained through combinations of traditional grazing, hay-making and tree management in the Mediterranean. Variations in the local climate, topography and interventions, and the accumulation of long cultural traditions of use have resulted in a variety of highly distinctive types such as the dehesas of Spain and montados of Portugal. Typically the tree canopy is of evergreen broadleaved trees, variously with veterans, pollards or coppice, often with elements of sclerophyllous scrub beneath, and perennial and annual grasses and herbs in the field layer. In some traditions, there can even be small arable areas.

## S11 – Shrub tundra

Tundra with a usually extensive cover of sub-shrubs or dwarf shrubs over herbs, bryophytes and lichens. It occurs in the southern Arctic and subarctic zones, often on permafrost soils. In grazed areas, it occurs in mosaics with grassland.



### Corresponding alliances in EuroVegChecklist 2016

- <> KOB-01C Dryadion integrifoliae Ohba ex Daniëls 1982
- <> KOB-01B Dryado octopetalae-Caricion arctisibiricae Koroleva et Kulyugina in Chytrý et al. 2015
- <> KOB-01A Kobresio-Dryadion Nordhagen 1943
- <> LOI-03A Loiseleurio-Arctostaphylon Kalliola ex Nordhagen 1943
- <> LOI-03B Phylloco-Vaccinion myrtilli Nordhagen 1943

### Characteristic species combination

Diagnostic species (phi coefficient \* 100)

<i>Dicranum fuscescens</i>	40
<i>Ptilidium ciliare</i>	37
<i>Nephroma arcticum</i>	33
<i>Barbilophozia hatcheri</i>	33
<i>Cladonia mitis</i>	33
<i>Peltigera scabrosa</i>	32
<i>Cornus suecica</i>	32
<i>Empetrum nigrum</i> aggr.	32
<i>Psoroma hypnorum</i>	30

<i>Cladonia gracilis</i>	29
<i>Betula nana</i>	28
<i>Arctostaphylos alpinus</i>	28
<i>Cladonia coccifera</i> aggr.	27
<i>Ochrolechia frigida</i>	26
<i>Cetraria ericetorum</i>	25
<i>Cladonia rangiferina</i>	25
<i>Pedicularis lapponica</i>	25
<i>Cladonia bellidiflora</i>	25
<i>Vaccinium uliginosum</i>	24
<i>Stereocaulon paschale</i>	24
<i>Peltigera aphthosa</i>	24
<i>Dicranum elongatum</i>	24
<i>Cladonia uncialis</i>	24
<i>Cladonia amaurocraea</i>	23
<i>Sphaerophorus globosus</i> aggr.	23
<i>Cetraria cucullata</i>	22
<i>Vaccinium vitis-idaea</i>	22
<i>Cetraria nivalis</i>	21
<i>Stereocaulon alpinum</i>	21
<i>Cladonia macroceras</i>	21
<i>Calamagrostis lapponica</i>	20
<i>Barbilophozia kunzeana</i>	19
<i>Barbilophozia floerkei</i>	19
<i>Anastrophyllum minutum</i>	19
<i>Pertusaria geminipara</i>	18
<i>Rubus chamaemorus</i>	18
<i>Carex bigelowii</i>	18
<i>Cladonia crispata</i>	17
<i>Dicranum majus</i>	17
<i>Thamnolia vermicularis</i>	17
<i>Cassiope tetragona</i>	17
<i>Cetraria islandica</i>	17
<i>Lophozia wenzelii</i>	16
<i>Peltigera malacea</i>	16
<i>Nephroma expallidum</i>	16
<i>Gymnomitrium coralloides</i>	16
<i>Salix glauca</i>	16
<i>Barbilophozia lycopodioides</i>	16
<i>Pannaria pezizoides</i>	16
<i>Aulacomnium turgidum</i>	15

Constant species (percentage frequencies)

<i>Empetrum nigrum</i> aggr.	94
<i>Vaccinium vitis-idaea</i>	80
<i>Vaccinium uliginosum</i>	63
<i>Ptilidium ciliare</i>	56
<i>Pleurozium schreberi</i>	54
<i>Betula nana</i>	54
<i>Cladonia gracilis</i>	53
<i>Dicranum fuscescens</i>	52
<i>Cladonia rangiferina</i>	50
<i>Cladonia uncialis</i>	47
<i>Cladonia mitis</i>	44
<i>Cladonia coccifera</i> aggr.	44
<i>Dicranum scoparium</i>	37
<i>Ochrolechia frigida</i>	36
<i>Vaccinium myrtillus</i>	35
<i>Rubus chamaemorus</i>	34

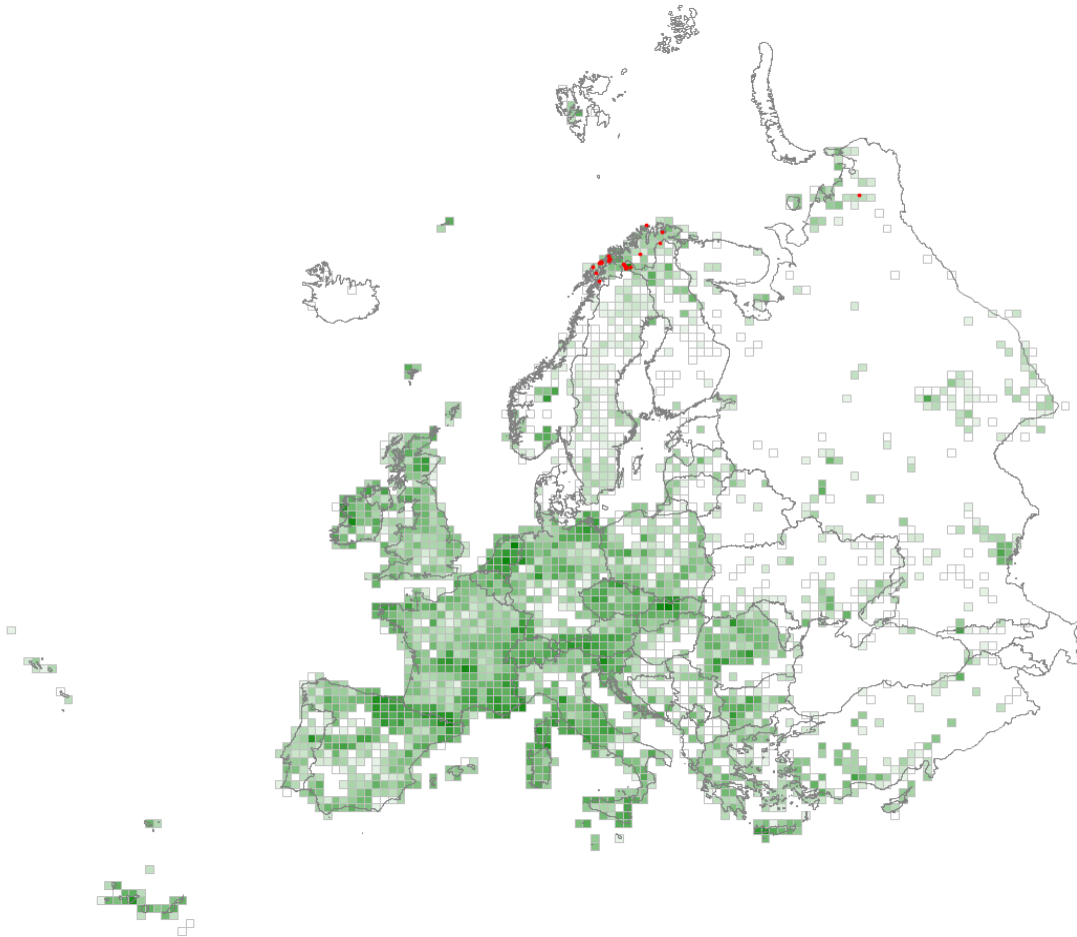
<i>Avenella flexuosa</i>	34
<i>Cladonia bellidiflora</i>	33
<i>Cetraria islandica</i>	33
<i>Nephroma arcticum</i>	32
<i>Hylocomium splendens</i>	31
<i>Dicranum elongatum</i>	30
<i>Cetraria nivalis</i>	30
<i>Cornus suecica</i>	29
<i>Cetraria ericetorum</i>	28
<i>Arctostaphylos alpinus</i>	28
<i>Sphaerophorus globosus</i> aggr.	27
<i>Peltigera scabrosa</i>	27
<i>Cladonia amaurocraea</i>	27
<i>Barbilophozia hatcheri</i>	26
<i>Stereocaulon paschale</i>	25
<i>Polytrichum strictum</i>	25
<i>Cladonia arbuscula</i> aggr.	25
<i>Cetraria cucullata</i>	25
<i>Festuca ovina</i>	24
<i>Cladonia crispata</i>	22
<i>Carex bigelowii</i>	22
<i>Peltigera aphthosa</i>	21
<i>Psoroma hypnorum</i>	20
<i>Polytrichum commune</i>	20
<i>Pohlia nutans</i>	19
<i>Dicranum majus</i>	19
<i>Bistorta vivipara</i>	19
<i>Thamnolia vermicularis</i>	18
<i>Pedicularis lapponica</i>	18
<i>Andromeda polifolia</i>	17
<i>Barbilophozia floerkei</i>	16
<i>Sanionia uncinata</i>	14
<i>Pertusaria geminipara</i>	14
<i>Cladonia macroceras</i>	14
<i>Bryocaulon divergens</i>	14
<i>Alectoria nigricans</i>	14
<i>Stereocaulon alpinum</i>	13
<i>Salix glauca</i>	13
<i>Cladonia pyxidata</i> aggr.	13
<i>Calamagrostis lapponica</i>	13
<i>Rhododendron tomentosum</i>	12
<i>Polytrichum juniperinum</i>	12
<i>Ochrolechia androgyna</i>	12
<i>Cladonia sulphurina</i>	12
<i>Barbilophozia lycopodioides</i>	12
<i>Anastrophyllum minutum</i>	12
<i>Polytrichum hyperboreum</i>	11
<i>Juncus trifidus</i>	11
<i>Cetrariella delisei</i>	11

Dominant species (percentage frequencies of occurrences with cover > 25%)

<i>Empetrum nigrum</i> aggr.	55
<i>Vaccinium myrtillus</i>	15
<i>Pleurozium schreberi</i>	12
<i>Dicranum fuscescens</i>	10
<i>Hylocomium splendens</i>	7
<i>Ptilidium ciliare</i>	5
<i>Cassiope tetragona</i>	5

## S12 – Moss and lichen tundra

Tundra of the middle and northern High Arctic zones where permafrost soils, often occurring in the patterned ground, support a frequently sparse cover of bryophytes, lichens and low herbs.



### Corresponding alliances in EuroVegChecklist 2016

- > COC-01B Cerastio arctici-Saxifragion cernuae H. Hartmann ex Mucina et Daniëls in Mucina et al. 2016
- <> KOB-01C Dryadion integrifoliae Ohba ex Daniëls 1982
- <> KOB-01B Dryado octopetalae-Caricion arctisibiricae Koroleva et Kulyugina in Chytrý et al. 2015
- <> KOB-01A Kobresio-Dryadion Nordhagen 1943
- <> LOI-03A Loiseleurio-Arctostaphylon Kalliola ex Nordhagen 1943
- <> LOI-03B Phyllodoco-Vaccinion myrtilli Nordhagen 1943

### Characteristic species combination

Diagnostic species (phi coefficient \* 100)

<i>Cetraria ericetorum</i>	67
<i>Stereocaulon paschale</i>	63
<i>Cladonia crispata</i>	55
<i>Pertusaria geminipara</i>	54
<i>Cladonia mitis</i>	54
<i>Dicranum fuscescens</i>	49
<i>Cladonia uncialis</i>	49



<i>Ptilidium ciliare</i>	45
<i>Cladonia bellidiflora</i>	41
<i>Racomitrium lanuginosum</i>	38
<i>Anastrophyllum minutum</i>	37
<i>Betula nana</i>	35
<i>Cladonia gracilis</i>	35
<i>Cladonia macrophylla</i>	35
<i>Cladonia rangiferina</i>	34
<i>Cladonia macroceras</i>	34
<i>Ochrolechia frigida</i>	33
<i>Barbilophozia floerkei</i>	33
<i>Peltigera scabrosa</i>	32
<i>Empetrum nigrum</i> aggr.	32
<i>Arctostaphylos alpinus</i>	32
<i>Cladonia coccifera</i> aggr.	31
<i>Sphaerophorus globosus</i> aggr.	31
<i>Racomitrium microcarpon</i>	30
<i>Cetraria odontella</i>	29
<i>Cetraria nivalis</i>	29
<i>Barbilophozia hatcheri</i>	29
<i>Nephroma arcticum</i>	28
<i>Cladonia sulphurina</i>	28
<i>Juncus trifidus</i>	27
<i>Tetralophozia setiformis</i>	27
<i>Cetraria aculeata</i>	26
<i>Ochrolechia lapuensis</i>	26
<i>Lycopodium alpinum</i>	25
<i>Cladonia ecmocyna</i>	24
<i>Trapeliopsis granulosa</i>	24
<i>Vaccinium uliginosum</i>	23
<i>Loiseleuria procumbens</i>	23
<i>Polytrichum hyperboreum</i>	22
<i>Barbilophozia binstaedii</i>	21
<i>Psoroma hypnorum</i>	21
<i>Cladonia deformis</i> aggr.	21
<i>Pertusaria bryontha</i>	21
<i>Cetraria cucullata</i>	21
<i>Cladonia metacorallifera</i>	20
<i>Nardia geoscyphus</i>	20
<i>Phyllodoce caerulea</i>	20
<i>Prasanthus suecicus</i>	20
<i>Tetraplodon angustatus</i>	19
<i>Placynthiella uliginosa</i>	19
<i>Cephalozia leucantha</i>	19
<i>Cladonia amaurocraea</i>	19
<i>Rubus chamaemorus</i>	19
<i>Lophozia bicrenata</i>	19
<i>Pedicularis lapponica</i>	19
<i>Lophozia ventricosa</i>	18
<i>Polytrichum commune</i>	18
<i>Barbilophozia kunzeana</i>	18
<i>Lophozia wenzelii</i>	18
<i>Dicranum elongatum</i>	18
<i>Pohlia nutans</i>	17
<i>Lophozia longidens</i>	17
<i>Placynthiella oligotropha</i>	17
<i>Tetraplodon mnioides</i>	17
<i>Salix herbacea</i>	17
<i>Dibaeis baeomyces</i>	16

<i>Cetraria islandica</i>	16
<i>Dicranum leioneuron</i>	16
<i>Vaccinium vitis-idaea</i>	16
<i>Parmelia omphalodes</i>	16
<i>Barbilophozia quadriloba</i>	16

Constant species (percentage frequencies)

<i>Empetrum nigrum</i> aggr.	95
<i>Cladonia uncialis</i>	95
<i>Cladonia mitis</i>	73
<i>Cetraria ericetorum</i>	73
<i>Ptilidium ciliare</i>	68
<i>Cladonia rangiferina</i>	68
<i>Cladonia crispata</i>	68
<i>Betula nana</i>	68
<i>Stereocaulon paschale</i>	64
<i>Dicranum fuscescens</i>	64
<i>Cladonia gracilis</i>	64
<i>Vaccinium vitis-idaea</i>	59
<i>Vaccinium uliginosum</i>	59
<i>Racomitrium lanuginosum</i>	59
<i>Pleurozium schreberi</i>	55
<i>Cladonia bellidiflora</i>	55
<i>Cladonia coccifera</i> aggr.	50
<i>Ochrolechia frigida</i>	45
<i>Polytrichum commune</i>	41
<i>Pertusaria geminipara</i>	41
<i>Dicranum scoparium</i>	41
<i>Cetraria nivalis</i>	41
<i>Calluna vulgaris</i>	41
<i>Sphaerophorus globosus</i> aggr.	36
<i>Rubus chamaemorus</i>	36
<i>Juncus trifidus</i>	36
<i>Cetraria aculeata</i>	36
<i>Cetraria islandica</i>	32
<i>Arctostaphylos alpinus</i>	32
<i>Vaccinium myrtillus</i>	27
<i>Pohlia nutans</i>	27
<i>Peltigera scabrosa</i>	27
<i>Nephroma arcticum</i>	27
<i>Festuca ovina</i>	27
<i>Cladonia sulphurina</i>	27
<i>Cladonia macrophylla</i>	27
<i>Barbilophozia floerkei</i>	27
<i>Andromeda polifolia</i>	27
<i>Salix herbacea</i>	23
<i>Polytrichum strictum</i>	23
<i>Hylocomium splendens</i>	23
<i>Dicranum elongatum</i>	23
<i>Cladonia macroceras</i>	23
<i>Cladonia amaurocraea</i>	23
<i>Cetraria cucullata</i>	23
<i>Barbilophozia hatcheri</i>	23
<i>Anastrophyllum minutum</i>	23
<i>Polytrichum juniperinum</i>	18
<i>Polytrichum hyperboreum</i>	18
<i>Loiseleuria procumbens</i>	18
<i>Cladonia deformis</i> aggr.	18
<i>Cladonia arbuscula</i> aggr.	18

<i>Trapeliopsis granulosa</i>	14
<i>Racomitrium microcarpon</i>	14
<i>Psoroma hypnorum</i>	14
<i>Phyllodoce caerulea</i>	14
<i>Pedicularis lapponica</i>	14
<i>Lycopodium annotinum</i>	14
<i>Lycopodium alpinum</i>	14
<i>Lophozia ventricosa</i>	14
<i>Juniperus communis</i> subsp. <i>communis</i>	14
<i>Huperzia selago</i>	14
<i>Cornus suecica</i>	14
<i>Cladonia stellaris</i>	14
<i>Cladonia squamosa</i>	14
<i>Cladonia ecmocyna</i>	14
<i>Cladonia cornuta</i>	14
<i>Carex bigelowii</i>	14
<i>Bryocaulon divergens</i>	14
<i>Avenella flexuosa</i>	14

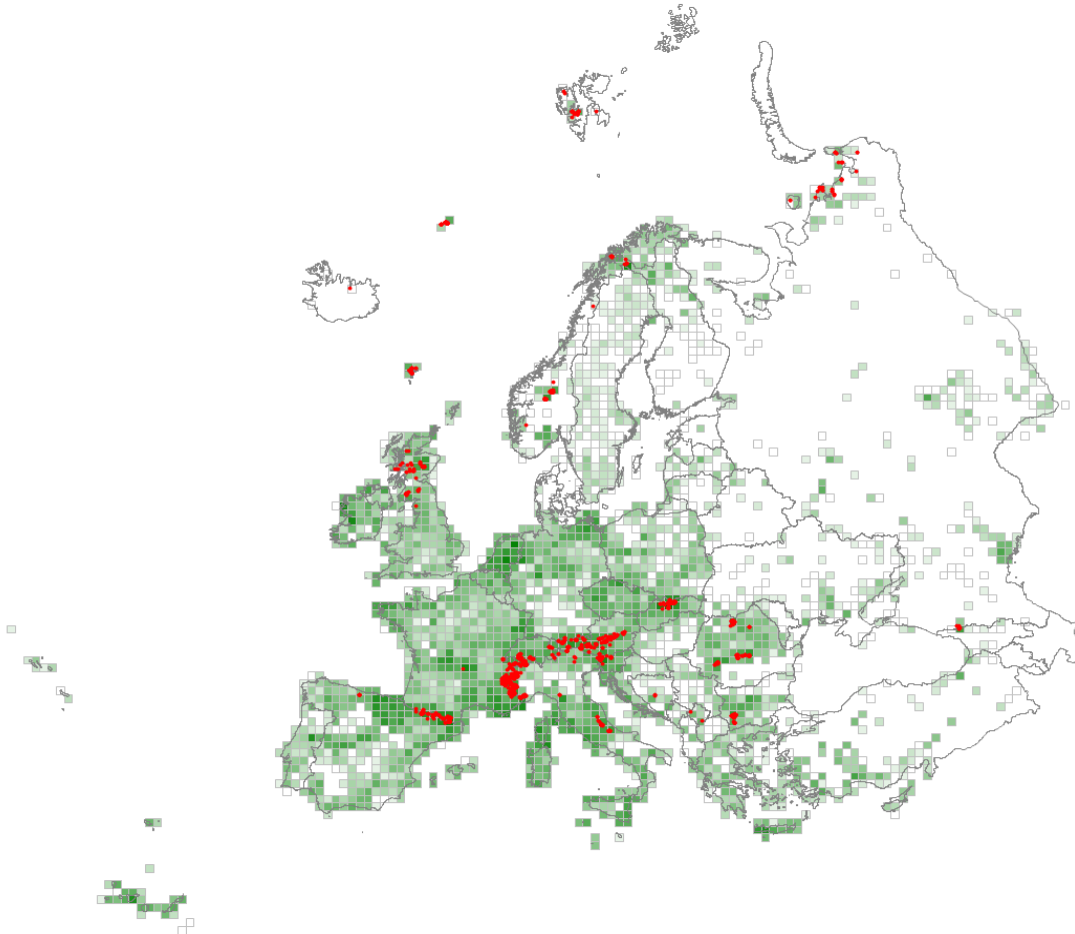
Dominant species (percentage frequencies of occurrences with cover > 25%)

<i>Racomitrium lanuginosum</i>	55
<i>Stereocaulon paschale</i>	41
<i>Empetrum nigrum</i> aggr.	14

## S21 – Subarctic and alpine dwarf *Salix* scrub

*Salix*-dominated dwarf scrub, often with abundant bryophytes and lichens, on skeletal calcareous or siliceous soils in late snow beds with a short growing-season, occurring in the Arctic and subarctic zones and in the high mountains of temperate Europe, increasingly local and fragmentary to the south.

**Remark:** This habitat also occurs in the Arctic zone (e.g. Svalbard), which is not reflected in its current name.



### Corresponding alliances in EuroVegChecklist 2016

- <> HER-01H Cassiopo-Salicion herbaceae Nordhagen 1943
- <> HER-01B Salici herbaceae-Arabidion caeruleae Englisch 1999
- <> HER-01A Salicion herbaceae Br.-Bl. in Br.-Bl. et Jenny 1926

### Characteristic species combination

Diagnostic species (phi coefficient \* 100)

<i>Salix retusa</i>	41
<i>Salix herbacea</i>	37
<i>Salix reticulata</i>	29
<i>Bistorta vivipara</i>	26
<i>Silene acaulis</i>	23
<i>Salix serpillifolia</i>	21
<i>Poa alpina</i>	20
<i>Gnaphalium supinum</i>	20
<i>Kobresia myosuroides</i>	20

<i>Veronica aphylla</i>	17
<i>Bartsia alpina</i>	17
<i>Minuartia sedoides</i>	16
<i>Sibbaldia procumbens</i>	16
<i>Carex foetida</i>	16
<i>Veronica alpina</i>	16
<i>Sagina glabra</i>	16
<i>Ranunculus alpestris</i>	16
<i>Gentiana nivalis</i>	15

Constant species (percentage frequencies)

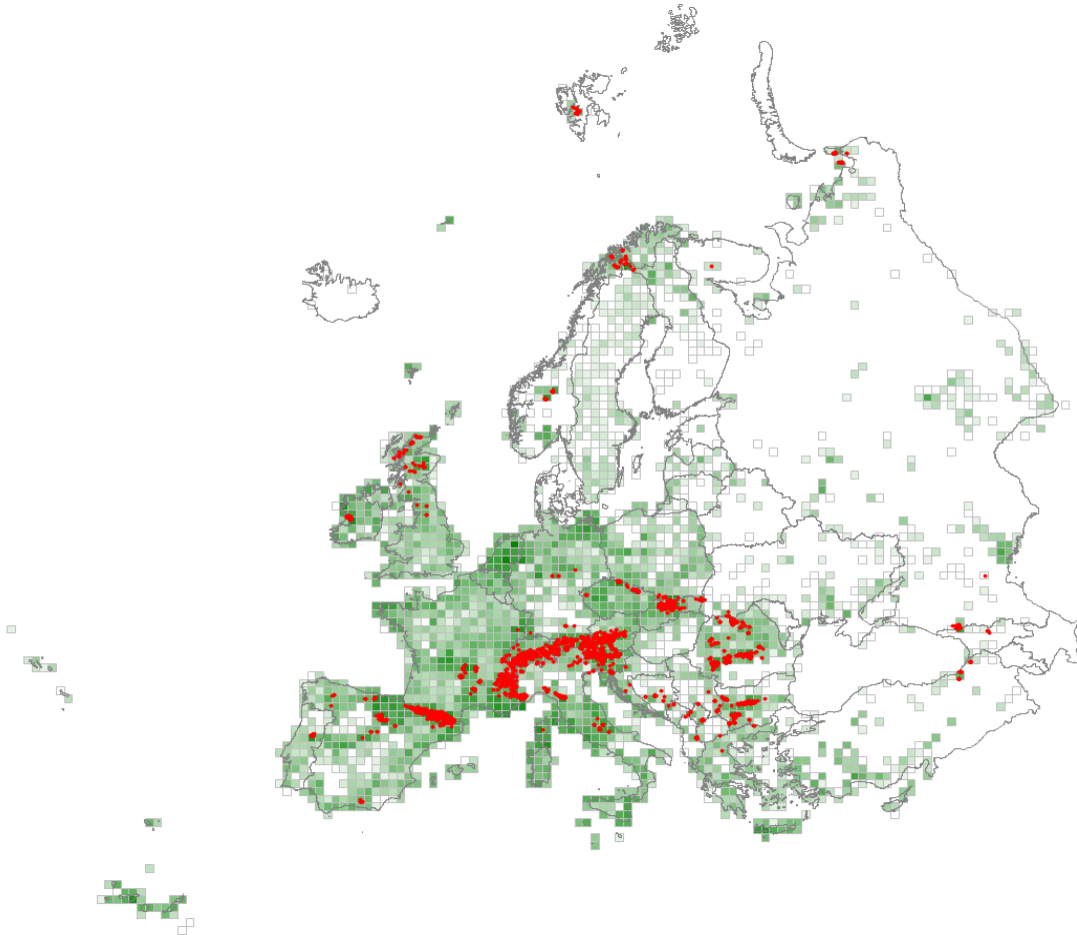
<i>Bistorta vivipara</i>	58
<i>Salix herbacea</i>	50
<i>Poa alpina</i>	44
<i>Salix retusa</i>	38
<i>Silene acaulis</i>	33
<i>Salix reticulata</i>	26
<i>Gnaphalium supinum</i>	23
<i>Bartsia alpina</i>	22
<i>Myosotis alpestris</i>	20
<i>Dryas octopetala</i>	18
<i>Homogyne alpina</i>	17
<i>Cetraria islandica</i>	17
<i>Sibbaldia procumbens</i>	16
<i>Campanula scheuchzeri</i>	16
<i>Veronica alpina</i>	15
<i>Soldanella alpina</i>	15
<i>Saxifraga oppositifolia</i>	15
<i>Plantago alpina</i>	15
<i>Minuartia sedoides</i>	15
<i>Carex sempervirens</i>	15
<i>Sesleria caerulea</i>	14
<i>Selaginella selaginoides</i>	14
<i>Ranunculus alpestris</i>	14
<i>Gentiana verna</i>	14
<i>Luzula alpinopilosa</i>	13
<i>Kobresia myosuroides</i>	13
<i>Euphrasia minima</i>	13
<i>Bellidiastrum michelii</i>	13
<i>Anthoxanthum odoratum</i> aggr.	13
<i>Leucanthemopsis alpina</i>	12
<i>Festuca quadriflora</i>	12
<i>Saxifraga aizoides</i>	11
<i>Sanionia uncinata</i>	11
<i>Luzula spicata</i>	11
<i>Lotus alpinus</i>	11
<i>Hornungia alpina</i>	11
<i>Festuca violacea</i>	11
<i>Carex bigelowii</i>	11

Dominant species (percentage frequencies of occurrences with cover > 25%)

<i>Salix herbacea</i>	35
<i>Salix retusa</i>	22
<i>Salix reticulata</i>	11
<i>Salix serpillifolia</i>	6

## S22 – Alpine and subalpine ericoid heath

Dwarf-shrub vegetation dominated by ericoids and other woody species (not juniper or genistoids) occurring in high mountains throughout Europe, varying in dominants and associates according to regional climate, degree of exposure and snow lie, soil reaction, soil depth and moisture.



### Corresponding alliances in EuroVegChecklist 2016

- > RHO-01B *Aquilegio nigricantis-Rhododendrion hirsuti* Čarni et Mucina 2015
- > ULI-02E *Bruckenthalion spiculifoliae* Horvat 1949
- > RHO-01A *Ericion carneae* Rübél ex Grabherr et al. 1993
- <> ULI-02D *Genisto pilosae-Vaccinion* Br.-Bl. 1926
- <> KOB-01A *Kobresio-Dryadion* Nordhagen 1943
- > LOI-01A *Loiseleurio procumbentis-Vaccinion* Br.-Bl. in Br.-Bl. et Jenny 1926
- <> LOI-03A *Loiseleurio-Arctostaphylion* Kalliola ex Nordhagen 1943
- <> LOI-03B *Phyllodoco-Vaccinion myrtilli* Nordhagen 1943
- > LOI-01E *Rhododendrion caucasicum* Onipchenko 2002
- > LOI-01D *Rhododendrion myrtifolium* de Foucault ex Theurillat et Mucina in Mucina et al. 2016
- > LOI-01B *Rhododendro ferruginei-Vaccinion* Br.-Bl. ex Schnyder 1930
- > KOB-03B *Salici kazbekensis-Empetrion nigrae* Onipchenko 2002
- > LOI-01C *Vaccinion myrtilli* Krajina 1933

## Characteristic species combination

### Diagnostic species (phi coefficient \* 100)

<i>Dryas octopetala</i>	21
<i>Homogyne alpina</i>	16

### Constant species (percentage frequencies)

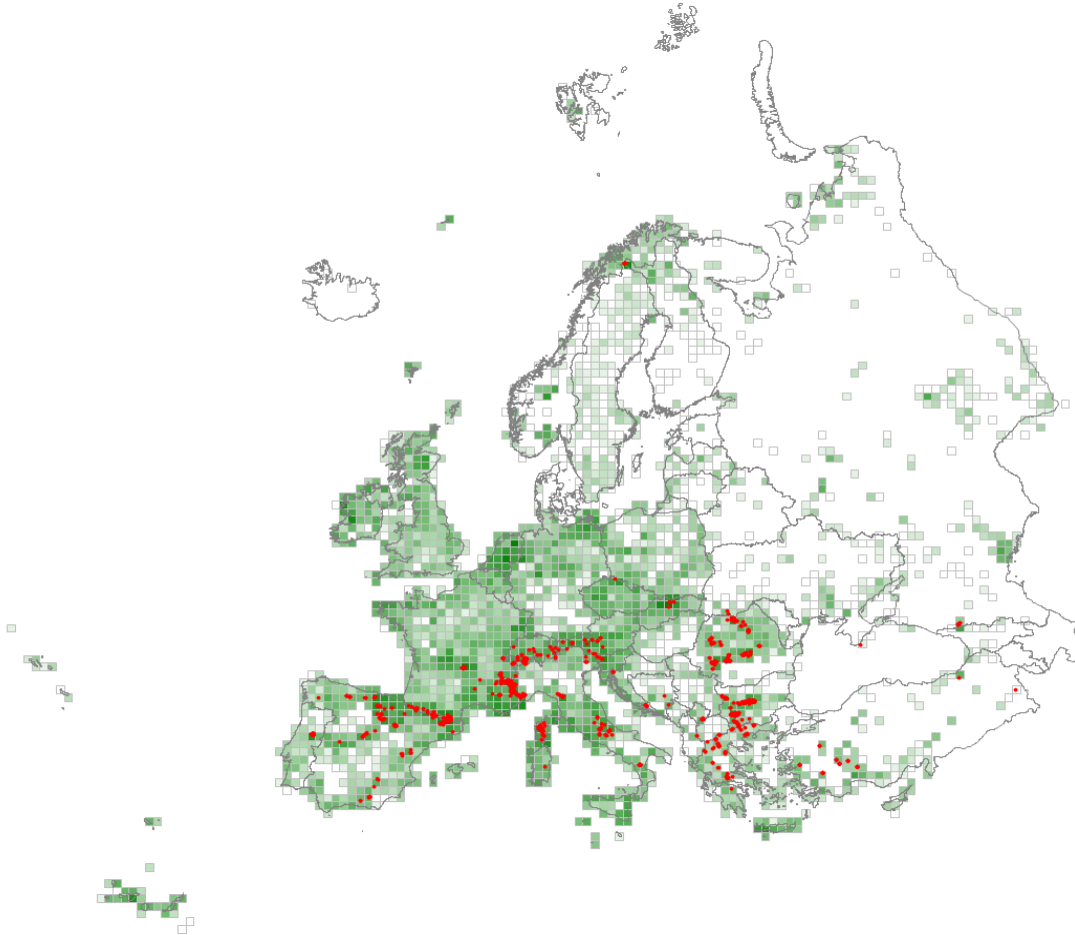
<i>Vaccinium myrtillus</i>	53
<i>Vaccinium uliginosum</i>	39
<i>Avenella flexuosa</i>	37
<i>Vaccinium vitis-idaea</i>	33
<i>Homogyne alpina</i>	30
<i>Dryas octopetala</i>	27
<i>Anthoxanthum odoratum</i> aggr.	27
<i>Calluna vulgaris</i>	26
<i>Nardus stricta</i>	24
<i>Juniperus communis</i> subsp. <i>nana</i>	23
<i>Potentilla erecta</i>	21
<i>Festuca rubra</i> aggr.	21
<i>Carex sempervirens</i>	21
<i>Bistorta vivipara</i>	21
<i>Sesleria caerulea</i>	20
<i>Cetraria islandica</i>	20
<i>Rhododendron ferrugineum</i>	17
<i>Potentilla aurea</i>	17
<i>Campanula scheuchzeri</i>	17
<i>Lotus corniculatus</i>	16
<i>Antennaria dioica</i>	16
<i>Juncus trifidus</i>	15
<i>Thymus praecox</i>	13
<i>Solidago virgaurea</i>	13
<i>Luzula campestris</i> aggr.	13
<i>Helictochloa versicolor</i>	13
<i>Silene acaulis</i>	12
<i>Scorzoneroides helvetica</i>	12
<i>Hylocomium splendens</i>	12
<i>Geum montanum</i>	12
<i>Empetrum nigrum</i> aggr.	12
<i>Pulsatilla alpina</i>	11
<i>Pleurozium schreberi</i>	11
<i>Luzula luzuloides</i>	11
<i>Festuca airoides</i>	11
<i>Dicranum scoparium</i>	11
<i>Anthyllis vulneraria</i>	11
<i>Agrostis capillaris</i>	11

### Dominant species (percentage frequencies of occurrences with cover > 25%)

<i>Vaccinium myrtillus</i>	20
<i>Dryas octopetala</i>	18
<i>Vaccinium uliginosum</i>	16
<i>Calluna vulgaris</i>	11
<i>Rhododendron ferrugineum</i>	7
<i>Loiseleuria procumbens</i>	6
<i>Arctostaphylos uva-ursi</i>	5

## S23 – Alpine and subalpine *Juniperus* scrub

Juniper-dominated vegetation of the montane to subalpine belts of European mountains, occurring as primary vegetation tolerant of both high exposure and snow-lie, but also a secondary derivative of the deforested, long-grazed and eroded ground at high altitudes.



### Corresponding alliances in EuroVegChecklist 2016

- > LOI-02C Aconito nasuti-Juniperion communis Onipchenko 2002
- > LOI-02B Daphno oleoidis-Juniperion alpinae Stanisci 1997
- > SAB-02B Genisto versicoloris-Juniperion hemisphaericae Rivas-Mart. et J.A. Molina in Rivas-Mart. et al. 1999
- > LOI-02A Juniperion nanae Br.-Bl. in Br.-Bl. et al. 1939
- > SAB-02C Pruno prostratae-Juniperion sabiniae Rivas-Mart. et J.A. Molina in Rivas-Mart. et al. 1999

### Characteristic species combination

Diagnostic species (phi coefficient \* 100)

<i>Juniperus communis</i> subsp. <i>nana</i>	40
<i>Bruckenthalia spiculifolia</i>	20
<i>Juniperus sabina</i>	20
<i>Genista depressa</i>	18

Constant species (percentage frequencies)

<i>Juniperus communis</i> subsp. <i>nana</i>	90
<i>Vaccinium myrtillus</i>	42



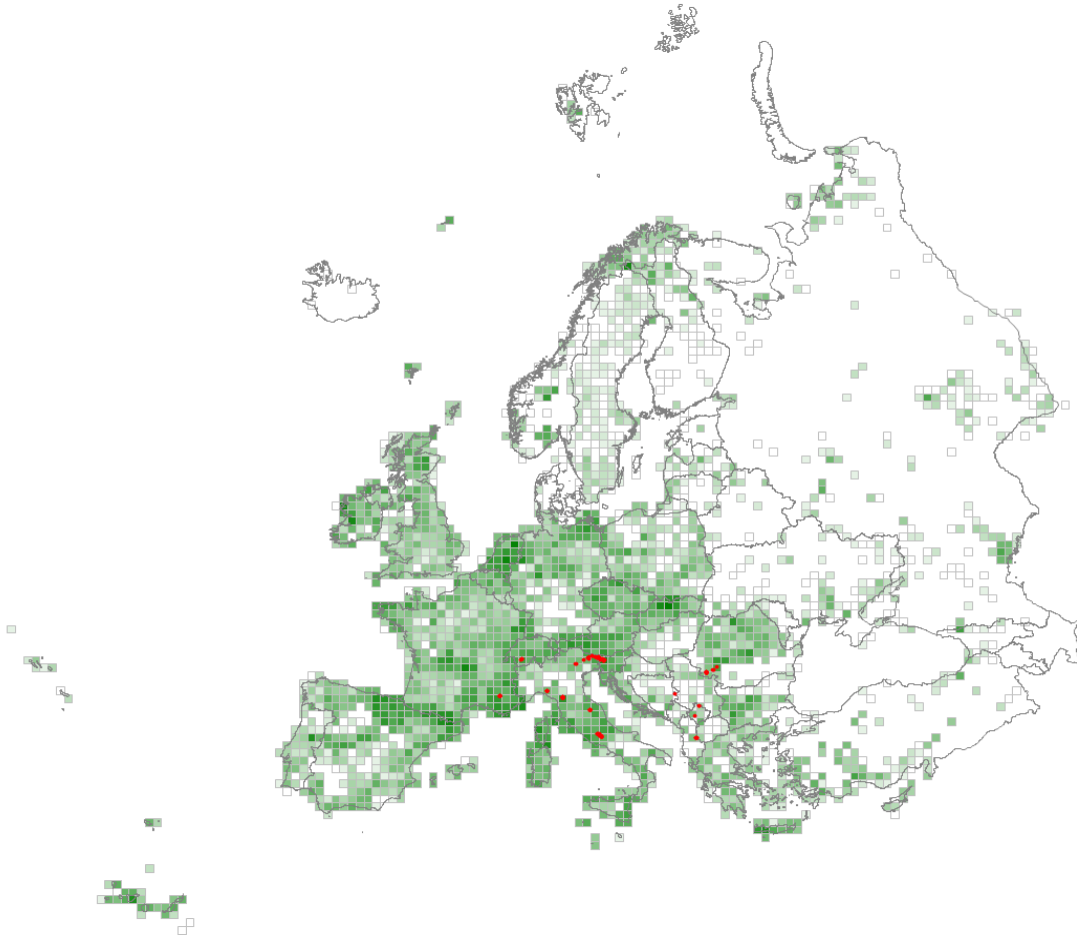
<i>Avenella flexuosa</i>	40
<i>Vaccinium vitis-idaea</i>	23
<i>Festuca rubra</i> aggr.	23
<i>Anthoxanthum odoratum</i> aggr.	22
<i>Vaccinium uliginosum</i>	21
<i>Nardus stricta</i>	20
<i>Luzula luzuloides</i>	20
<i>Homogyne alpina</i>	18
<i>Helianthemum nummularium</i>	16
<i>Antennaria dioica</i>	16
<i>Potentilla aurea</i>	15
<i>Thymus praecox</i>	14
<i>Bruckenthalia spiculifolia</i>	13
<i>Arctostaphylos uva-ursi</i>	13
<i>Lotus corniculatus</i>	12
<i>Carex sempervirens</i>	12
<i>Juniperus sabina</i>	11
<i>Campanula patula</i> aggr.	11

Dominant species (percentage frequencies of occurrences with cover > 25%)

<i>Juniperus communis</i> subsp. <i>nana</i>	63
<i>Vaccinium myrtillus</i>	6
<i>Juniperus sabina</i>	6

## S24 – Subalpine genistoid scrub of the Amphi-Adriatic region

Genistoid heath and scrub of high mountains in Italy and the Balkans, often in primary grassy mosaics at higher altitudes, but also extending below the timberline where wood-cutting and grazing open up the forest cover and sustain the vegetation as an anthropogenic replacement.



### Corresponding alliances in EuroVegChecklist 2016

- > RHO-01C *Daphno oleoidis-Genistion radiatae* N. Randelović, Rexhepi et Jovanović ex Mucina et Theurillat in Mucina et al. 2016

### Characteristic species combination

Diagnostic species (phi coefficient \* 100)

<i>Genista radiata</i>	93
<i>Laserpitium siler</i>	36
<i>Stachys alopecuros</i>	33
<i>Buphthalmum salicifolium</i>	29
<i>Athamanta turbith</i>	28
<i>Lilium albanicum</i>	27
<i>Brachypodium genuense</i>	27
<i>Linum viscosum</i>	27
<i>Festuca calva</i>	26
<i>Bromopsis condensata</i>	26
<i>Laserpitium peucedanoides</i>	24
<i>Carduus defloratus</i> aggr.	24

<i>Erica carnea</i>	24
<i>Syringa vulgaris</i>	23
<i>Leucanthemum heterophyllum</i>	22
<i>Cephalaria laevigata</i>	22
<i>Cirsium erisithales</i>	22
<i>Peucedanum austriacum</i>	21
<i>Knautia ressmannii</i>	21
<i>Festuca xanthina</i>	20
<i>Fourraea alpina</i>	20
<i>Pedicularis elongata</i>	20
<i>Festuca alpestris</i>	20
<i>Cyanus triumfettii</i> aggr.	19
<i>Scabiosa lucida</i>	19
<i>Eryngium alpinum</i>	19
<i>Calamagrostis varia</i>	19
<i>Lathyrus laevigatus</i>	19
<i>Dichoropetalum schottii</i>	19
<i>Prunella grandiflora</i>	18
<i>Valeriana stolonifera</i>	17
<i>Campanula thyrsoides</i>	17
<i>Helianthemum nummularium</i>	17
<i>Galium lucidum</i>	17
<i>Thesium rostratum</i>	17
<i>Hierochloe australis</i>	17
<i>Genista hassertiana</i>	17
<i>Teucrium montanum</i>	16
<i>Orobanche gracilis</i>	16
<i>Gymnadenia conopsea</i>	16
<i>Scutellaria altissima</i>	16
<i>Aconitum angustifolium</i>	16
<i>Sanguisorba albanica</i>	15
<i>Potentilla montenegrina</i>	15
<i>Cyclamen purpurascens</i>	15
<i>Asperula purpurea</i>	15
<i>Festuca billyi</i>	15
<i>Anemone trifolia</i>	15

Constant species (percentage frequencies)

<i>Genista radiata</i>	95
<i>Teucrium chamaedrys</i>	43
<i>Helianthemum nummularium</i>	43
<i>Laserpitium siler</i>	36
<i>Carduus defloratus</i> aggr.	36
<i>Teucrium montanum</i>	33
<i>Erica carnea</i>	33
<i>Bupthalmum salicifolium</i>	33
<i>Bromopsis erecta</i>	33
<i>Stachys alopecuros</i>	31
<i>Lotus corniculatus</i>	31
<i>Galium lucidum</i>	31
<i>Thymus praecox</i>	29
<i>Calamagrostis varia</i>	29
<i>Sesleria caerulea</i>	26
<i>Prunella grandiflora</i>	21
<i>Dactylis glomerata</i>	21
<i>Carlina acaulis</i>	21
<i>Carex humilis</i>	21
<i>Brachypodium genuense</i>	21
<i>Thymus longicaulis</i>	19

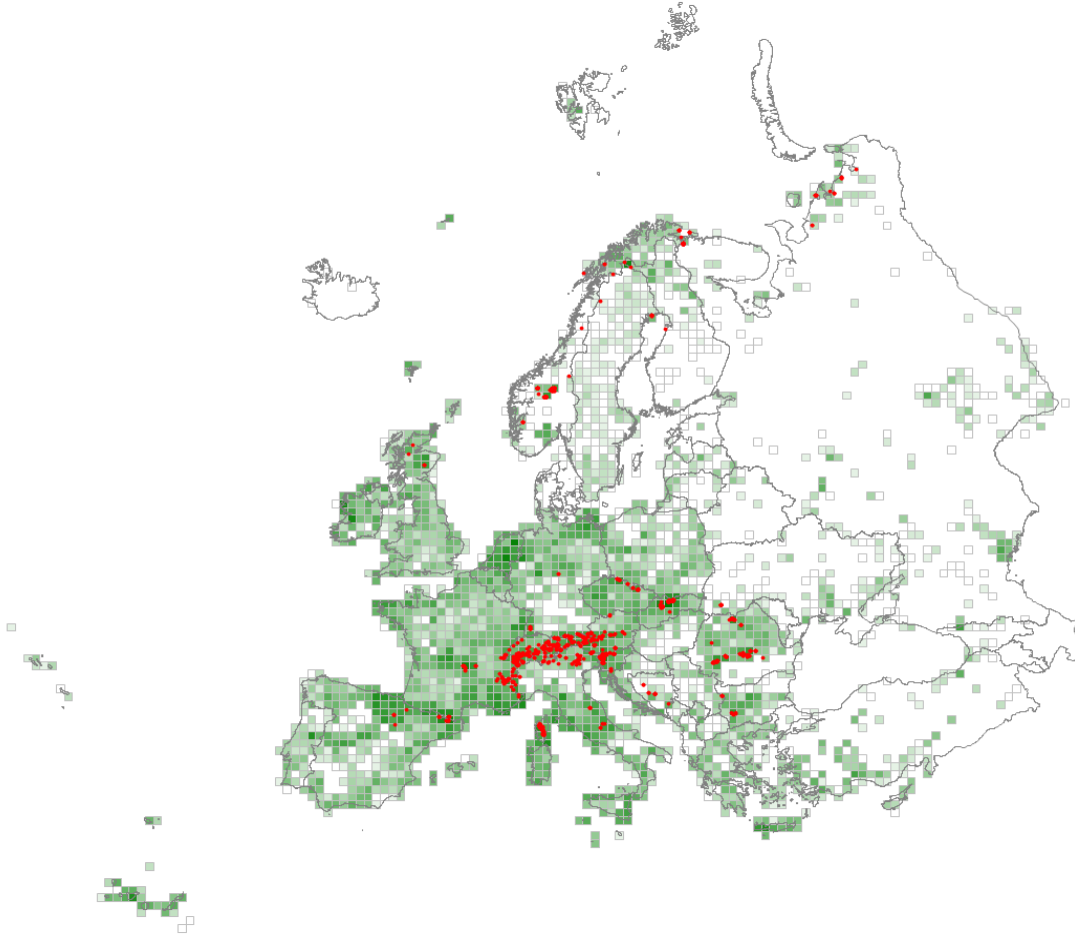
<i>Scabiosa lucida</i>	19
<i>Gymnadenia conopsea</i>	19
<i>Cyanus triumfettii</i> aggr.	19
<i>Cirsium erisithales</i>	19
<i>Asperula purpurea</i>	19
<i>Sorbus aria</i> aggr.	17
<i>Silene vulgaris</i>	17
<i>Polygonatum odoratum</i>	17
<i>Phyteuma orbiculare</i>	17
<i>Galium verum</i>	17
<i>Galium mollugo</i> aggr.	17
<i>Centaurea jacea</i>	17
<i>Thalictrum aquilegiifolium</i>	14
<i>Stachys recta</i>	14
<i>Serratula tinctoria</i>	14
<i>Rosa pendulina</i>	14
<i>Polygala chamaebuxus</i>	14
<i>Peucedanum oreoselinum</i>	14
<i>Origanum vulgare</i>	14
<i>Laserpitium peucedanoides</i>	14
<i>Laserpitium latifolium</i>	14
<i>Euphorbia cyparissias</i>	14
<i>Cyclamen purpurascens</i>	14
<i>Clinopodium alpinum</i>	14
<i>Cerastium arvense</i>	14
<i>Carduus nutans</i>	14
<i>Campanula scheuchzeri</i>	14
<i>Bupleurum falcatum</i>	14
<i>Brachypodium pinnatum</i>	14
<i>Vincetoxicum hirundinaria</i>	12
<i>Syringa vulgaris</i>	12
<i>Silene nutans</i>	12
<i>Rubus saxatilis</i>	12
<i>Pimpinella saxifraga</i>	12
<i>Mercurialis perennis</i>	12
<i>Linum viscosum</i>	12
<i>Lilium albanicum</i>	12
<i>Carex macrolepis</i>	12
<i>Brachypodium rupestre</i>	12
<i>Arctostaphylos uva-ursi</i>	12
<i>Anthericum ramosum</i>	12
<i>Amelanchier ovalis</i>	12
<i>Allium flavum</i>	12
<i>Achillea millefolium</i> aggr.	12

Dominant species (percentage frequencies of occurrences with cover > 25%)

<i>Genista radiata</i>	95
<i>Laserpitium siler</i>	12
<i>Erica carnea</i>	7

## S25 – Subalpine and subarctic deciduous scrub

Low scrub, including krummholz, dominated by various deciduous trees and shrubs, on moist but free-draining, sometimes quite fertile, soils on high-mountain slopes throughout Europe, often with long snow-lie and prone to natural disturbance due to avalanche and scree slides, after which it is well able to recover and recolonise. The associated flora can be rich in tall mountain herbs. It can also be found as a secondary succession stage in abandoned subalpine pastures and meadows.



### Corresponding alliances in EuroVegChecklist 2016

- > VIR-01A Alnion viridis Schnyder 1930
- > VIR-03C Geranio sylvatici-Betulion pumilae Mucina et Willner ined.
- > VIR-02B Lonicero-Rhamnion fallacis P. Fukarek 1969
- > VIR-01E Pruno petraeae-Sorbion aucupariae Rameau ex Seytre et Bœuf in Bœuf 2011
- <> VIR-04A Rhododendro caucasicum-Betulion litwinowii Onipchenko 2002
- > VIR-03B Salicion callicarpeae Daniëls in Mucina et al. 2016
- > VIR-01C Salicion helveticae Rübél ex Theurillat in Theurillat et al. 1995
- > VIR-01B Salicion pentandrae Br.-Bl. 1967
- <> VIR-03A Salicion phyllicifoliae Dierssen 1992
- > VIR-01D Salicion silesiaca Rejmánek et al. 1971
- > VIR-02A Seslerio calcariae-Rhamnion fallacis Dakskobler et al. 2013

### Characteristic species combination

Diagnostic species (phi coefficient \* 100)

*Alnus viridis*

<i>Peucedanum ostruthium</i>	28
<i>Adenostyles alliariae</i>	28
<i>Achillea macrophylla</i>	27
<i>Saxifraga rotundifolia</i>	24
<i>Viola biflora</i>	24
<i>Rumex arifolius</i>	23
<i>Athyrium distentifolium</i>	22
<i>Lactuca alpina</i>	22
<i>Aconitum napellus</i> aggr.	19
<i>Salix silesiaca</i>	18
<i>Salix helvetica</i>	18
<i>Stellaria nemorum</i>	17
<i>Veratrum album</i>	17
<i>Geranium sylvaticum</i> aggr.	17
<i>Salix lapponum</i>	16
<i>Salix bicolor</i>	16
<i>Salix appendiculata</i>	16
<i>Chaerophyllum hirsutum</i>	16
<i>Epilobium alpestre</i>	16

Constant species (percentage frequencies)

<i>Alnus viridis</i>	56
<i>Viola biflora</i>	42
<i>Geranium sylvaticum</i> aggr.	36
<i>Adenostyles alliariae</i>	34
<i>Vaccinium myrtillus</i>	32
<i>Rubus idaeus</i>	32
<i>Deschampsia cespitosa</i> aggr.	29
<i>Saxifraga rotundifolia</i>	28
<i>Stellaria nemorum</i>	27
<i>Sorbus aucuparia</i>	27
<i>Rumex arifolius</i>	27
<i>Solidago virgaurea</i>	26
<i>Peucedanum ostruthium</i>	26
<i>Veratrum album</i>	23
<i>Oxalis acetosella</i>	23
<i>Chaerophyllum hirsutum</i>	23
<i>Senecio nemorensis</i> aggr.	22
<i>Homogyne alpina</i>	21
<i>Dryopteris dilatata</i>	21
<i>Athyrium distentifolium</i>	20
<i>Athyrium filix-femina</i>	19
<i>Picea abies</i>	18
<i>Lactuca alpina</i>	18
<i>Aconitum napellus</i> aggr.	18
<i>Luzula sylvatica</i>	17
<i>Geum rivale</i>	17
<i>Dryopteris filix-mas</i>	17
<i>Calamagrostis villosa</i>	17
<i>Avenella flexuosa</i>	17
<i>Silene vulgaris</i>	16
<i>Hypericum maculatum</i> aggr.	16
<i>Salix appendiculata</i>	15
<i>Rhododendron ferrugineum</i>	15
<i>Poa nemoralis</i>	14
<i>Thalictrum aquilegifolium</i>	13
<i>Soldanella alpina</i>	13
<i>Primula elatior</i>	13
<i>Aconitum lycoctonum</i>	13

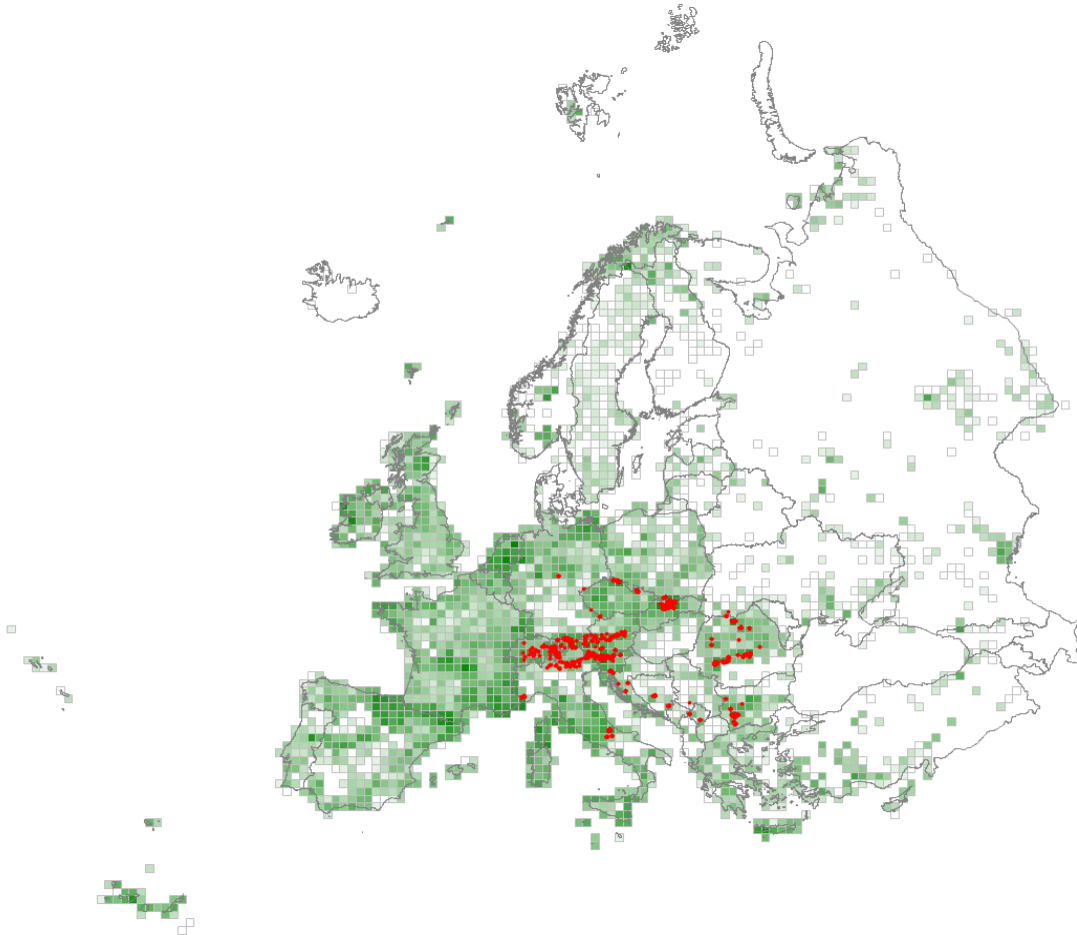
<i>Valeriana tripteris</i>	12
<i>Polystichum lonchitis</i>	12
<i>Polygonatum verticillatum</i>	12
<i>Myosotis sylvatica</i>	12
<i>Luzula luzuloides</i>	12
<i>Bistorta vivipara</i>	12
<i>Veratrum lobelianum</i>	11
<i>Urtica dioica</i>	11
<i>Rosa pendulina</i>	11
<i>Lamium galeobdolon</i>	11
<i>Heracleum sphondylium</i>	11
<i>Anthoxanthum odoratum</i> aggr.	11
<i>Alchemilla vulgaris</i> aggr.	11

Dominant species (percentage frequencies of occurrences with cover > 25%)

<i>Alnus viridis</i>	54
<i>Adenostyles alliariae</i>	9
<i>Salix lapponum</i>	7
<i>Rhamnus alpina</i>	6
<i>Salix waldsteiniana</i>	5

## S26 – Subalpine *Pinus mugo* scrub

Krummholz of dwarf mountain pine (*Pinus mugo*) on mineral soils with long snow-lie above the tree line through the mountains of central and South-Eastern Europe. Woody and herbaceous species and the sometimes abundant bryophyte layer vary according to the base-richness of the soils and ground moisture.



### Corresponding alliances in EuroVegChecklist 2016

- > MUG-01C Epipactido atropurpureae-Pinion mugo Stanisci 1997
- > MUG-01B Erico-Pinion mugo Leibundgut 1948
- > MUG-01D Lonicero borbasianaee-Pinion mugo Čarni et Mucina 2015
- > MUG-01A Pinion mugo Pawłowski et al. 1928

### Characteristic species combination

Diagnostic species (phi coefficient \* 100)

<i>Pinus mugo</i> subsp. <i>mugo</i>	74
<i>Rhododendron hirsutum</i>	34
<i>Homogyne alpina</i>	29
<i>Sorbus chamaemespilus</i>	29
<i>Calamagrostis villosa</i>	24
<i>Erica carnea</i>	23
<i>Salix glabra</i>	22
<i>Daphne striata</i>	21
<i>Vaccinium myrtillus</i>	19
<i>Vaccinium vitis-idaea</i>	18



<i>Laserpitium peucedanoides</i>	16
<i>Lonicera caerulea</i>	16
<i>Rhodothamnus chamaecistus</i>	16
Constant species (percentage frequencies)	
<i>Pinus mugo</i> subsp. <i>mugo</i>	98
<i>Vaccinium myrtillus</i>	83
<i>Vaccinium vitis-idaea</i>	65
<i>Homogyne alpina</i>	53
<i>Picea abies</i>	38
<i>Avenella flexuosa</i>	38
<i>Dicranum scoparium</i>	37
<i>Sorbus aucuparia</i>	36
<i>Hylocomium splendens</i>	34
<i>Rhododendron hirsutum</i>	33
<i>Calamagrostis villosa</i>	33
<i>Juniperus communis</i> subsp. <i>nana</i>	32
<i>Erica carnea</i>	32
<i>Sesleria caerulea</i>	29
<i>Pleurozium schreberi</i>	29
<i>Luzula sylvatica</i>	29
<i>Oxalis acetosella</i>	26
<i>Sorbus chamaemespilus</i>	25
<i>Rhytidadelphus triquetrus</i>	24
<i>Viola biflora</i>	23
<i>Solidago virgaurea</i>	22
<i>Cetraria islandica</i>	22
<i>Rubus saxatilis</i>	21
<i>Rosa pendulina</i>	21
<i>Lycopodium annotinum</i>	20
<i>Geranium sylvaticum</i> aggr.	20
<i>Dryopteris dilatata</i>	20
<i>Calamagrostis varia</i>	20
<i>Veratrum album</i>	19
<i>Rhododendron ferrugineum</i>	19
<i>Valeriana tripteris</i>	18
<i>Campanula scheuchzeri</i>	18
<i>Rubus idaeus</i>	16
<i>Potentilla erecta</i>	16
<i>Hieracium murorum</i>	16
<i>Valeriana montana</i>	15
<i>Vaccinium uliginosum</i>	15
<i>Galium anisophyllum</i>	15
<i>Daphne mezereum</i>	15
<i>Bellidiastrum michelii</i>	15
<i>Salix glabra</i>	14
<i>Salix appendiculata</i>	14
<i>Luzula luzuloides</i>	14
<i>Lonicera caerulea</i>	14
<i>Larix decidua</i>	14
<i>Clematis alpina</i>	14
<i>Tortella tortuosa</i>	13
<i>Polygala chamaebuxus</i>	13
<i>Phyteuma orbiculare</i>	13
<i>Dryas octopetala</i>	13
<i>Rhodothamnus chamaecistus</i>	12
<i>Polygonatum verticillatum</i>	12
<i>Carex ferruginea</i>	12
<i>Athyrium distentifolium</i>	12

<i>Adenostyles alliariae</i>	12
<i>Stachys alopecuros</i>	11
<i>Senecio nemorensis</i> aggr.	11
<i>Potentilla aurea</i>	11
<i>Juniperus communis</i> subsp. <i>communis</i>	11
<i>Huperzia selago</i>	11
<i>Carduus defloratus</i> aggr.	11
<i>Anthoxanthum odoratum</i> aggr.	11

Dominant species (percentage frequencies of occurrences with cover > 25%)

<i>Pinus mugo</i> subsp. <i>mugo</i>	98
<i>Vaccinium myrtillus</i>	30
<i>Erica carnea</i>	10
<i>Rhododendron hirsutum</i>	9
<i>Rhododendron ferrugineum</i>	7
<i>Hylocomium splendens</i>	6

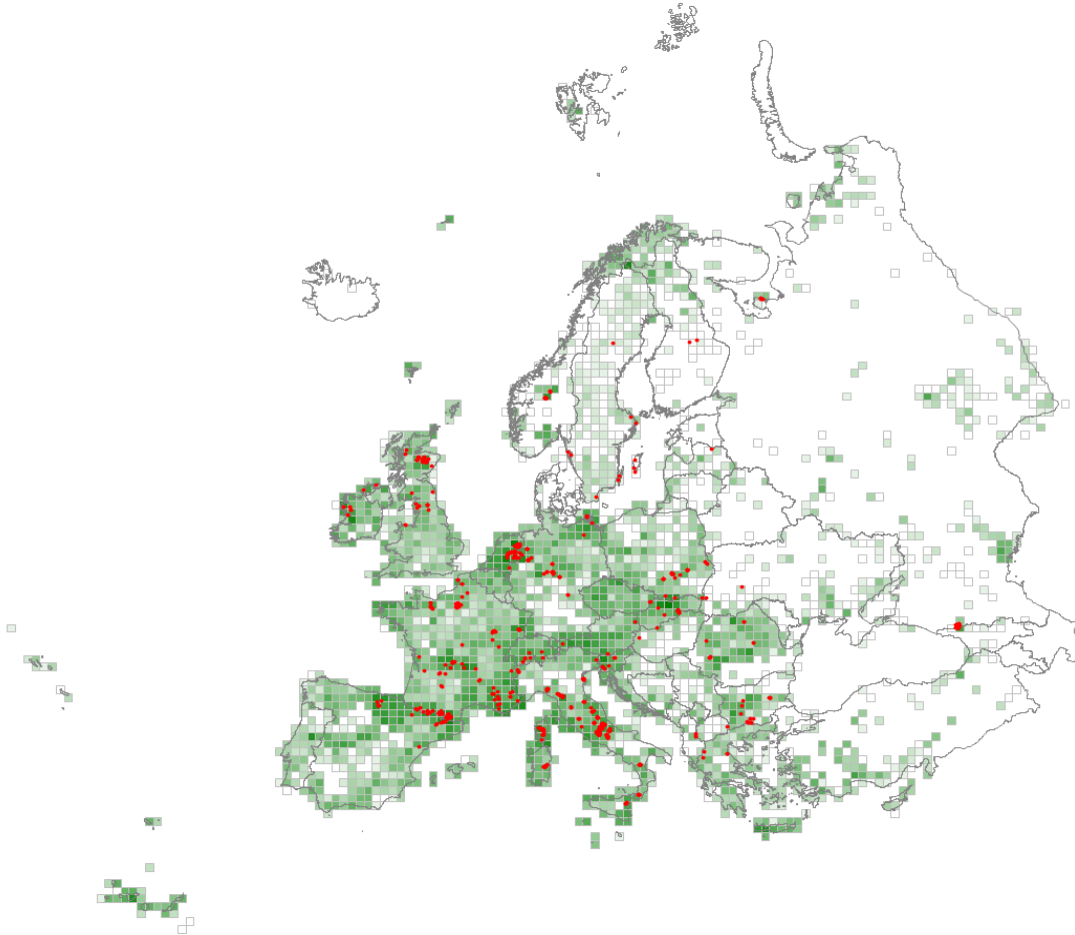
## **S27 – Krummholz with conifers other than *Pinus mugo***

[This habitat could not be formally defined in the expert system because it is based on vegetation physiognomy that is not reflected by species composition.]

Coniferous krummholz on mineral soils above the tree line dominated by short individuals of *Pinus sylvestris* (especially in Scotland and Norway) or *Picea abies* (especially in Scandinavia).

### S31 – Lowland to montane temperate and submediterranean *Juniperus* scrub

*Juniperus communis* scrub on nutrient-poor sandy and calcareous soils through the temperate and submediterranean lowlands and foothills of Europe. The juniper can be very patchy in occurrence, often related to past land use, and with a striking variety of growth forms, the associated flora being very diverse according to soil base-status, sharing much in common, where the scrub is open, with local calcicolous grasslands or heath.



#### Corresponding alliances in EuroVegChecklist 2016

- > RHA-01I Brachypodio pinnati-Juniperion communis Mucina in Mucina et al. 2016
- <> SAB-03C Jasmino-Juniperion excelsae Didukh, Vakarenko et Shelyag-Sosonko ex Didukh 1996
- > ULI-03A Vaccinio-Juniperion communis Passarge in Passarge et G. Hofmann 1968

#### Characteristic species combination

Diagnostic species (phi coefficient \* 100)

*Juniperus communis* subsp. *communis* 32

Constant species (percentage frequencies)

*Juniperus communis* subsp. *communis* 100

*Avenella flexuosa* 29

*Calluna vulgaris* 24

*Vaccinium myrtillus* 23

*Hypnum cupressiforme* aggr. 21

*Rosa canina* aggr. 19

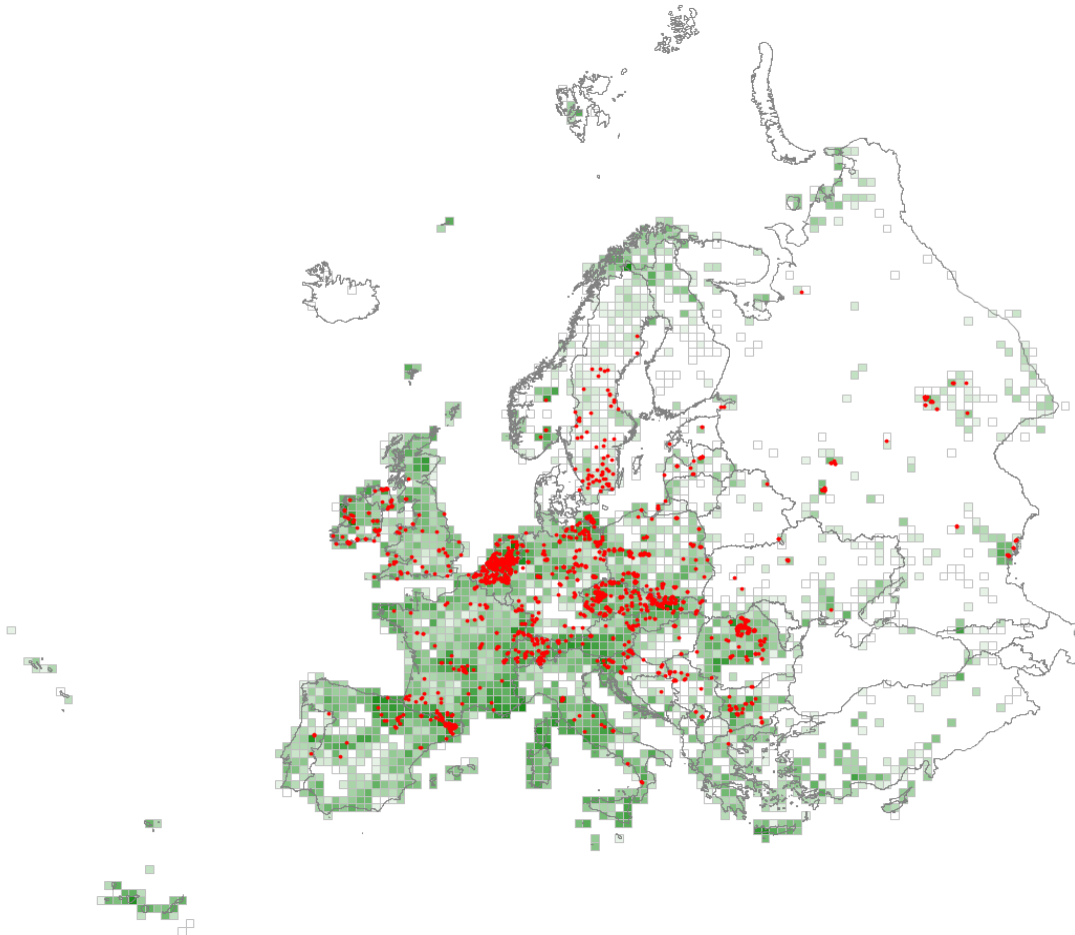
<i>Pleurozium schreberi</i>	18
<i>Festuca rubra</i> aggr.	18
<i>Festuca ovina</i>	18
<i>Lotus corniculatus</i>	17
<i>Potentilla erecta</i>	16
<i>Dicranum scoparium</i>	16
<i>Teucrium chamaedrys</i>	15
<i>Sanguisorba minor</i> aggr.	15
<i>Pilosella officinarum</i>	15
<i>Bromopsis erecta</i>	15
<i>Brachypodium pinnatum</i>	15
<i>Anthoxanthum odoratum</i> aggr.	15
<i>Agrostis capillaris</i>	15
<i>Pinus sylvestris</i>	14
<i>Helianthemum nummularium</i>	14
<i>Vaccinium vitis-idaea</i>	13
<i>Galium verum</i>	13
<i>Carex flacca</i>	13
<i>Arctostaphylos uva-ursi</i>	13
<i>Leontodon hispidus</i>	12
<i>Prunus spinosa</i>	11
<i>Plantago lanceolata</i>	11
<i>Hippocrepis comosa</i>	11
<i>Galium saxatile</i>	11
<i>Euphorbia cyparissias</i>	11
<i>Briza media</i>	11
<i>Achillea millefolium</i> aggr.	11

Dominant species (percentage frequencies of occurrences with cover > 25%)

<i>Juniperus communis</i> subsp. <i>communis</i>	100
<i>Calluna vulgaris</i>	7
<i>Arctostaphylos uva-ursi</i>	7
<i>Brachypodium pinnatum</i>	6

## S32 – Temperate *Rubus* scrub

Low *Rubus*-dominated scrub, deciduous or sometimes evergreen, of successions and ecotones in a wide variety of semi-natural landscapes through the Atlantic region and elsewhere in submontane belts Europe where a locally moist climate prevails. *Rubus* is an enormously diverse genus of often apomictic and endemic taxa with associated floras related to soil base-status and moisture.



### Corresponding alliances in EuroVegChecklist 2016

- > LON-02A Frangulo-Rubion Rivas Goday 1964
- <> LON-01A Lonicero-Rubion silvatici Tx. et Neumann ex Wittig 1977
- <> RHA-03A Pruno spinosae-Rubion ulmifolii O. de Bolòs 1954
- > RHA-01F Pruno-Rubion radulae Weber 1974
- > RHA-03D Scrophulario glabratae-Rubion ulmifolii Vicente Orellana et al. 2012

### Characteristic species combination

Diagnostic species (phi coefficient \* 100)

*Rubus caesius* 17

Constant species (percentage frequencies)

*Urtica dioica* 44

*Rubus fruticosus* aggr. 43

*Rubus caesius* 37

*Rubus idaeus* 35

*Galium aparine* 21

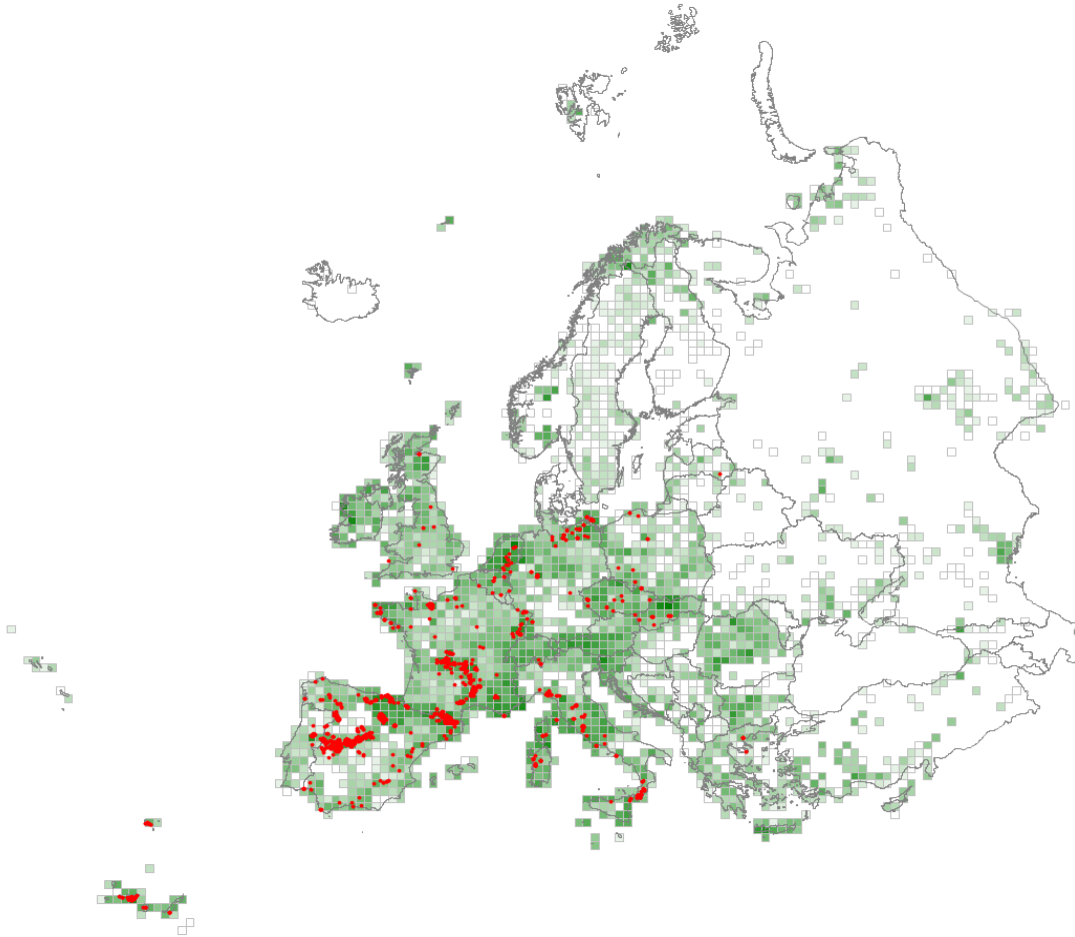
<i>Dactylis glomerata</i>	21
<i>Cirsium arvense</i>	21
<i>Elytrigia repens</i> aggr.	20
<i>Epilobium angustifolium</i>	19
<i>Arrhenatherum elatius</i>	16
<i>Agrostis capillaris</i>	16
<i>Sorbus aucuparia</i>	14
<i>Calystegia sepium</i>	14
<i>Galium mollugo</i> aggr.	12
<i>Calamagrostis epigejos</i>	12
<i>Artemisia vulgaris</i>	12
<i>Achillea millefolium</i> aggr.	12
<i>Senecio nemorensis</i> aggr.	11
<i>Poa trivialis</i>	11
<i>Picea abies</i>	11
<i>Fragaria vesca</i>	11

Dominant species (percentage frequencies of occurrences with cover > 25%)

<i>Rubus fruticosus</i> aggr.	35
<i>Rubus caesius</i>	35
<i>Rubus idaeus</i>	30

### S33 – Lowland to montane temperate and submediterranean genistoid scrub

Low scrub dominated by various woody legumes on mostly sharply-draining, nutrient-poor acidic soils throughout the temperate and submediterranean lowlands and Mediterranean foothills of Europe. To the north the vegetation is usually found in successions or ecotones within pastoral landscapes and is often rather species-poor; further south, the scrub can occur as a more persistent or repeatedly renewed habitat among rocky or unstable hill-slopes with richer associated floras.



#### Corresponding alliances in EuroVegChecklist 2016

- > CYT-01F *Adenocarpion decorticantis* (Rivas-Mart. et F. Valle ex F. Valle 1985) Rivas-Mart. et al. 1999
- > CYT-01C *Cytision multiflori* Rivas-Mart. 1974
- > RHA-02A *Cytision sessilifolii* Biondi in Biondi et al. 1989
- <> CYT-03C *Erico scopariae-Cytision scoparii* Mucina in Mucina et al. 2016
- > CYT-01B *Genistion floridae* Rivas-Mart. 1974
- > CYT-02D *Genistion specioso-equisetiformis* Rivas-Mart. et F. Valle in Rivas-Mart. et al. 2011
- > CYT-02C *Genisto scorpii-Retamion sphaerocarpace* Rivas-Mart. et M. Costa in Rivas-Mart. et al. 2011
- > CYT-02B *Genisto spartioidis-Phlomidion almeriensis* Rivas Goday et Rivas-Mart. 1969
- > CYT-01D *Retamion monospermae* Rivas-Mart. et Cantó in Rivas-Mart et al. 2002
- > CYT-01E *Retamion sphaerocarpace* Rivas-Mart. 1981
- <> CYT-03A *Sarothamnion scoparii* Oberd. 1957
- > CYT-02A *Telinion monspessulano-linifoliae* Rivas-Mart. et al. 2002
- > CYT-01A *Ulici europaei-Cytision striati* Rivas-Mart. et al. 1991
- > CYT-01G *Violo messanensis-Adenocarpion complicati* Mucina in Mucina et al. 2016



## Characteristic species combination

### Diagnostic species (phi coefficient \* 100)

<i>Cytisus scoparius</i>	32
<i>Genista florida</i>	24
<i>Cytisus balansae</i>	22
<i>Cytisus multiflorus</i>	21
<i>Genista cinerascens</i>	20
<i>Adenocarpus complicatus</i>	18
<i>Cytisus striatus</i>	18
<i>Lavandula pedunculata</i>	17

### Constant species (percentage frequencies)

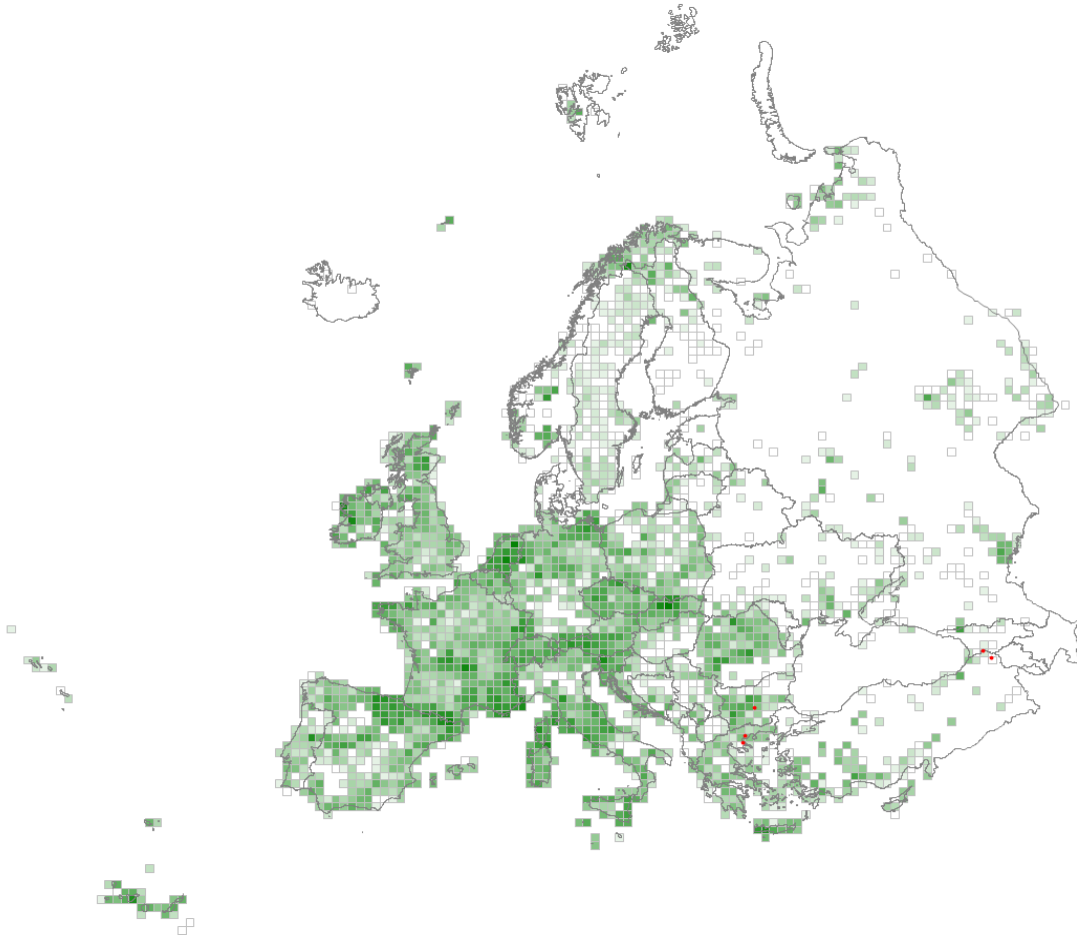
<i>Cytisus scoparius</i>	60
<i>Pteridium aquilinum</i>	30
<i>Agrostis capillaris</i>	24
<i>Calluna vulgaris</i>	23
<i>Teucrium scorodonia</i>	21
<i>Cytisus balansae</i>	20
<i>Avenella flexuosa</i>	19
<i>Rumex acetosella</i>	16
<i>Rubus ulmifolius</i>	16
<i>Lavandula pedunculata</i>	15
<i>Erica arborea</i>	14
<i>Genista florida</i>	13
<i>Jasione montana</i>	12
<i>Hypericum perforatum</i>	12
<i>Dactylis glomerata</i>	12
<i>Crataegus monogyna</i>	12
<i>Anthoxanthum odoratum</i> aggr.	12
<i>Achillea millefolium</i> aggr.	12
<i>Cytisus multiflorus</i>	11

### Dominant species (percentage frequencies of occurrences with cover > 25%)

<i>Cytisus scoparius</i>	46
<i>Cytisus balansae</i>	17
<i>Genista florida</i>	7
<i>Cytisus multiflorus</i>	6

## S34 – Balkan-Anatolian submontane genistoid scrub

Open scrub, dominated by *Genista lydia* endemic to steep rocky slopes and screes, and also degraded forest, in the lowlands and foothills of the south-eastern Balkan Peninsula, on various soils but especially rich on limey substrates where calcicolous grassland species figure strongly among the associated flora.



### Corresponding alliances in EuroVegChecklist 2016

x                      no relationship (yet)

### Characteristic species combination

Diagnostic species (phi coefficient \* 100)

<i>Genista lydia</i>	97
<i>Hypericum olympicum</i>	53
<i>Astragalus shepardii</i>	45
<i>Astragalus persicus</i>	45
<i>Astragalus bachmarensis</i>	45
<i>Delphinium dasystachyum</i>	44
<i>Arenaria tmolea</i>	44
<i>Salsola verrucosa</i>	43
<i>Pseudosempervivum aucheri</i>	43
<i>Hypericum formosissimum</i>	43
<i>Astragalus bombycalyx</i>	43
<i>Astragalus melitenensis</i>	43
<i>Hypericum neurocalycinum</i>	42

<i>Paronychia carica</i>	42
<i>Alyssum umbellatum</i>	42
<i>Odontarrhena pateri</i>	42
<i>Hypericum minutum</i>	41
<i>Astracantha amblolepis</i>	41
<i>Digitalis viridiflora</i>	41
<i>Noaea mucronata</i>	41
<i>Campanula lingulata</i>	40
<i>Orobanche teucrii</i>	40
<i>Barbarea verna</i>	39
<i>Hesperis bottae</i>	39
<i>Verbascum speciosum</i>	38
<i>Ranunculus isthmicus</i>	38
<i>Digitalis lanata</i>	38
<i>Malva arborea</i>	37
<i>Dianthus cruentus</i>	37
<i>Jasione heldreichii</i>	37
<i>Minuartia hirsuta</i>	36
<i>Achillea crithmifolia</i>	35
<i>Malva moschata</i>	34
<i>Festuca koritnicensis</i>	34
<i>Dryopteris aemula</i>	33
<i>Trifolium heldreichianum</i>	33
<i>Rorippa pyrenaica</i>	33
<i>Cytisus eriocarpus</i>	32
<i>Laphangium luteoalbum</i>	32
<i>Thymus thracicus</i>	32
<i>Centaurea grisebachii</i>	32
<i>Sesleria robusta</i>	32
<i>Verbascum densiflorum</i>	30
<i>Linum hirsutum</i>	29
<i>Scabiosa triniifolia</i>	29
<i>Noccaea praecox</i>	28
<i>Draba lasiocarpa</i>	28
<i>Hypericum atomarium</i>	28
<i>Allium guttatum</i>	27
<i>Thymus sibthorpii</i>	27
<i>Mesembryanthemum nodiflorum</i>	25
<i>Silene viscaria</i>	25
<i>Dianthus petraeus</i>	25
<i>Carduus tmoleus</i>	25
<i>Potentilla argentea</i>	24
<i>Carlina acanthifolia</i>	23
<i>Botrychium lunaria</i>	22
<i>Silene colorata</i>	21
<i>Salvia verticillata</i>	21
<i>Cuscuta epithymum</i>	20
<i>Micropyrum tenellum</i>	20
<i>Cota tinctoria</i>	19
<i>Euphorbia myrsinites</i>	19
<i>Pilosella hoppeana</i>	17
<i>Phleum phleoides</i>	17
<i>Scabiosa ochroleuca</i>	16
<i>Silene otites aggr.</i>	16
<i>Asperula purpurea</i>	16
<i>Koeleria lobata</i>	16
<i>Helianthemum nummularium</i>	16
<i>Rostraria cristata</i>	16
<i>Brachypodium pinnatum</i>	16

Constant species (percentage frequencies)

<i>Genista lydia</i>	100
<i>Rumex acetosella</i>	40
<i>Potentilla argentea</i>	40
<i>Hypericum olympicum</i>	40
<i>Helianthemum nummularium</i>	40
<i>Brachypodium pinnatum</i>	40
<i>Anthoxanthum odoratum</i> aggr.	40
<i>Verbascum speciosum</i>	20
<i>Verbascum densiflorum</i>	20
<i>Trifolium heldreichianum</i>	20
<i>Trifolium dubium</i>	20
<i>Trifolium arvense</i>	20
<i>Tragopogon pratensis</i>	20
<i>Thymus thracicus</i>	20
<i>Thymus sibthorpii</i>	20
<i>Silene vulgaris</i>	20
<i>Silene viscaria</i>	20
<i>Silene otites</i> aggr.	20
<i>Silene colorata</i>	20
<i>Sesleria robusta</i>	20
<i>Sedum album</i>	20
<i>Sedum acre</i>	20
<i>Scleranthus perennis</i>	20
<i>Scabiosa triniifolia</i>	20
<i>Scabiosa ochroleuca</i>	20
<i>Scabiosa columbaria</i> aggr.	20
<i>Sanguisorba minor</i> aggr.	20
<i>Salvia verticillata</i>	20
<i>Salsola verrucosa</i>	20
<i>Rubus saxatilis</i>	20
<i>Rostraria cristata</i>	20
<i>Rosa canina</i> aggr.	20
<i>Rorippa pyrenaica</i>	20
<i>Ranunculus isthmicus</i>	20
<i>Pteridium aquilinum</i>	20
<i>Pseudosempervivum aucheri</i>	20
<i>Poa pratensis</i> aggr.	20
<i>Plantago lanceolata</i>	20
<i>Pinus sylvestris</i>	20
<i>Pilosella hoppeana</i>	20
<i>Phleum phleoides</i>	20
<i>Paronychia carica</i>	20
<i>Orobanche teucris</i>	20
<i>Odontarrhena pateri</i>	20
<i>Noccaea praecox</i>	20
<i>Noaea mucronata</i>	20
<i>Minuartia hirsuta</i>	20
<i>Micropyrum tenellum</i>	20
<i>Mesembryanthemum nodiflorum</i>	20
<i>Melica ciliata</i> aggr.	20
<i>Malva moschata</i>	20
<i>Malva arborea</i>	20
<i>Lotus corniculatus</i>	20
<i>Linum hirsutum</i>	20
<i>Laphangium luteoalbum</i>	20
<i>Lactuca serriola</i>	20
<i>Koeleria macrantha</i>	20

<i>Koeleria lobata</i>	20
<i>Juniperus communis</i> subsp. <i>nana</i>	20
<i>Juniperus communis</i> subsp. <i>communis</i>	20
<i>Jasione heldreichii</i>	20
<i>Hypericum perforatum</i>	20
<i>Hypericum neurocalycinum</i>	20
<i>Hypericum minutum</i>	20
<i>Hypericum formosissimum</i>	20
<i>Hypericum atomarium</i>	20
<i>Hesperis bottae</i>	20
<i>Galium mollugo</i> aggr.	20
<i>Fragaria viridis</i>	20
<i>Fragaria vesca</i>	20
<i>Festuca valesiaca</i> aggr.	20
<i>Festuca koritnicensis</i>	20
<i>Euphorbia seguieriana</i>	20
<i>Euphorbia myrsinites</i>	20
<i>Euphorbia cyparissias</i>	20
<i>Euphorbia amygdaloides</i>	20
<i>Echium vulgare</i>	20
<i>Dryopteris aemula</i>	20
<i>Draba lasiocarpa</i>	20
<i>Digitalis viridiflora</i>	20
<i>Digitalis lanata</i>	20
<i>Dianthus petraeus</i>	20
<i>Dianthus cruentus</i>	20
<i>Delphinium dasystachyum</i>	20
<i>Daucus carota</i>	20
<i>Daphne oleoides</i>	20
<i>Dactylis glomerata</i>	20
<i>Cytisus eriocarpus</i>	20
<i>Cuscuta epithymum</i>	20
<i>Cruciata glabra</i>	20
<i>Cota tinctoria</i>	20
<i>Clinopodium alpinum</i>	20
<i>Cichorium intybus</i>	20
<i>Centaurea stoebe</i>	20
<i>Centaurea grisebachii</i>	20
<i>Carlina acanthifolia</i>	20
<i>Carex humilis</i>	20
<i>Carduus tmoleus</i>	20
<i>Campanula lingulata</i>	20
<i>Calamagrostis epigejos</i>	20
<i>Calamagrostis arundinacea</i>	20
<i>Bromus squarrosus</i>	20
<i>Briza media</i>	20
<i>Botrychium lunaria</i>	20
<i>Barbarea verna</i>	20
<i>Astragalus shepardii</i>	20
<i>Astragalus persicus</i>	20
<i>Astragalus melitenensis</i>	20
<i>Astragalus bombycalyx</i>	20
<i>Astragalus bachmarensis</i>	20
<i>Astracantha amblolepis</i>	20
<i>Asperula purpurea</i>	20
<i>Asperula cynanchica</i>	20
<i>Asperula aristata</i>	20
<i>Arenaria tmolea</i>	20
<i>Apera spica-venti</i>	20

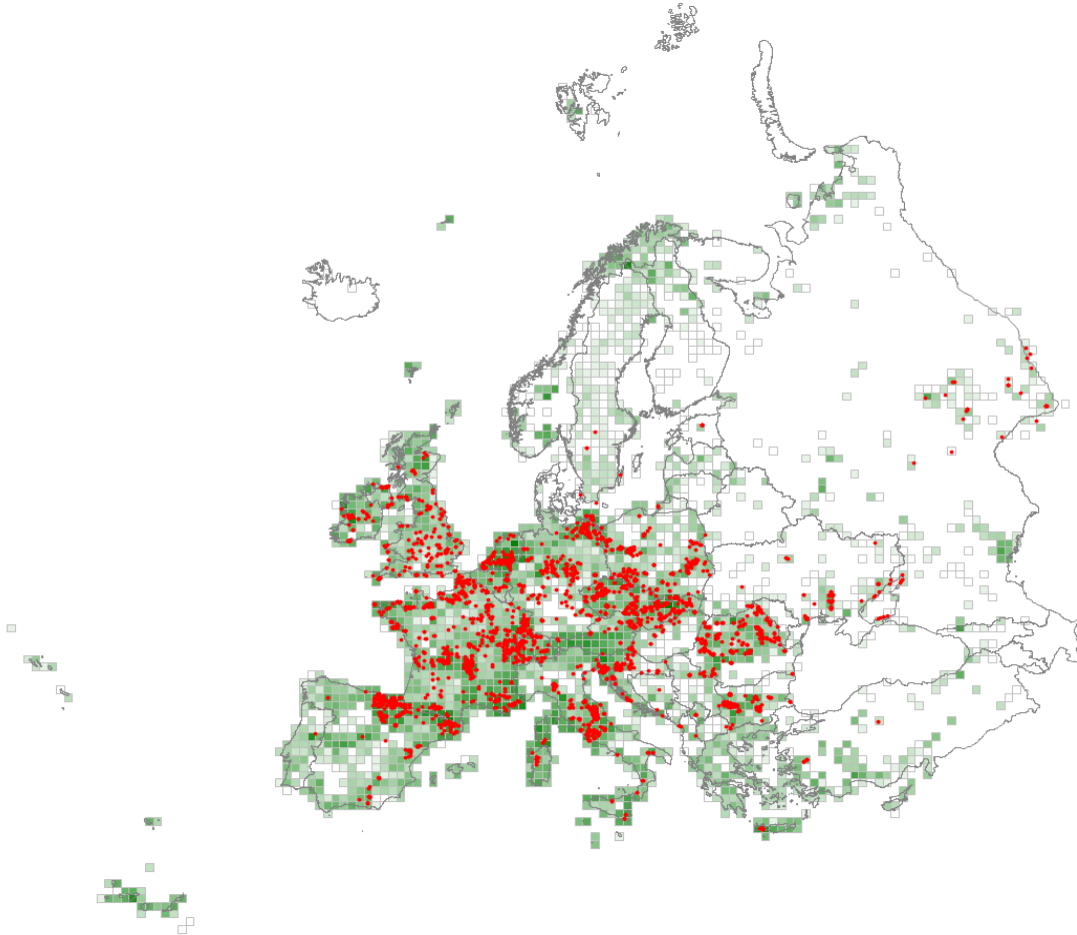
<i>Alyssum umbellatum</i>	20
<i>Allium guttatum</i>	20
<i>Achillea crithmifolia</i>	20
<i>Agrimonia eupatoria</i>	20

Dominant species (percentage frequencies of occurrences with cover > 25%)

<i>Genista lydia</i>	100
<i>Silene colorata</i>	20
<i>Pteridium aquilinum</i>	20
<i>Phleum phleoides</i>	20
<i>Hypericum olympicum</i>	20
<i>Arenaria tmolea</i>	20

## S35 – Temperate and submediterranean thorn scrub

Scrub dominated by a diversity of mostly thorny shrubs, small trees and saplings, in successions and ecotones on mesic soils in a wide variety of semi-natural landscapes through the temperate and submediterranean lowlands of Europe but sometimes extending to higher altitudes, as in the Balkan šibljak. The dominants and associated floras vary widely with differences in regional climate and soils.



### Corresponding alliances in EuroVegChecklist 2016

- <> RHA-01B *Amelanchiero-Buxion* O. de Bolòs et Romo in Romo 1989
- > RHA-03B *Arundo plinii-Rubion ulmifolii* Biondi, Blasi, Casavecchia et Gasparri in Biondi et al. 2014
- > RHA-02I *Asparago verticillati-Crataegion tauricae* Korzhenevskii et Kliukin 1990
- <> RHA-01A *Berberidion vulgaris* Br.-Bl. ex Tx. 1952 nom. conserv. propos.
- <> RHA-02H *Berberido creticae-Prunion cocomiliae* Bergmeier 1990
- <> RHA-02D *Buxo-Syringion* P. Fukarek ex Diklić 1965
- <> RHA-02J *Elytrigio nodosae-Rhuion coriariae* Korzhenevskii et Ryff ex Didukh et Mucina 2014
- > RHA-02G *Eryngio campestris-Paliurion spinae-christi* (Jovanović 1985) Matevski et al. 2008
- > RHA-01G *Frangulo alni-Pyrion cordatae* Herrera et al. 1991
- > RHA-02C *Fraxino orni-Cotinion* Soó 1960
- <> RHA-02B *Ilici aquifolii-Crataegion laciniatae* Ubaldi 2011
- > RHA-01K *Lamio purpureae-Acerion tatarici* Fitsailo 2007
- > RHA-04A *Lauro nobilis-Sambucion nigrae* Biondi, Blasi, Casavecchia, Galdenzi et Gasparri in Biondi et al. 2014
- > RHA-01C *Lonicero arboreae-Berberidion hispanicae* O. de Bolòs 1954

- <> LON-01B Molinio-Frangulion Passarge in Passarge et G. Hofmann 1968
- <> RHA-02E Paliuro-Petterion P. Fukarek 1962
- > RHA-02F Rhamno saxatilis-Paliurion spinae-christi Biondi, Casavecchia, Biscotti et Pesaresi in Biondi et al. 2014
- > RHA-03C Rubio periclymeni-Rubion ulmifolii Oberd. ex Rivas-Mart. et al. 1993
- <> RHA-01H Tamo communis-Viburnion lantanae (Géhu et al. 1983) Mucina in Mucina et al. 2016
- <> RHA-01D Urtico-Crataegion Passarge et G. Hofmann 1968

### Characteristic species combination

Diagnostic species (phi coefficient \* 100)

<i>Prunus spinosa</i>	27
<i>Rosa canina</i> aggr.	19
<i>Cornus sanguinea</i>	16
<i>Crataegus monogyna</i>	15

Constant species (percentage frequencies)

<i>Prunus spinosa</i>	63
<i>Crataegus monogyna</i>	52
<i>Rosa canina</i> aggr.	46
<i>Cornus sanguinea</i>	37
<i>Ligustrum vulgare</i>	29
<i>Urtica dioica</i>	27
<i>Galium aparine</i>	24
<i>Sambucus nigra</i>	22
<i>Euonymus europaeus</i>	22
<i>Rubus ulmifolius</i>	19
<i>Hedera helix</i> aggr.	18
<i>Dactylis glomerata</i>	18
<i>Clematis vitalba</i>	18
<i>Rubus caesius</i>	17
<i>Corylus avellana</i>	17
<i>Rubus fruticosus</i> aggr.	15
<i>Geum urbanum</i>	15
<i>Galium mollugo</i> aggr.	15
<i>Viburnum lantana</i>	13
<i>Rhamnus cathartica</i>	13
<i>Fraxinus excelsior</i>	13
<i>Brachypodium pinnatum</i>	12
<i>Acer campestre</i>	12
<i>Poa pratensis</i> aggr.	11
<i>Hypericum perforatum</i>	11
<i>Glechoma hederacea</i>	11
<i>Elytrigia repens</i> aggr.	11
<i>Achillea millefolium</i> aggr.	11
<i>Agrimonia eupatoria</i>	11

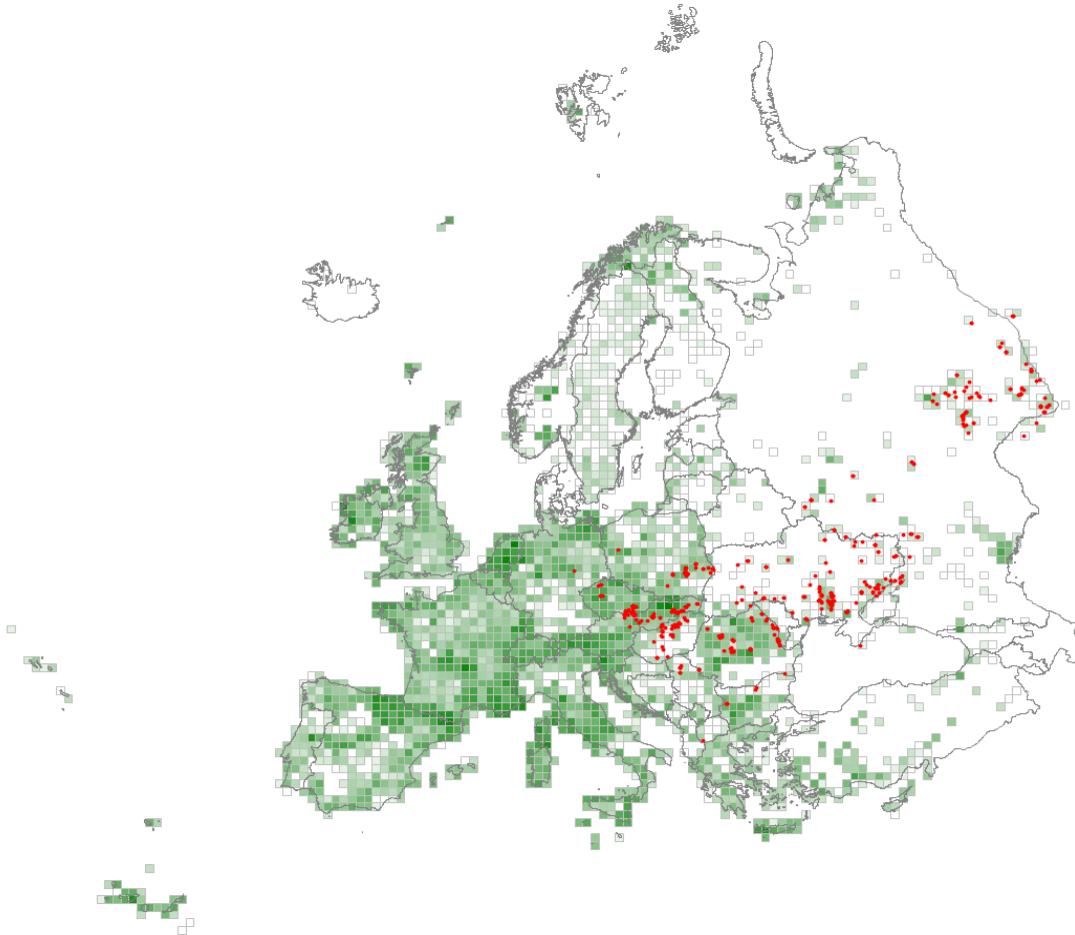
Dominant species (percentage frequencies of occurrences with cover > 25%)

<i>Prunus spinosa</i>	36
<i>Crataegus monogyna</i>	16
<i>Cornus sanguinea</i>	9
<i>Sambucus nigra</i>	7
<i>Ligustrum vulgare</i>	5



## S36 – Low steppe scrub

Low scrub, dominated by various, often clonal, shrubs frequently forming patches in locally mesic and sheltered situations within the dry grasslands of the steppe zone of Central and Eastern Europe. It can form a persistent natural landscape element or develop after the abandonment of pasturing.



### Corresponding alliances in EuroVegChecklist 2016

- > RHA-01J Prunion fruticosae Tx. 1952

### Characteristic species combination

Diagnostic species (phi coefficient \* 100)

<i>Prunus fruticosa</i>	47
<i>Prunus tenella</i>	46
<i>Caragana frutex</i>	37
<i>Phlomis tuberosa</i>	31
<i>Spiraea media</i>	29
<i>Elytrigia intermedia</i>	25
<i>Salvia nemorosa</i>	25
<i>Achillea pannonica</i>	20
<i>Vinca herbacea</i>	20
<i>Fragaria viridis</i>	20
<i>Cytisus graniticus</i>	19
<i>Adonis vernalis</i>	19
<i>Falcaria vulgaris</i>	18

<i>Bromopsis inermis</i>	18
<i>Thalictrum minus</i>	18
<i>Salvia dumetorum</i>	17
<i>Festuca valesiaca</i> aggr.	17
<i>Veronica spicata</i>	17
<i>Spiraea crenata</i>	16
<i>Galium glaucum</i>	16
<i>Stipa capillata</i>	16
<i>Medicago falcata</i>	16
<i>Artemisia sericea</i>	15

Constant species (percentage frequencies)

<i>Poa pratensis</i> aggr.	40
<i>Festuca valesiaca</i> aggr.	39
<i>Galium verum</i>	33
<i>Teucrium chamaedrys</i>	30
<i>Stachys recta</i>	29
<i>Prunus tenella</i>	29
<i>Prunus fruticosa</i>	29
<i>Medicago falcata</i>	28
<i>Thalictrum minus</i>	27
<i>Elytrigia intermedia</i>	26
<i>Caragana frutex</i>	26
<i>Fragaria viridis</i>	25
<i>Elytrigia repens</i> aggr.	24
<i>Salvia nemorosa</i>	23
<i>Achillea millefolium</i> aggr.	23
<i>Falcaria vulgaris</i>	22
<i>Eryngium campestre</i>	22
<i>Stipa capillata</i>	21
<i>Phlomis tuberosa</i>	21
<i>Filipendula vulgaris</i>	21
<i>Vincetoxicum hirundinaria</i>	20
<i>Securigera varia</i>	20
<i>Bromopsis inermis</i>	20
<i>Hypericum perforatum</i>	19
<i>Euphorbia cyparissias</i>	19
<i>Veronica spicata</i>	18
<i>Centaurea scabiosa</i>	18
<i>Agrimonia eupatoria</i>	18
<i>Rosa canina</i> aggr.	17
<i>Prunus spinosa</i>	17
<i>Origanum vulgare</i>	17
<i>Hylotelephium maximum</i>	17
<i>Festuca stricta</i> subsp. <i>sulcata</i>	17
<i>Thymus pulegioides</i>	15
<i>Calamagrostis epigejos</i>	15
<i>Plantago media</i>	14
<i>Asparagus officinalis</i>	14
<i>Artemisia campestris</i>	14
<i>Salvia pratensis</i>	13
<i>Salvia nutans</i>	13
<i>Potentilla argentea</i>	13
<i>Geranium sanguineum</i>	13
<i>Dactylis glomerata</i>	13
<i>Convolvulus arvensis</i>	13
<i>Achillea pannonica</i>	13
<i>Adonis vernalis</i>	13
<i>Stipa pennata</i>	12

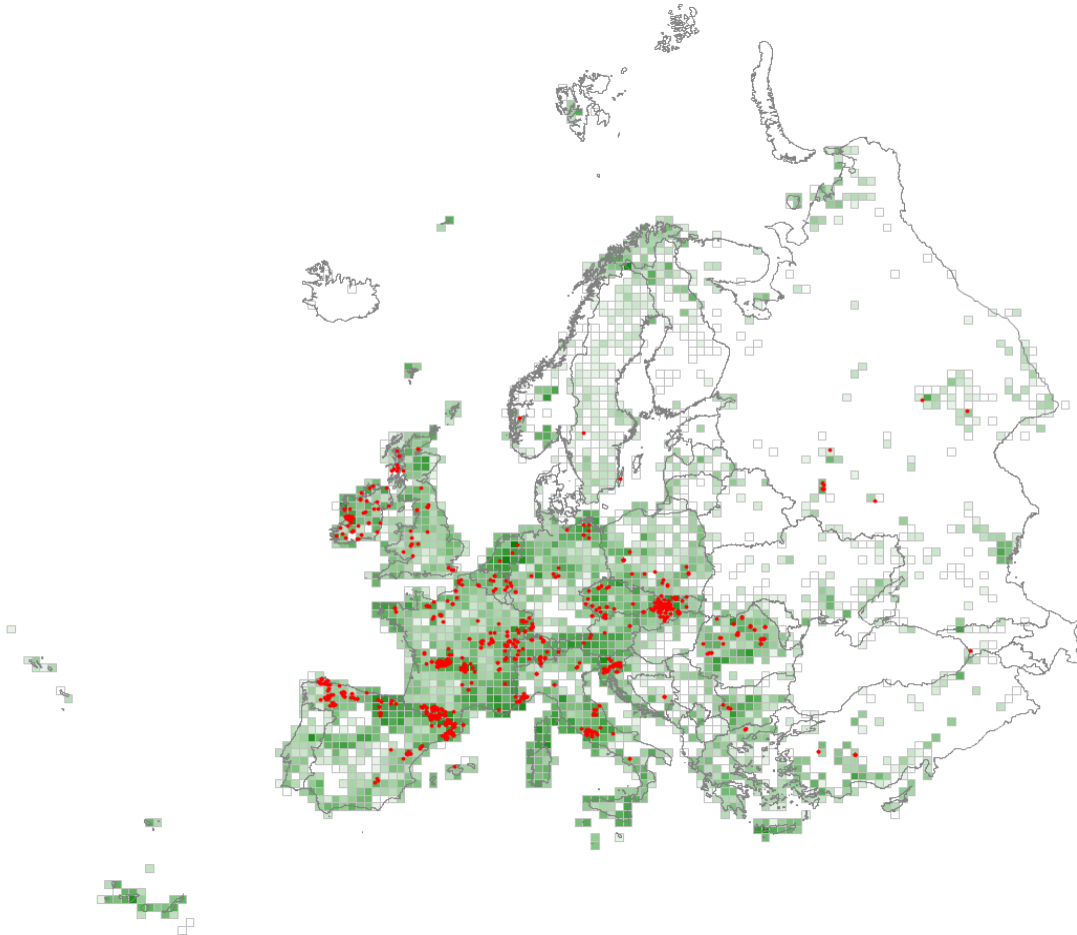
<i>Melica transsilvanica</i>	12
<i>Knautia arvensis</i>	12
<i>Euphorbia nicaeensis</i>	12
<i>Asperula cynanchica</i>	12
<i>Artemisia austriaca</i>	12
<i>Vinca herbacea</i>	11
<i>Spiraea media</i>	11
<i>Scabiosa ochroleuca</i>	11
<i>Koeleria pyramidata</i>	11
<i>Galium mollugo</i> aggr.	11
<i>Galium glaucum</i>	11
<i>Crataegus monogyna</i>	11
<i>Brachypodium pinnatum</i>	11

Dominant species (percentage frequencies of occurrences with cover > 25%)

<i>Prunus tenella</i>	24
<i>Prunus fruticosa</i>	23
<i>Caragana frutex</i>	23
<i>Spiraea media</i>	11
<i>Cytisus ruthenicus</i>	6

## S37 – *Corylus avellana* scrub

Scrub dominated by hazel (*Corylus avellana*). Natural occurrences are found on shallow soils along the northern Atlantic seabords, where they are permanently maintained by exposure to winds, and locally on rocky slopes and cliffs through the continental region. Secondary hazel scrub can develop after by felling of mesic broadleaved forests.



### Corresponding alliances in EuroVegChecklist 2016

- > RHA-01E Astantio-Corylion avellanae Passarge 1978
- <> RHA-01A Berberidion vulgaris Br.-Bl. ex Tx. 1952 nom. conserv. propos.
- <> RHA-01H Tamo communis-Viburnion lantanae (Géhu et al. 1983) Mucina in Mucina et al. 2016
- <> RHA-01D Urtico-Crataegion Passarge et G. Hofmann 1968

### Characteristic species combination

Diagnostic species (phi coefficient \* 100)

*Corylus avellana* 33

Constant species (percentage frequencies)

<i>Corylus avellana</i>	100
<i>Crataegus monogyna</i>	46
<i>Hedera helix</i> aggr.	41
<i>Cornus sanguinea</i>	29
<i>Prunus spinosa</i>	28
<i>Geranium robertianum</i>	28

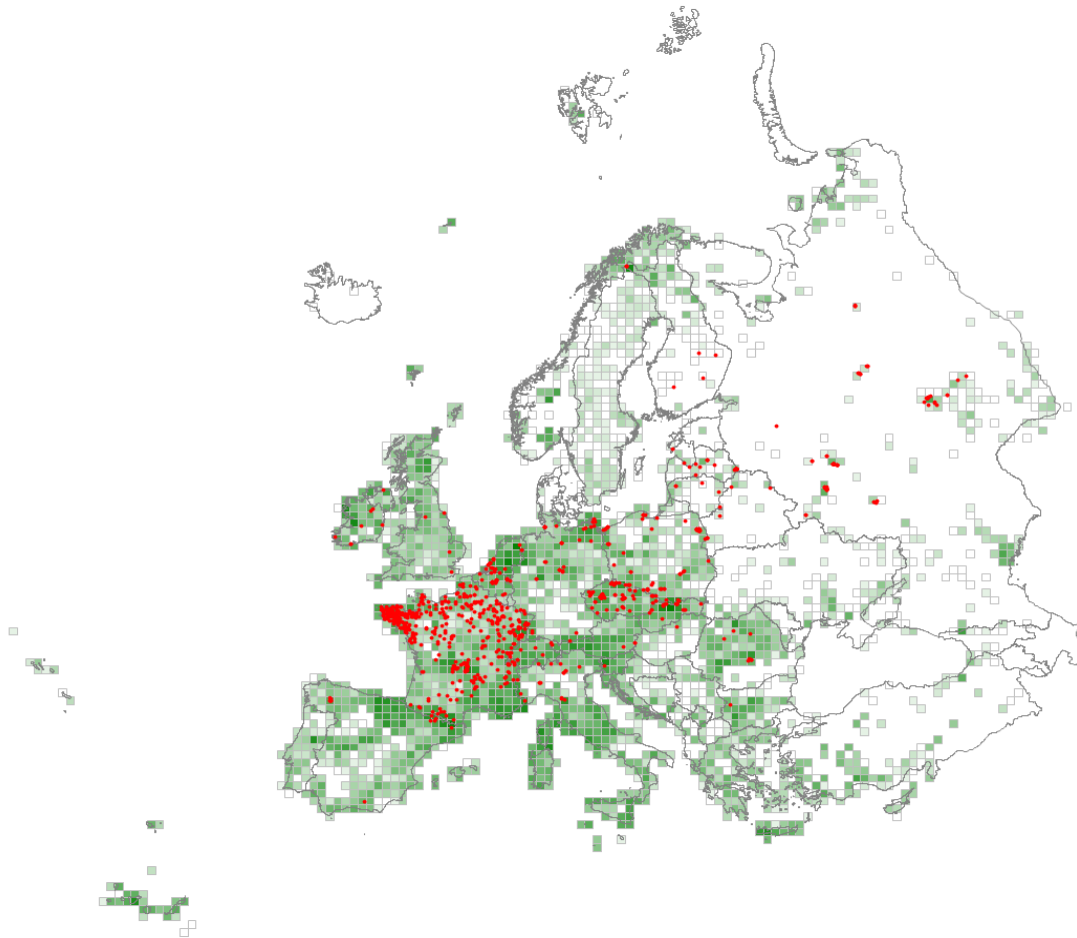
<i>Fragaria vesca</i>	27
<i>Urtica dioica</i>	25
<i>Geum urbanum</i>	25
<i>Brachypodium sylvaticum</i>	25
<i>Poa nemoralis</i>	23
<i>Mercurialis perennis</i>	23
<i>Fraxinus excelsior</i>	23
<i>Rubus fruticosus</i> aggr.	22
<i>Rosa canina</i> aggr.	21
<i>Lonicera periclymenum</i>	21
<i>Stellaria holostea</i>	20
<i>Oxalis acetosella</i>	20
<i>Dryopteris filix-mas</i>	20
<i>Lonicera xylosteum</i>	19
<i>Viola reichenbachiana</i>	18
<i>Primula acaulis</i>	18
<i>Veronica chamaedrys</i> aggr.	17
<i>Pteridium aquilinum</i>	17
<i>Euonymus europaeus</i>	17
<i>Viburnum opulus</i>	16
<i>Ligustrum vulgare</i>	16
<i>Lamium galeobdolon</i>	16
<i>Athyrium filix-femina</i>	16
<i>Aegopodium podagraria</i>	16
<i>Acer campestre</i>	16
<i>Sambucus nigra</i>	15
<i>Hepatica nobilis</i>	15
<i>Galium aparine</i>	15
<i>Campanula trachelium</i>	15
<i>Asarum europaeum</i>	15
<i>Anemone nemorosa</i>	15
<i>Ajuga reptans</i>	15
<i>Sanicula europaea</i>	14
<i>Quercus robur</i>	14
<i>Vicia sepium</i>	13
<i>Viburnum lantana</i>	13
<i>Carex sylvatica</i>	13
<i>Acer pseudoplatanus</i>	13
<i>Polygonatum multiflorum</i>	12
<i>Melica uniflora</i>	12
<i>Fagus sylvatica</i>	12
<i>Euphorbia amygdaloides</i>	12
<i>Dioscorea communis</i>	12
<i>Dactylis glomerata</i>	12
<i>Clematis vitalba</i>	12
<i>Ilex aquifolium</i>	11
<i>Heracleum sphondylium</i>	11

Dominant species (percentage frequencies of occurrences with cover > 25%)

<i>Corylus avellana</i>	100
<i>Hedera helix</i> aggr.	10

## S38 – Temperate forest clearing scrub

Often dense scrub of shrubs and small trees invading after natural or anthropogenic clearance in forests of the temperate zone of Europe.



### Corresponding alliances in EuroVegChecklist 2016

- <> LON-01B Molinio-Frangulion Passarge in Passarge et G. Hofmann 1968
- > ROB-01A Sambuco-Salicion capreae Tx. et Neumann ex Oberd. 1957

### Characteristic species combination

Diagnostic species (phi coefficient \* 100)

<i>Salix caprea</i>	49
<i>Rubus fruticosus</i> aggr.	16
<i>Betula pendula</i>	16

Constant species (percentage frequencies)

<i>Salix caprea</i>	86
<i>Rubus fruticosus</i> aggr.	59
<i>Urtica dioica</i>	48
<i>Betula pendula</i>	46
<i>Quercus robur</i>	42
<i>Corylus avellana</i>	39
<i>Hedera helix</i> aggr.	36
<i>Rubus idaeus</i>	31
<i>Fraxinus excelsior</i>	31

<i>Crataegus monogyna</i>	29
<i>Dactylis glomerata</i>	27
<i>Sambucus nigra</i>	25
<i>Sorbus aucuparia</i>	24
<i>Populus tremula</i>	24
<i>Fragaria vesca</i>	23
<i>Epilobium angustifolium</i>	23
<i>Athyrium filix-femina</i>	23
<i>Fagus sylvatica</i>	22
<i>Ranunculus repens</i>	21
<i>Dryopteris filix-mas</i>	21
<i>Prunus spinosa</i>	20
<i>Juncus effusus</i>	20
<i>Galium aparine</i>	20
<i>Lonicera periclymenum</i>	19
<i>Geranium robertianum</i>	19
<i>Angelica sylvestris</i>	18
<i>Rosa canina</i> aggr.	17
<i>Pteridium aquilinum</i>	17
<i>Picea abies</i>	17
<i>Acer pseudoplatanus</i>	17
<i>Geum urbanum</i>	16
<i>Eupatorium cannabinum</i>	16
<i>Epilobium montanum</i>	16
<i>Dryopteris dilatata</i>	16
<i>Dryopteris carthusiana</i>	15
<i>Deschampsia cespitosa</i> aggr.	15
<i>Cornus sanguinea</i>	15
<i>Cirsium arvense</i>	15
<i>Sambucus racemosa</i>	14
<i>Ilex aquifolium</i>	14
<i>Heracleum sphondylium</i>	14
<i>Carex sylvatica</i>	14
<i>Calamagrostis epigejos</i>	14
<i>Brachypodium sylvaticum</i>	14
<i>Ajuga reptans</i>	14
<i>Agrostis capillaris</i>	14
<i>Prunus avium</i>	13
<i>Pinus sylvestris</i>	13
<i>Frangula alnus</i>	13
<i>Carpinus betulus</i>	13
<i>Stellaria holostea</i>	12
<i>Poa nemoralis</i>	12
<i>Holcus mollis</i>	12
<i>Holcus lanatus</i>	12
<i>Veronica chamaedrys</i> aggr.	11
<i>Oxalis acetosella</i>	11
<i>Hypericum perforatum</i>	11
<i>Glechoma hederacea</i>	11
<i>Galeopsis tetrahit</i> aggr.	11
<i>Cirsium palustre</i>	11
<i>Avenella flexuosa</i>	11
<i>Alnus glutinosa</i>	11

Dominant species (percentage frequencies of occurrences with cover > 25%)

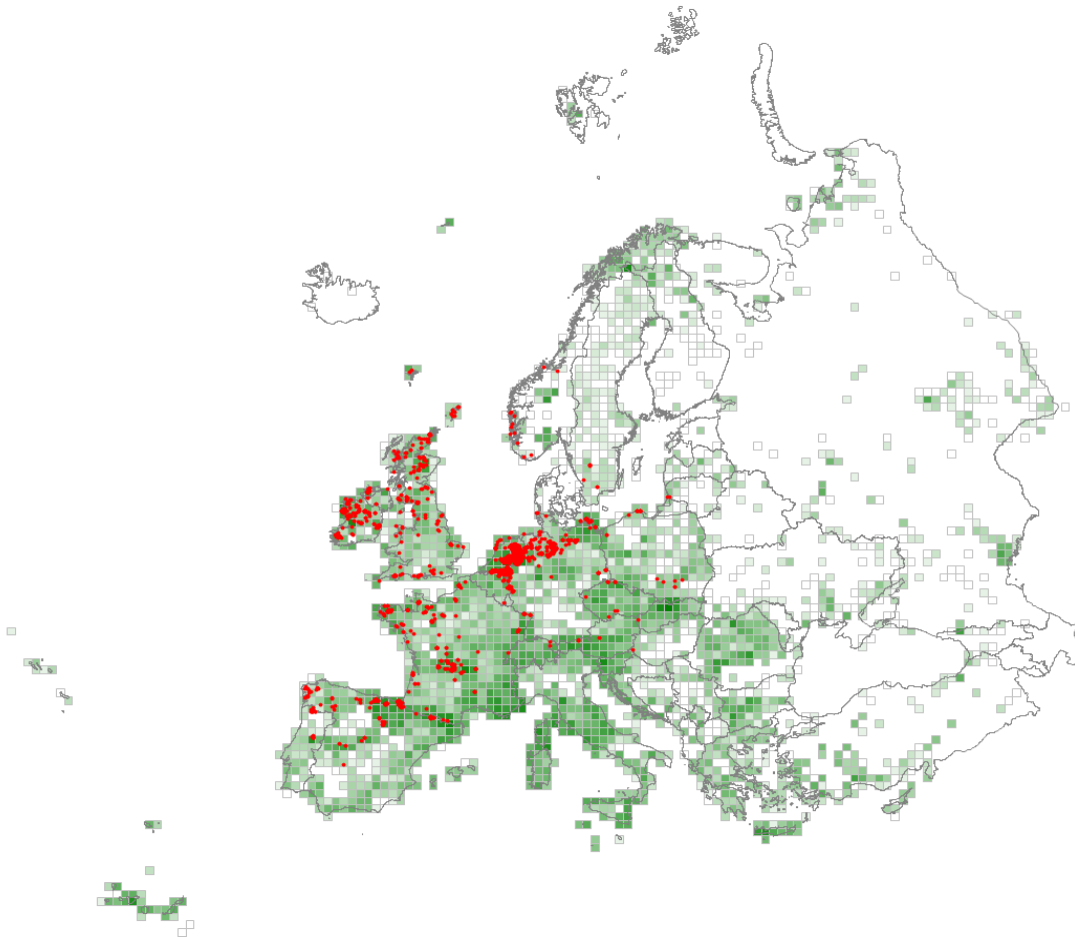
<i>Salix caprea</i>	76
<i>Rubus fruticosus</i> aggr.	30
<i>Hedera helix</i> aggr.	15
<i>Rubus idaeus</i>	13

<i>Betula pendula</i>	11
<i>Corylus avellana</i>	10
<i>Urtica dioica</i>	8
<i>Calamagrostis epigejos</i>	6
<i>Sambucus racemosa</i>	5



## S41 – Wet heath

Heath with prominent *Erica tetralix* on shallow, acid, nutrient-poor peats and peaty mineral soils, kept moist for much of the year and often seasonally waterlogged, through the Atlantic and subatlantic lowlands and foothills of Europe. It typically occurs in wet depressions and seepage areas within dry heaths or as a marginal zone around bogs where drainage of deeper peats can increase its extent. In milder oceanic climates, other *Erica* and *Ulex* spp. occur in richer humid heath. The habitat is frequently influenced by grazing and sod-cutting.



### Corresponding alliances in EuroVegChecklist 2016

- <> OXY-01A *Ericion tetralicis* Schwickerath 1933
- > ULI-01E *Genision micrantho-anglicae* Rivas-Mart. 1979
- <> OXY-01B *Oxycocco-Ericion tetralicis* Nordhagen ex Tx. 1937
- <> ULI-01B *Ulicion* Malcuit 1929

### Characteristic species combination

Diagnostic species (phi coefficient \* 100)

<i>Erica tetralix</i>	42
<i>Juncus squarrosus</i>	26
<i>Trichophorum cespitosum</i>	23
<i>Molinia caerulea</i> aggr.	22
<i>Calluna vulgaris</i>	21
<i>Sphagnum compactum</i>	20
<i>Gentiana pneumonanthe</i>	15

Constant species (percentage frequencies)

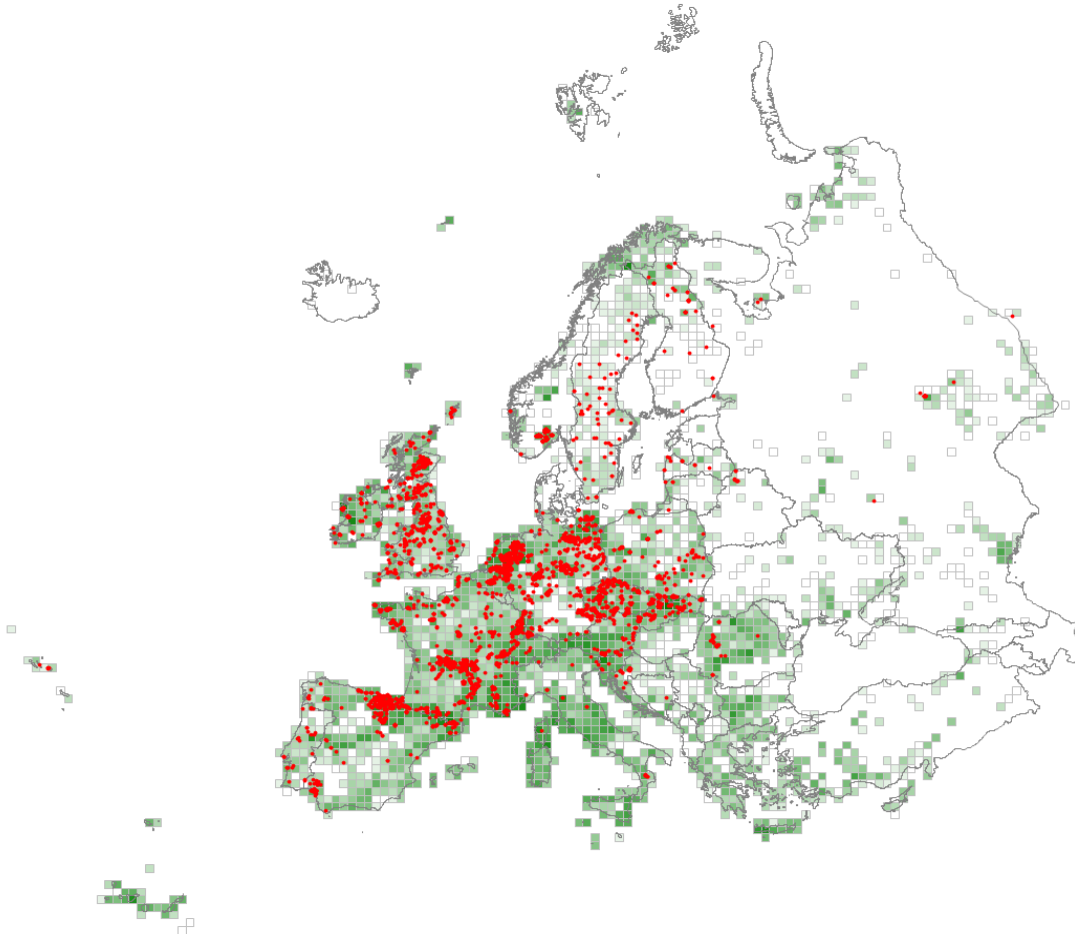
<i>Erica tetralix</i>	88
<i>Calluna vulgaris</i>	86
<i>Molinia caerulea</i> aggr.	77
<i>Potentilla erecta</i>	47
<i>Trichophorum cespitosum</i>	44
<i>Hypnum cupressiforme</i> aggr.	35
<i>Juncus squarrosus</i>	34
<i>Eriophorum angustifolium</i>	31
<i>Drosera rotundifolia</i>	23
<i>Carex panicea</i>	23
<i>Narthecium ossifragum</i>	20
<i>Nardus stricta</i>	19
<i>Sphagnum compactum</i>	17
<i>Pleurozium schreberi</i>	16
<i>Cladonia portentosa</i>	16
<i>Eriophorum vaginatum</i>	15
<i>Dicranum scoparium</i>	14
<i>Betula pubescens</i>	14
<i>Pinus sylvestris</i>	13
<i>Carex nigra</i>	13
<i>Danthonia decumbens</i>	12
<i>Sphagnum tenellum</i>	11
<i>Salix repens</i>	11
<i>Polygala serpyllifolia</i>	11
<i>Luzula campestris</i> aggr.	11
<i>Gentiana pneumonanthe</i>	11
<i>Erica cinerea</i>	11
<i>Cladonia uncialis</i>	11

Dominant species (percentage frequencies of occurrences with cover > 25%)

<i>Erica tetralix</i>	69
<i>Calluna vulgaris</i>	43
<i>Molinia caerulea</i> aggr.	17
<i>Trichophorum cespitosum</i>	5
<i>Hypnum cupressiforme</i> aggr.	5

## S42 – Dry heath

Heath dominated by various ericaceous sub-shrubs on free-draining, nutrient-poor, acid sands and siliceous soils through the lowlands and foothills of Western and Central Europe, extending northwards in more oceanic situations and into continental regions in precipitation-rich areas at higher altitudes. Very often influenced by grazing and burning and frequently a secondary vegetation type derived by clearance of acidophilous forest and maintained anthropogenically.



### Corresponding alliances in EuroVegChecklist 2016

- <> ULI-02B Calluno-Geniston pilosae P. Duvigneaud 1945
- > ULI-01C Daboecion cantabrigae (Dupont ex Rivas-Mart. 1979) Rivas-Mart. et al. in Loidi et al. 1997
- <> ULI-01A Ericion cinereae Böcher 1940
- <> ULI-01D Ericion umbellatae Br.-Bl. in Br.-Bl. et al. 1952
- > ULI-02C Euphorbio-Callunion Schubert ex Passarge 1964
- <> ULI-02D Genisto pilosae-Vaccinion Br.-Bl. 1926
- > ULI-01F Stauracanthion bovinii (Rivas-Mart. 1979) Rivas-Mart. et al. 1999
- <> ULI-01B Ulicion Malcuit 1929

### Characteristic species combination

Diagnostic species (phi coefficient \* 100)

*Calluna vulgaris*

Constant species (percentage frequencies)

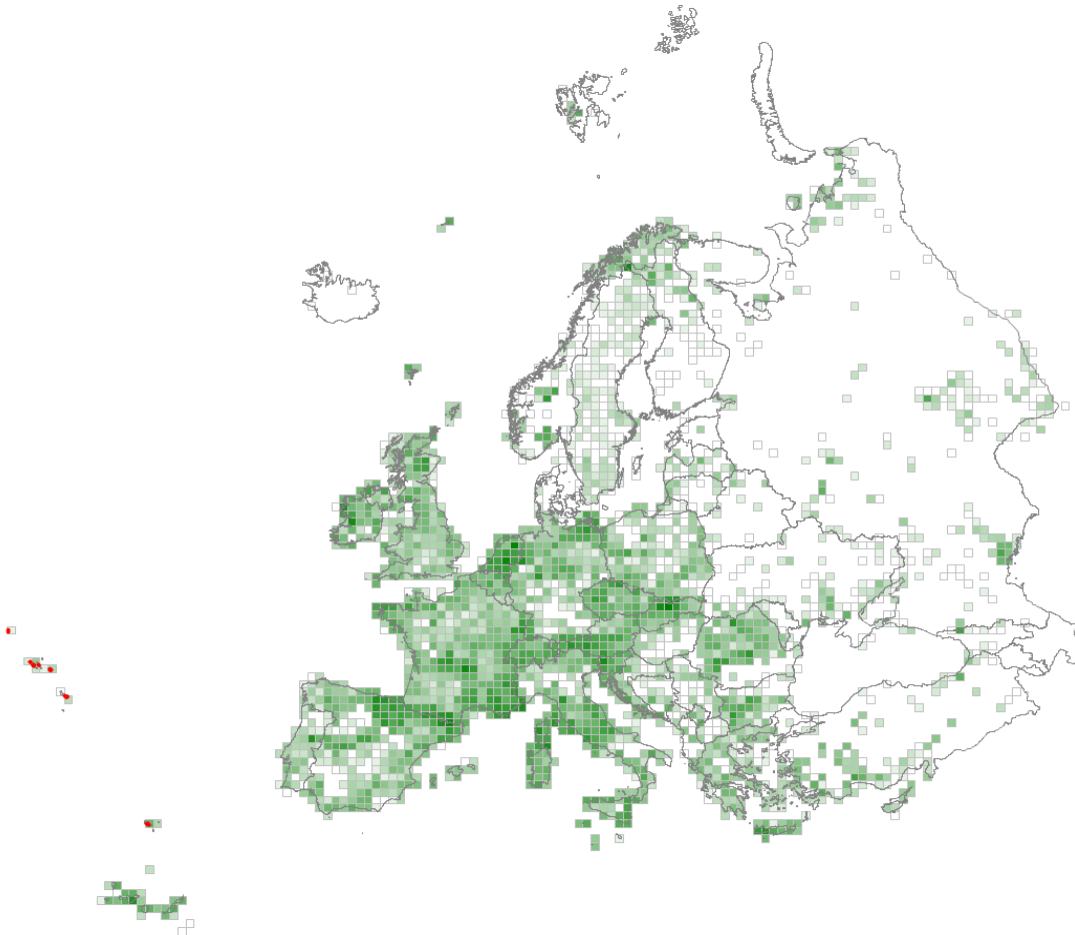
<i>Calluna vulgaris</i>	77
<i>Avenella flexuosa</i>	47
<i>Vaccinium myrtillus</i>	36
<i>Pleurozium schreberi</i>	30
<i>Hypnum cupressiforme</i> aggr.	28
<i>Potentilla erecta</i>	27
<i>Agrostis capillaris</i>	26
<i>Dicranum scoparium</i>	24
<i>Festuca ovina</i>	21
<i>Nardus stricta</i>	18
<i>Genista pilosa</i>	18
<i>Danthonia decumbens</i>	18
<i>Vaccinium vitis-idaea</i>	17
<i>Pinus sylvestris</i>	17
<i>Pilosella officinarum</i>	17
<i>Luzula campestris</i> aggr.	16
<i>Carex pilulifera</i>	16
<i>Anthoxanthum odoratum</i> aggr.	16
<i>Pteridium aquilinum</i>	14
<i>Festuca rubra</i> aggr.	14
<i>Galium saxatile</i>	13
<i>Rumex acetosella</i>	12
<i>Betula pendula</i>	12
<i>Achillea millefolium</i> aggr.	12
<i>Molinia caerulea</i> aggr.	11
<i>Lotus corniculatus</i>	11
<i>Campanula rotundifolia</i>	11

Dominant species (percentage frequencies of occurrences with cover > 25%)

<i>Calluna vulgaris</i>	64
<i>Vaccinium myrtillus</i>	17
<i>Pleurozium schreberi</i>	10
<i>Hypnum cupressiforme</i> aggr.	7
<i>Genista pilosa</i>	6
<i>Erica vagans</i>	6

## S43 – Macaronesian heath

Shrubby vegetation on thin soils in the Azores, Madeira and Canary Islands, colonising pyroclastic debris, lava, rock outcrops and landslips, sometimes cyclically renewed by further disturbance or seral to a forest. Floristically diverse between and within the archipelagos.



### Corresponding alliances in EuroVegChecklist 2016

- > LAU-01D Bystropogono punctati-Telinion maderensis Capelo et al. 2000
- > ULI-01G Daboecion azoricae Lüpnitz 1975
- <> LAU-01A Myrico fayae-Ericion arborea Oberd. 1965
- <> LAU-01B Polysticho falcinelli-Ericion arborea Rivas-Mart. et al. 2002
- > LAU-01C Telino canariensis-Adenocarpion foliolosi Rivas-Mart. et al. 1993

### Characteristic species combination

Diagnostic species (phi coefficient \* 100)

<i>Lysimachia azorica</i>	50
<i>Huperzia dentata</i>	45
<i>Thymus caespititius</i>	45
<i>Tolpis azorica</i>	43
<i>Holcus rigidus</i>	42
<i>Vaccinium cylindraceum</i>	41
<i>Luzula elegans</i>	40
<i>Festuca francoi</i>	39
<i>Leontodon filii</i>	39
<i>Daboecia azorica</i>	39

<i>Hypericum foliosum</i>	35
<i>Blechnum spicant</i>	33
<i>Lycopodiella cernua</i>	31
<i>Erica scoparia</i>	31
<i>Platanthera micrantha</i>	28
<i>Deschampsia foliosa</i>	28
<i>Centaureum scilloides</i>	27
<i>Juniperus brevifolia</i>	24
<i>Leontodon rigens</i>	22
<i>Lotus pedunculatus</i>	21
<i>Agrostis castellana</i>	21
<i>Pittosporum undulatum</i>	20
<i>Calluna vulgaris</i>	20
<i>Carex demissa</i>	17
<i>Frangula azorica</i>	17
<i>Potentilla erecta</i>	16
<i>Frullania tamarisci</i>	16
<i>Danthonia decumbens</i>	16

Constant species (percentage frequencies)

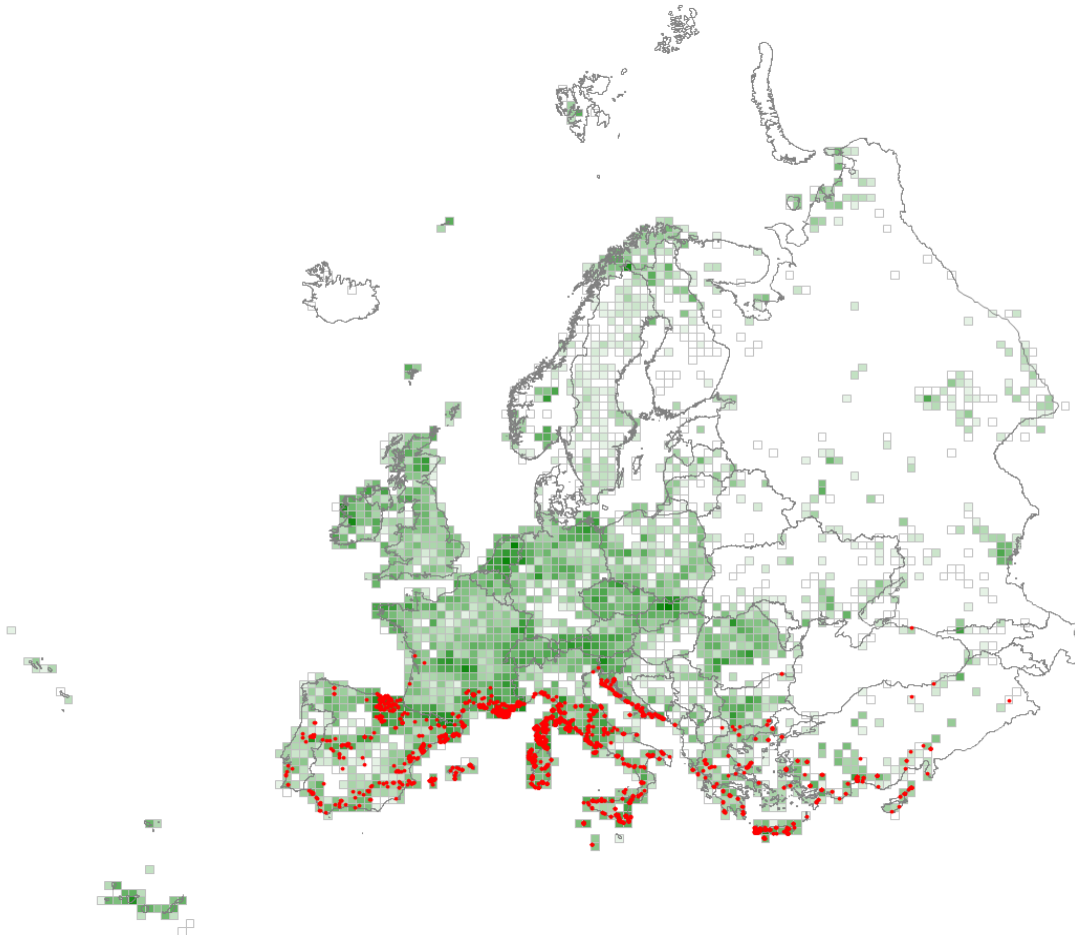
<i>Calluna vulgaris</i>	80
<i>Potentilla erecta</i>	65
<i>Blechnum spicant</i>	60
<i>Erica scoparia</i>	50
<i>Luzula elegans</i>	40
<i>Holcus rigidus</i>	40
<i>Agrostis castellana</i>	40
<i>Vaccinium cylindraceum</i>	35
<i>Lotus pedunculatus</i>	35
<i>Thymus caespititius</i>	30
<i>Huperzia dentata</i>	30
<i>Festuca francoi</i>	30
<i>Danthonia decumbens</i>	30
<i>Anthoxanthum odoratum</i> aggr.	30
<i>Tolpis azorica</i>	25
<i>Lysimachia azorica</i>	25
<i>Juniperus brevifolia</i>	20
<i>Hypochaeris radicata</i>	20
<i>Deschampsia foliosa</i>	20
<i>Carex pilulifera</i>	20
<i>Pteridium aquilinum</i>	15
<i>Molinia caerulea</i> aggr.	15
<i>Leontodon filii</i>	15
<i>Hypericum foliosum</i>	15
<i>Festuca ovina</i>	15
<i>Erica tetralix</i>	15
<i>Daboecia azorica</i>	15
<i>Centaureum scilloides</i>	15
<i>Carex demissa</i>	15

Dominant species (percentage frequencies of occurrences with cover > 25%)

<i>Calluna vulgaris</i>	80
<i>Frullania tamarisci</i>	10
<i>Erica tetralix</i>	10
<i>Thymus caespititius</i>	5
<i>Pteridium aquilinum</i>	5
<i>Erica scoparia</i>	5
<i>Erica arborea</i>	5
<i>Daboecia azorica</i>	5

## S51 – Mediterranean maquis and arborescent matorral

Evergreen sclerophyllous or laurophyllous shrub vegetation forming a dense closed canopy, with or without low emergent trees, on a wide variety of substrates and soils through the thermo- to mesomediterranean belts. May be permanent primary vegetation on xeric sites but is usually derived by the degradation of evergreen deciduous or coniferous forest and much influenced in structure and composition by grazing and fire.



### Corresponding alliances in EuroVegChecklist 2016

- <> QUI-04C Asparago albi-Rhamnion oleoidis Rivas Goday ex Rivas-Mart. 1975
- <> QUI-04L Cerantonio-Pistacion lentisci Zohary et Orshan 1959
- > QUI-04A Ericion arboreae (Rivas-Mart. ex Rivas-Mart. et al. 1986) Rivas-Mart. 1987
- <> QUI-04H Oleo-Cerantonion siliquae Br.-Bl. ex Guinochet et Drouineau 1944
- <> QUI-04E Periplocion angustifoliae Rivas-Mart. 1975
- > QUI-04M Pistacio terebinthi-Rhamnion alaterni Barbero et Quézel 1975
- > QUI-04D Rhamno lycioidis-Quercion cocciferae Rivas Goday ex Rivas-Mart. 1975

### Characteristic species combination

Diagnostic species (phi coefficient \* 100)

<i>Arbutus unedo</i>	17
<i>Pistacia lentiscus</i>	17
<i>Juniperus phoenicea</i>	16
<i>Myrtus communis</i>	15

Constant species (percentage frequencies)

<i>Pistacia lentiscus</i>	45
<i>Rubia peregrina</i>	41
<i>Erica arborea</i>	37
<i>Smilax aspera</i>	33
<i>Asparagus acutifolius</i>	33
<i>Juniperus oxycedrus</i> aggr.	32
<i>Arbutus unedo</i>	28
<i>Juniperus phoenicea</i>	27
<i>Brachypodium retusum</i>	27
<i>Phillyrea latifolia</i>	26
<i>Quercus ilex</i>	25
<i>Cistus salviifolius</i>	25
<i>Myrtus communis</i>	23
<i>Rhamnus alaternus</i>	20
<i>Lonicera implexa</i>	20
<i>Phillyrea angustifolia</i>	19
<i>Rubus ulmifolius</i>	16
<i>Cistus monspeliensis</i>	16
<i>Rosmarinus officinalis</i>	14
<i>Dactylis glomerata</i>	14
<i>Pinus halepensis</i>	13
<i>Olea europaea</i>	13
<i>Daphne gnidium</i>	13
<i>Cistus creticus</i>	13
<i>Calicotome villosa</i>	13
<i>Prasium majus</i>	12
<i>Clematis flammula</i>	12
<i>Arisarum vulgare</i>	12
<i>Quercus coccifera</i>	11

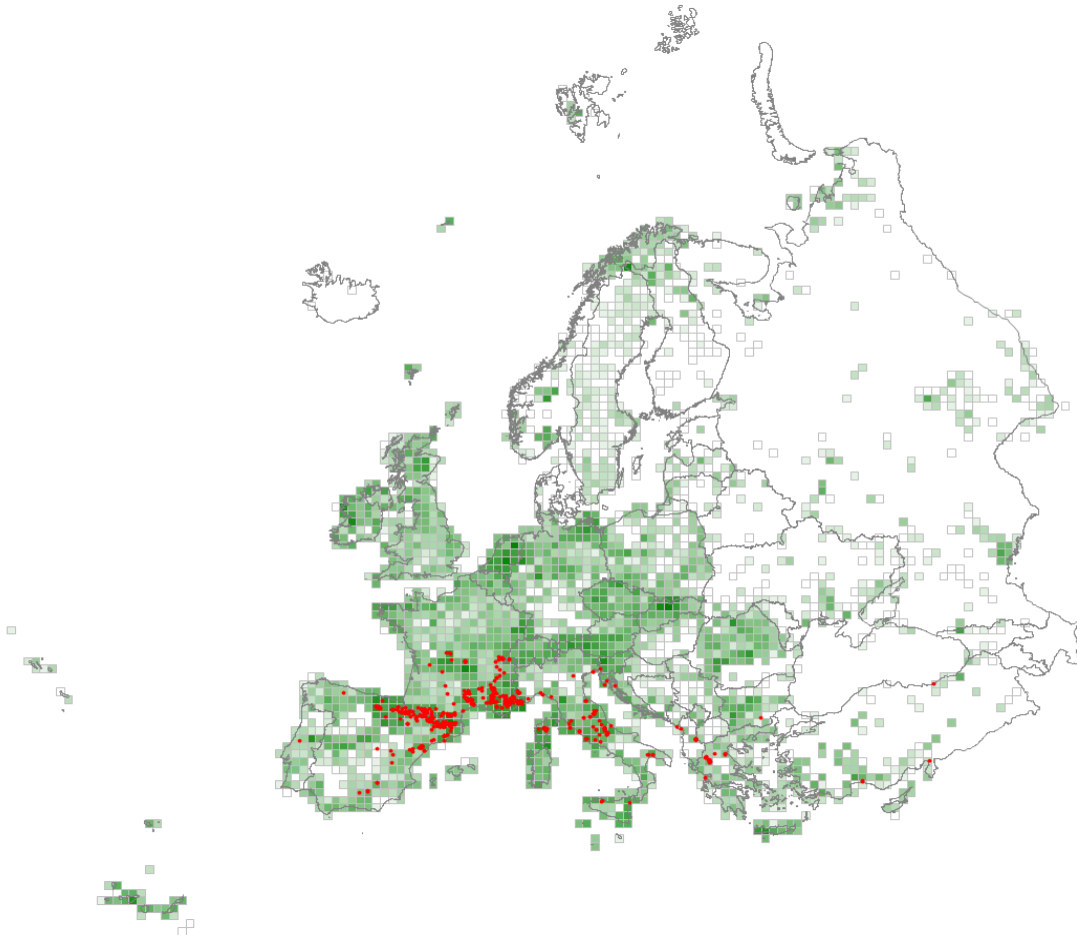
Dominant species (percentage frequencies of occurrences with cover > 25%)

<i>Erica arborea</i>	23
<i>Juniperus phoenicea</i>	19
<i>Juniperus oxycedrus</i> aggr.	15
<i>Arbutus unedo</i>	12
<i>Myrtus communis</i>	9
<i>Phillyrea latifolia</i>	5



## S52 – Submediterranean pseudomaquis

Mixed deciduous-evergreen scrub of shallow, rocky, mostly calcareous soils in the lowlands and foothills of Southern Europe. Usually derived by forest degradation and much affected in structure and composition by grazing, fire and logging.



### Corresponding alliances in EuroVegChecklist 2016

- <> RHA-01B Amelanchiero-Buxion O. de Bolòs et Romo in Romo 1989
- <> RHA-02H Berberido creticae-Prunion cocomiliae Bergmeier 1990
- <> RHA-02D Buxo-Syringion P. Fukarek ex Diklić 1965
- <> RHA-02J Elytrigio nodosae-Rhuion coriariae Korzhenevskii et Ryff ex Didukh et Mucina 2014
- <> RHA-02B Ilici aquifolii-Crataegion laciniatae Ubaldi 2011
- <> RHA-02E Paliuro-Petterion P. Fukarek 1962

### Characteristic species combination

Diagnostic species (phi coefficient \* 100)

<i>Buxus sempervirens</i>	43
<i>Amelanchier ovalis</i>	18

Constant species (percentage frequencies)

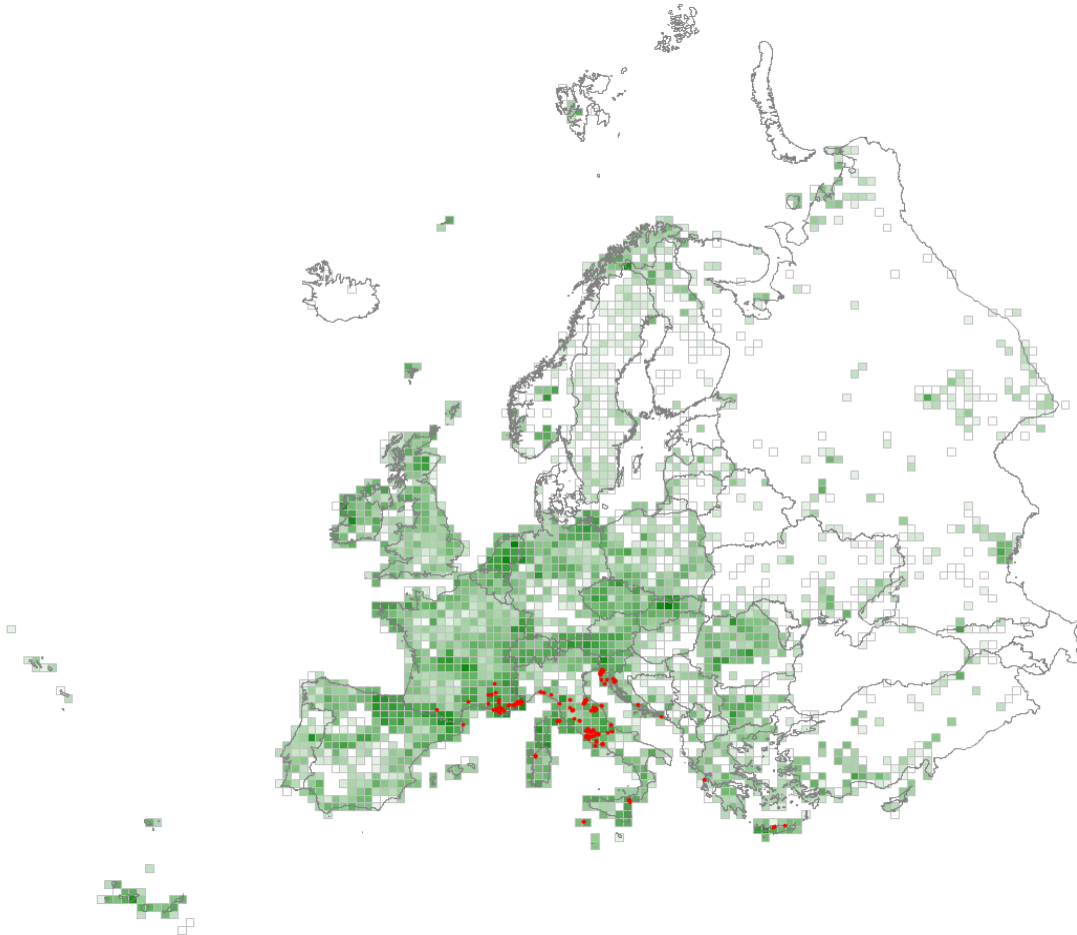
<i>Buxus sempervirens</i>	81
<i>Teucrium chamaedrys</i>	42
<i>Amelanchier ovalis</i>	34
<i>Juniperus communis</i> subsp. <i>communis</i>	31

<i>Thymus vulgaris</i>	29
<i>Quercus pubescens</i>	29
<i>Rubia peregrina</i>	28
<i>Crataegus monogyna</i>	27
<i>Hedera helix</i> aggr.	21
<i>Hepatica nobilis</i>	20
<i>Carex humilis</i>	20
<i>Bromopsis erecta</i>	19
<i>Primula veris</i>	18
<i>Carex halleriana</i>	18
<i>Juniperus oxycedrus</i> aggr.	16
<i>Corylus avellana</i>	16
<i>Pinus sylvestris</i>	15
<i>Hippocrepis emerus</i>	15
<i>Genista scorpius</i>	15
<i>Coronilla minima</i>	15
<i>Asparagus acutifolius</i>	15
<i>Quercus ilex</i>	14
<i>Phillyrea latifolia</i>	14
<i>Helleborus foetidus</i>	14
<i>Festuca ovina</i>	14
<i>Dactylis glomerata</i>	14
<i>Brachypodium pinnatum</i>	14
<i>Sorbus aria</i> aggr.	13
<i>Lavandula angustifolia</i>	13
<i>Hieracium murorum</i>	13
<i>Aphyllanthes monspeliensis</i>	13
<i>Rosa canina</i> aggr.	12
<i>Genista hispanica</i>	12
<i>Fraxinus ornus</i>	12
<i>Fragaria vesca</i>	12
<i>Cytisophyllum sessilifolium</i>	12
<i>Anthyllis vulneraria</i>	12
<i>Viburnum lantana</i>	11
<i>Silene nutans</i>	11
<i>Ruscus aculeatus</i>	11
<i>Rubus ulmifolius</i>	11
<i>Rhamnus saxatilis</i>	11
<i>Prunus spinosa</i>	11
<i>Koeleria vallesiana</i>	11
<i>Helianthemum nummularium</i>	11
<i>Cornus sanguinea</i>	11

Dominant species (percentage frequencies of occurrences with cover > 25%)  
*Buxus sempervirens* 81

## S53 – *Spartium junceum* scrub

Secondary scrub dominated by Spanish broom (*Spartium junceum*), typical of disturbed, open, sunny situations on a wide variety of soils through the Mediterranean, where its rapid establishment is favoured by post-fire seed germination, aggressive rooting, nitrogen-fixation and unpalatability.



### Corresponding alliances in EuroVegChecklist 2016

- <> CYT-03B Cytision oromediterraneo-scoparii Rivas-Mart. et al. 2002
- <> CYT-03C Erico scopariae-Cytision scoparii Mucina in Mucina et al. 2016
- <> CYT-03A Sarothamnion scoparii Oberd. 1957

### Characteristic species combination

Diagnostic species (phi coefficient \* 100)

<i>Spartium junceum</i>	65
<i>Rubus ulmifolius</i>	20
<i>Clematis vitalba</i>	17
<i>Clematis flammula</i>	17
<i>Brachypodium rupestre</i>	16

Constant species (percentage frequencies)

<i>Spartium junceum</i>	100
<i>Rubus ulmifolius</i>	57
<i>Dactylis glomerata</i>	48
<i>Asparagus acutifolius</i>	38

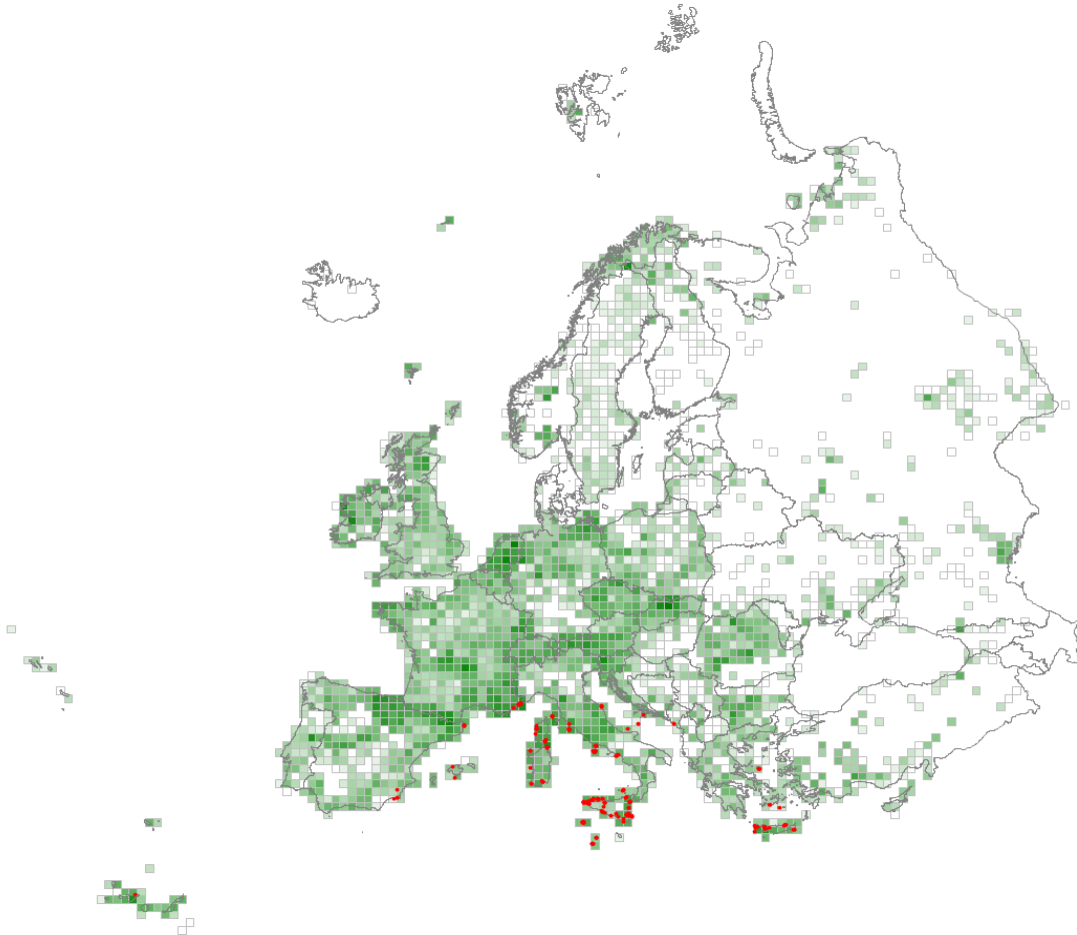
<i>Clematis vitalba</i>	37
<i>Rubia peregrina</i>	36
<i>Crataegus monogyna</i>	35
<i>Quercus pubescens</i>	30
<i>Brachypodium rupestre</i>	29
<i>Cornus sanguinea</i>	28
<i>Rosa canina</i> aggr.	27
<i>Bituminaria bituminosa</i>	26
<i>Teucrium chamaedrys</i>	25
<i>Sanguisorba minor</i> aggr.	25
<i>Prunus spinosa</i>	23
<i>Fraxinus ornus</i>	23
<i>Clematis flammula</i>	23
<i>Daucus carota</i>	22
<i>Bromopsis erecta</i>	22
<i>Dorycnium pentaphyllum</i>	21
<i>Carex flacca</i>	20
<i>Lonicera etrusca</i>	18
<i>Brachypodium phoenicoides</i>	18
<i>Eryngium campestre</i>	17
<i>Juniperus oxycedrus</i> aggr.	16
<i>Juniperus communis</i> subsp. <i>communis</i>	16
<i>Ulmus minor</i>	15
<i>Rosa sempervirens</i>	14
<i>Rhamnus alaternus</i>	14
<i>Osyris alba</i>	14
<i>Ligustrum vulgare</i>	14
<i>Hypericum perforatum</i>	14
<i>Helichrysum italicum</i>	14
<i>Dorycnium hirsutum</i>	14
<i>Dittrichia viscosa</i>	14
<i>Picris hieracioides</i>	13
<i>Thymus vulgaris</i>	12
<i>Hippocrepis emerus</i>	12
<i>Hedera helix</i> aggr.	12
<i>Rosa rubiginosa</i> aggr.	11
<i>Ononis spinosa</i>	11
<i>Galium mollugo</i> aggr.	11
<i>Foeniculum vulgare</i>	11
<i>Centaurium erythraea</i>	11
<i>Carlina corymbosa</i> aggr.	11
<i>Brachypodium pinnatum</i>	11

Dominant species (percentage frequencies of occurrences with cover > 25%)

<i>Spartium junceum</i>	100
<i>Brachypodium rupestre</i>	7
<i>Bromopsis erecta</i>	6
<i>Brachypodium phoenicoides</i>	6

## S54 – Thermomediterranean arid scrub

Scrub with a usually low and rather open cover of shrubs with sub-shrubs, dwarf shrubs and herbs between, on dry soils of varied composition in the thermomediterranean belt, and of very diverse local composition. Primary and permanent in more arid and exposed situations, but can be successional to a forest and often much affected by grazing.



### Corresponding alliances in EuroVegChecklist 2016

- <> QUI-04C Asparago albi-Rhamnion oleoidis Rivas Goday ex Rivas-Mart. 1975
- <> QUI-04E Periplocion angustifoliae Rivas-Mart. 1975
- > QUI-04K Phlomidio fruticosae-Euphorbion dendroidis Mucina et Dimopoulos in Mucina et al. 2016

### Characteristic species combination

Diagnostic species (phi coefficient \* 100)

<i>Euphorbia dendroides</i>	70
<i>Teucrium fruticans</i>	38
<i>Olea europaea</i>	29
<i>Asparagus albus</i>	29
<i>Ruta chalepensis</i>	28
<i>Prasium majus</i>	28
<i>Drimys pancratioides</i>	26
<i>Chamaerops humilis</i>	26
<i>Pistacia lentiscus</i>	25
<i>Arisarum vulgare</i>	23

<i>Ferula communis</i> aggr.	23
<i>Ampelodesmos mauritanicus</i>	21
<i>Hyparrhenia hirta</i>	21
<i>Asphodelus ramosus</i>	20
<i>Asparagus acutifolius</i>	18
<i>Calicotome infesta</i>	18
<i>Genista ephedroides</i>	18
<i>Anagyris foetida</i>	18
<i>Phagnalon saxatile</i>	17
<i>Calicotome villosa</i>	17
<i>Lomelosia cretica</i>	16
<i>Carlina sicula</i>	16
<i>Micromeria graeca</i>	16

Constant species (percentage frequencies)

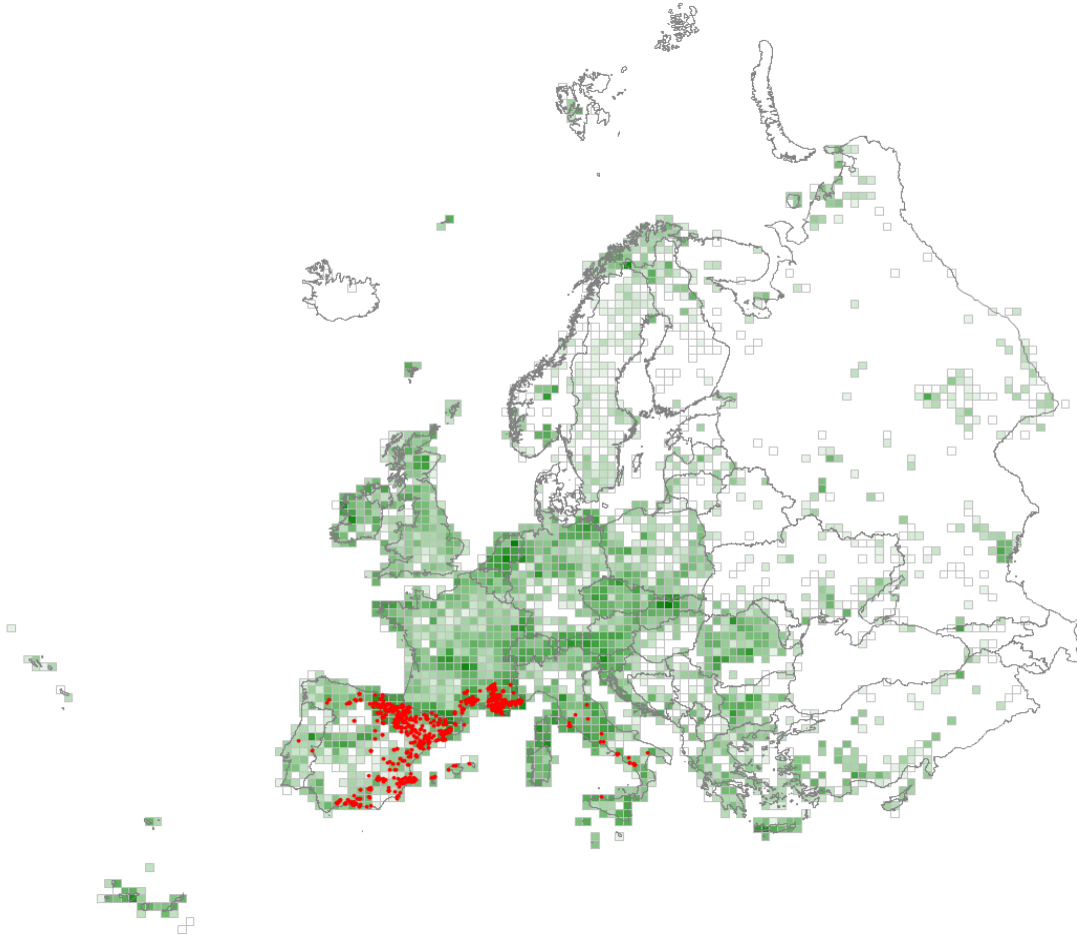
<i>Euphorbia dendroides</i>	86
<i>Pistacia lentiscus</i>	64
<i>Asparagus acutifolius</i>	48
<i>Olea europaea</i>	46
<i>Prasium majus</i>	41
<i>Hyparrhenia hirta</i>	41
<i>Dactylis glomerata</i>	39
<i>Arisarum vulgare</i>	39
<i>Asphodelus ramosus</i>	34
<i>Smilax aspera</i>	32
<i>Rubia peregrina</i>	32
<i>Brachypodium retusum</i>	32
<i>Teucrium fruticans</i>	30
<i>Bituminaria bituminosa</i>	26
<i>Phagnalon saxatile</i>	23
<i>Chamaerops humilis</i>	23
<i>Calicotome villosa</i>	23
<i>Asparagus albus</i>	22
<i>Ruta chalepensis</i>	21
<i>Ampelodesmos mauritanicus</i>	21
<i>Rhamnus alaternus</i>	18
<i>Myrtus communis</i>	18
<i>Micromeria graeca</i>	18
<i>Ferula communis</i> aggr.	18
<i>Rosmarinus officinalis</i>	16
<i>Phillyrea latifolia</i>	16
<i>Thymbra capitata</i>	15
<i>Reichardia picroides</i>	15
<i>Periploca angustifolia</i>	15
<i>Avena barbata</i>	15
<i>Drimia maritima</i> aggr.	14
<i>Cistus monspeliensis</i>	14
<i>Piptatherum miliaceum</i>	13
<i>Carlina corymbosa</i> aggr.	13
<i>Teucrium flavum</i>	12
<i>Sedum sediforme</i>	12
<i>Phlomis fruticosa</i>	12
<i>Phagnalon rupestre</i>	12
<i>Juniperus phoenicea</i>	12
<i>Erica multiflora</i>	12
<i>Valantia hispida</i>	11
<i>Daucus carota</i>	11
<i>Briza maxima</i>	11
<i>Allium subhirsutum</i>	11

Dominant species (percentage frequencies of occurrences with cover > 25%)

<i>Euphorbia dendroides</i>	75
<i>Periploca angustifolia</i>	13
<i>Chamaerops humilis</i>	8
<i>Pistacia lentiscus</i>	6

## S61 – Western basiphilous garrigue

Sub-shrub vegetation dominated by nanophanerophytes and chamaephytes on thin, base-rich soils through the western thermo- to mesomediterranean belts. Its species composition is very diverse in response to differences in local climate and soils. On rocky slopes, it can be permanent vegetation but is often derived from forest clearance and is much affected by grazing and fire.



### Corresponding alliances in EuroVegChecklist 2016

- <> ROS-05A *Andryalion agardhii* Rivas-Mart. ex Rivas Goday et Mayor 1966
- > ROS-04B *Anthyllido terniflorae-Salsolion papillosae* Rivas Goday et Esteve 1968
- > ROS-01I *Cisto cretici-Genistion corsicae* Arrigoni et Di Tommaso 1991
- > ROS-01B *Eryngio trifidi-Ulicion erinacei* Rothmaler 1943
- > ONO-02E *Genistion lobelii* Molinier 1934
- > ROS-01E *Helianthemo italici-Aphyllanthion monspeliensis* Díez Garretas et al. 1998
- <> ROS-01H *Hypericion balearici* O. de Bolòs et Molinier 1958
- > ROS-01G *Hypericion ericoidis* Esteve ex M. Costa et Peris 1985
- > ROS-05B *Lavandulion lanatae* (Martínez-Parras et al. 1984) Rivas-Mart. et al. 2002
- > ONO-02H *Lavandulo angustifoliae-Genistion cinerea* Barbero et al. 1974
- > ROS-01A *Lavandulo latifoliae-Genistion boissieri* Rivas Goday et Rivas-Mart. 1969
- > ONO-01C *Plantagini discoloris-Thymion mastigophori* Molina et Izco 1989
- > ROS-01J *Polygalo-Seslerion insularis* Arrigoni ex Arrigoni et Di Tommaso 1986
- <> ROS-01F *Rosmarinion officinalis* Molinier 1934
- > ONO-01D *Seselio granatensis-Festucion hystricis* Rivas-Mart. in Rivas-Mart. et al. 2011
- > ROS-04C *Sideritidion bourgaeanae* Peinado et Martínez-Parras in Peinado et al. 1992
- > ROS-01D *Sideritido incanae-Salvion lavandulifoliae* (Rivas Goday et Rivas-Mart. 1969)



- Izco et Molina 1989
- > ROS-04A Thymo-Sideritidion leucanthae O. de Bolòs 1957
  - > ROS-01C Ulici densi-Thymion sylvestris (Capelo et al. 1993) J.C. Costa et al. 2009

### Characteristic species combination

Diagnostic species (phi coefficient \* 100)

<i>Genista scorpius</i>	30
<i>Thymus vulgaris</i>	29
<i>Coris monspeliensis</i>	29
<i>Lavandula latifolia</i>	28
<i>Fumana ericifolia</i>	27
<i>Aphyllanthes monspeliensis</i>	27
<i>Helictochloa bromoides</i>	26
<i>Rosmarinus officinalis</i>	25
<i>Bupleurum fruticosum</i>	25
<i>Argyrolobium zanonii</i>	25
<i>Staehelina dubia</i>	24
<i>Helianthemum marifolium</i>	24
<i>Erica multiflora</i>	24
<i>Rhaponticum coniferum</i>	23
<i>Lithodora fruticosa</i>	23
<i>Atractylis humilis</i>	23
<i>Fumana thymifolia</i>	22
<i>Coronilla minima</i>	22
<i>Koeleria vallesiana</i>	21
<i>Hippocrepis scorpioides</i>	20
<i>Cistus clusii</i>	20
<i>Fumana ericoides</i>	20
<i>Ononis minutissima</i>	20
<i>Globularia alypum</i>	20
<i>Linum suffruticosum</i> aggr.	20
<i>Brachypodium retusum</i>	20
<i>Pinus halepensis</i>	19
<i>Dorycnium pentaphyllum</i>	19
<i>Polygala rupestris</i>	18
<i>Helianthemum violaceum</i>	18
<i>Stipa juncea</i>	18
<i>Cistus albidus</i>	18
<i>Orobanche latisquama</i>	17
<i>Helianthemum cinereum</i>	17
<i>Convolvulus lanuginosus</i>	16
<i>Stipa offneri</i>	16
<i>Centaurea linifolia</i>	16
<i>Thymelaea tinctoria</i>	16
<i>Helichrysum stoechas</i>	15
<i>Carex halleriana</i>	15

Constant species (percentage frequencies)

<i>Thymus vulgaris</i>	65
<i>Brachypodium retusum</i>	52
<i>Genista scorpius</i>	47
<i>Rosmarinus officinalis</i>	46
<i>Koeleria vallesiana</i>	42
<i>Dorycnium pentaphyllum</i>	40
<i>Aphyllanthes monspeliensis</i>	40
<i>Teucrium polium</i> aggr.	37
<i>Lavandula latifolia</i>	35

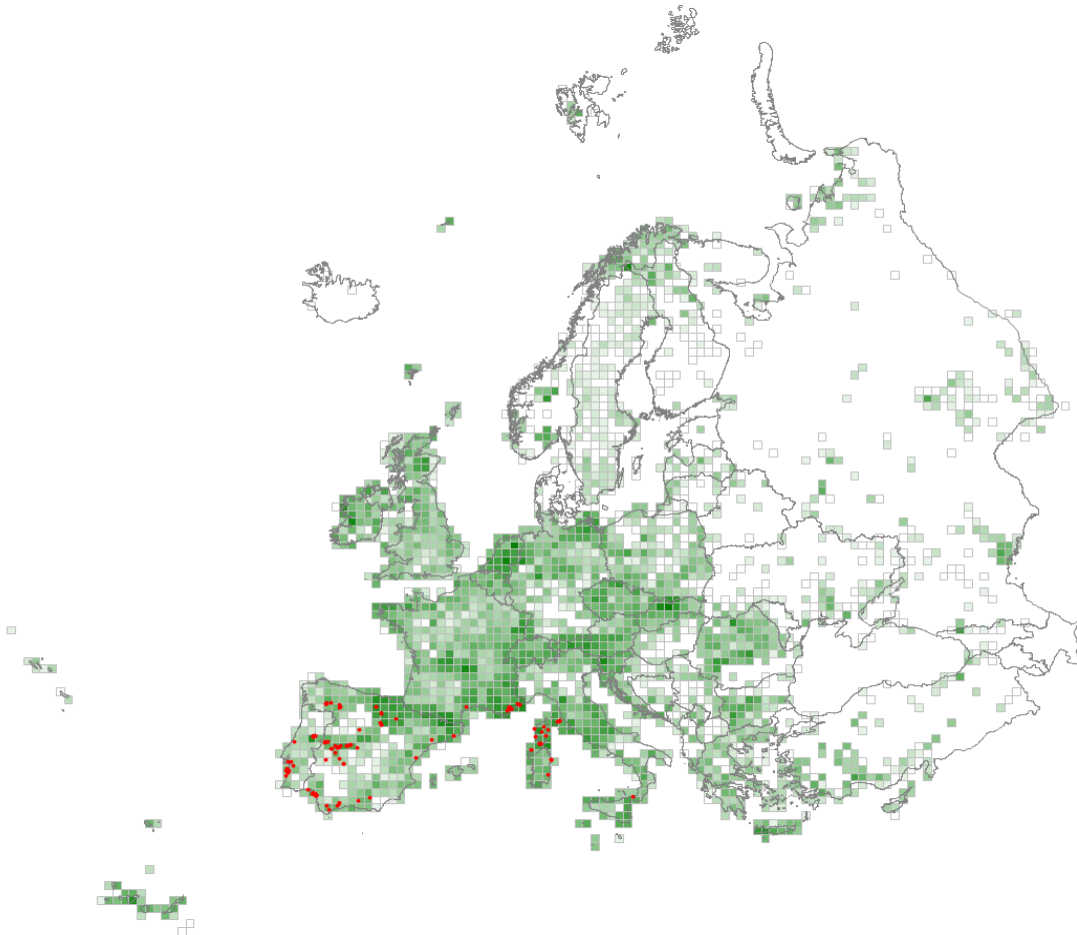
<i>Pinus halepensis</i>	34
<i>Helictochloa bromoides</i>	33
<i>Coronilla minima</i>	33
<i>Coris monspeliensis</i>	30
<i>Helichrysum stoechas</i>	28
<i>Fumana ericifolia</i>	28
<i>Carex halleriana</i>	26
<i>Argyrolobium zanonii</i>	26
<i>Linum suffruticosum</i> aggr.	25
<i>Juniperus oxycedrus</i> aggr.	25
<i>Fumana thymifolia</i>	25
<i>Quercus coccifera</i>	24
<i>Staehelina dubia</i>	23
<i>Rhaponticum coniferum</i>	22
<i>Bupleurum fruticosum</i>	22
<i>Eryngium campestre</i>	21
<i>Teucrium chamaedrys</i>	20
<i>Ononis minutissima</i>	20
<i>Erica multiflora</i>	20
<i>Fumana ericoides</i>	19
<i>Carex humilis</i>	19
<i>Atractylis humilis</i>	19
<i>Cistus albidus</i>	18
<i>Bromopsis erecta</i>	17
<i>Sedum sediforme</i>	16
<i>Lithodora fruticosa</i>	16
<i>Genista hispanica</i>	16
<i>Helianthemum apenninum</i>	15
<i>Helianthemum italicum</i>	14
<i>Dactylis glomerata</i>	14
<i>Buxus sempervirens</i>	14
<i>Asperula cynanchica</i>	14
<i>Ulex parviflorus</i>	13
<i>Helianthemum marifolium</i>	13
<i>Globularia alypum</i>	13
<i>Anthyllis vulneraria</i>	13
<i>Pistacia lentiscus</i>	12
<i>Fumana procumbens</i>	12
<i>Echinops ritro</i>	12
<i>Stipa offneri</i>	11
<i>Pilosella officinarum</i>	11
<i>Linum narbonense</i>	11
<i>Juniperus phoenicea</i>	11
<i>Helianthemum violaceum</i>	11
<i>Helianthemum syriacum</i>	11
<i>Helianthemum cinereum</i>	11
<i>Helianthemum canum</i>	11
<i>Cistus clusii</i>	11
<i>Brachypodium phoenicoides</i>	11

Dominant species (percentage frequencies of occurrences with cover > 25%)

<i>Rosmarinus officinalis</i>	20
<i>Thymus vulgaris</i>	11
<i>Erica multiflora</i>	11
<i>Genista hispanica</i>	9
<i>Brachypodium retusum</i>	7
<i>Genista scorpius</i>	6

## S62 – Western acidophilous garrigue

Sub-shrub vegetation dominated by nanophanerophytes on thin, acidic soils, developed on hard silicate bedrock or soft sand, through the western thermo- to lower supramediterranean belts. Its species composition is very diverse in response to differences in local climate and soils. On rocky slopes, it can be permanent vegetation but is often derived from forest clearance or abandonment of farm fields and is much affected by grazing and fire.



### Corresponding alliances in EuroVegChecklist 2016

- > LAV-01H Armerio sardoae-Geniston salzmannii Arrigoni 1986
- > LAV-01F Calicotomo villosae-Geniston tyrrhenae Biondi 2000
- > LAV-01E Cistion ladaniferi Br.-Bl. ex A. Bolòs et O. Bolòs in A. Bolòs 1950
- > LAV-01A Cistion laurifolii Rivas Goday in Rivas Goday et al. 1956
- <> LAV-02A Coremation albi Rothmaler 1943
- <> ULI-01D Ericion umbellatae Br.-Bl. in Br.-Bl. et al. 1952
- <> LAV-01D Quercion fruticosae Rothmaler 1954
- > LAV-01B Staehelino-Ulicion baetici Rivas Goday et Rivas-Mart. 1969
- > LAV-01G Teucrion mari (Gamisans et Muracciole 1984) Biondi et Mossa 1992
- > LAV-01C Ulici argentei-Cistion ladaniferi Br.-Bl. et al. 1964

### Characteristic species combination

Diagnostic species (phi coefficient \* 100)

<i>Cytinus hypocistis</i>	48
<i>Cistus ladanifer</i>	45
<i>Erica australis</i>	41

<i>Lavandula pedunculata</i>	40
<i>Cistus calycinus</i>	34
<i>Cistus halimifolius</i>	34
<i>Genista hirsuta</i>	32
<i>Ulex genistoides</i>	30
<i>Thymus mastichina</i>	30
<i>Tuberaria lignosa</i>	30
<i>Erophaca baetica</i>	29
<i>Erica umbellata</i>	28
<i>Cistus ocymoides</i>	27
<i>Thapsia villosa</i>	26
<i>Genista tridentata</i>	25
<i>Cistus crispus</i>	23
<i>Ulex parviflorus</i>	23
<i>Thymus capitellatus</i>	23
<i>Helichrysum italicum</i>	23
<i>Cistus populifolius</i>	23
<i>Lavandula stoechas</i>	23
<i>Armeria velutina</i>	22
<i>Cistus salviifolius</i>	22
<i>Genista triacanthos</i>	21
<i>Andryala arenaria</i>	21
<i>Pinus pinea</i>	19
<i>Thymus albicans</i>	18
<i>Narcissus triandrus</i> aggr.	17
<i>Daphne gnidium</i>	17
<i>Quercus rotundifolia</i>	16
<i>Cistus psilosepalus</i>	16
<i>Glandora prostrata</i>	16
<i>Cytisus striatus</i>	15
<i>Tuberaria guttata</i>	15
<i>Calicotome spinosa</i>	15

Constant species (percentage frequencies)

<i>Helichrysum italicum</i>	44
<i>Cistus salviifolius</i>	41
<i>Lavandula pedunculata</i>	36
<i>Cytinus hypocistis</i>	36
<i>Cistus ladanifer</i>	32
<i>Lavandula stoechas</i>	30
<i>Erica australis</i>	27
<i>Dactylis glomerata</i>	26
<i>Rosmarinus officinalis</i>	25
<i>Daphne gnidium</i>	25
<i>Cistus halimifolius</i>	24
<i>Tuberaria guttata</i>	23
<i>Calluna vulgaris</i>	23
<i>Thymus mastichina</i>	22
<i>Ulex parviflorus</i>	20
<i>Pistacia lentiscus</i>	20
<i>Pinus pinea</i>	20
<i>Carlina corymbosa</i> aggr.	19
<i>Thapsia villosa</i>	18
<i>Quercus rotundifolia</i>	18
<i>Pinus pinaster</i>	18
<i>Juniperus oxycedrus</i> aggr.	18
<i>Erica umbellata</i>	18
<i>Rubia peregrina</i>	17
<i>Cistus monspeliensis</i>	17

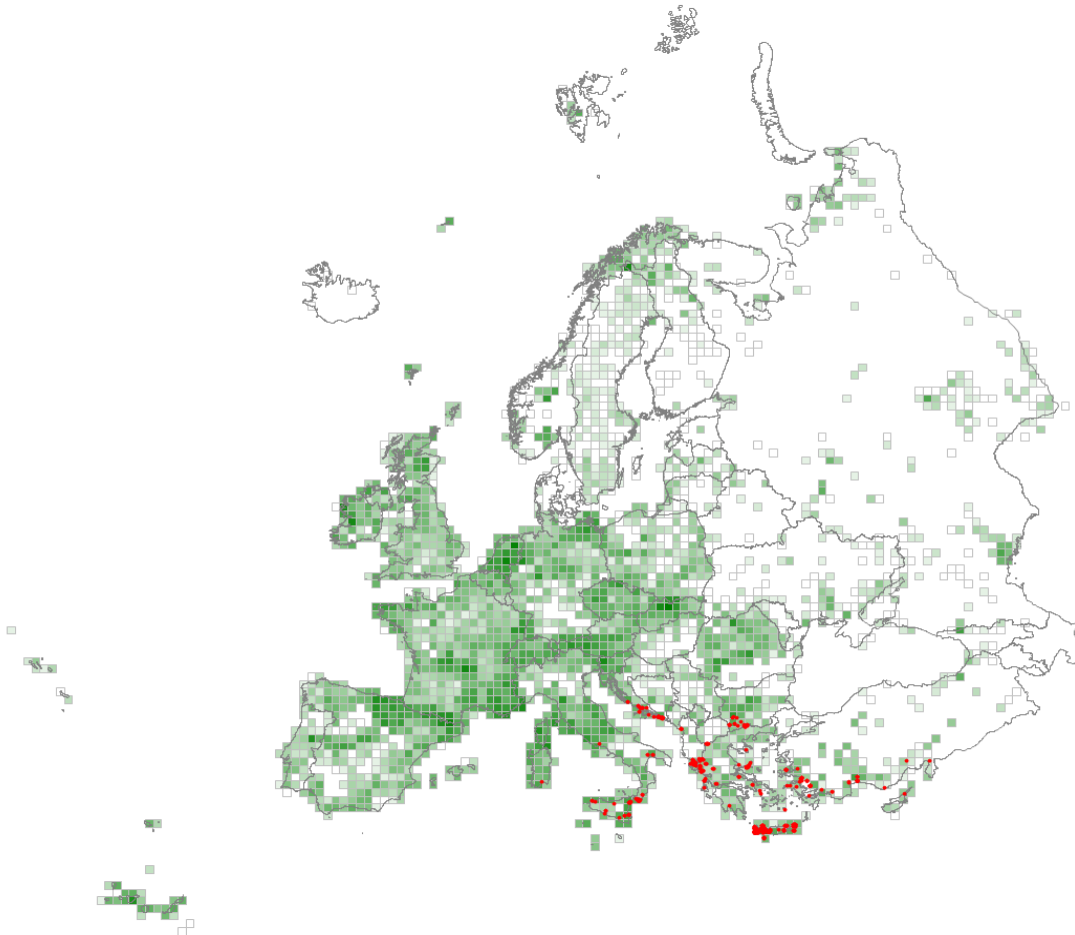
<i>Cistus calycinus</i>	17
<i>Brachypodium retusum</i>	17
<i>Phillyrea angustifolia</i>	16
<i>Tuberaria lignosa</i>	15
<i>Genista tridentata</i>	15
<i>Asparagus acutifolius</i>	15
<i>Cistus albidus</i>	14
<i>Briza maxima</i>	14
<i>Ulex genistoides</i>	12
<i>Genista hirsuta</i>	12
<i>Erica arborea</i>	12
<i>Drimia maritima</i> aggr.	12
<i>Cistus ocymoides</i>	12
<i>Calicotome spinosa</i>	12
<i>Arbutus unedo</i>	12
<i>Aira caryophyllea</i>	12
<i>Sanguisorba minor</i> aggr.	11
<i>Pinus halepensis</i>	11
<i>Eryngium campestre</i>	11
<i>Erophaca baetica</i>	11

Dominant species (percentage frequencies of occurrences with cover > 25%)

<i>Cistus ladanifer</i>	24
<i>Cistus halimifolius</i>	12
<i>Ulex parviflorus</i>	10
<i>Erica umbellata</i>	7
<i>Cistus populifolius</i>	7
<i>Cistus ocymoides</i>	7
<i>Cistus albidus</i>	7
<i>Thymus mastichina</i>	6
<i>Lavandula stoechas</i>	6

## S63 – Eastern garrigue

Low, mostly evergreen sclerophyllous scrub on diverse soils occurring through the Eastern Mediterranean meso-, thermo- and occasionally supramediterranean belts, including the regions around the southern seaboard of the Black Sea. The habitat is derived from forest degradation and usually maintained by grazing and fire. Vegetation structure and composition vary greatly with local climate and human impacts.



### Corresponding alliances in EuroVegChecklist 2016

- > ROS-06A Cisto cretici-Ericion manipuliflorae Horvatić 1958
- > ROS-06B Cisto eriocephali-Ericion multiflorae Biondi 2000
- > ROS-06D Dorycnio-Coridothymion capitati (Oberd. 1954) S. Brullo et al. 1997
- <> ROS-06C Micromerion Oberd. 1954

### Characteristic species combination

Diagnostic species (phi coefficient \* 100)

<i>Phlomis fruticosa</i>	36
<i>Erica manipuliflora</i>	34
<i>Thymra capitata</i>	28
<i>Calicotome villosa</i>	25
<i>Anisantha fasciculata</i>	23
<i>Drimia maritima</i> aggr.	22
<i>Cistus creticus</i>	22
<i>Teucrium microphyllum</i>	22
<i>Genista acanthoclada</i>	21

<i>Fumana arabica</i>	21
<i>Cuscuta palaestina</i> aggr.	20
<i>Phagnalon rupestre</i>	20
<i>Filago aegaea</i>	20
<i>Satureja thymbra</i>	18
<i>Valantia hispida</i>	18
<i>Leontodon tuberosus</i>	18
<i>Micromeria juliana</i>	18
<i>Allium rubrovittatum</i>	18
<i>Crucianella latifolia</i>	18
<i>Tordylium apulum</i>	17
<i>Sarcopoterium spinosum</i>	17
<i>Muscari spreizenhoferi</i>	17
<i>Cistus parviflorus</i>	16
<i>Euphorbia dimorphocaulon</i>	16
<i>Crepis neglecta</i> aggr.	16
<i>Asperula rigida</i>	16
<i>Lomelosia palaestina</i>	15
<i>Biscutella didyma</i>	15

Constant species (percentage frequencies)

<i>Dactylis glomerata</i>	52
<i>Thymbra capitata</i>	36
<i>Cistus creticus</i>	35
<i>Brachypodium retusum</i>	35
<i>Phlomis fruticosa</i>	33
<i>Calicotome villosa</i>	33
<i>Drimia maritima</i> aggr.	32
<i>Pistacia lentiscus</i>	30
<i>Erica manipuliflora</i>	27
<i>Teucrium polium</i> aggr.	25
<i>Trifolium campestre</i>	24
<i>Cistus salviifolius</i>	24
<i>Catapodium rigidum</i>	24
<i>Anagallis arvensis</i>	23
<i>Sarcopoterium spinosum</i>	22
<i>Phagnalon rupestre</i>	22
<i>Leontodon tuberosus</i>	22
<i>Asphodelus ramosus</i>	22
<i>Linum strictum</i> aggr.	21
<i>Hypochaeris achyrophorus</i>	21
<i>Briza maxima</i>	19
<i>Asparagus acutifolius</i>	19
<i>Olea europaea</i>	18
<i>Valantia hispida</i>	17
<i>Tordylium apulum</i>	17
<i>Sherardia arvensis</i>	17
<i>Quercus coccifera</i>	17
<i>Genista acanthoclada</i>	17
<i>Fumana thymifolia</i>	17
<i>Trifolium scabrum</i>	16
<i>Phillyrea latifolia</i>	16
<i>Galium murale</i>	16
<i>Crepis neglecta</i> aggr.	16
<i>Anisantha fasciculata</i>	16
<i>Poa bulbosa</i>	15
<i>Crucianella latifolia</i>	15
<i>Asterolinon linum-stellatum</i>	15
<i>Micromeria juliana</i>	14

<i>Hyparrhenia hirta</i>	14
<i>Bituminaria bituminosa</i>	14
<i>Arisarum vulgare</i>	14
<i>Anthyllis vulneraria</i>	14
<i>Urospermum picroides</i>	13
<i>Trifolium stellatum</i>	13
<i>Trachynia distachya</i>	13
<i>Sonchus bulbosus</i>	13
<i>Satureja thymbra</i>	13
<i>Rostraria cristata</i>	13
<i>Micromeria graeca</i>	13
<i>Cynosurus echinatus</i>	13
<i>Avena barbata</i>	13
<i>Asparagus aphyllus</i>	13
<i>Teucrium microphyllum</i>	12
<i>Pistacia terebinthus</i>	12
<i>Ononis reclinata</i>	12
<i>Fumana arabica</i>	12
<i>Euphorbia peplus</i>	12
<i>Carlina corymbosa</i> aggr.	12
<i>Achnatherum bromoides</i>	12
<i>Prasium majus</i>	11
<i>Piptatherum coerulescens</i>	11
<i>Lagoecia cuminoides</i>	11
<i>Cuscuta palaestina</i> aggr.	11
<i>Convolvulus althaeoides</i>	11
<i>Carlina graeca</i>	11

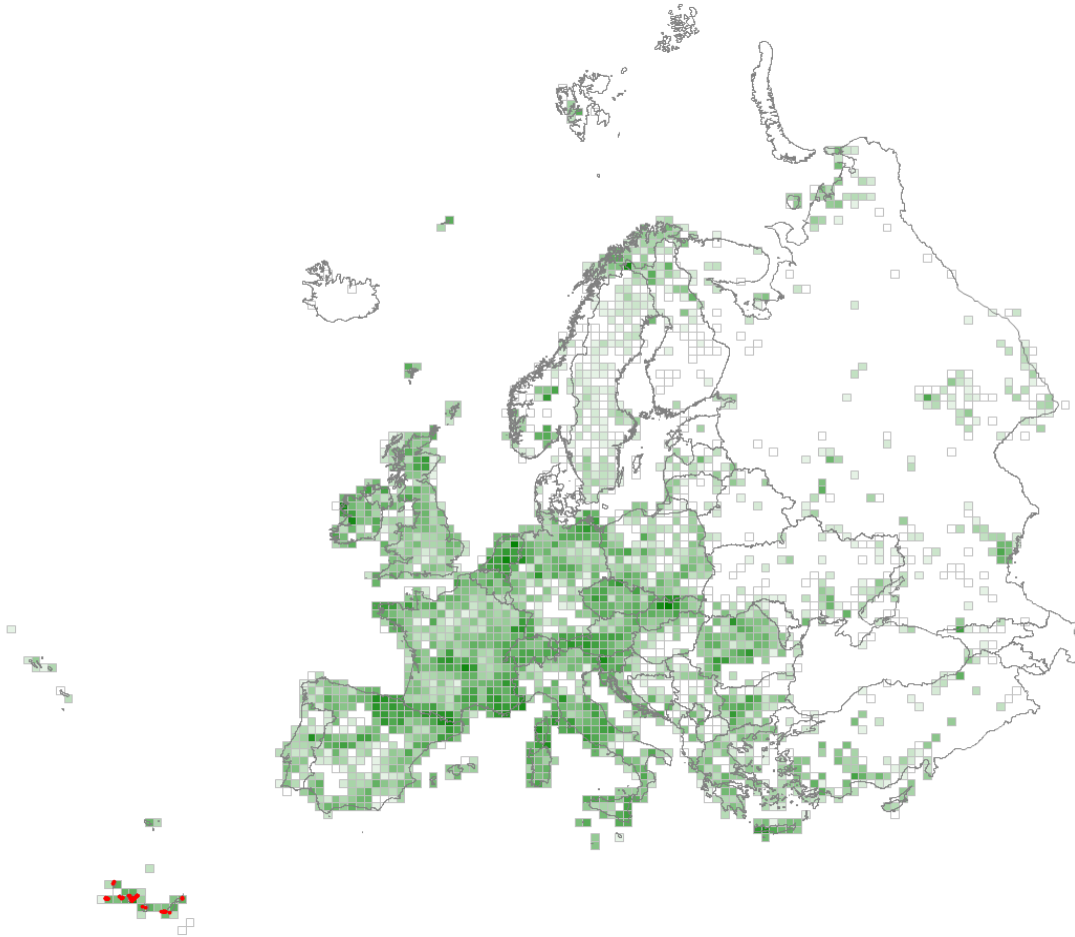
Dominant species (percentage frequencies of occurrences with cover > 25%)

<i>Phlomis fruticosa</i>	28
<i>Erica manipuliflora</i>	24
<i>Thymbra capitata</i>	16
<i>Cytisus eriocarpus</i>	8
<i>Cistus creticus</i>	6



## S64 – Macaronesian garrigue

Low shrub vegetation with an open canopy, of the Canary Islands, Azores and Madeira.



### Corresponding alliances in EuroVegChecklist 2016

- > OLE-02A Cisto canariensis-Micromerion hyssopifoliae Pérez de Paz et al. 1990 corr. Rivas-Mart. in Rivas-Mart. 2011
- > OLE-02B Soncho ustulati-Artemision argenteae Capelo et al. 2000

### Characteristic species combination

Diagnostic species (phi coefficient \* 100)

<i>Micromeria hyssopifolia</i>	59
<i>Asteriscus sericeus</i>	36
<i>Cistus monspeliensis</i>	32
<i>Echium hierrense</i>	31
<i>Artemisia thuscula</i>	30
<i>Aeonium holochrysum</i>	30
<i>Cistus symphytifolius</i>	26
<i>Allosorus guanchicus</i>	26
<i>Aichryson bethencourtianum</i>	26
<i>Echium decaisnei</i>	26
<i>Rubia fruticosa</i>	24
<i>Pericallis steetzii</i>	24
<i>Micromeria varia</i>	24
<i>Kleinia neriifolia</i>	23

<i>Echium virescens</i>	22
<i>Polycarpha divaricata</i>	21
<i>Lobularia canariensis</i>	21
<i>Lavandula canariensis</i>	21
<i>Lotus lancerottensis</i>	21
<i>Carlina salicifolia</i>	21
<i>Spergularia fimbriata</i>	20
<i>Pericallis lanata</i>	19
<i>Argyranthemum frutescens</i>	19
<i>Argyranthemum foeniculaceum</i>	19
<i>Wahlenbergia lobelioides</i>	18
<i>Euphorbia regis-jubae</i>	18
<i>Ononis pendula</i>	18
<i>Argyranthemum sventenii</i>	18
<i>Argyranthemum broussonetii</i>	18
<i>Aeonium valverdense</i>	18
<i>Asphodelus aestivus</i>	18
<i>Rumex lunaria</i>	17
<i>Aeonium urbicum</i>	17
<i>Ilfoga spicata</i>	17
<i>Cytisus proliferus</i>	16
<i>Sonchus microcarpus</i>	16
<i>Phagnalon umbelliforme</i>	16
<i>Maytenus canariensis</i>	16
<i>Bupleurum handiense</i>	16
<i>Argyranthemum hierrense</i>	16
<i>Retama raetam</i>	16
<i>Aeonium palmense</i>	16
<i>Hypericum reflexum</i>	16
<i>Trisetaria loeflingiana</i>	15
<i>Phagnalon saxatile</i>	15
<i>Hyparrhenia hirta</i>	15

Constant species (percentage frequencies)

<i>Cistus monspeliensis</i>	60
<i>Micromeria hyssopifolia</i>	53
<i>Micromeria varia</i>	30
<i>Hyparrhenia hirta</i>	30
<i>Rubia fruticosa</i>	27
<i>Kleinia neriifolia</i>	27
<i>Cistus symphytifolius</i>	27
<i>Euphorbia regis-jubae</i>	23
<i>Carlina salicifolia</i>	23
<i>Bituminaria bituminosa</i>	23
<i>Asphodelus aestivus</i>	23
<i>Phagnalon saxatile</i>	20
<i>Dittrichia viscosa</i>	20
<i>Cytisus proliferus</i>	20
<i>Trachynia distachya</i>	17
<i>Launaea arborescens</i>	17
<i>Juniperus phoenicea</i>	17
<i>Artemisia thuscula</i>	17
<i>Argyranthemum frutescens</i>	17
<i>Anagallis arvensis</i>	17
<i>Trifolium arvense</i>	13
<i>Lobularia canariensis</i>	13
<i>Lavandula canariensis</i>	13
<i>Globularia salicina</i>	13
<i>Erica arborea</i>	13

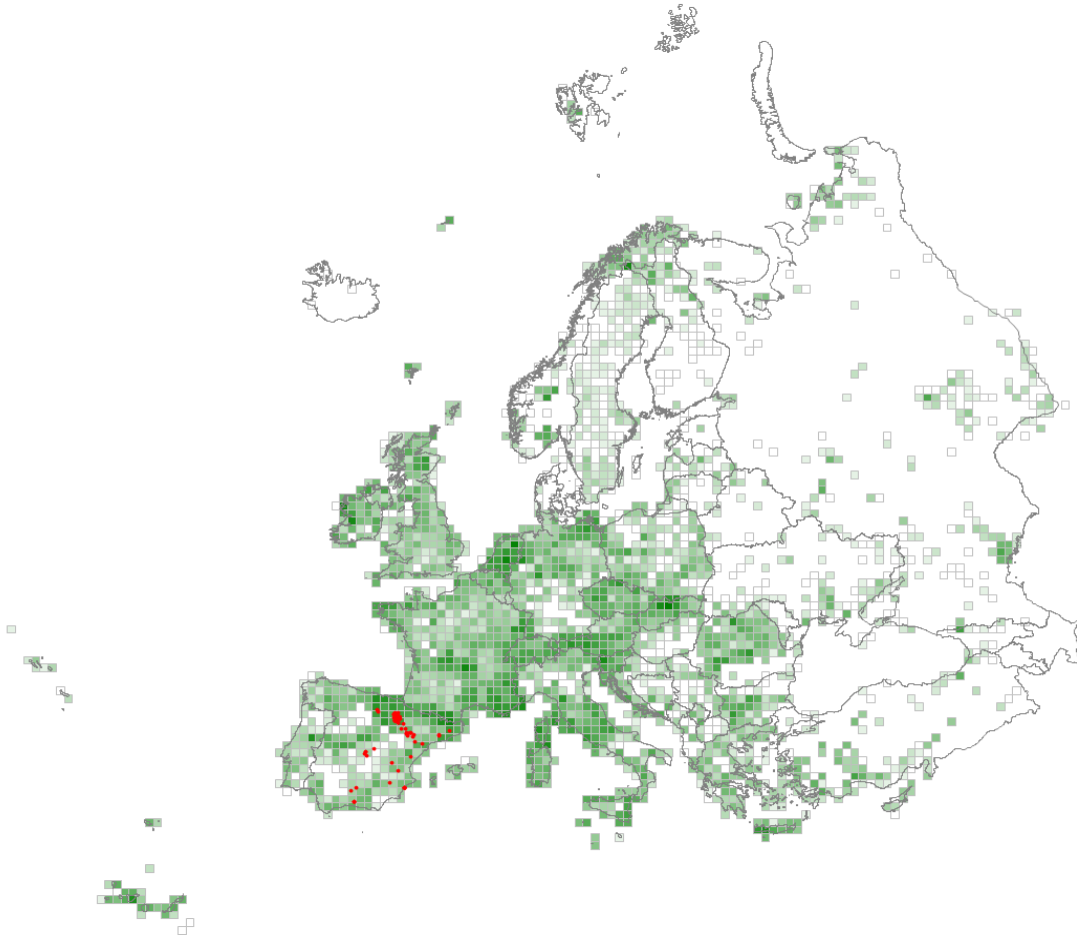
<i>Echium virescens</i>	13
<i>Echium decaisnei</i>	13
<i>Asteriscus sericeus</i>	13
<i>Andryala pinnatifida</i>	13
<i>Aeonium holochrysum</i>	13

Dominant species (percentage frequencies of occurrences with cover > 25%)

<i>Cistus monspeliensis</i>	53
<i>Micromeria hyssopifolia</i>	37
<i>Echium decaisnei</i>	10
<i>Carlina salicifolia</i>	10
<i>Hyparrhenia hirta</i>	7

## S65 – Mediterranean gypsum scrub

Open chamaephyte scrub with a lichen crust and rainy-spring annual herb flora, on gypsum-rich substrates in areas with a dry to semi-arid mediterranean climate in the Iberian Peninsula. The extreme climatic and edaphic conditions maintain the habitat as naturally stable, but it can bear some light grazing.



### Corresponding alliances in EuroVegChecklist 2016

- > ROS-03A *Lepidion subulati* Bellot et Rivas Goday in Rivas Goday et al. 1957
- > ROS-03B *Thymo-Teucrium verticillati* Rivas Goday in Rivas Goday et al. 1957

### Characteristic species combination

Diagnostic species (phi coefficient \* 100)

<i>Ononis tridentata</i>	71
<i>Herniaria fruticosa</i>	71
<i>Helianthemum squamatum</i>	71
<i>Helianthemum syriacum</i>	70
<i>Gypsophila struthium</i>	54
<i>Plantago albicans</i>	52
<i>Launaea pumila</i>	50
<i>Reseda stricta</i>	43
<i>Lepidium subulatum</i>	43
<i>Atractylis humilis</i>	38
<i>Stipa parviflora</i>	33
<i>Thymus vulgaris</i>	31

<i>Odontites longiflora</i>	29
<i>Lygeum spartum</i>	29
<i>Helichrysum stoechas</i>	28
<i>Launaea fragilis</i>	27
<i>Rosmarinus officinalis</i>	25
<i>Fumana ericoides</i>	25
<i>Coris monspeliensis</i>	25
<i>Genista scorpius</i>	24
<i>Koeleria vallesiana</i>	23
<i>Sedum sediforme</i>	23
<i>Santolina chamaecyparissus</i> aggr.	22
<i>Matthiola fruticulosa</i>	22
<i>Brachypodium retusum</i>	21
<i>Thymus zygis</i>	20
<i>Sideritis pungens</i>	20
<i>Artemisia herba-alba</i>	18
<i>Cistus clusii</i>	18
<i>Centaurea aspera</i>	18
<i>Linum suffruticosum</i> aggr.	17
<i>Bombycilaena discolor</i>	17
<i>Helianthemum violaceum</i>	17
<i>Helianthemum hirtum</i>	16
<i>Teucrium polium</i> aggr.	16

Constant species (percentage frequencies)

<i>Thymus vulgaris</i>	68
<i>Helianthemum syriacum</i>	66
<i>Herniaria fruticosa</i>	60
<i>Ononis tridentata</i>	54
<i>Helianthemum squamatum</i>	54
<i>Brachypodium retusum</i>	54
<i>Helichrysum stoechas</i>	50
<i>Plantago albicans</i>	48
<i>Rosmarinus officinalis</i>	46
<i>Koeleria vallesiana</i>	46
<i>Teucrium polium</i> aggr.	38
<i>Genista scorpius</i>	38
<i>Sedum sediforme</i>	36
<i>Gypsophila struthium</i>	34
<i>Atractylis humilis</i>	32
<i>Lygeum spartum</i>	30
<i>Launaea pumila</i>	28
<i>Coris monspeliensis</i>	26
<i>Fumana ericoides</i>	24
<i>Santolina chamaecyparissus</i> aggr.	22
<i>Reseda stricta</i>	22
<i>Linum suffruticosum</i> aggr.	22
<i>Stipa parviflora</i>	20
<i>Lepidium subulatum</i>	20
<i>Dactylis glomerata</i>	16
<i>Artemisia herba-alba</i>	16
<i>Thymus zygis</i>	14
<i>Odontites longiflora</i>	14
<i>Launaea fragilis</i>	14
<i>Helictochloa bromoides</i>	14
<i>Helianthemum canum</i>	14
<i>Fumana thymifolia</i>	14
<i>Echinops ritro</i>	14
<i>Pinus halepensis</i>	12

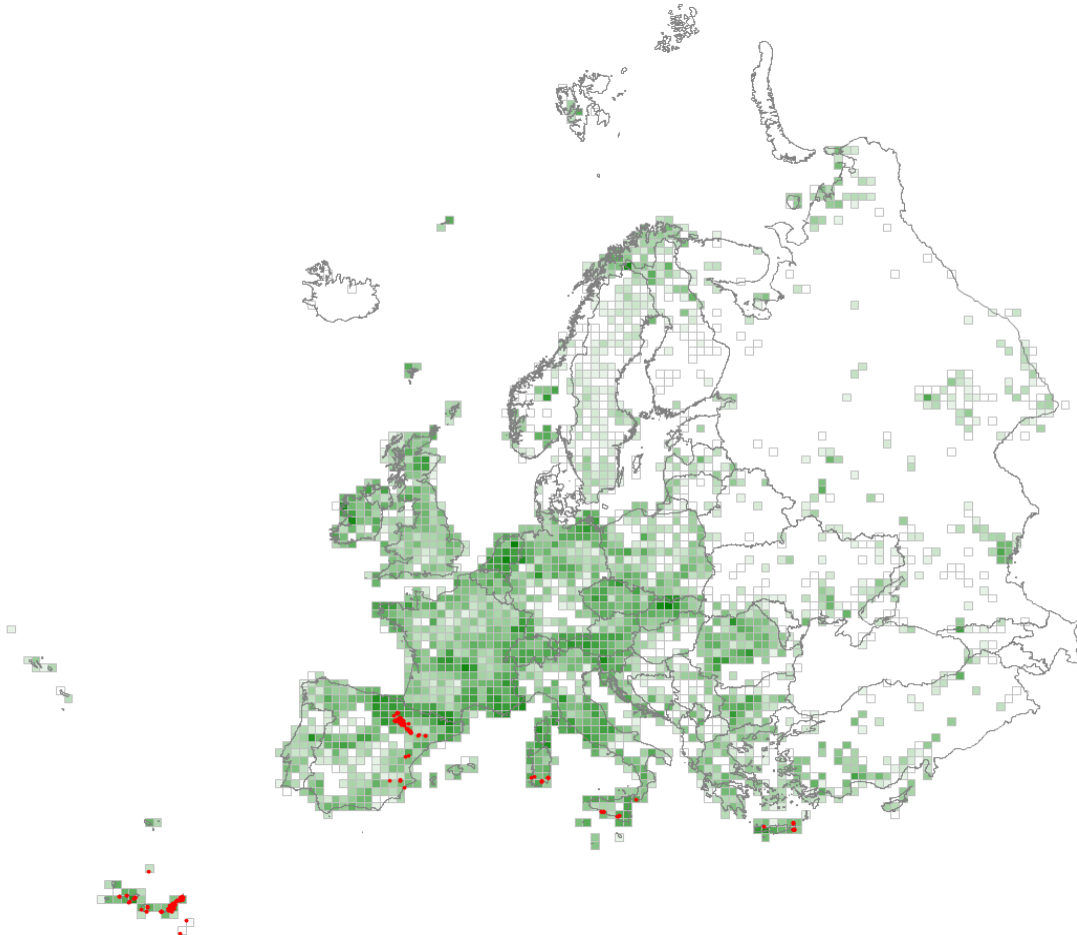
<i>Matthiola fruticulosa</i>	12
<i>Linum strictum</i> aggr.	12
<i>Centaurea aspera</i>	12

Dominant species (percentage frequencies of occurrences with cover > 25%)

<i>Ononis tridentata</i>	16
<i>Rosmarinus officinalis</i>	10
<i>Gypsophila struthium</i>	8

## S66 – Mediterranean halo-nitrophilous scrub

Perennial coastal scrub dominated by nitrophilous and salt-tolerant species in often artificially-disturbed places through the semi-arid infra- and thermomediterranean belts. In coastal situations, the sea-borne salt and concentration of birds have a major influence on the high levels of soil nutrients and high levels of salt deposition.



### Corresponding alliances in EuroVegChecklist 2016

- > PEG-04C *Argyranthemo succulenti-Calendulion maderensis* Capelo et al. 2000
- > PEG-02A *Artemisio glutinosae-Santolinion rosmarinifoliae* M. Costa 1975
- > PEG-04A *Artemisio thusculae-Rumicion lunariae* Rivas-Mart. et al. 1993
- > PEG-01E *Artemision arborescentis* Géhu et al. 1986
- > PEG-01F *Atriplici halimi-Suaedion verae* Géhu et al. ex Bergmeier et Dimopoulos 2003
- > PEG-01B *Haloxylon-Atriplicion* Rivas Goday et Rivas-Mart. ex Rigual 1972
- > PEG-03A *Chenoleion tomentosae* Sunding 1972
- > PEG-04B *Launaeo arborescentis-Schizogynion sericeae* Rivas-Mart. et al. 1993
- > PEG-01D *Lycio europaei-Ipomoeion purpureae* O. de Bolòs ex Mucina in Mucina et al. 2016
- > PEG-01G *Medicagini citrinae-Lavaterion arborea* O. de Bolòs et Vigo in O. de Bolòs et al. 1984
- > PEG-04D *Nicotiano glaucae-Ricinion communis* Rivas-Mart. et al. 1999
- > PEG-01C *Salsolo oppositifoliae-Suaedion fruticosae* Rigual 1972
- > PEG-01A *Salsolo vermiculatae-Peganion harmalae* Br.-Bl. et O. de Bolòs 1954
- > PEG-02B *Santolinion pectinato-canescens* Peinado et Martínez-Parras 1984

## Characteristic species combination

### Diagnostic species (phi coefficient \* 100)

<i>Salsola vermiculata</i>	52
<i>Artemisia herba-alba</i>	39
<i>Bassia tomentosa</i>	29
<i>Suaeda vermiculata</i>	21
<i>Suaeda ifniensis</i>	20
<i>Asphodelus fistulosus</i>	20
<i>Lycium intricatum</i>	20
<i>Artemisia arborescens</i>	19
<i>Anisantha rubens</i>	18
<i>Salsola tetrandra</i>	18
<i>Launaea arborescens</i>	18
<i>Convolvulus caput-medusae</i>	18
<i>Atriplex halimus</i>	17
<i>Bupleurum semicompositum</i>	17
<i>Forsskaolea angustifolia</i>	16
<i>Zilla spinosa</i>	15
<i>Mesembryanthemum cryptanthum</i>	15
<i>Linaria aegyptiaca</i>	15
<i>Kleinia anteuphorbium</i>	15
<i>Euphorbia officinarum</i>	15
<i>Asparagus altissimus</i>	15
<i>Anastatica hierochuntica</i>	15
<i>Notoceras bicornis</i>	15

### Constant species (percentage frequencies)

<i>Salsola vermiculata</i>	49
<i>Artemisia herba-alba</i>	34
<i>Launaea arborescens</i>	24
<i>Lycium intricatum</i>	21
<i>Eryngium campestre</i>	19
<i>Suaeda vera</i>	16
<i>Anisantha rubens</i>	16
<i>Camphorosma monspeliaca</i>	14
<i>Plantago lagopus</i>	13
<i>Lygeum spartum</i>	13
<i>Dactylis glomerata</i>	13
<i>Atriplex halimus</i>	13
<i>Asphodelus fistulosus</i>	13
<i>Rostraria cristata</i>	12
<i>Herniaria hirsuta</i>	12
<i>Frankenia laevis</i>	12
<i>Filago pyramidata</i>	12
<i>Teucrium polium</i> aggr.	11
<i>Suaeda vermiculata</i>	11
<i>Plantago albicans</i>	11
<i>Cenchrus ciliaris</i>	11
<i>Bupleurum semicompositum</i>	11

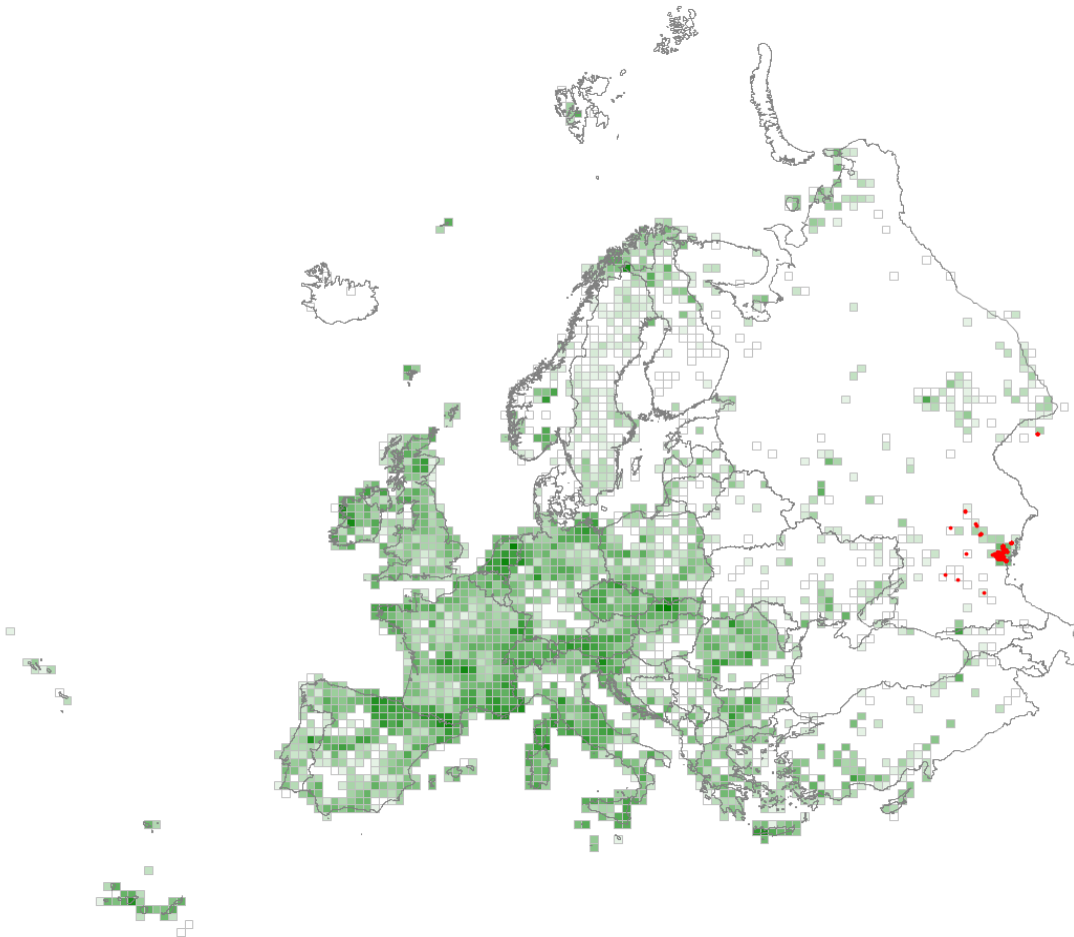
### Dominant species (percentage frequencies of occurrences with cover > 25%)

<i>Salsola vermiculata</i>	16
<i>Artemisia herba-alba</i>	16
<i>Launaea arborescens</i>	8
<i>Camphorosma monspeliaca</i>	6



## S67 – Aralo-Caspian semi-desert

Zonal scrub on loamy and sandy-loamy, often subsaline soils of the semi-deserts of the Caucasus foothills, South-Eastern European Russia and Kazakhstan. The open vegetation is dominated by species of *Artemisia* and other sub-halophytic shrubs (e.g. *Petrosimonia* spp. and *Salsola* spp.). In the Caspian lowland, this habitat reaches its north-western distribution limit, having its main distribution in the desert regions surrounding the Caspian Sea, in the basin that used to support Aral Lake, and further into central Asia.



### Corresponding alliances in EuroVegChecklist 2016

- > LER-01B Anabasio aphyllae-Artemisio pauciflorae Lysenko in Lysenko et Mucina 2015
- > LER-01A Artemision lerchiana Golub 1994

### Characteristic species combination

Diagnostic species (phi coefficient \* 100)

<i>Ceratocarpus arenarius</i>	58
<i>Eremopyrum orientale</i>	54
<i>Artemisia lerchiana</i>	48
<i>Medicago orthoceras</i>	47
<i>Alyssum turkestanicum</i>	46
<i>Agropyron fragile</i>	35
<i>Medicago medicaginoides</i>	34
<i>Xanthoparmelia rysssolea</i>	34
<i>Eremopyrum triticeum</i>	34

<i>Ceratocephala falcata</i>	34
<i>Xanthoparmelia camtschadalis</i>	33
<i>Neotorularia contortuplicata</i>	32
<i>Alhagi maurorum</i>	30
<i>Meniocus linifolius</i>	30
<i>Petrosimonia brachiata</i>	27
<i>Pyankovia brachiata</i>	26
<i>Bassia prostrata</i>	25
<i>Holosteum umbellatum</i>	25
<i>Salsola dendroides</i>	24
<i>Anabasis aphylla</i>	24
<i>Sclerocaryopsis spinocarpus</i>	22
<i>Petrosimonia oppositifolia</i>	22
<i>Salsola tamariscina</i>	22
<i>Tulipa biflora</i>	21
<i>Erodium hoefftianum</i>	21
<i>Pterygoneurum subsessile</i>	21
<i>Iris scariosa</i>	21
<i>Lappula patula</i>	20
<i>Androsace maxima</i>	20
<i>Camphorosma monspeliaca</i>	20
<i>Xanthoria parietina</i>	19
<i>Descurainia sophia</i>	18
<i>Stipa sareptana</i>	18
<i>Bromus squarrosus</i>	18
<i>Zygophyllum fabago</i>	18
<i>Fumaria schleicheri</i>	17
<i>Poa bulbosa</i>	17
<i>Gagea reticulata</i>	16
<i>Nonea caspica</i>	16
<i>Tripleurospermum parviflorum</i>	16
<i>Atriplex cana</i>	16
<i>Salsola kali</i> aggr.	16
<i>Heliotropium ellipticum</i>	16
<i>Lepidium perfoliatum</i>	15
<i>Anabasis salsa</i>	15

Constant species (percentage frequencies)

<i>Alyssum turkestanicum</i>	74
<i>Ceratocarpus arenarius</i>	61
<i>Artemisia lerchiana</i>	61
<i>Eremopyrum orientale</i>	55
<i>Poa bulbosa</i>	53
<i>Eremopyrum triticeum</i>	50
<i>Medicago orthoceras</i>	32
<i>Bromus squarrosus</i>	32
<i>Alhagi maurorum</i>	32
<i>Salsola kali</i> aggr.	29
<i>Ceratocephala falcata</i>	29
<i>Bassia prostrata</i>	29
<i>Meniocus linifolius</i>	26
<i>Holosteum umbellatum</i>	26
<i>Descurainia sophia</i>	26
<i>Agropyron fragile</i>	24
<i>Anisantha tectorum</i>	21
<i>Camphorosma monspeliaca</i>	18
<i>Xanthoparmelia camtschadalis</i>	16
<i>Petrosimonia oppositifolia</i>	16
<i>Androsace maxima</i>	16

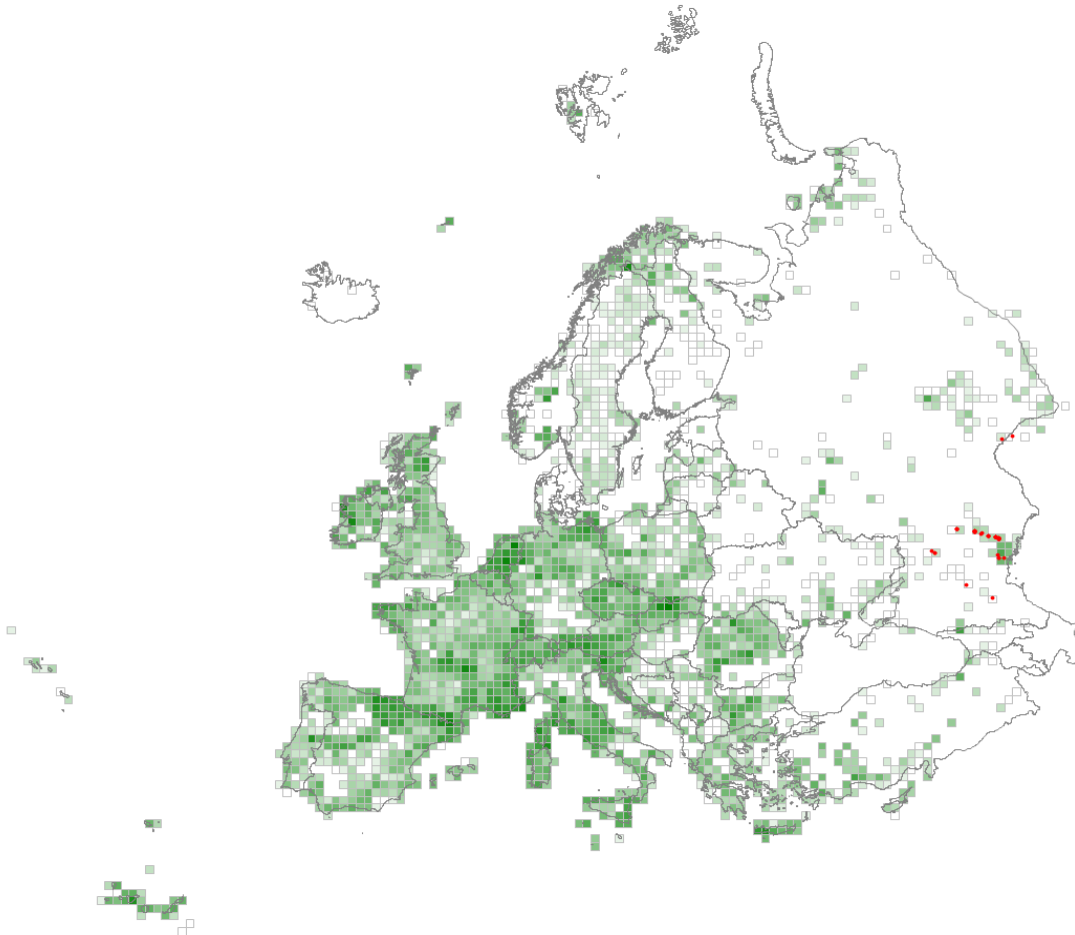
<i>Xanthoparmelia rysssolea</i>	13
<i>Syntrichia ruralis</i> aggr.	13
<i>Petrosimonia brachiata</i>	13
<i>Medicago medicaginoides</i>	13
<i>Lepidium perfoliatum</i>	13
<i>Filago arvensis</i>	13
<i>Veronica triphyllos</i>	11
<i>Tanacetum achilleifolium</i>	11
<i>Stipa sareptana</i>	11
<i>Salsola dendroides</i>	11
<i>Nectorularia contortuplicata</i>	11
<i>Lappula patula</i>	11
<i>Carduus uncinatus</i>	11
<i>Buglossoides arvensis</i>	11
<i>Bassia sedoides</i>	11
<i>Atriplex tatarica</i>	11
<i>Artemisia santonicum</i>	11
<i>Artemisia austriaca</i>	11
<i>Anabasis aphylla</i>	11

Dominant species (percentage frequencies of occurrences with cover > 25%)

<i>Artemisia lerchiana</i>	8
<i>Ceratocarpus arenarius</i>	5

## S68 – Semi-desert sand dune with sparse scrub

Open perennial vegetation of halophytic shrubs, e.g. *Artemisia* spp., *Haloxylon* spp., *Salsola* spp. and *Tamarix* spp., and annuals on wind-blown drifting or stabilised dunes and sandy soils in the semi-desert region of the Caspian lowlands. If overgrazed, this habitat can change into shifting dunes (barkhans) devoid of vegetation.



### Corresponding alliances in EuroVegChecklist 2016

- > LER-02A Euphorbion seguieranae Golub 1994
- <> DIG-01G Tamarici ramosissimae-Salsolion australis Golub 1994

### Characteristic species combination

Diagnostic species (phi coefficient \* 100)

<i>Eremopyrum triticeum</i>	44
<i>Sibbaldianthe bifurca</i>	42
<i>Alyssum turkestanicum</i>	40
<i>Artemisia arenaria</i>	38
<i>Artemisia austriaca</i>	35
<i>Amaranthus albus</i>	30
<i>Linaria odora</i>	29
<i>Carex stenophylla</i>	29
<i>Tragopogon podolicus</i>	29
<i>Centaurea gerberi</i>	28
<i>Agropyron tanaiticum</i>	27

<i>Cytisus borysthenticus</i>	27
<i>Atriplex tatarica</i>	26
<i>Tragopogon tanaiticus</i>	25
<i>Carduus uncinatus</i>	24
<i>Ceratocarpus arenarius</i>	24
<i>Asperula graveolens</i>	23
<i>Euphorbia esula</i>	23
<i>Ceratocephala falcata</i>	23
<i>Rhaponticum repens</i>	23
<i>Bassia sedoides</i>	22
<i>Agropyron fragile</i>	22
<i>Lappula squarrosa</i>	21
<i>Carex praecox</i>	21
<i>Plantago maxima</i>	20
<i>Corispermum marschallii</i>	20
<i>Peganum harmala</i>	19
<i>Delphinium speciosum</i>	19
<i>Euphorbia iberica</i>	19
<i>Anisantha tectorum</i>	19
<i>Bassia laniflora</i>	18
<i>Bromopsis inermis</i>	18
<i>Descurainia sophia</i>	17
<i>Dianthus squarrosus</i>	17
<i>Bromus squarrosus</i>	17
<i>Erysimum montanum</i>	17
<i>Helichrysum arenarium</i>	16
<i>Polygonum bellardii</i>	16
<i>Chondrilla graminea</i>	16
<i>Gypsophila rupestris</i>	16
<i>Tulipa sylvestris</i>	16
<i>Achillea micrantha</i>	16
<i>Carex melanostachya</i>	16
<i>Gagea reticulata</i>	16
<i>Koeleria glauca</i>	15

Constant species (percentage frequencies)

<i>Eremopyrum triticeum</i>	65
<i>Alyssum turkestanicum</i>	65
<i>Artemisia austriaca</i>	55
<i>Convolvulus arvensis</i>	40
<i>Poa bulbosa</i>	35
<i>Elytrigia repens</i> aggr.	35
<i>Artemisia arenaria</i>	35
<i>Anisantha tectorum</i>	35
<i>Sibbaldianthe bifurca</i>	30
<i>Polygonum aviculare</i> aggr.	30
<i>Bromus squarrosus</i>	30
<i>Atriplex tatarica</i>	30
<i>Salsola kali</i> aggr.	25
<i>Euphorbia esula</i>	25
<i>Descurainia sophia</i>	25
<i>Ceratocarpus arenarius</i>	25
<i>Carex stenophylla</i>	25
<i>Amaranthus albus</i>	25
<i>Rhaponticum repens</i>	20
<i>Chenopodium album</i> aggr.	20
<i>Helichrysum arenarium</i>	20
<i>Galium verum</i>	20
<i>Euphorbia seguieriana</i>	20

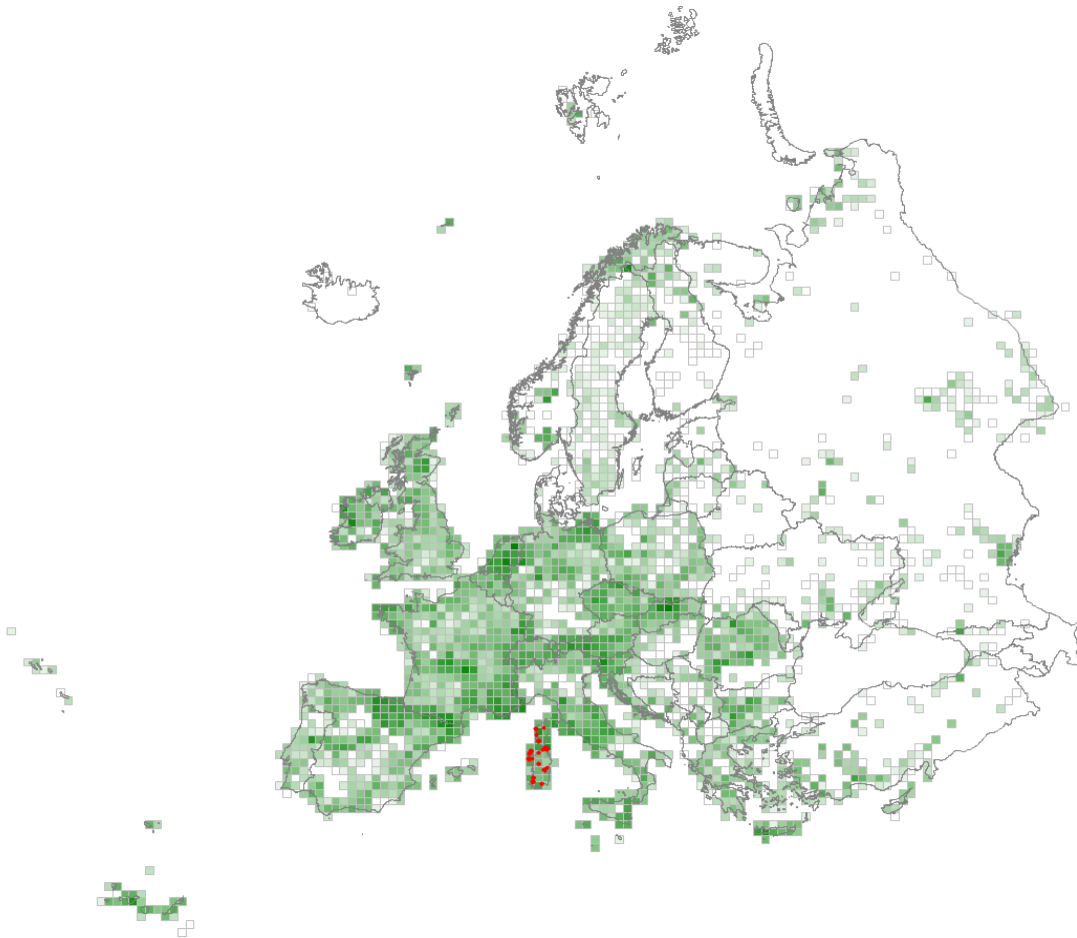
<i>Ceratocephala falcata</i>	20
<i>Carex praecox</i>	20
<i>Carduus uncinatus</i>	20
<i>Bromopsis inermis</i>	20
<i>Bassia sedoides</i>	20
<i>Veronica verna</i>	15
<i>Tragopogon podolicus</i>	15
<i>Medicago sativa</i>	15
<i>Linaria odora</i>	15
<i>Leymus racemosus</i>	15
<i>Lappula squarrosa</i>	15
<i>Koeleria glauca</i>	15
<i>Glycyrrhiza glabra</i>	15
<i>Carex colchica</i>	15
<i>Calamagrostis epigejos</i>	15
<i>Bassia laniflora</i>	15
<i>Agropyron fragile</i>	15

Dominant species (percentage frequencies of occurrences with cover > 25%)

<i>Leymus racemosus</i>	5
<i>Euphorbia seguieriana</i>	5
<i>Ceratocarpus arenarius</i>	5
<i>Artemisia taurica</i>	5
<i>Artemisia arenaria</i>	5

## S71 – Western Mediterranean spiny heath

Low scrub of often spiny, cushion-forming plants on thin soils on wind-exposed and spray-splashed tops of rocky cliffs on Corsica, Sardinia, Pantelleria and in the Gulf of Taranto.



### Corresponding alliances in EuroVegChecklist 2016

- > CRI-02E Anthyllidion barbae-jovis S. Brullo et De Marco 1989
- > CRI-02B Astragalion tragacanthae (Folch ex Rivas-Mart., Fernández-González et Loidi 1999) Rivas-Mart. et al. 2002
- > CRI-02D Euphorbion pithusae Biondi et Géhu in Géhu et Biondi 1994
- <> ROS-01H Hypericion balearici O. de Bolòs et Molinier 1958
- > CRI-02C Launaeion cervicornis (O. de Bolòs et Vigo ex Gil et Llorens 1995) Rivas-Mart. et al. 1999
- <> ROS-01F Rosmarinion officinalis Molinier 1934

### Characteristic species combination

Diagnostic species (phi coefficient \* 100)

<i>Genista corsica</i>	80
<i>Stachys glutinosa</i>	43
<i>Teucrium marum</i>	41
<i>Helichrysum italicum</i>	34
<i>Genista sardoa</i>	31
<i>Carlina corymbosa</i> aggr.	27
<i>Cistus monspeliensis</i>	24
<i>Astragalus tragacantha</i>	21

<i>Teucrium massiliense</i>	21
<i>Euphorbia pithyusa</i>	20
<i>Cistus salviifolius</i>	19
<i>Thymus catharinae</i>	18
<i>Linum muelleri</i>	18
<i>Limonium nymphaeum</i>	18
<i>Polygala sardoa</i>	18
<i>Orobanche rigens</i>	18
<i>Centaurea horrida</i>	17
<i>Drymocallis corsica</i>	17
<i>Brachypodium retusum</i>	17
<i>Crocus minimus</i>	17
<i>Ptilostemon casabonae</i>	17
<i>Allium parviflorum</i>	16
<i>Carex macrolepis</i>	16
<i>Juniperus phoenicea</i>	16
<i>Trisetum gracile</i>	16
<i>Asphodelus ramosus</i>	15
<i>Galium schmidii</i>	15

Constant species (percentage frequencies)

<i>Genista corsica</i>	84
<i>Helichrysum italicum</i>	65
<i>Cistus monspeliensis</i>	45
<i>Carlina corymbosa</i> aggr.	45
<i>Brachypodium retusum</i>	45
<i>Teucrium marum</i>	35
<i>Pistacia lentiscus</i>	35
<i>Cistus salviifolius</i>	35
<i>Stachys glutinosa</i>	26
<i>Juniperus phoenicea</i>	26
<i>Dactylis glomerata</i>	26
<i>Asphodelus ramosus</i>	26
<i>Rosmarinus officinalis</i>	23
<i>Reichardia picroides</i>	23
<i>Phillyrea angustifolia</i>	23
<i>Daucus carota</i>	23
<i>Rubia peregrina</i>	16
<i>Lotus cytisoides</i>	16
<i>Lavandula stoechas</i>	16
<i>Lagurus ovatus</i>	16
<i>Calicotome villosa</i>	16
<i>Asparagus acutifolius</i>	16
<i>Sonchus bulbosus</i>	13
<i>Rumex bucephalophorus</i>	13
<i>Jasione montana</i>	13
<i>Euphorbia pithyusa</i>	13
<i>Euphorbia characias</i>	13
<i>Erica arborea</i>	13
<i>Dittrichia viscosa</i>	13
<i>Cistus creticus</i>	13
<i>Carex macrolepis</i>	13

Dominant species (percentage frequencies of occurrences with cover > 25%)

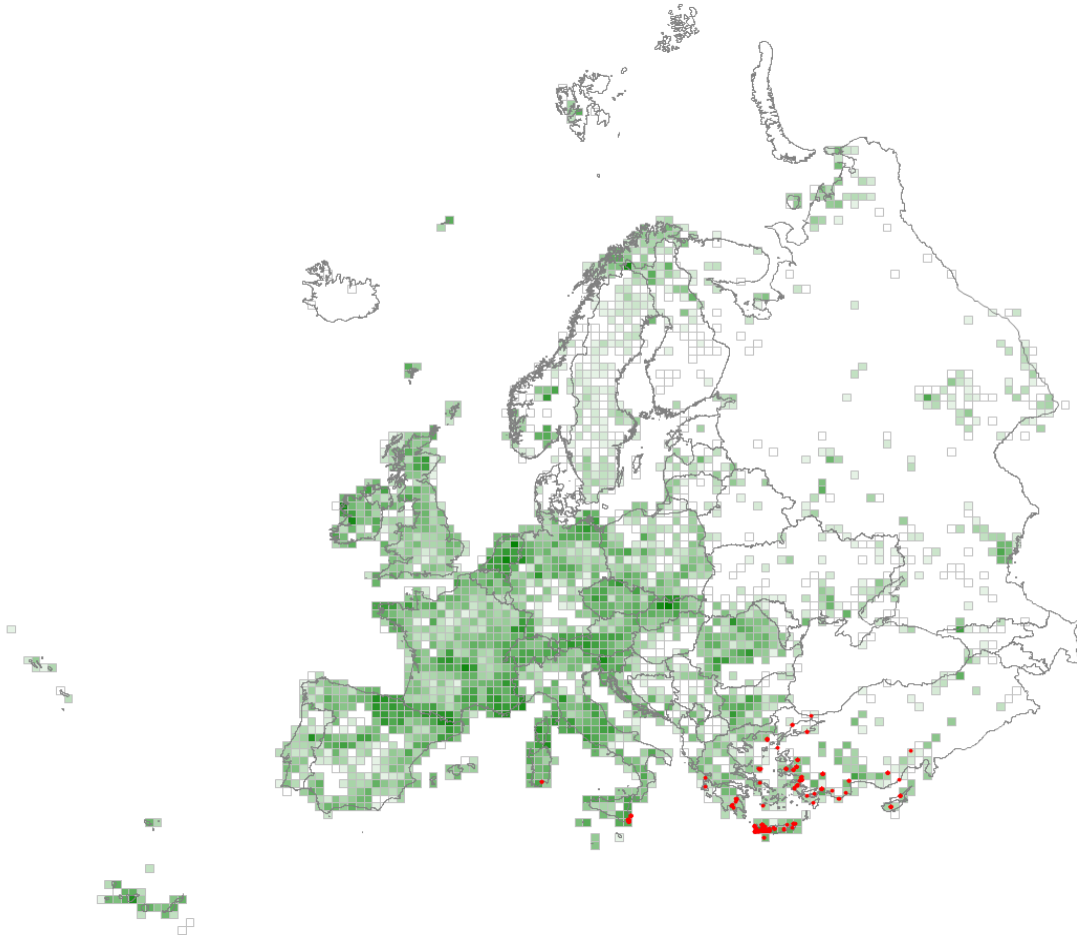
<i>Genista corsica</i>	84
<i>Genista sardoa</i>	10
<i>Thymus catharinae</i>	6
<i>Rosmarinus officinalis</i>	6
<i>Cistus monspeliensis</i>	6





## S72 – Eastern Mediterranean spiny heath (phrygana)

Low scrub dominated by thorny hemispherical chamaephytes on various base-rich and acidic substrates in the thermo-, meso- and supramediterranean belts of mainland Greece, Anatolia, the Aegean and Ionian islands, Crete, Cyprus and parts of Sicily. It can be of a primary origin or develops after clearance of evergreen sclerophyllous forest.



### Corresponding alliances in EuroVegChecklist 2016

- > LAV-03C Helichryso barrelieri-Phagnalion graeci (Barbero et Quézel 1989) R. Jahn in Mucina et al. 2009
- > ROS-07A Hyperico empetrifolii-Micromerion graecae Barbero et Quézel 1989
- > LAV-03A Hyperico olympici-Cistion cretici (Oberd. 1954) R. Jahn et Bergmeier in Mucina et al. 2009
- <> ROS-06C Micromerion Oberd. 1954
- > LAV-03B Odontarrheno euboeae-Lavandulion stoechadis Mucina in Mucina et al. 2016
- > ROS-07B Origano syriaci-Hypericion thymifolii Mucina et Theurillat in Mucina et al. 2016
- > ROS-07C Sarcopoterio spinosi-Genistion fasselatae M. Costa et al. 1984

### Characteristic species combination

Diagnostic species (phi coefficient \* 100)

<i>Sarcopoterium spinosum</i>	62
<i>Genista acanthoclada</i>	42
<i>Thymbra capitata</i>	32
<i>Carlina graeca</i>	32

<i>Lagoecia cuminoides</i>	31
<i>Leontodon tuberosus</i>	31
<i>Anisantha fasciculata</i>	26
<i>Allium rubrovittatum</i>	25
<i>Valantia hispida</i>	25
<i>Satureja thymbra</i>	25
<i>Phagnalon rupestre</i>	25
<i>Bromus intermedius</i>	24
<i>Ranunculus paludosus</i>	24
<i>Galium murale</i>	24
<i>Cuscuta palaestina</i> aggr.	23
<i>Gastroidium phleoides</i>	23
<i>Euphorbia acanthothamnos</i>	23
<i>Gagea graeca</i>	23
<i>Medicago coronata</i>	22
<i>Teucrium microphyllum</i>	22
<i>Crepis neglecta</i> aggr.	22
<i>Bupleurum gracile</i>	22
<i>Aira elegantissima</i>	22
<i>Hymenocarpus circinnatus</i>	21
<i>Fumana arabica</i>	21
<i>Asperula rigida</i>	21
<i>Filago eriocephala</i>	21
<i>Convolvulus oleifolius</i>	21
<i>Hypochaeris achyrophorus</i>	20
<i>Verbascum spinosum</i>	20
<i>Biscutella didyma</i>	19
<i>Trifolium stellatum</i>	19
<i>Trifolium infamia-ponertii</i>	19
<i>Crucianella latifolia</i>	19
<i>Plantago cretica</i>	19
<i>Pyrus spinosa</i>	18
<i>Drimia maritima</i> aggr.	18
<i>Erica manipuliflora</i>	18
<i>Stachys spinosa</i>	18
<i>Scorpiurus muricatus</i>	18
<i>Micromeria nervosa</i>	18
<i>Hypericum trichocaulon</i>	17
<i>Thesium humile</i>	17
<i>Tordylium apulum</i>	17
<i>Polygala venulosa</i>	17
<i>Teucrium alpestre</i>	17
<i>Ononis reclinata</i>	17
<i>Salvia viridis</i>	16
<i>Onobrychis caput-galli</i>	16
<i>Aegilops biuncialis</i>	16
<i>Hypericum empetrifolium</i>	16
<i>Scaligeria napiformis</i>	16
<i>Filago aegaea</i>	16
<i>Centaurea idaea</i>	16
<i>Trifolium uniflorum</i>	15

Constant species (percentage frequencies)

<i>Sarcopoterium spinosum</i>	80
<i>Thymbra capitata</i>	42
<i>Dactylis glomerata</i>	40
<i>Leontodon tuberosus</i>	37
<i>Brachypodium retusum</i>	35
<i>Genista acanthoclada</i>	34

<i>Trifolium campestre</i>	31
<i>Hypochaeris achyrophorus</i>	28
<i>Phagnalon rupestre</i>	27
<i>Drimia maritima</i> aggr.	27
<i>Anagallis arvensis</i>	27
<i>Lagoecia cuminoides</i>	26
<i>Galium murale</i>	26
<i>Valantia hispida</i>	24
<i>Catapodium rigidum</i>	24
<i>Carlina graeca</i>	24
<i>Asphodelus ramosus</i>	24
<i>Trifolium stellatum</i>	22
<i>Linum strictum</i> aggr.	22
<i>Avena barbata</i>	22
<i>Sherardia arvensis</i>	21
<i>Pistacia lentiscus</i>	21
<i>Crepis neglecta</i> aggr.	21
<i>Ranunculus paludosus</i>	20
<i>Cistus creticus</i>	20
<i>Aira elegantissima</i>	20
<i>Sonchus bulbosus</i>	19
<i>Poa bulbosa</i>	19
<i>Bromus intermedius</i>	19
<i>Anisantha fasciculata</i>	19
<i>Trifolium scabrum</i>	18
<i>Trachynia distachya</i>	18
<i>Satureja thymbra</i>	18
<i>Calicotome villosa</i>	18
<i>Briza maxima</i>	18
<i>Asterolinon linum-stellatum</i>	18
<i>Arisarum vulgare</i>	18
<i>Tordylium apulum</i>	17
<i>Quercus coccifera</i>	17
<i>Plantago lagopus</i>	17
<i>Hyparrhenia hirta</i>	16
<i>Crucianella latifolia</i>	16
<i>Vulpia ciliata</i>	15
<i>Scorpiurus muricatus</i>	15
<i>Pyrus spinosa</i>	15
<i>Medicago coronata</i>	15
<i>Hymenocarpus circinnatus</i>	15
<i>Euphorbia peplus</i>	15
<i>Euphorbia acanthothamnus</i>	15
<i>Erica manipuliflora</i>	15
<i>Crepis foetida</i> aggr.	15
<i>Allium rubrovittatum</i>	15
<i>Teucrium polium</i> aggr.	13
<i>Rostraria cristata</i>	13
<i>Ononis reclinata</i>	13
<i>Linum trigynum</i>	13
<i>Hedypnois rhagadioloides</i>	13
<i>Eryngium campestre</i>	13
<i>Carlina corymbosa</i> aggr.	13
<i>Asparagus aphyllus</i>	13
<i>Teucrium microphyllum</i>	12
<i>Scaligeria napiformis</i>	12
<i>Psilurus incurvus</i>	12
<i>Phlomis fruticosa</i>	12
<i>Hypericum empetrifolium</i>	12

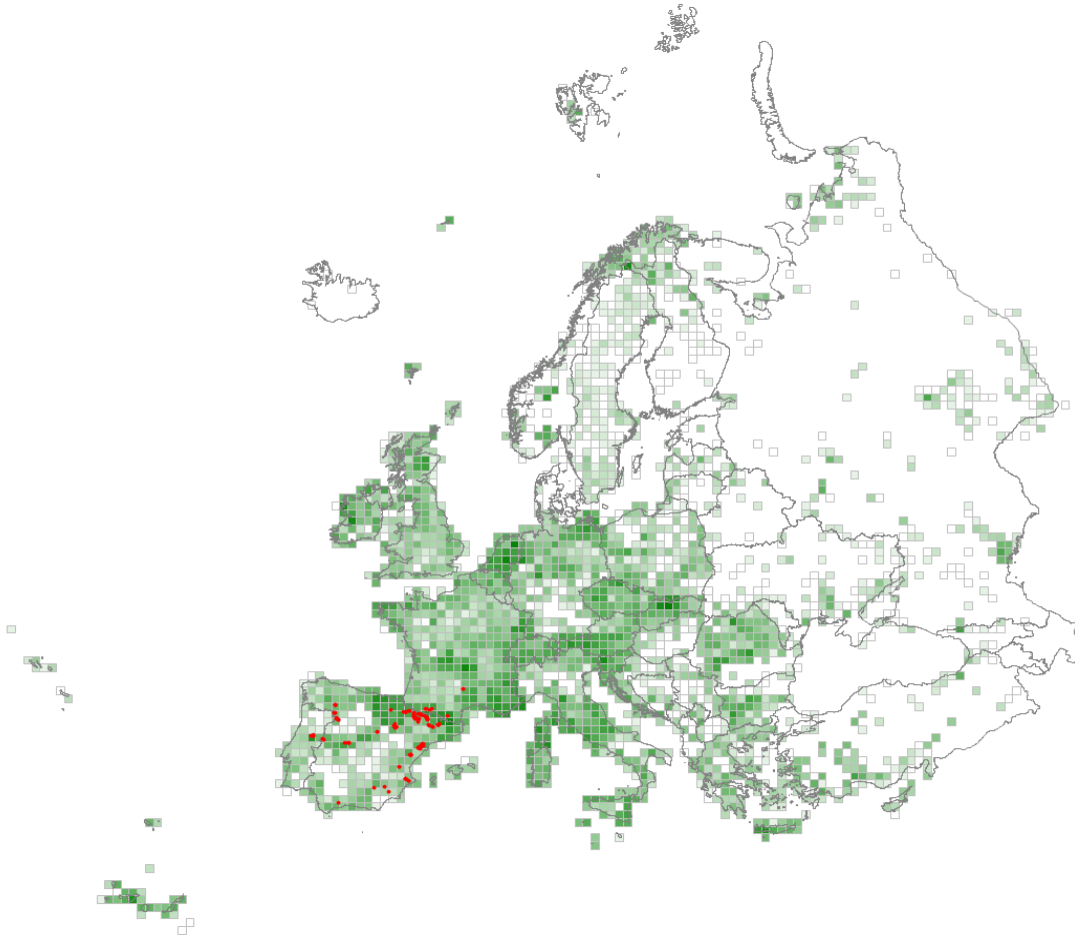
<i>Gastridium phleoides</i>	12
<i>Gagea graeca</i>	12
<i>Fumana arabica</i>	12
<i>Cuscuta palaestina</i> aggr.	12
<i>Biscutella didyma</i>	12
<i>Asparagus acutifolius</i>	12
<i>Urospermum picroides</i>	11
<i>Selaginella denticulata</i>	11
<i>Cynosurus echinatus</i>	11
<i>Asperula rigida</i>	11
<i>Anthoxanthum odoratum</i> aggr.	11

Dominant species (percentage frequencies of occurrences with cover > 25%)

<i>Sarcopoterium spinosum</i>	60
<i>Genista acanthoclada</i>	27
<i>Euphorbia acanthothamnos</i>	9
<i>Thymbra capitata</i>	6

## S73 – Western Mediterranean mountain hedgehog-heath

Heath of often spiny hedgehog sub-shrubs on base-rich and acidic soils in the upper supra- and oromediterranean belts of the Iberian Peninsula, historically sustaining transhumance pastoralism but often extending down from crests and steep slopes due to grazing and burning.



### Corresponding alliances in EuroVegChecklist 2016

- <> ROS-05A *Andryalion agardhii* Rivas-Mart. ex Rivas Goday et Mayor 1966
- > SAB-02A *Cytision oromediterranei* Tx. in Tx. et Oberd. 1958 corr. Rivas-Mart. 1987
- <> CYT-03B *Cytision oromediterraneo-scoparii* Rivas-Mart. et al. 2002
- > ONO-02F *Echinopartion horridi* Rivas-Mart. et al. 1991
- > ONO-02G *Genision occidentalis* Rivas-Mart. in Rivas-Mart. et al. 1984
- > ROS-02A *Xeroacantho-Erinaceion* (Quézel 1953) O. de Bolòs 1967

### Characteristic species combination

Diagnostic species (phi coefficient \* 100)

<i>Echinopartum horridum</i>	54
<i>Erinacea anthyllis</i>	46
<i>Echinopartum lusitanicum</i>	37
<i>Helianthemum apenninum</i>	26
<i>Koeleria vallesiana</i>	25
<i>Thymus vulgaris</i>	23
<i>Crepis albida</i>	23
<i>Brassica repanda</i>	23

<i>Centaurea resupinata</i>	23
<i>Paronychia kapela</i>	21
<i>Bupleurum fruticosum</i>	20
<i>Saponaria caespitosa</i>	19
<i>Carex humilis</i>	18
<i>Linum narbonense</i>	18
<i>Helictochloa pratensis</i>	18
<i>Teucrium pyrenaicum</i>	18
<i>Marrubium supinum</i>	18
<i>Carthamus carduncellus</i>	17
<i>Potentilla pusilla</i>	17
<i>Helianthemum origanifolium</i>	17
<i>Buxus sempervirens</i>	17
<i>Lavandula latifolia</i>	16
<i>Euphorbia flavicoma</i>	16
<i>Anthyllis montana</i>	16
<i>Genista hystrix</i>	16
<i>Arenaria aggregata</i> aggr.	16
<i>Ornithogalum concinnum</i>	16
<i>Erodium foetidum</i>	16
<i>Armeria fontqueri</i>	16
<i>Genista scorpius</i>	15

Constant species (percentage frequencies)

<i>Thymus vulgaris</i>	52
<i>Koeleria vallesiana</i>	51
<i>Erinacea anthyllis</i>	41
<i>Carex humilis</i>	41
<i>Echinopartum horridum</i>	36
<i>Helianthemum apenninum</i>	34
<i>Buxus sempervirens</i>	32
<i>Teucrium chamaedrys</i>	30
<i>Bromopsis erecta</i>	27
<i>Pinus sylvestris</i>	25
<i>Genista scorpius</i>	25
<i>Teucrium polium</i> aggr.	23
<i>Helictochloa pratensis</i>	23
<i>Anthyllis vulneraria</i>	22
<i>Lavandula latifolia</i>	21
<i>Juniperus communis</i> subsp. <i>nana</i>	19
<i>Anthyllis montana</i>	19
<i>Potentilla pusilla</i>	18
<i>Paronychia kapela</i>	18
<i>Fumana procumbens</i>	18
<i>Bupleurum fruticosum</i>	18
<i>Echinopartum lusitanicum</i>	16
<i>Crepis albida</i>	16
<i>Helianthemum canum</i>	15
<i>Brachypodium retusum</i>	15
<i>Teucrium pyrenaicum</i>	14
<i>Linum narbonense</i>	14
<i>Carex flacca</i>	14
<i>Aphyllanthes monspeliensis</i>	14
<i>Sedum sediforme</i>	12
<i>Sanguisorba minor</i> aggr.	12
<i>Ononis minutissima</i>	12
<i>Linum suffruticosum</i> aggr.	12
<i>Lavandula angustifolia</i>	12
<i>Helichrysum stoechas</i>	12

<i>Helianthemum italicum</i>	12
<i>Globularia vulgaris</i>	12
<i>Festuca ovina</i>	12
<i>Coronilla minima</i>	12
<i>Carthamus carduncellus</i>	12
<i>Arctostaphylos uva-ursi</i>	12
<i>Festuca rubra</i> aggr.	11
<i>Festuca hystrix</i>	11
<i>Dorycnium pentaphyllum</i>	11
<i>Brassica repanda</i>	11
<i>Arenaria aggregata</i> aggr.	11

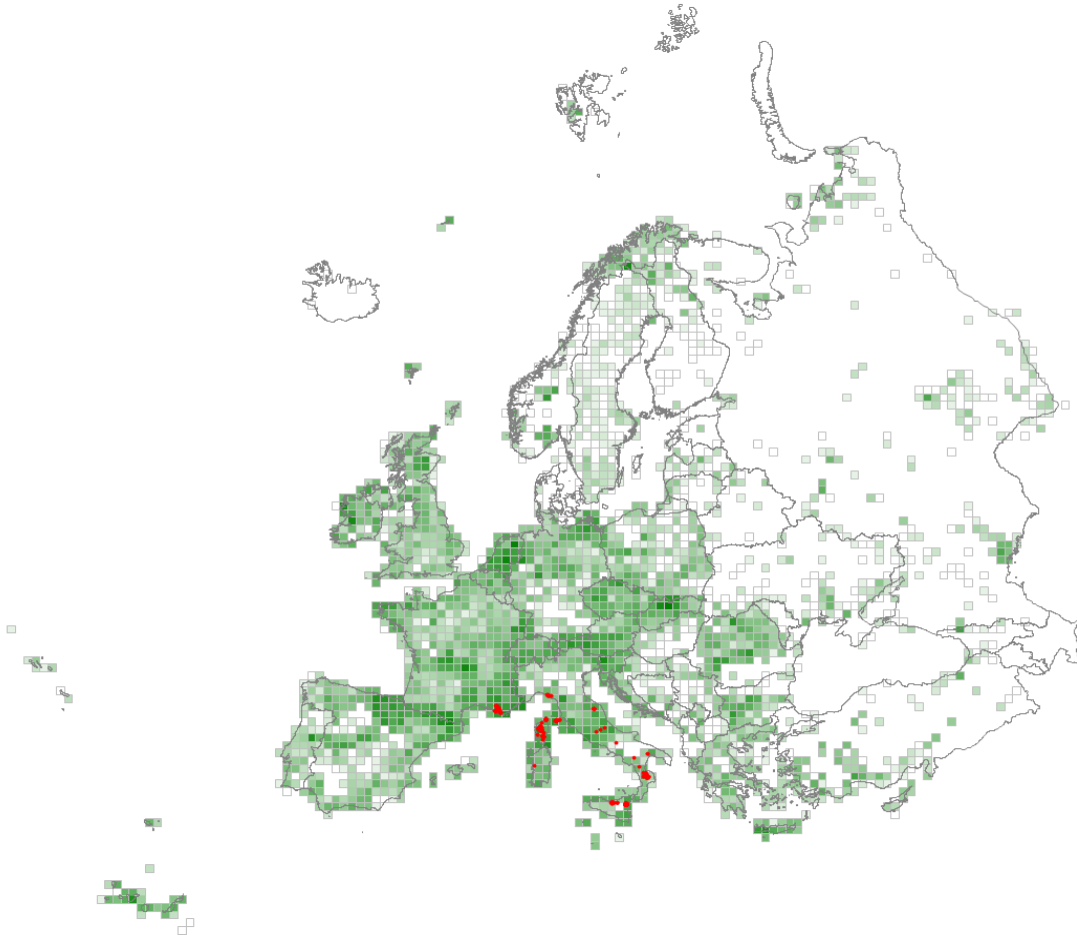
Dominant species (percentage frequencies of occurrences with cover > 25%)

<i>Echinochloa crus-galli</i>	36
<i>Erinacea anthyllis</i>	33
<i>Echinochloa lusitanicum</i>	16
<i>Carex humilis</i>	5
<i>Bupleurum fruticosum</i>	5



## S74 – Central Mediterranean mountain hedgehog-heath

Heath of often spiny hedgehog sub-shrubs on base-rich and acidic soils in windy and sunny places in the supra- and oromediterranean belts of Corsica, Sardinia, Elba, Sicily and the southern mainland mountains of Italy. Downslope expansion below the timberline can follow clearance and grazing.



### Corresponding alliances in EuroVegChecklist 2016

- > GEN-01A Anthyllidion hermanniae Klein 1972
- > RUM-02B Armerion aspromontanae S. Brullo et al. 2001
- > RUM-01B Armerion nebrodensis S. Brullo 1984
- > ONO-03E Cerastio-Astragalion nebrodensis Pignatti et Nimis ex S. Brullo 1984
- > RUM-02A Koelerio brutiae-Astragalion calabrici Giacomini et Gentile ex S. Brullo 2005
- <> RUM-01A Rumici-Astragalion siculi Poli 1965

### Characteristic species combination

Diagnostic species (phi coefficient \* 100)

<i>Astracantha parnassi</i> subsp. <i>calabricus</i>	38
<i>Genista lobelii</i>	36
<i>Centaurea sarfattiana</i>	36
<i>Armeria brutia</i>	35
<i>Tolpis virgata</i>	30
<i>Genista desoleana</i>	27
<i>Carlina nebrodensis</i>	27
<i>Petrorhagia saxifraga</i>	26

<i>Thymus herba-barona</i>	25
<i>Phleum ambiguum</i>	24
<i>Genista salzmannii</i>	23
<i>Bunium alpinum</i>	23
<i>Hypericum barbatum</i>	22
<i>Genista cupanii</i>	22
<i>Astracantha sicula</i>	22
<i>Cytisus spinescens</i>	21
<i>Klasea nudicaulis</i>	21
<i>Festuca circummediterranea</i>	20
<i>Valeriana tuberosa</i>	20
<i>Hypochaeris cretensis</i>	20
<i>Anthemis cretica</i>	19
<i>Sedum amplexicaule</i>	19
<i>Anthyllis hermanniae</i>	19
<i>Plantago maritima</i> subsp. <i>serpentina</i>	18
<i>Morisia monanthos</i>	18
<i>Festuca laevigata</i>	18
<i>Brimeura fastigiata</i>	18
<i>Rosa serafinii</i>	17
<i>Silene italica</i> aggr.	17
<i>Crocus corsicus</i>	17
<i>Galium aetnicum</i>	16
<i>Potentilla detommasii</i>	16
<i>Bellium bellidioides</i>	16
<i>Scleranthus aetnensis</i>	15

Constant species (percentage frequencies)

<i>Petrorhagia saxifraga</i>	38
<i>Genista lobelii</i>	32
<i>Festuca circummediterranea</i>	26
<i>Silene italica</i> aggr.	24
<i>Jasione montana</i>	24
<i>Helianthemum nummularium</i>	24
<i>Thymus herba-barona</i>	23
<i>Phleum ambiguum</i>	23
<i>Anthoxanthum odoratum</i> aggr.	23
<i>Plantago maritima</i> subsp. <i>serpentina</i>	22
<i>Bromopsis erecta</i>	22
<i>Anthyllis vulneraria</i>	22
<i>Thymus vulgaris</i>	20
<i>Sedum amplexicaule</i>	20
<i>Tolpis virgata</i>	18
<i>Astracantha parnassi</i> subsp. <i>calabricus</i>	18
<i>Anthyllis hermanniae</i>	18
<i>Anthemis cretica</i>	18
<i>Thymus longicaulis</i>	17
<i>Rumex acetosella</i>	17
<i>Hypericum barbatum</i>	17
<i>Helichrysum italicum</i>	17
<i>Bunium alpinum</i>	17
<i>Valeriana tuberosa</i>	16
<i>Clinopodium alpinum</i>	16
<i>Teucrium polium</i> aggr.	15
<i>Teucrium chamaedrys</i>	15
<i>Hypochaeris cretensis</i>	15
<i>Genista salzmannii</i>	15
<i>Festuca rubra</i> aggr.	15
<i>Cytisus spinescens</i>	15

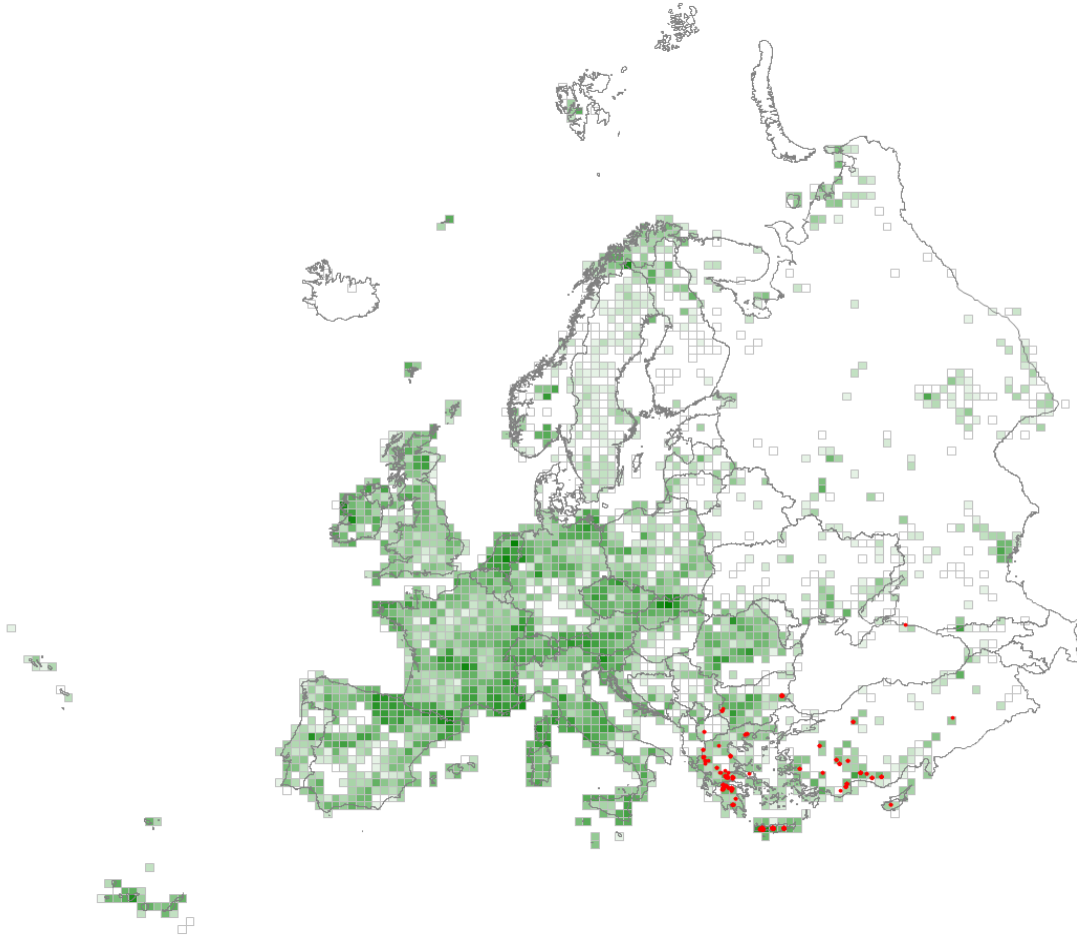
<i>Centaurea sarfattiana</i>	15
<i>Bellium bellidioides</i>	15
<i>Armeria brutia</i>	15
<i>Pilosella hoppeana</i>	14
<i>Koeleria splendens</i>	14
<i>Dactylis glomerata</i>	14
<i>Carex humilis</i>	14
<i>Teucrium montanum</i>	13
<i>Santolina chamaecyparissus</i> aggr.	13
<i>Koeleria vallesiana</i>	13
<i>Cerastium arvense</i>	13
<i>Carlina nebrodensis</i>	13
<i>Carex halleriana</i>	13
<i>Avenella flexuosa</i>	13
<i>Satureja montana</i> aggr.	11
<i>Lavandula angustifolia</i>	11
<i>Klasea nudicaulis</i>	11
<i>Juniperus phoenicea</i>	11
<i>Hypochaeris robertia</i>	11
<i>Herniaria glabra</i>	11
<i>Galium corsicum</i>	11
<i>Brachypodium rupestre</i>	11
<i>Aphyllanthes monspeliensis</i>	11
<i>Aira caryophyllea</i>	11

Dominant species (percentage frequencies of occurrences with cover > 25%)

<i>Genista lobelii</i>	32
<i>Astracantha parnassi</i> subsp. <i>calabricus</i>	15
<i>Genista salzmannii</i>	14
<i>Genista desoleana</i>	8
<i>Cytisus spinescens</i>	8
<i>Astracantha sicula</i>	8
<i>Thymus longicaulis</i>	7
<i>Plantago maritima</i> subsp. <i>serpentina</i>	7
<i>Genista cupanii</i>	6
<i>Festuca circummediterranea</i>	6

## S75 – Eastern Mediterranean mountain hedgehog-heath

Heath of often spiny hedgehog sub-shrubs on mostly base-rich soils in dry mountains of the supra- and oromediterranean belts of the Eastern Mediterranean. Downslope expansion below the timberline can follow clearance and grazing.



### Corresponding alliances in EuroVegChecklist 2016

- > DAP-02A Astragalion cretici Bergmeier 2002
- > DAP-01A Astragalo angustifolii-Seslerion coerulantis Quézel 1964
- > DAP-02C Colchico cretensis-Cirsion morinifolii Bergmeier 2002
- > DAP-01B Eryngio multifidi-Bromion fibrosi Quézel 1964
- > CYP-01A Hyperico stenobotryos-Alyssion troodi S. Brullo et al. 2005
- > DAP-01C Stipo pulcherrimae-Morinion persicae Quézel 1964
- > DAP-02B Verbascion spinosi Zaffran ex Bergmeier 2002

### Characteristic species combination

Diagnostic species (phi coefficient \* 100)

<i>Astragalus angustifolius</i>	56
<i>Marrubium velutinum</i>	50
<i>Astracantha rumelica</i>	42
<i>Cerastium candidissimum</i>	35
<i>Astracantha cretica</i>	34
<i>Prunus prostrata</i>	33
<i>Acantholimon ulicinum</i>	32
<i>Daphne oleoides</i>	30

<i>Carduus tmoleus</i>	30
<i>Aubrieta deltoidea</i>	30
<i>Cirsium hypopsilum</i>	29
<i>Berberis cretica</i>	29
<i>Poa thessala</i>	27
<i>Galium thymifolium</i>	27
<i>Ptilostemon afer</i>	27
<i>Minuartia attica</i>	26
<i>Eryngium amethystinum</i>	26
<i>Festuca varia</i>	25
<i>Sesleria vaginalis</i>	23
<i>Galium incanum</i>	23
<i>Asperula idaea</i>	23
<i>Festuca polita</i>	22
<i>Phleum montanum</i>	22
<i>Marrubium cylleneum</i>	22
<i>Dianthus biflorus</i>	21
<i>Verbascum epixanthinum</i>	21
<i>Malcolmia graeca</i>	21
<i>Anchusa cespitosa</i>	21
<i>Rosa pulverulenta</i>	20
<i>Geranium subcaulescens</i>	20
<i>Festuca jeanpertii</i>	20
<i>Euphorbia herniariifolia</i>	20
<i>Lepidium hirtum</i>	19
<i>Thymus sipyleus</i>	19
<i>Colchicum cretense</i>	19
<i>Cirsium morinifolium</i>	19
<i>Astracantha parnassi</i> subsp. <i>cyllenea</i>	19
<i>Astracantha arnacantha</i>	19
<i>Asyneuma limonifolium</i>	18
<i>Bufonia stricta</i>	18
<i>Rosa heckeliana</i>	18
<i>Campanula spatulata</i>	18
<i>Cerastium brachypetalum</i>	18
<i>Minuartia juniperina</i>	17
<i>Galium taygetum</i>	17
<i>Morina persica</i>	17
<i>Centaurea idaea</i>	17
<i>Acantholimon puberulum</i>	17
<i>Centaurea affinis</i>	17
<i>Bromopsis tomentella</i>	17
<i>Cyanus pichleri</i>	17
<i>Achillea fraasii</i>	17
<i>Sideritis clandestina</i>	16
<i>Satureja spinosa</i>	16
<i>Veronica thymifolia</i>	16
<i>Taraxacum</i> sect. <i>Scariosa</i>	16
<i>Scilla nana</i>	16
<i>Allium frigidum</i>	16
<i>Tragopogon olympicus</i>	16
<i>Geranium macrostylum</i>	16
<i>Asperula oetaea</i>	16
<i>Ornithogalum nivale</i>	16
<i>Astracantha thracica</i>	15

Constant species (percentage frequencies)

<i>Astragalus angustifolius</i>	59
<i>Daphne oleoides</i>	44

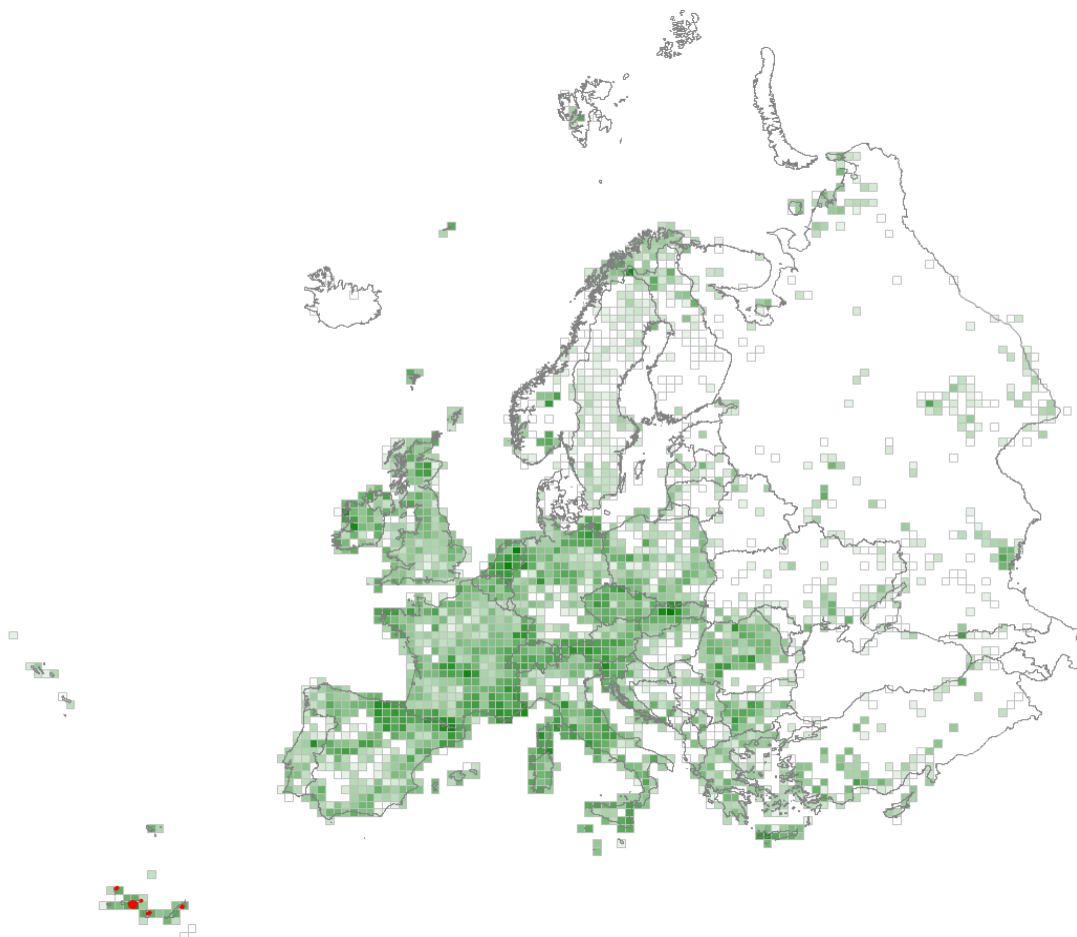
<i>Dactylis glomerata</i>	39
<i>Eryngium amethystinum</i>	35
<i>Marrubium velutinum</i>	30
<i>Astracantha rumelica</i>	28
<i>Festuca varia</i>	24
<i>Carduus tmoleus</i>	24
<i>Prunus prostrata</i>	23
<i>Clinopodium alpinum</i>	23
<i>Melica ciliata</i> aggr.	22
<i>Cerastium candidissimum</i>	22
<i>Poa thessala</i>	21
<i>Cerastium brachypetalum</i>	20
<i>Berberis cretica</i>	20
<i>Acantholimon ulicinum</i>	20
<i>Poa bulbosa</i>	18
<i>Campanula spatulata</i>	17
<i>Astracantha cretica</i>	17
<i>Minuartia attica</i>	16
<i>Bromus squarrosus</i>	16
<i>Aubrieta deltoidea</i>	16
<i>Sanguisorba minor</i> aggr.	15
<i>Asyneuma limonifolium</i>	15
<i>Trisetum flavescens</i>	13
<i>Rosa pulverulenta</i>	13
<i>Phleum montanum</i>	13
<i>Koeleria lobata</i>	13
<i>Cirsium hypopsilum</i>	13
<i>Stipa pennata</i>	12
<i>Sedum album</i>	12
<i>Festuca jeanpertia</i>	12
<i>Thymus longicaulis</i>	11
<i>Ptilostemon afer</i>	11
<i>Pimpinella tragium</i>	11
<i>Minuartia verna</i> aggr.	11
<i>Galium thymifolium</i>	11
<i>Euphorbia kotschyana</i>	11
<i>Centaurea idaea</i>	11
<i>Asperula idaea</i>	11

Dominant species (percentage frequencies of occurrences with cover > 25%)

<i>Astragalus angustifolius</i>	34
<i>Astracantha rumelica</i>	26
<i>Astracantha cretica</i>	13
<i>Berberis cretica</i>	6

## S76 – Canary mountain hedgehog-heath

Oromediterranean sparse summit low-grown scrub on volcanic screes of Tenerife and La Palma.



### Corresponding alliances in EuroVegChecklist 2016

- > SUP-01B Plantaginion webbii Martín Osorio, Wildpret et Rivas-Mart. In Martín Osorio et al. 2007
- > SUP-01A Spartocytision nubigeni Oberd. ex Esteve 1973
- <> VIO-01A Violion cheiranthifoliae Voggenreiter ex Martín Osorio, Wildpret et Rivas-Mart. in Martín Osorio et al. 2007

### Characteristic species combination

Diagnostic species (phi coefficient \* 100)

<i>Nepeta teydea</i>	65
<i>Cytisus supranubius</i>	52
<i>Tolpis webbii</i>	46
<i>Pterocephalus lasiospermus</i>	45
<i>Erysimum scoparium</i>	43
<i>Arrhenatherum calderae</i>	42
<i>Scrophularia glabrata</i>	39
<i>Sideritis eriocephala</i>	38
<i>Adenocarpus viscosus</i>	33
<i>Micromeria lasiophylla</i>	31
<i>Descurainia lemsii</i>	31

<i>Descurainia bourgaeana</i>	30
<i>Carlina xeranthemoides</i>	27
<i>Genista benehoavensis</i>	22
<i>Echium gentianoides</i>	22
<i>Cerastium sventenii</i>	22
<i>Argyranthemum tenerifae</i>	21
<i>Sonchus canariensis</i>	20
<i>Argyranthemum adauctum</i>	19
<i>Polycarpha tenuis</i>	17
<i>Cheirolophus teydis</i>	16
<i>Cytisus proliferus</i>	15
<i>Festuca agustinii</i>	15
<i>Erigeron calderae</i>	15
<i>Genista canariensis</i>	15

Constant species (percentage frequencies)

<i>Cytisus supranubius</i>	57
<i>Pterocephalus lasiospermus</i>	48
<i>Nepeta teydea</i>	48
<i>Erysimum scoparium</i>	43
<i>Tolpis webbii</i>	38
<i>Adenocarpus viscosus</i>	38
<i>Scrophularia glabrata</i>	29
<i>Arrhenatherum calderae</i>	29
<i>Descurainia bourgaeana</i>	24
<i>Pinus canariensis</i>	19
<i>Cytisus proliferus</i>	19
<i>Sideritis eriocephala</i>	14
<i>Carlina xeranthemoides</i>	14
<i>Argyranthemum tenerifae</i>	14

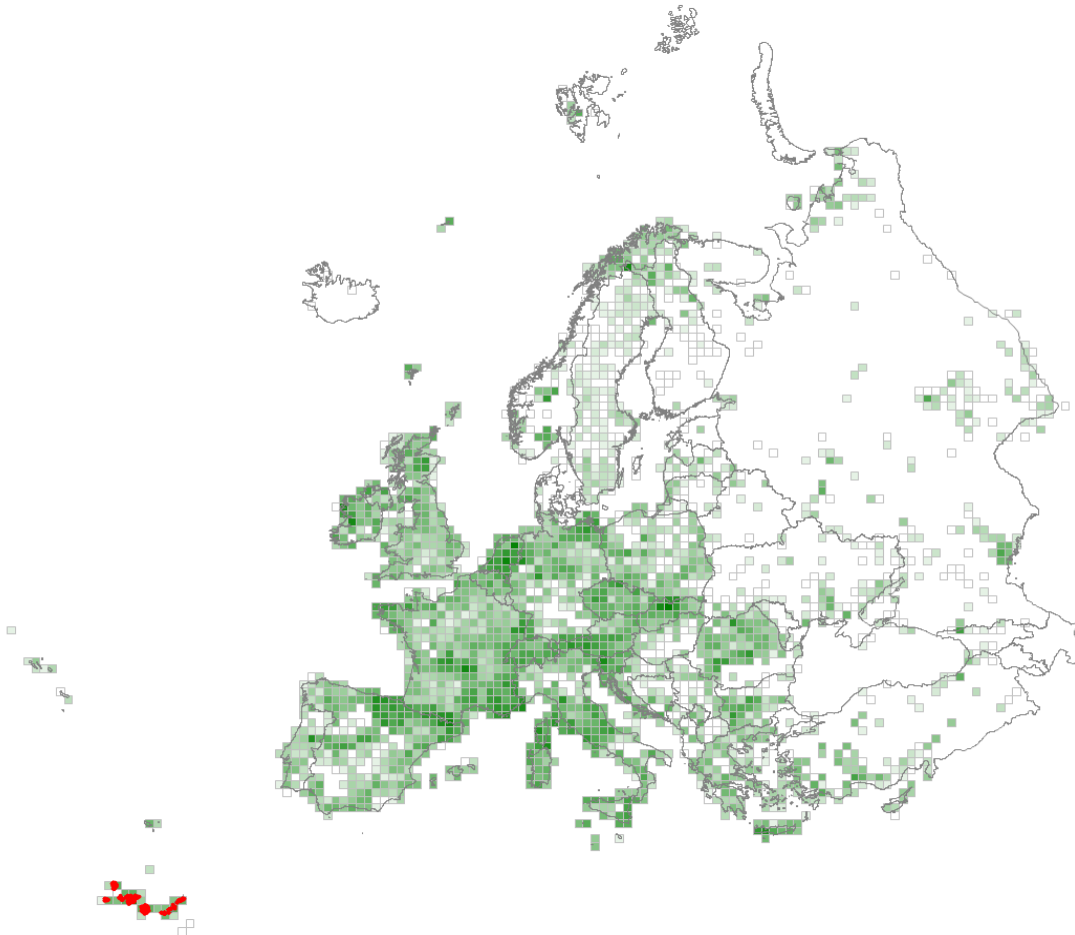
Dominant species (percentage frequencies of occurrences with cover > 25%)

<i>Cytisus supranubius</i>	43
<i>Pterocephalus lasiospermus</i>	19



## S81 – Canary xerophytic scrub

Open scrub dominated by succulent and sclerophyllous shrubs on rocky substrates with skeletal soils in the arid lowlands and on deeper soils in the moist foothills of the Canary Islands.



### Corresponding alliances in EuroVegChecklist 2016

- <> KLE-01A Aeonio-Euphorbion canariensis Sunding 1972
- > AEO-02A Aichryso laxi-Monanthion laxiflorae Santos et Reyes Betancort 2009
- > KLE-01B Euphorbion regijs-jubo-lamarckii Rivas-Mart., Wildpret, O. Rodríguez et Del Arco in Rivas-Mart. et al. 2011
- > AEO-01B Greenovion aureae Rivas-Mart. et al. 1993
- > AEO-01A Soncho acaulis-Sempervivion Sunding 1972

### Characteristic species combination

Diagnostic species (phi coefficient \* 100)

<i>Euphorbia canariensis</i>	56
<i>Kleinia neriifolia</i>	52
<i>Euphorbia balsamifera</i>	48
<i>Plocama pendula</i>	45
<i>Rubia fruticosa</i>	43
<i>Euphorbia regis-jubae</i>	35
<i>Cenchrus ciliaris</i>	33
<i>Helianthemum canariense</i>	30
<i>Neochamaelea pulverulenta</i>	30

<i>Schizogyne sericea</i>	30
<i>Campylanthus salsoloides</i>	29
<i>Ceropegia fusca</i>	28
<i>Kickxia scoparia</i>	27
<i>Aristida adscensionis</i>	26
<i>Launaea arborescens</i>	26
<i>Lycium afrum</i>	25
<i>Fagonia cretica</i>	25
<i>Echium brevirame</i>	25
<i>Asparagus pastorianus</i>	25
<i>Scilla haemorrhoidalis</i>	24
<i>Sonchus leptcephalus</i>	23
<i>Aeonium percarneum</i>	23
<i>Periploca angustifolia</i>	23
<i>Euphorbia aphylla</i>	23
<i>Euphorbia lamarckii</i>	22
<i>Rumex lunaria</i>	22
<i>Lycium intricatum</i>	22
<i>Lavandula canariensis</i>	22
<i>Phagnalon purpurascens</i>	21
<i>Echium decaisnei</i>	21
<i>Asparagus arborescens</i>	21
<i>Salvia aegyptiaca</i>	18
<i>Argyranthemum frutescens</i>	18
<i>Forsskaolea angustifolia</i>	18
<i>Ajuga iva</i>	18
<i>Salvia canariensis</i>	17
<i>Micromeria preauxii</i>	17
<i>Lotus pentaphyllus</i>	17
<i>Lavandula buchii</i>	17
<i>Aeonium viscatum</i>	17
<i>Artemisia thuscula</i>	17
<i>Aeonium manriqueorum</i>	16
<i>Cenchrus setaceus</i>	16
<i>Hyparrhenia hirta</i>	16
<i>Reseda scoparia</i>	16
<i>Opuntia stricta</i>	16
<i>Lotus lancerottensis</i>	15
<i>Retama raetam</i>	15

Constant species (percentage frequencies)

<i>Kleinia neriifolia</i>	60
<i>Rubia fruticosa</i>	47
<i>Euphorbia balsamifera</i>	47
<i>Euphorbia regis-jubae</i>	44
<i>Launaea arborescens</i>	34
<i>Plocama pendula</i>	33
<i>Hyparrhenia hirta</i>	32
<i>Euphorbia canariensis</i>	31
<i>Schizogyne sericea</i>	28
<i>Periploca angustifolia</i>	28
<i>Lycium intricatum</i>	24
<i>Cenchrus ciliaris</i>	24
<i>Helianthemum canariense</i>	19
<i>Neochamaelea pulverulenta</i>	17
<i>Aristida adscensionis</i>	17
<i>Scilla haemorrhoidalis</i>	16
<i>Argyranthemum frutescens</i>	16
<i>Lavandula canariensis</i>	14

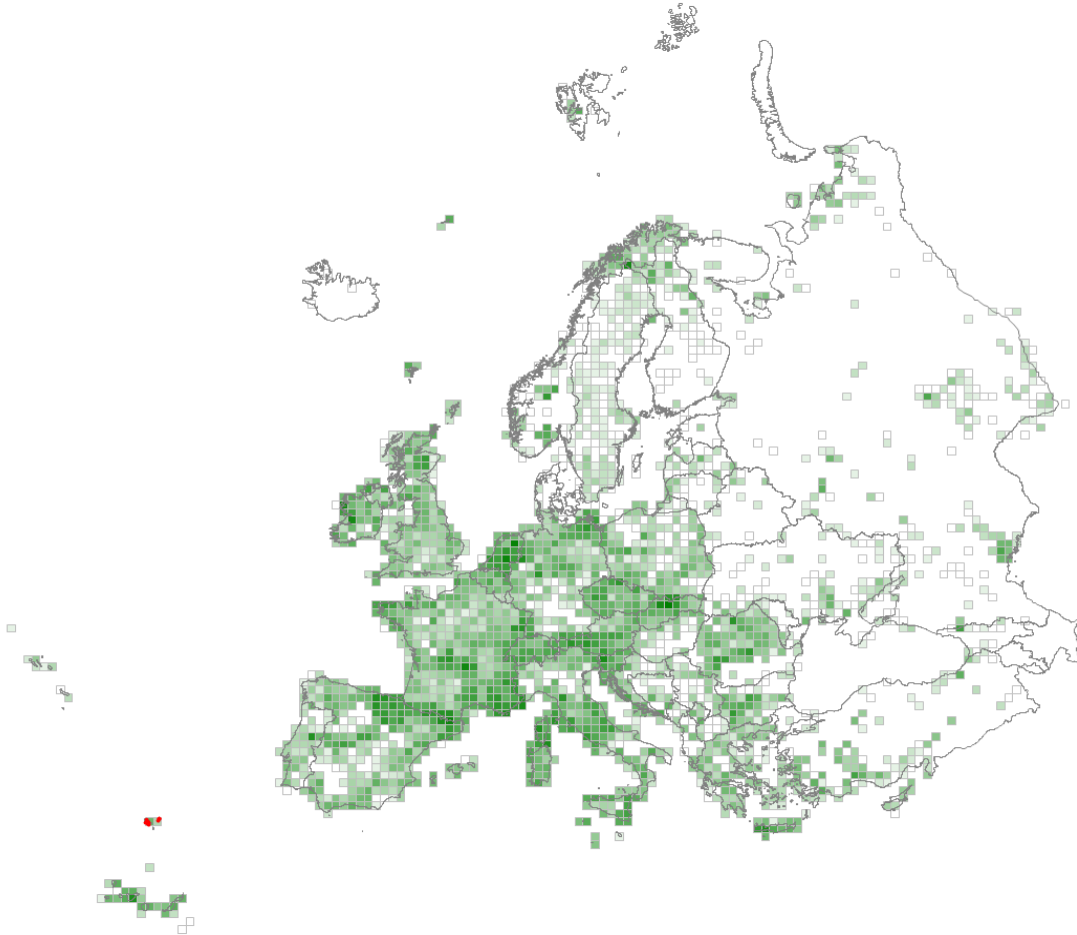
<i>Fagonia cretica</i>	14
<i>Rumex lunaria</i>	13
<i>Ceropegia fusca</i>	13
<i>Echium decaisnei</i>	11

Dominant species (percentage frequencies of occurrences with cover > 25%)

<i>Euphorbia balsamifera</i>	37
<i>Euphorbia canariensis</i>	12
<i>Euphorbia regis-jubae</i>	7
<i>Plocama pendula</i>	6
<i>Helianthemum canariense</i>	6

## S82 – Madeiran xerophytic scrub

Diverse scrub of sclerophyllous shrubs, small trees and succulent herbs on usually thin soils of rocky outcrops, cliffs and abandoned fields in the arid lowlands of Madeira.



### Corresponding alliances in EuroVegChecklist 2016

- <> KLE-01A Aeonio-Euphorbion canariensis Sunding 1972
- > AEO-01C Sinapidendro angustifolii-Aeonion glutinosi Capelo et al. 2000

### Characteristic species combination

Diagnostic species (phi coefficient \* 100)

<i>Echium nervosum</i>	78
<i>Sideroxylon mirmulans</i>	71
<i>Maytenus umbellata</i>	71
<i>Aeonium glandulosum</i>	70
<i>Globularia salicina</i>	70
<i>Helichrysum melaleucum</i>	67
<i>Dactylis smithii</i>	58
<i>Sonchus pinnatus</i>	50
<i>Phyllis nobla</i>	47
<i>Davallia canariensis</i>	45
<i>Euphorbia mellifera</i>	43
<i>Echium portasanctensis</i>	39
<i>Plantago arborescens</i>	38
<i>Hypericum grandifolium</i>	37

<i>Carlina salicifolia</i>	35
<i>Opuntia tuna</i>	35
<i>Sinapidendron gymnocalyx</i>	35
<i>Sideritis candicans</i>	33
<i>Crambe fruticosa</i>	32
<i>Asparagus umbellatus</i>	31
<i>Sinapidendron angustifolium</i>	27
<i>Argyranthemum webbii</i>	26
<i>Teucrium betonicum</i>	25
<i>Sonchus ustulatus</i>	24
<i>Bituminaria bituminosa</i>	23
<i>Lotus argyroides</i>	22
<i>Cheirolophus massonianus</i>	22
<i>Erysimum arbuscula</i>	22
<i>Carduus squarrosus</i>	22
<i>Matthiola maderensis</i>	21
<i>Asparagus asparagoides</i>	18
<i>Lotus macranthus</i>	17
<i>Polypodium cambricum</i> subsp. <i>macaronesicum</i>	17
<i>Crepis heldreichiana</i>	17
<i>Orobanche minor</i>	16

Constant species (percentage frequencies)

<i>Aeonium glandulosum</i>	85
<i>Helichrysum melaleucum</i>	75
<i>Globularia salicina</i>	75
<i>Echium nervosum</i>	70
<i>Maytenus umbellata</i>	60
<i>Davallia canariensis</i>	55
<i>Dactylis smithii</i>	55
<i>Sideroxylon mirmulans</i>	50
<i>Phyllis nobla</i>	50
<i>Bituminaria bituminosa</i>	50
<i>Carlina salicifolia</i>	40
<i>Hypericum grandifolium</i>	35
<i>Sonchus pinnatus</i>	30
<i>Plantago arborescens</i>	30
<i>Hedera helix</i> aggr.	30
<i>Euphorbia mellifera</i>	25
<i>Asparagus umbellatus</i>	25
<i>Smilax aspera</i>	20
<i>Sideritis candicans</i>	20
<i>Rubus ulmifolius</i>	20
<i>Opuntia tuna</i>	20
<i>Hyparrhenia hirta</i>	20
<i>Sinapidendron gymnocalyx</i>	15
<i>Polypodium cambricum</i> subsp. <i>macaronesicum</i>	15
<i>Echium portasanctensis</i>	15
<i>Crambe fruticosa</i>	15
<i>Argyranthemum webbii</i>	15

Dominant species (percentage frequencies of occurrences with cover > 25%)

<i>Sideroxylon mirmulans</i>	50
<i>Helichrysum melaleucum</i>	15
<i>Globularia salicina</i>	10
<i>Euphorbia mellifera</i>	10
<i>Echium portasanctensis</i>	10
<i>Sideritis candicans</i>	5
<i>Hypericum canariense</i>	5

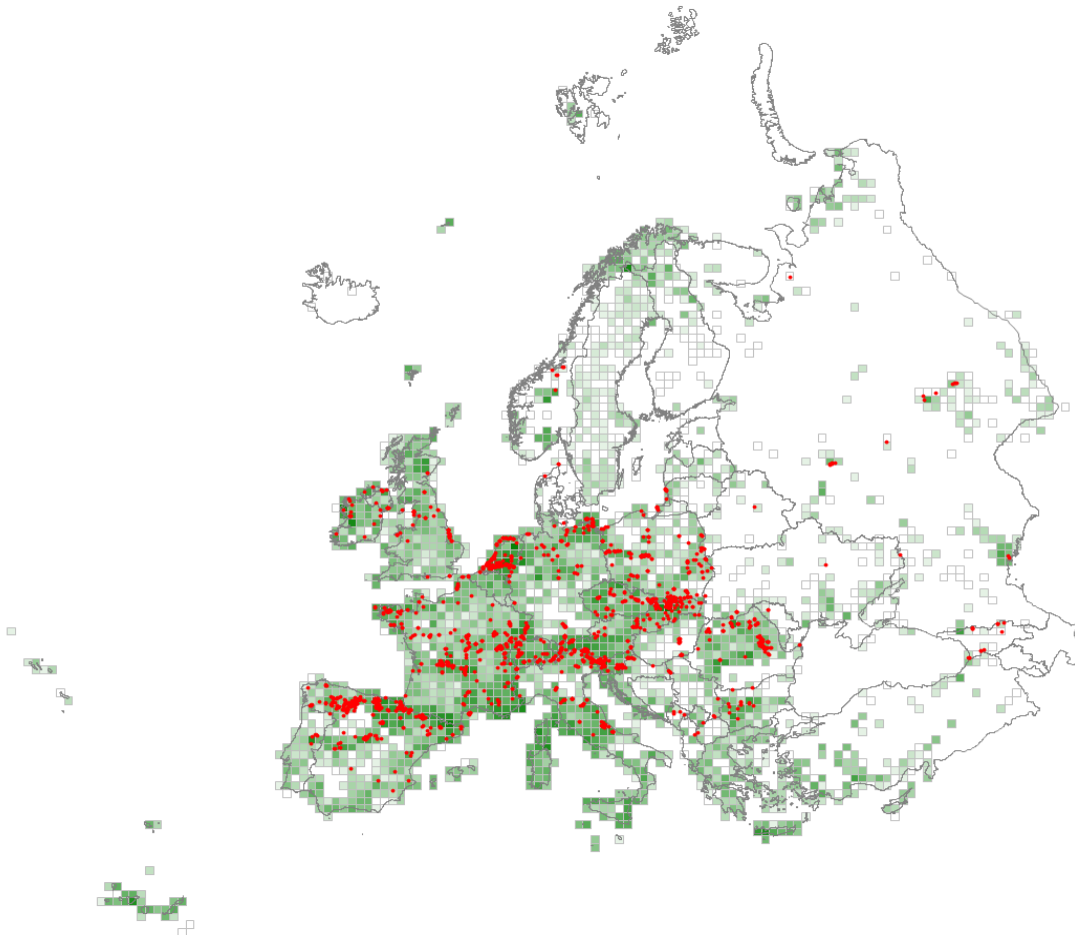
*Echium virescens*  
*Echium nervosum*

5  
5

## S91 – Temperate riparian scrub

Scrub of *Salix* spp. and *Myricaria germanica* developed on the mineral sediments of banks, shoals and gravel bars of lowland to montane streams through the temperate zone, re-establishing after seasonal flooding or succeeding to riparian and gallery forest where the sediments stabilise.

**Remark:** *Salix acutifolia* scrub in Ukraine, occurring not only in floodplains, needs to be considered as potential new habitat.



### Corresponding alliances in EuroVegChecklist 2016

- > PUR-01E Artemisio dniproicae-Salicion acutifoliae Shevchyk et V. Solomakha in Shevchyk et al. 1996
- > PUR-02B Artemisio scopariae-Tamaricion ramosissimae Simon et Dihoru 1963
- > PUR-01D Rubo caesii-Amorphion fruticosae Shevchyk et V. Solomakha in Shevchyk et al. 1996
- > PUR-01J Salicion apennino-purpureae Biondi et Allegranza in Biondi et al. 2014
- > PUR-01H Salicion cantabricae Rivas-Mart., T.E. Díaz et Penas in Rivas-Mart. et al. 2011
- > PUR-01G Salicion discolori-neotrichae Br.-Bl. et O. de Bolòs 1958 corr. Rivas-Mart. et al. 2002
- > PUR-01A Salicion eleagno-daphnoidis (Moor 1958) Grass 1993
- > PUR-01I Salicion pedicellatae Rivas-Mart. et al. 1984
- ◁ VIR-03A Salicion phyllicifoliae Dierssen 1992
- > PUR-01F Salicion salviifoliae Rivas-Mart. et al. 1984
- > PUR-01C Salicion triandrae T. Müller et Görs 1958
- > PUR-02A Tamaricion parviflorae I. Kárpáti et V. Kárpáti 1961

## Characteristic species combination

### Diagnostic species (phi coefficient \* 100)

<i>Salix purpurea</i>	39
<i>Salix triandra</i>	39
<i>Salix eleagnos</i>	30
<i>Salix viminalis</i>	29
<i>Myricaria germanica</i>	21
<i>Salix salviifolia</i>	15

### Constant species (percentage frequencies)

<i>Salix purpurea</i>	44
<i>Urtica dioica</i>	36
<i>Salix triandra</i>	30
<i>Rubus caesius</i>	26
<i>Salix eleagnos</i>	25
<i>Phalaroides arundinacea</i>	23
<i>Agrostis stolonifera</i>	22
<i>Ranunculus repens</i>	21
<i>Solanum dulcamara</i>	20
<i>Calystegia sepium</i>	20
<i>Galium aparine</i>	19
<i>Salix viminalis</i>	18
<i>Poa trivialis</i>	17
<i>Salix cinerea</i> subsp. <i>oleifolia</i>	16
<i>Equisetum arvense</i>	16
<i>Hippophae rhamnoides</i>	14
<i>Dactylis glomerata</i>	14
<i>Tussilago farfara</i>	13
<i>Salix euxina</i>	13
<i>Lythrum salicaria</i>	13
<i>Lysimachia vulgaris</i>	13
<i>Glechoma hederacea</i>	13
<i>Angelica sylvestris</i>	13
<i>Salix alba</i>	12
<i>Populus nigra</i>	12
<i>Mentha longifolia</i>	12
<i>Lycopus europaeus</i>	12
<i>Galium mollugo</i> aggr.	12
<i>Taraxacum</i> sect. <i>Taraxacum</i>	11
<i>Phragmites australis</i>	11
<i>Galium palustre</i> aggr.	11
<i>Filipendula ulmaria</i>	11
<i>Eupatorium cannabinum</i>	11
<i>Deschampsia cespitosa</i> aggr.	11

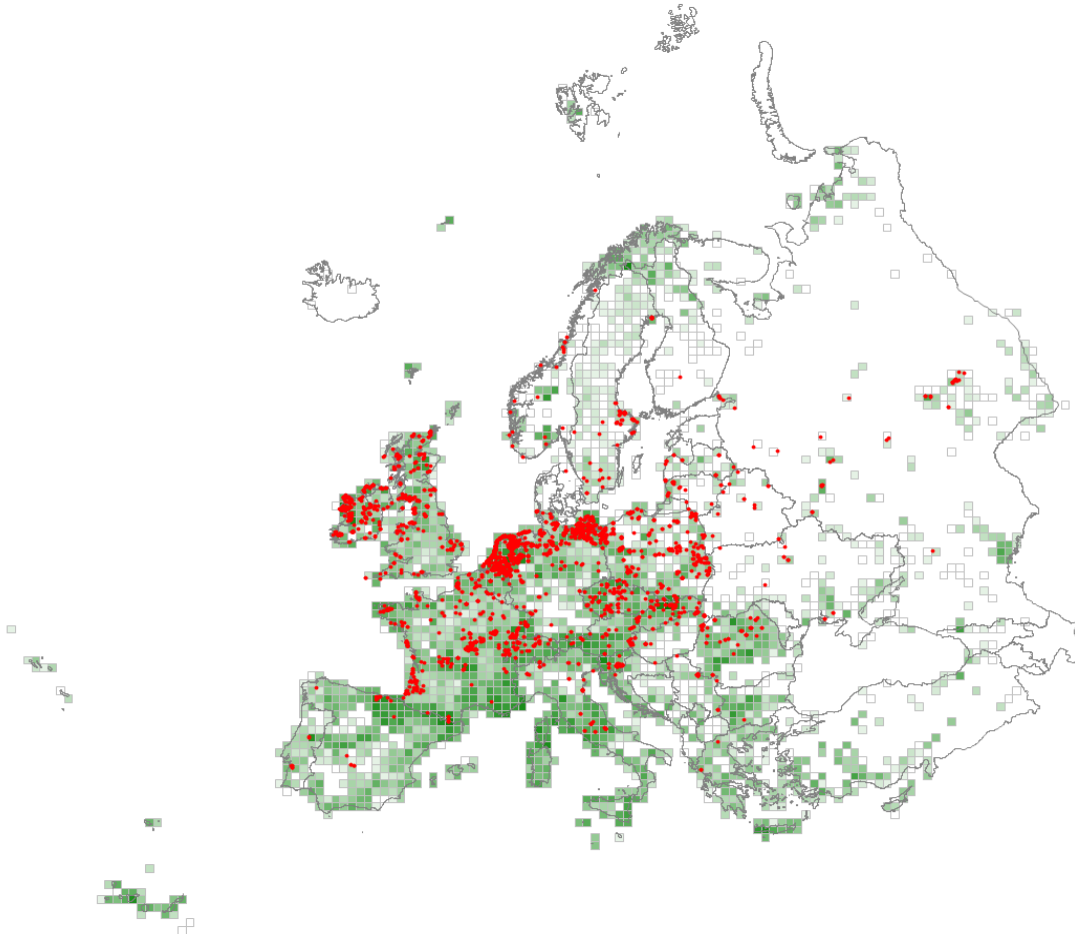
### Dominant species (percentage frequencies of occurrences with cover > 25%)

<i>Salix purpurea</i>	23
<i>Salix triandra</i>	16
<i>Salix eleagnos</i>	14
<i>Salix cinerea</i> subsp. <i>oleifolia</i>	13
<i>Hippophae rhamnoides</i>	13
<i>Salix viminalis</i>	11
<i>Urtica dioica</i>	7
<i>Myricaria germanica</i>	7



## S92 – *Salix* fen scrub

Scrub dominated by various species of *Salix* spp. on peaty and mineral soils maintained in a permanently waterlogged state by high groundwater in floodplain backwaters, around lakes and ponds, among mires and dunes, and in abandoned wet meadows and pastures, occurring through the lowlands of Atlantic, boreal and continental Europe and extending into the Mediterranean region at higher altitudes. Associated floras vary according to the base status of the groundwater and soils.



### Corresponding alliances in EuroVegChecklist 2016

- > FRA-01B *Alno incanae*-*Salicion pentandrae* Kielland-Lund 1981
- > FRA-01A *Salicion cinereae* T. Müller et Görs ex Passarge 1961

### Characteristic species combination

Diagnostic species (phi coefficient \* 100)

<i>Salix cinerea</i> subsp. <i>cinerea</i>	33
<i>Myrica gale</i>	20

Constant species (percentage frequencies)

<i>Salix cinerea</i> subsp. <i>cinerea</i>	55
<i>Molinia caerulea</i> aggr.	32
<i>Lysimachia vulgaris</i>	31
<i>Galium palustre</i> aggr.	29
<i>Phragmites australis</i>	24
<i>Frangula alnus</i>	24

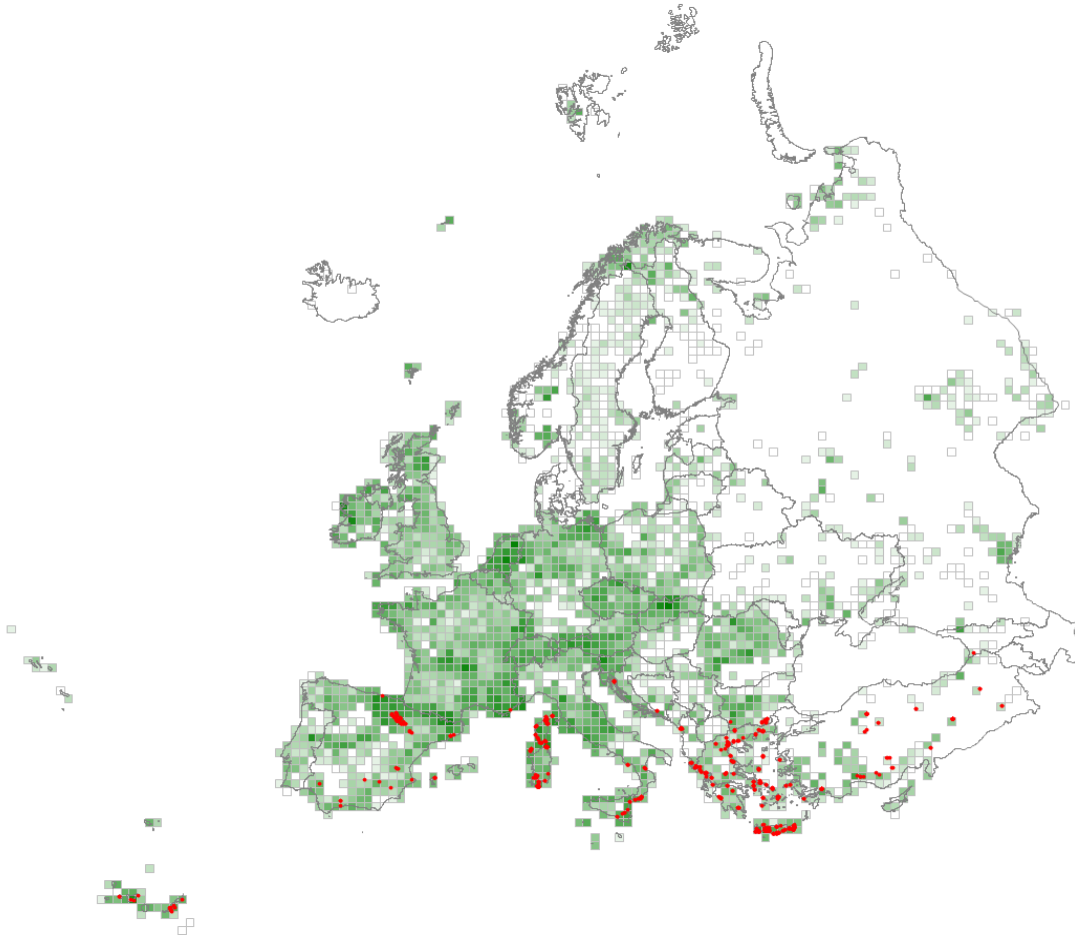
<i>Salix repens</i>	22
<i>Myrica gale</i>	21
<i>Lycopus europaeus</i>	20
<i>Urtica dioica</i>	19
<i>Solanum dulcamara</i>	19
<i>Lythrum salicaria</i>	19
<i>Potentilla erecta</i>	18
<i>Filipendula ulmaria</i>	17
<i>Calliergonella cuspidata</i>	17
<i>Betula pubescens</i>	16
<i>Comarum palustre</i>	15
<i>Cirsium palustre</i>	15
<i>Salix aurita</i>	14
<i>Juncus effusus</i>	14
<i>Iris pseudacorus</i>	14
<i>Calamagrostis canescens</i>	14
<i>Equisetum fluviatile</i>	13
<i>Peucedanum palustre</i>	12
<i>Carex panicea</i>	12
<i>Carex acutiformis</i>	12
<i>Caltha palustris</i>	12
<i>Angelica sylvestris</i>	12
<i>Alnus glutinosa</i>	12
<i>Scutellaria galericulata</i>	11
<i>Ranunculus repens</i>	11
<i>Poa trivialis</i>	11
<i>Mentha aquatica</i>	11
<i>Holcus lanatus</i>	11
<i>Erica tetralix</i>	11
<i>Calluna vulgaris</i>	11
<i>Agrostis stolonifera</i>	11

Dominant species (percentage frequencies of occurrences with cover > 25%)

<i>Salix cinerea</i> subsp. <i>cinerea</i>	46
<i>Myrica gale</i>	19
<i>Salix repens</i>	16
<i>Molinia caerulea</i> aggr.	14
<i>Frangula alnus</i>	8
<i>Salix aurita</i>	7

## S93 – Mediterranean riparian scrub

Usually open scrub dominated by species of *Tamarix* spp., *Nerium oleander*, *Vitex agnus-castus* and similar shrubs and small trees on seasonally dry or irregularly flooded riverbeds and along streamsides through the thermo- and mesomediterranean belts.



### Corresponding alliances in EuroVegChecklist 2016

- <> NER-01F Rubo sancti-Nerion oleandri Brullo et al. 2004
- > NER-01C Rubo ulmifolii-Nerion oleandri O. de Bolòs 1958
- > NER-01D Securinegion buxifoliae Rivas Goday ex López Sáez et Velasco-Negueruela
- > NER-01A Tamaricion africanae Br.-Bl. et O. de Bolòs 1958
- > NER-01B Tamaricion boveano-canariensis Izco et al. 1984
- > NER-01E Tamaricion dalmaticae Jasprica in Jasprica, Kovačić & Ruščić 2016

### Characteristic species combination

Diagnostic species (phi coefficient \* 100)

<i>Vitex agnus-castus</i>	37
<i>Tamarix africana</i>	33
<i>Tamarix parviflora</i>	32
<i>Nerium oleander</i>	32
<i>Tamarix hampeana</i>	28
<i>Tamarix canariensis</i>	26
<i>Tamarix tetrandra</i>	19

Constant species (percentage frequencies)

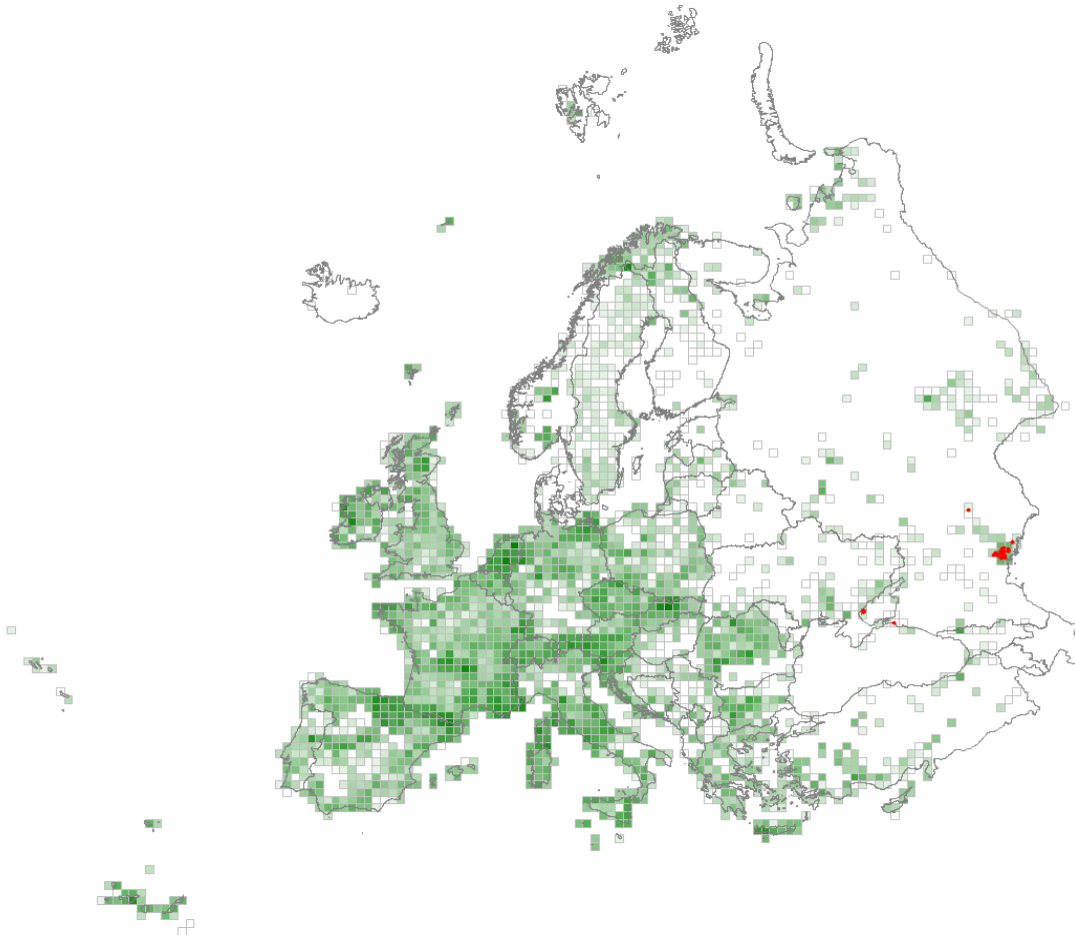
<i>Nerium oleander</i>	34
<i>Vitex agnus-castus</i>	29
<i>Rubus ulmifolius</i>	22
<i>Tamarix africana</i>	17
<i>Phragmites australis</i>	15
<i>Dittrichia viscosa</i>	15
<i>Tamarix hampeana</i>	14
<i>Pistacia lentiscus</i>	14
<i>Tamarix parviflora</i>	13
<i>Tamarix canariensis</i>	13
<i>Juncus acutus</i>	13
<i>Smilax aspera</i>	12
<i>Galium aparine</i>	12
<i>Scirpoides holoschoenus</i>	11
<i>Piptatherum miliaceum</i>	11
<i>Hordeum murinum</i>	11

Dominant species (percentage frequencies of occurrences with cover > 25%)

<i>Nerium oleander</i>	29
<i>Vitex agnus-castus</i>	18
<i>Tamarix africana</i>	14
<i>Tamarix parviflora</i>	13
<i>Tamarix hampeana</i>	13
<i>Tamarix canariensis</i>	11

## S94 – Semi-desert riparian scrub

Open scrub of *Tamarix* spp. and other shrubs and small trees occupying small or linear patches at sites characterised by seasonally high groundwater table and saline soils in beds of temporary or permanent rivers, in pans or sometimes in human-affected sites like irrigation systems through the semi-desert and desert region of South-Eastern Europe.



### Corresponding alliances in EuroVegChecklist 2016

- > TAM-01A *Agropyro fragilis-Tamaricion ramosissimae* Golub in Barmin 2001

### Characteristic species combination

Diagnostic species (phi coefficient \* 100)

<i>Tamarix ramosissima</i>	74
<i>Alhagi maurorum</i>	65
<i>Aeluropus pungens</i>	55
<i>Polygonum arenarium</i>	54
<i>Suaeda altissima</i>	42
<i>Tamarix gracilis</i>	41
<i>Atriplex aucheri</i>	39
<i>Limonium meyeri</i>	39
<i>Atriplex micrantha</i>	37
<i>Tamarix laxa</i>	36
<i>Bolboschoenus glaucus</i>	34
<i>Eremopyrum triticeum</i>	32

<i>Polygonum bellardii</i>	31
<i>Descurainia sophia</i>	30
<i>Puccinellia gigantea</i>	29
<i>Atriplex tatarica</i>	29
<i>Lactuca tatarica</i>	28
<i>Bassia hyssopifolia</i>	27
<i>Lepidium latifolium</i>	27
<i>Suaeda acuminata</i>	24
<i>Frankenia hirsuta</i>	24
<i>Artemisia santonicum</i>	24
<i>Sisymbrium loeselii</i>	23
<i>Althaea officinalis</i>	22
<i>Cynanchum acutum</i>	22
<i>Zygophyllum fabago</i>	21
<i>Medicago sativa</i>	21
<i>Petrosimonia oppositifolia</i>	20
<i>Cynodon dactylon</i>	19
<i>Sisymbrium orientale</i>	17
<i>Galium humifusum</i>	17
<i>Carduus uncinatus</i>	17
<i>Chorispora tenella</i>	17
<i>Lepidium perfoliatum</i>	17
<i>Argusia sibirica</i>	17
<i>Elytrigia repens</i> aggr.	17
<i>Bassia sedoides</i>	16
<i>Pterygoneurum ovatum</i>	16
<i>Cuscuta monogyna</i>	16

Constant species (percentage frequencies)

<i>Tamarix ramosissima</i>	67
<i>Alhagi maurorum</i>	67
<i>Polygonum arenarium</i>	57
<i>Limonium meyeri</i>	52
<i>Elytrigia repens</i> aggr.	52
<i>Eremopyrum triticeum</i>	48
<i>Descurainia sophia</i>	43
<i>Cynodon dactylon</i>	43
<i>Artemisia santonicum</i>	38
<i>Aeluropus pungens</i>	38
<i>Lactuca tatarica</i>	33
<i>Atriplex tatarica</i>	33
<i>Atriplex aucheri</i>	33
<i>Suaeda altissima</i>	29
<i>Phragmites australis</i>	29
<i>Cynanchum acutum</i>	29
<i>Medicago sativa</i>	24
<i>Atriplex micrantha</i>	24
<i>Anisantha tectorum</i>	24
<i>Tamarix laxa</i>	19
<i>Tamarix gracilis</i>	19
<i>Puccinellia gigantea</i>	19
<i>Polygonum bellardii</i>	19
<i>Poa bulbosa</i>	19
<i>Lepidium latifolium</i>	19
<i>Galium humifusum</i>	19
<i>Althaea officinalis</i>	19
<i>Suaeda acuminata</i>	14
<i>Sisymbrium loeselii</i>	14
<i>Senecio leucanthemifolius</i>	14

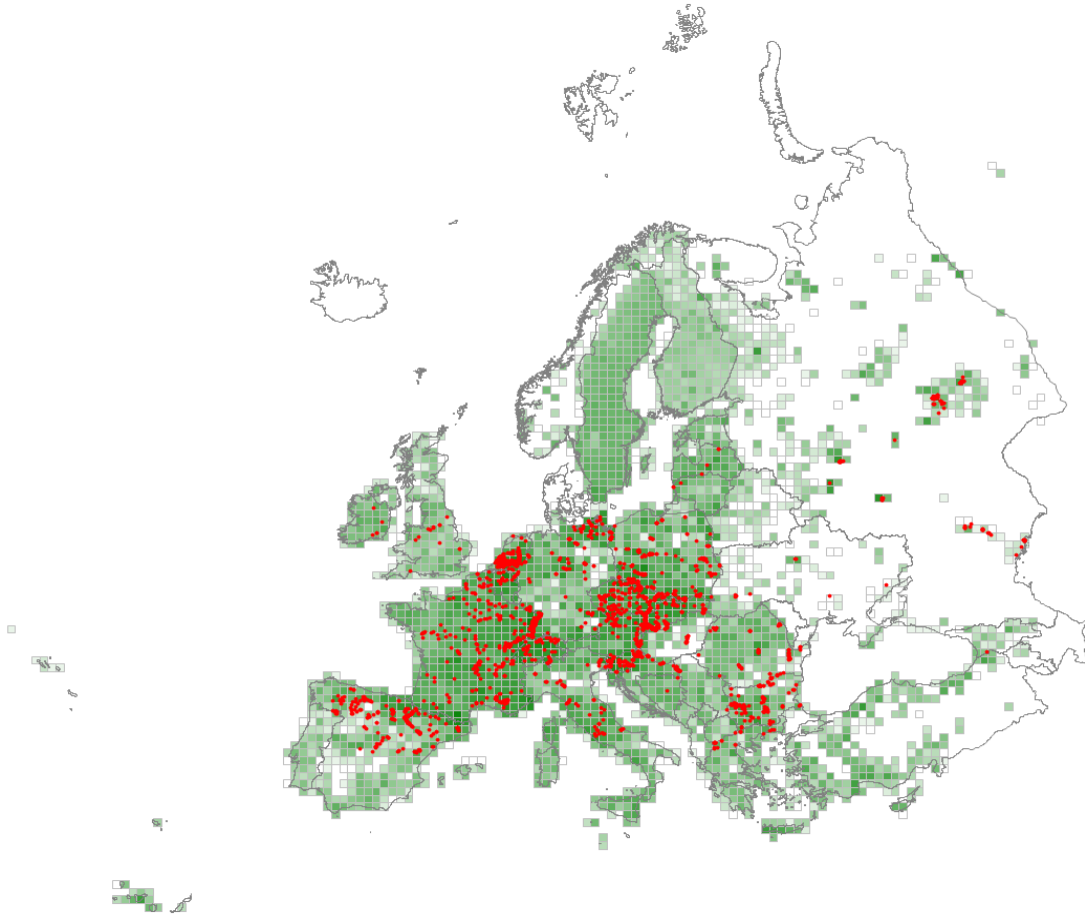
<i>Petrosimonia oppositifolia</i>	14
<i>Lepidium perfoliatum</i>	14
<i>Juncus gerardi</i>	14
<i>Glycyrrhiza glabra</i>	14
<i>Frankenia hirsuta</i>	14
<i>Crambe maritima</i>	14
<i>Carduus uncinatus</i>	14
<i>Calamagrostis epigejos</i>	14
<i>Bolboschoenus glaucus</i>	14
<i>Bassia sedoides</i>	14
<i>Bassia hyssopifolia</i>	14
<i>Artemisia austriaca</i>	14
<i>Alyssum turkestanicum</i>	14

Dominant species (percentage frequencies of occurrences with cover > 25%)

<i>Tamarix ramosissima</i>	52
<i>Tamarix gracilis</i>	19

## T11 – Temperate *Salix* and *Populus* riparian forest

Riparian forests dominated by willows (*Salix* spp.) and poplars (*Populus* spp.) of periodically-inundated terraces and shoals with deposition of nutrient-rich alluvium in the active floodplains of rivers through the lowlands of the temperate, submediterranean and steppe zones of Europe.



### Corresponding alliances in EuroVegChecklist 2016

- > PUR-01B *Salicion albae* Soó 1951

### Characteristic species combination

Diagnostic species (phi coefficient \* 100)

<i>Salix alba</i>	48
<i>Salix euxina</i>	41
<i>Populus nigra</i>	28
<i>Humulus lupulus</i>	21
<i>Rubus caesius</i>	21
<i>Urtica dioica</i>	19
<i>Phalaroides arundinacea</i>	19
<i>Populus alba</i>	18
<i>Glechoma hederacea</i>	17
<i>Impatiens glandulifera</i>	17
<i>Calystegia sepium</i>	16
<i>Salix triandra</i>	16
<i>Symphytum officinale</i>	15



*Salix purpurea* 15

Constant species (percentage frequencies)

<i>Urtica dioica</i>	70
<i>Salix alba</i>	59
<i>Rubus caesius</i>	44
<i>Galium aparine</i>	42
<i>Salix euxina</i>	41
<i>Phalaroides arundinacea</i>	34
<i>Glechoma hederacea</i>	32
<i>Populus nigra</i>	30
<i>Calystegia sepium</i>	29
<i>Poa trivialis</i>	27
<i>Ranunculus repens</i>	25
<i>Humulus lupulus</i>	25
<i>Sambucus nigra</i>	24
<i>Cornus sanguinea</i>	23
<i>Solanum dulcamara</i>	22
<i>Aegopodium podagraria</i>	22
<i>Alnus glutinosa</i>	21
<i>Symphytum officinale</i>	20
<i>Crataegus monogyna</i>	19
<i>Salix purpurea</i>	18
<i>Phragmites australis</i>	18
<i>Geum urbanum</i>	18
<i>Fraxinus excelsior</i>	18
<i>Dactylis glomerata</i>	18
<i>Lythrum salicaria</i>	17
<i>Lysimachia vulgaris</i>	17
<i>Lycopus europaeus</i>	17
<i>Brachypodium sylvaticum</i>	17
<i>Agrostis stolonifera</i>	17
<i>Filipendula ulmaria</i>	16
<i>Angelica sylvestris</i>	16
<i>Populus alba</i>	15
<i>Lysimachia nummularia</i>	15
<i>Lamium maculatum</i>	15
<i>Iris pseudacorus</i>	14
<i>Heracleum sphondylium</i>	14
<i>Rubus fruticosus</i> aggr.	13
<i>Euonymus europaeus</i>	13
<i>Equisetum arvense</i>	13
<i>Alliaria petiolata</i>	13
<i>Stachys sylvatica</i>	12
<i>Salix triandra</i>	12
<i>Impatiens noli-tangere</i>	12
<i>Galium palustre</i> aggr.	12
<i>Ficaria verna</i>	12
<i>Schedonorus giganteus</i>	11
<i>Myosotis scorpioides</i> aggr.	11
<i>Deschampsia cespitosa</i> aggr.	11
<i>Anthriscus sylvestris</i>	11

Dominant species (percentage frequencies of occurrences with cover > 25%)

<i>Salix alba</i>	48
<i>Salix euxina</i>	30
<i>Urtica dioica</i>	23
<i>Populus nigra</i>	17
<i>Rubus caesius</i>	10

*Populus alba*

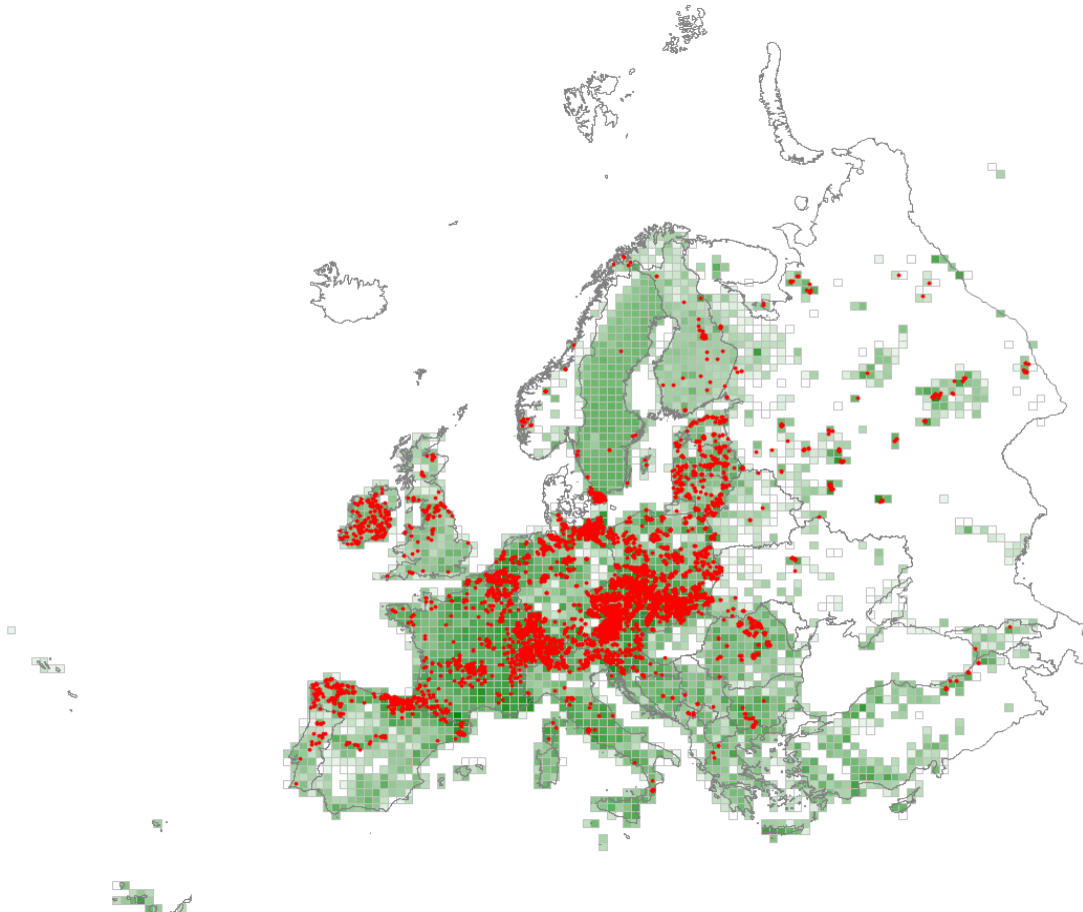
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*Phalaroides arundinacea*

6

## T12 – *Alnus glutinosa*-*Alnus incana* forest on riparian and mineral soils

Riparian and non-riparian forests dominated by alder (*Alnus glutinosa*, *Alnus incana*), and sometimes ash (*Fraxinus angustifolia*, *Fraxinus excelsior*), typically without many softwood willows in the canopy and occurring throughout Europe along streams and small to medium rivers. The field layer can be quite species-rich.



### Corresponding alliances in EuroVegChecklist 2016

- <> POP-02A *Alnion incanae* Pawłowski et al. 1928
- > POP-02B *Hyperico androsaemi-Alnion glutinosae* (Amigo et al. 1987) Biurrun et al. 2016
- > POP-01C *Osmundo-Alnion glutinosae* (Br.-Bl. et al. 1956) Dierschke et Rivas-Mart. in Rivas-Mart. 1975

### Characteristic species combination

Diagnostic species (phi coefficient \* 100)

<i>Alnus glutinosa</i>	30
<i>Alnus incana</i>	29
<i>Impatiens noli-tangere</i>	26
<i>Schedonorus giganteus</i>	22
<i>Carex remota</i>	22
<i>Chrysosplenium alternifolium</i>	21
<i>Prunus padus</i>	21
<i>Stachys sylvatica</i>	21

<i>Fraxinus excelsior</i>	21
<i>Plagiomnium undulatum</i>	20
<i>Filipendula ulmaria</i>	19
<i>Crepis paludosa</i>	19
<i>Aegopodium podagraria</i>	19
<i>Circaea lutetiana</i>	18
<i>Cirsium oleraceum</i>	18
<i>Athyrium filix-femina</i>	18
<i>Stellaria nemorum</i>	18
<i>Lamium galeobdolon</i>	16
<i>Urtica dioica</i>	16
<i>Cardamine amara</i>	15
<i>Geum urbanum</i>	15

Constant species (percentage frequencies)

<i>Alnus glutinosa</i>	66
<i>Urtica dioica</i>	59
<i>Fraxinus excelsior</i>	56
<i>Athyrium filix-femina</i>	47
<i>Filipendula ulmaria</i>	45
<i>Deschampsia cespitosa</i> aggr.	42
<i>Oxalis acetosella</i>	40
<i>Ranunculus repens</i>	37
<i>Geum urbanum</i>	36
<i>Impatiens noli-tangere</i>	35
<i>Geranium robertianum</i>	34
<i>Aegopodium podagraria</i>	34
<i>Stachys sylvatica</i>	33
<i>Rubus idaeus</i>	33
<i>Lamium galeobdolon</i>	33
<i>Corylus avellana</i>	33
<i>Alnus incana</i>	33
<i>Plagiomnium undulatum</i>	32
<i>Caltha palustris</i>	29
<i>Brachypodium sylvaticum</i>	29
<i>Stellaria nemorum</i>	28
<i>Sambucus nigra</i>	28
<i>Rubus fruticosus</i> aggr.	27
<i>Crepis paludosa</i>	27
<i>Angelica sylvestris</i>	27
<i>Acer pseudoplatanus</i>	27
<i>Galium aparine</i>	26
<i>Carex remota</i>	26
<i>Schedonorus giganteus</i>	25
<i>Circaea lutetiana</i>	25
<i>Prunus padus</i>	24
<i>Picea abies</i>	24
<i>Lysimachia vulgaris</i>	24
<i>Glechoma hederacea</i>	24
<i>Poa trivialis</i>	23
<i>Cirsium oleraceum</i>	23
<i>Carex sylvatica</i>	23
<i>Anemone nemorosa</i>	23
<i>Ajuga reptans</i>	23
<i>Sorbus aucuparia</i>	22
<i>Chrysosplenium alternifolium</i>	22
<i>Chaerophyllum hirsutum</i>	22
<i>Dryopteris carthusiana</i>	22
<i>Myosotis scorpioides</i> aggr.	21

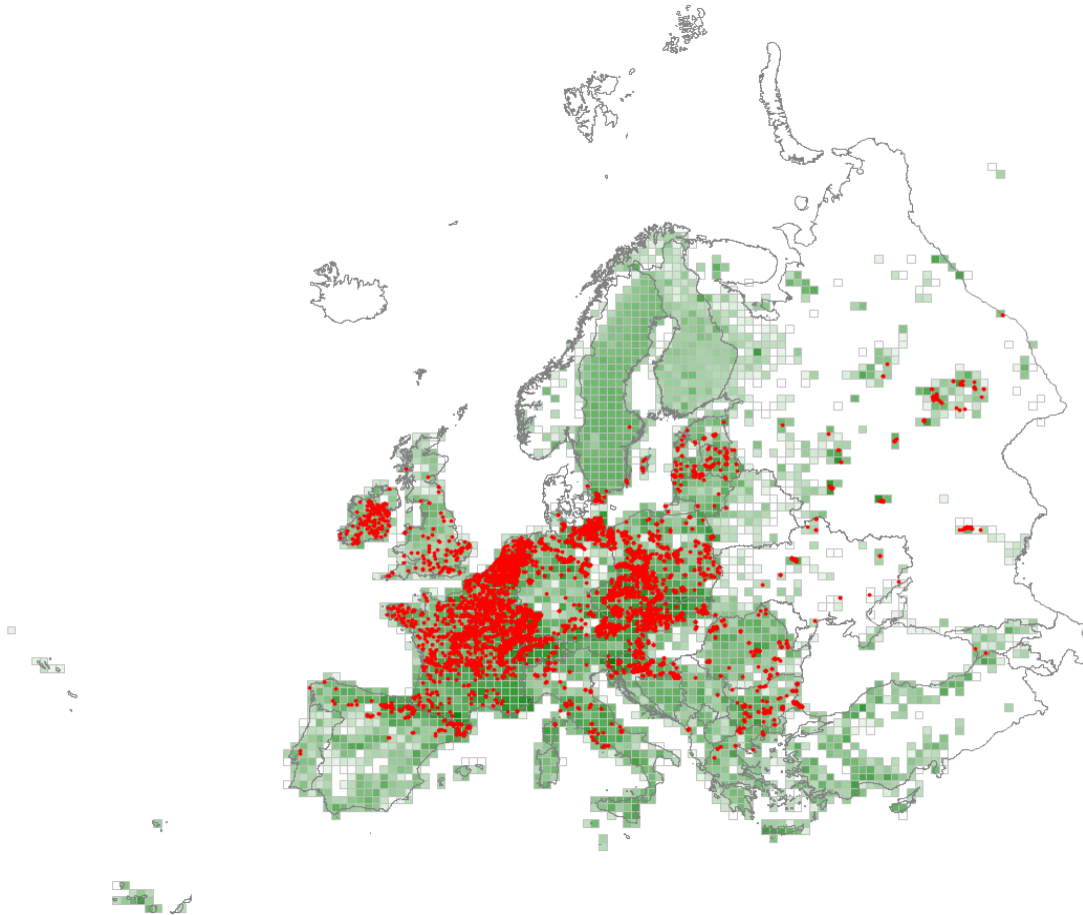
<i>Galium palustre</i> aggr.	21
<i>Geum rivale</i>	20
<i>Ficaria verna</i>	20
<i>Lycopus europaeus</i>	19
<i>Solanum dulcamara</i>	18
<i>Senecio nemorensis</i> aggr.	18
<i>Hedera helix</i> aggr.	18
<i>Cardamine amara</i>	18
<i>Frangula alnus</i>	17
<i>Euonymus europaeus</i>	17
<i>Dryopteris filix-mas</i>	17
<i>Viburnum opulus</i>	16
<i>Paris quadrifolia</i>	16
<i>Dryopteris dilatata</i>	16
<i>Primula elatior</i>	15
<i>Plagiomnium affine</i> aggr.	15
<i>Juncus effusus</i>	15
<i>Equisetum arvense</i>	15
<i>Crataegus monogyna</i>	15
<i>Brachythecium rutabulum</i>	15
<i>Valeriana officinalis</i> aggr.	14
<i>Silene dioica</i>	14
<i>Rubus caesius</i>	14
<i>Quercus robur</i>	14
<i>Poa nemoralis</i>	14
<i>Lysimachia nummularia</i>	14
<i>Humulus lupulus</i>	14
<i>Mercurialis perennis</i>	13
<i>Lysimachia nemorum</i>	13
<i>Fragaria vesca</i>	13
<i>Asarum europaeum</i>	13
<i>Viola reichenbachiana</i>	12
<i>Phalaroides arundinacea</i>	12
<i>Milium effusum</i>	12
<i>Lamium maculatum</i>	12
<i>Eupatorium cannabinum</i>	12
<i>Equisetum sylvaticum</i>	12
<i>Atrichum undulatum</i>	12
<i>Lonicera periclymenum</i>	11
<i>Fagus sylvatica</i>	11
<i>Dactylis glomerata</i>	11
<i>Cornus sanguinea</i>	11

Dominant species (percentage frequencies of occurrences with cover > 25%)

<i>Alnus glutinosa</i>	55
<i>Alnus incana</i>	26
<i>Fraxinus excelsior</i>	25
<i>Urtica dioica</i>	8

## T13 – Temperate hardwood riparian forest

Mixed broadleaved forests typical of less-frequently flooded, well-aerated mineral soils on floodplains of the middle and lower reaches of major European rivers. The canopy in high-forest stands can be very tall and multi-layered and is typically dominated by various mixtures of *Alnus glutinosa*, *Fraxinus angustifolia*, *Fraxinus excelsior*, *Populus alba*, *Populus canescens*, *Prunus padus*, *Quercus robur*, *Ulmus glabra*, *Ulmus laevis* and *Ulmus minor*. There is typically an abundant and varied understorey, again often structurally complex, with a range of small trees, shrubs and lianas that are more typical of mesic deciduous forests (such as T1E *Carpinus* and *Quercus* mesic deciduous forest).



### Corresponding alliances in EuroVegChecklist 2016

- <> POP-02A *Alnion incanae* Pawłowski et al. 1928
- <> POP-02D *Alno-Quercion roboris* Horvat 1950
- > POP-02C *Fraxino-Quercion roboris* Passarge 1968
- > POP-02E *Poo angustifoliae-Ulmion laevis* Golub in Golub et Kuzmina 1997

### Characteristic species combination

Diagnostic species (phi coefficient \* 100)

<i>Alnus glutinosa</i>	23
<i>Fraxinus excelsior</i>	21
<i>Quercus robur</i>	19
<i>Circaea lutetiana</i>	17
<i>Geum urbanum</i>	17

<i>Glechoma hederacea</i>	17
<i>Prunus padus</i>	16
<i>Urtica dioica</i>	16
<i>Humulus lupulus</i>	16
<i>Rubus caesius</i>	15

Constant species (percentage frequencies)

<i>Urtica dioica</i>	58
<i>Quercus robur</i>	58
<i>Fraxinus excelsior</i>	56
<i>Alnus glutinosa</i>	51
<i>Geum urbanum</i>	39
<i>Rubus fruticosus</i> aggr.	37
<i>Corylus avellana</i>	36
<i>Galium aparine</i>	35
<i>Crataegus monogyna</i>	35
<i>Rubus caesius</i>	33
<i>Sambucus nigra</i>	32
<i>Deschampsia cespitosa</i> aggr.	32
<i>Hedera helix</i> aggr.	31
<i>Glechoma hederacea</i>	31
<i>Cornus sanguinea</i>	29
<i>Brachypodium sylvaticum</i>	28
<i>Filipendula ulmaria</i>	26
<i>Euonymus europaeus</i>	26
<i>Circaea lutetiana</i>	24
<i>Iris pseudacorus</i>	22
<i>Ficaria verna</i>	22
<i>Stachys sylvatica</i>	21
<i>Ranunculus repens</i>	21
<i>Poa trivialis</i>	21
<i>Geranium robertianum</i>	21
<i>Carex sylvatica</i>	21
<i>Viburnum opulus</i>	20
<i>Ulmus minor</i>	20
<i>Lysimachia vulgaris</i>	20
<i>Carpinus betulus</i>	20
<i>Aegopodium podagraria</i>	20
<i>Prunus spinosa</i>	19
<i>Humulus lupulus</i>	19
<i>Solanum dulcamara</i>	18
<i>Prunus padus</i>	18
<i>Athyrium filix-femina</i>	18
<i>Acer pseudoplatanus</i>	18
<i>Lycopus europaeus</i>	17
<i>Angelica sylvestris</i>	17
<i>Schedonorus giganteus</i>	16
<i>Lamium galeobdolon</i>	16
<i>Galium palustre</i> aggr.	16
<i>Frangula alnus</i>	16
<i>Dryopteris carthusiana</i>	16
<i>Dactylis glomerata</i>	16
<i>Carex remota</i>	16
<i>Acer campestre</i>	16
<i>Ligustrum vulgare</i>	15
<i>Anemone nemorosa</i>	15
<i>Lysimachia nummularia</i>	14
<i>Alliaria petiolata</i>	14
<i>Sorbus aucuparia</i>	13

<i>Plagiomnium undulatum</i>	13
<i>Impatiens noli-tangere</i>	13
<i>Carex acutiformis</i>	13
<i>Ajuga reptans</i>	13
<i>Rumex sanguineus</i>	12
<i>Rubus idaeus</i>	12
<i>Prunus avium</i>	12
<i>Lonicera periclymenum</i>	12
<i>Brachythecium rutabulum</i>	12
<i>Viola reichenbachiana</i>	11
<i>Ribes rubrum</i> aggr.	11
<i>Poa nemoralis</i>	11
<i>Phalaroides arundinacea</i>	11
<i>Juncus effusus</i>	11
<i>Fagus sylvatica</i>	11
<i>Eupatorium cannabinum</i>	11
<i>Dryopteris filix-mas</i>	11
<i>Caltha palustris</i>	11

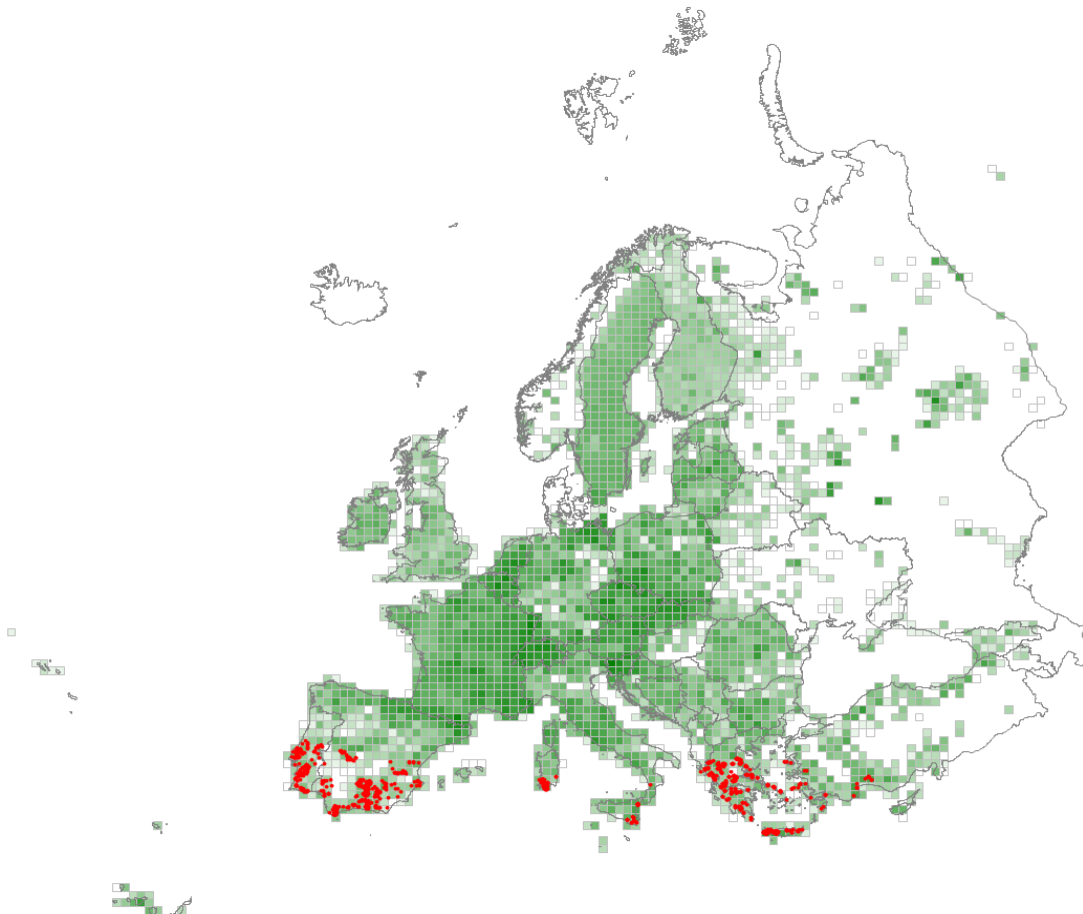
Dominant species (percentage frequencies of occurrences with cover > 25%)

<i>Alnus glutinosa</i>	36
<i>Quercus robur</i>	34
<i>Fraxinus excelsior</i>	28
<i>Rubus fruticosus</i> aggr.	11
<i>Urtica dioica</i>	10
<i>Hedera helix</i> aggr.	9
<i>Corylus avellana</i>	8
<i>Rubus caesius</i>	5
<i>Ficaria verna</i>	5



## T14 – Mediterranean and Macaronesian riparian forest

Deciduous broadleaved forest, most commonly dominated by poplars (*Populus*), willows (*Salix*) or oriental plane (*Platanus orientalis*), on periodically flooded alluvia or gravel terraces and streambanks in humid localities in the Mediterranean and Macaronesia. Also includes streamside forests with *Rhododendron ponticum* and *Betula pendula* var. *fontqueri* in Spain.



### Corresponding alliances in EuroVegChecklist 2016

- > POP-01F Lauro nobilis-Fraxinion angustifoliae I. Kárpáti et V. Kárpáti 1961
- > POP-01B Ligustro vulgaris-Alnion glutinosae Poldini, Sbulrino et Venanzoni in Biondi et al. 2015
- > POP-01C Osmundo-Alnion glutinosae (Br.-Bl. et al. 1956) Dierschke et Rivas-Mart. in Rivas-Mart. 1975
- > POP-01E Platanion orientalis I. Kárpáti et V. Kárpáti 1961
- > POP-01A Populion albae Br.-Bl. ex Tchou 1949
- > POP-01D Rhododendro pontici-Prunion lusitanicae Pérez Latorre, Galán de Mera et Cabezudo in Pérez Latorre et al. 1999
- = PUR-03A Salicion canariensis Rivas-Mart., Wildpret, Del Arco, O. Rodríguez, Pérez de Paz, García Gallo, Acebes, T.E. Díaz et Fernández-González ex Rivas-Mart. et al. 1999

### Characteristic species combination

Diagnostic species (phi coefficient \* 100)

*Platanus orientalis*

<i>Fraxinus angustifolia</i>	35
<i>Arundo donax</i>	29
<i>Nerium oleander</i>	26
<i>Populus alba</i>	25
<i>Vinca difformis</i>	24
<i>Vitis vinifera</i>	24
<i>Oenanthe crocata</i>	24
<i>Arum italicum</i>	23
<i>Rubus ulmifolius</i>	23
<i>Scrophularia scorodonia</i>	20
<i>Melissa officinalis</i>	19
<i>Populus nigra</i>	19
<i>Dorycnium rectum</i>	19
<i>Salix pedicellata</i>	18
<i>Rubus sanctus</i>	17
<i>Ficus carica</i>	17
<i>Flueggea tinctoria</i>	17
<i>Dioscorea communis</i>	17
<i>Carex pendula</i>	16
<i>Salix cinerea</i> subsp. <i>oleifolia</i>	16

Constant species (percentage frequencies)

<i>Rubus ulmifolius</i>	64
<i>Fraxinus angustifolia</i>	37
<i>Brachypodium sylvaticum</i>	37
<i>Dioscorea communis</i>	35
<i>Hedera helix</i> aggr.	34
<i>Platanus orientalis</i>	32
<i>Nerium oleander</i>	28
<i>Arum italicum</i>	27
<i>Smilax aspera</i>	25
<i>Scirpoides holoschoenus</i>	23
<i>Crataegus monogyna</i>	23
<i>Populus alba</i>	22
<i>Oenanthe crocata</i>	21
<i>Alnus glutinosa</i>	21
<i>Populus nigra</i>	20
<i>Vitis vinifera</i>	19
<i>Salix cinerea</i> subsp. <i>oleifolia</i>	18
<i>Rubia peregrina</i>	18
<i>Pteridium aquilinum</i>	18
<i>Galium aparine</i>	18
<i>Ficus carica</i>	18
<i>Piptatherum miliaceum</i>	17
<i>Clematis vitalba</i>	17
<i>Arundo donax</i>	17
<i>Salix alba</i>	16
<i>Carex pendula</i>	16
<i>Asparagus acutifolius</i>	16
<i>Salix euxina</i>	15
<i>Ulmus minor</i>	14
<i>Rosa sempervirens</i>	14
<i>Rumex conglomeratus</i>	13
<i>Mentha suaveolens</i>	13
<i>Equisetum ramosissimum</i>	13
<i>Calystegia sepium</i>	13
<i>Bryonia dioica</i>	13
<i>Rosa canina</i> aggr.	12
<i>Dactylis glomerata</i>	12

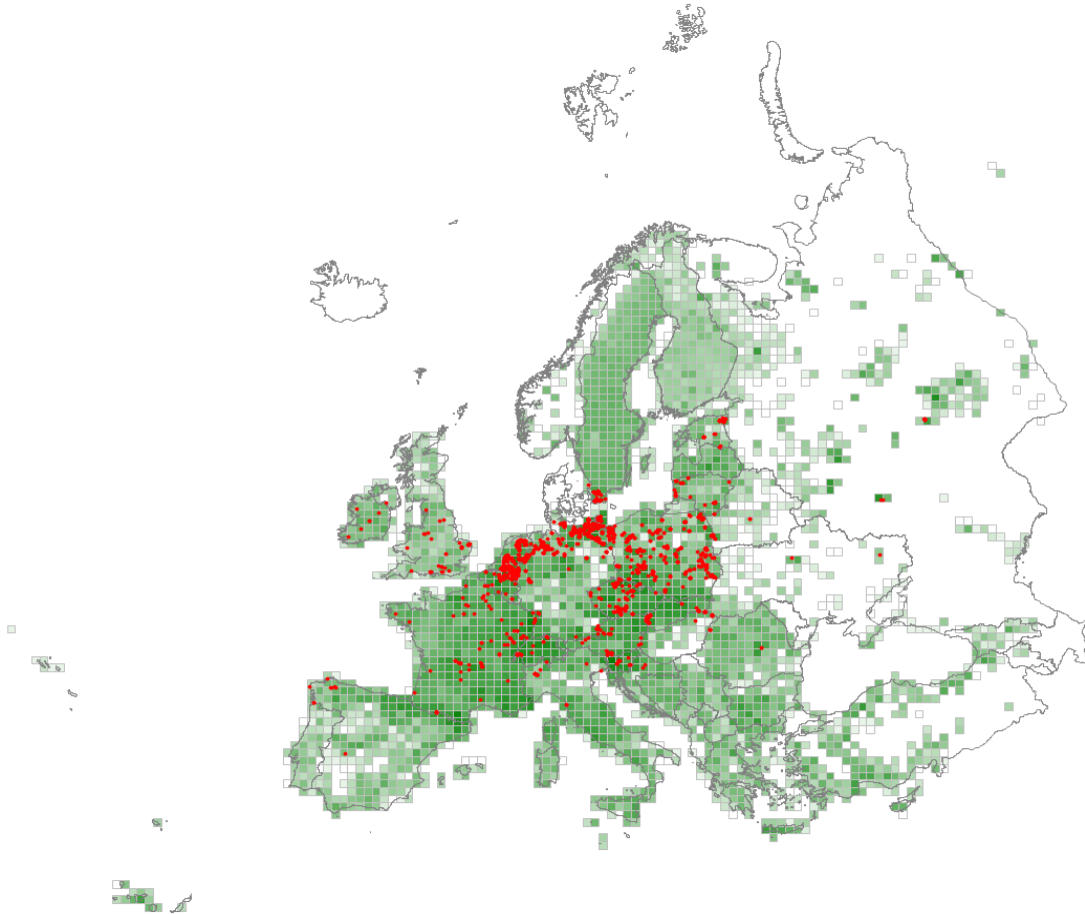
<i>Rubus sanctus</i>	11
<i>Phragmites australis</i>	11
<i>Parietaria judaica</i>	11
<i>Lythrum salicaria</i>	11
<i>Geranium purpureum</i>	11
<i>Ficaria verna</i>	11

Dominant species (percentage frequencies of occurrences with cover > 25%)

<i>Platanus orientalis</i>	30
<i>Fraxinus angustifolia</i>	21
<i>Populus alba</i>	17
<i>Alnus glutinosa</i>	16
<i>Rubus ulmifolius</i>	13
<i>Populus nigra</i>	9
<i>Salix euxina</i>	8
<i>Salix alba</i>	5

## T15 – Broadleaved swamp forest on non-acid peat

Deciduous broadleaved forest, commonly dominated by alder (*Alnus glutinosa*, *Alnus incana*), oak (*Quercus robur*) or aspen (*Populus tremula*) on non-acid peat with groundwater at or seasonally above the surface in swamps across the lowlands of the temperate and boreal zones.



### Corresponding alliances in EuroVegChecklist 2016

- <> ALN-01A Alnion glutinosae Malcuit 1929
- > ALN-01B Frangulo alni-Fraxinion oxycarpae Poldini, Sburlino et Venanzoni in Biondi et al. 2015
- > ALN-02A Salici pentandrae-Betulion pubescentis Clausnitzer in Dengler et al. 2004

### Characteristic species combination

Diagnostic species (phi coefficient \* 100)

<i>Carex elongata</i>	52
<i>Alnus glutinosa</i>	46
<i>Thelypteris palustris</i>	37
<i>Calamagrostis canescens</i>	34
<i>Peucedanum palustre</i>	34
<i>Lysimachia vulgaris</i>	29
<i>Solanum dulcamara</i>	28
<i>Carex pseudocyperus</i>	28
<i>Dryopteris carthusiana</i>	25
<i>Lycopus europaeus</i>	22

<i>Galium palustre</i> aggr.	22
<i>Carex paniculata</i>	22
<i>Carex acutiformis</i>	22
<i>Scutellaria galericulata</i>	22
<i>Iris pseudacorus</i>	22
<i>Ribes nigrum</i>	21
<i>Frangula alnus</i>	21
<i>Sphagnum squarrosum</i>	21
<i>Mnium hornum</i>	20
<i>Carex elata</i>	19
<i>Calla palustris</i>	18
<i>Salix cinerea</i> subsp. <i>cinerea</i>	18
<i>Lysimachia thyrsiflora</i>	17
<i>Calliergonella cuspidata</i>	15
<i>Calliergon cordifolium</i>	15

Constant species (percentage frequencies)

<i>Alnus glutinosa</i>	100
<i>Lysimachia vulgaris</i>	65
<i>Galium palustre</i> aggr.	55
<i>Frangula alnus</i>	53
<i>Dryopteris carthusiana</i>	51
<i>Solanum dulcamara</i>	50
<i>Carex elongata</i>	45
<i>Peucedanum palustre</i>	44
<i>Lycopus europaeus</i>	43
<i>Calamagrostis canescens</i>	39
<i>Thelypteris palustris</i>	36
<i>Iris pseudacorus</i>	34
<i>Betula pubescens</i>	34
<i>Juncus effusus</i>	33
<i>Sorbus aucuparia</i>	31
<i>Calliergonella cuspidata</i>	31
<i>Salix cinerea</i> subsp. <i>cinerea</i>	30
<i>Lythrum salicaria</i>	29
<i>Carex acutiformis</i>	29
<i>Athyrium filix-femina</i>	28
<i>Rubus fruticosus</i> aggr.	27
<i>Scutellaria galericulata</i>	26
<i>Mnium hornum</i>	26
<i>Phragmites australis</i>	25
<i>Molinia caerulea</i> aggr.	24
<i>Caltha palustris</i>	24
<i>Dryopteris dilatata</i>	23
<i>Rubus idaeus</i>	22
<i>Cirsium palustre</i>	21
<i>Carex paniculata</i>	21
<i>Carex elata</i>	21
<i>Viola palustris</i>	20
<i>Sphagnum palustre</i> aggr.	20
<i>Deschampsia cespitosa</i> aggr.	20
<i>Urtica dioica</i>	19
<i>Filipendula ulmaria</i>	19
<i>Equisetum fluviatile</i>	19
<i>Carex pseudocyperus</i>	19
<i>Plagiomnium affine</i> aggr.	18
<i>Sphagnum squarrosum</i>	17
<i>Lysimachia thyrsiflora</i>	17
<i>Brachythecium rutabulum</i>	17

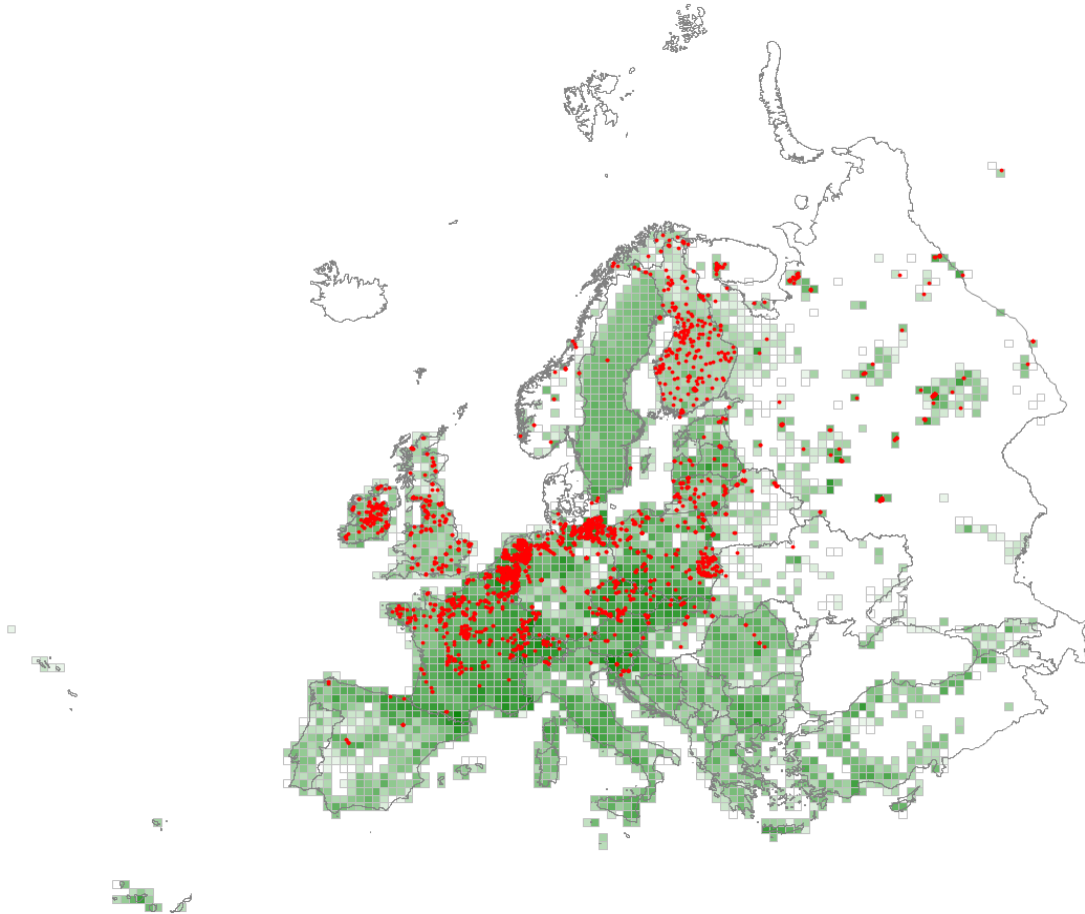
<i>Quercus robur</i>	16
<i>Oxalis acetosella</i>	16
<i>Kindbergia praelonga</i>	15
<i>Comarum palustre</i>	15
<i>Picea abies</i>	14
<i>Myosotis scorpioides</i> aggr.	14
<i>Climacium dendroides</i>	14
<i>Betula pendula</i>	14
<i>Salix aurita</i>	13
<i>Ribes nigrum</i>	13
<i>Mentha aquatica</i>	13
<i>Lonicera periclymenum</i>	13
<i>Fraxinus excelsior</i>	12
<i>Carex rostrata</i>	12
<i>Scirpus sylvaticus</i>	11
<i>Poa trivialis</i>	11
<i>Lemna minor</i>	11
<i>Glyceria fluitans</i> aggr.	11
<i>Carex canescens</i>	11
<i>Calliergon cordifolium</i>	11
<i>Calla palustris</i>	11

Dominant species (percentage frequencies of occurrences with cover > 25%)

<i>Alnus glutinosa</i>	100
<i>Thelypteris palustris</i>	13
<i>Molinia caerulea</i> aggr.	9
<i>Carex elongata</i>	9
<i>Carex acutiformis</i>	9
<i>Carex paniculata</i>	7
<i>Carex elata</i>	6

## T16 – Broadleaved mire forest on acid peat

Deciduous broadleaved or mixed forest on acid peat on or around active bogs and poor fens with nutrient-poor ground waters occurring through the Atlantic region and the boreal zone and locally, where ground conditions permit, also in the continental zone. It is usually dominated by birch (*Betula pubescens*).



### Corresponding alliances in EuroVegChecklist 2016

= ALN-03A *Betulion pubescentis* Lohmeyer et Tx. ex Oberd. 1957

### Characteristic species combination

Diagnostic species (phi coefficient \* 100)

<i>Betula pubescens</i>	26
<i>Molinia caerulea</i> aggr.	17
<i>Sphagnum palustre</i> aggr.	17
<i>Frangula alnus</i>	16
<i>Sphagnum fimbriatum</i>	16

Constant species (percentage frequencies)

<i>Betula pubescens</i>	78
<i>Molinia caerulea</i> aggr.	63
<i>Frangula alnus</i>	41
<i>Pinus sylvestris</i>	39
<i>Betula pendula</i>	39
<i>Vaccinium myrtillus</i>	37

<i>Quercus robur</i>	32
<i>Polytrichum commune</i>	32
<i>Pleurozium schreberi</i>	30
<i>Sorbus aucuparia</i>	29
<i>Sphagnum recurvum</i> aggr.	27
<i>Rubus fruticosus</i> aggr.	27
<i>Avenella flexuosa</i>	27
<i>Dryopteris carthusiana</i>	26
<i>Picea abies</i>	24
<i>Calluna vulgaris</i>	24
<i>Sphagnum palustre</i> aggr.	23
<i>Vaccinium vitis-idaea</i>	22
<i>Dicranum scoparium</i>	22
<i>Aulacomnium palustre</i>	22
<i>Salix cinerea</i> subsp. <i>cinerea</i>	20
<i>Vaccinium uliginosum</i>	19
<i>Lonicera periclymenum</i>	18
<i>Eriophorum vaginatum</i>	18
<i>Lysimachia vulgaris</i>	17
<i>Juncus effusus</i>	17
<i>Hypnum cupressiforme</i> aggr.	17
<i>Hylocomium splendens</i>	17
<i>Carex nigra</i>	17
<i>Potentilla erecta</i>	16
<i>Polytrichastrum formosum</i>	16
<i>Alnus glutinosa</i>	15
<i>Vaccinium oxycoccos</i>	14
<i>Trientalis europaea</i>	14
<i>Pteridium aquilinum</i>	14
<i>Dryopteris dilatata</i>	14
<i>Calamagrostis canescens</i>	14
<i>Salix aurita</i>	13
<i>Pseudoscleropodium purum</i>	13
<i>Comarum palustre</i>	13
<i>Agrostis canina</i>	13
<i>Rhododendron tomentosum</i>	12
<i>Polytrichum strictum</i>	12
<i>Pohlia nutans</i>	12
<i>Galium palustre</i> aggr.	12
<i>Carex rostrata</i>	12
<i>Sphagnum fimbriatum</i>	11
<i>Populus tremula</i>	11
<i>Melampyrum pratense</i>	11
<i>Carex canescens</i>	11

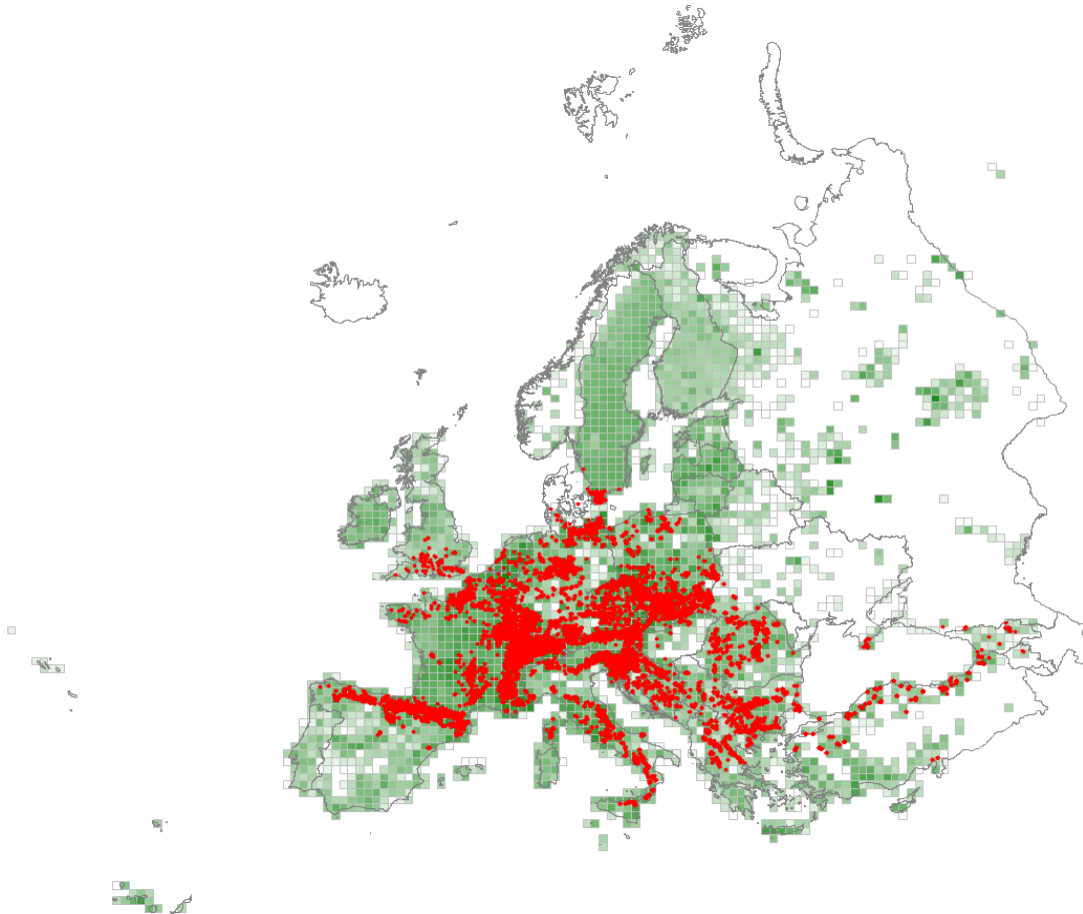
Dominant species (percentage frequencies of occurrences with cover > 25%)

<i>Betula pubescens</i>	56
<i>Molinia caerulea</i> aggr.	31
<i>Betula pendula</i>	25
<i>Sphagnum recurvum</i> aggr.	12
<i>Sphagnum palustre</i> aggr.	7
<i>Pteridium aquilinum</i>	7
<i>Vaccinium myrtillus</i>	6
<i>Polytrichum commune</i>	6



## T17 – *Fagus* forest on non-acid soils

Forest dominated by beech (*Fagus sylvatica* and *Fagus orientalis*) on base-rich to neutral, mesotrophic to eutrophic, mineral soils. It occurs through the Atlantic and continental areas of Europe and, at higher altitudes, in the submediterranean zone. Associated trees, including evergreen conifers like fir (*Abies alba*) and spruce (*Picea abies*) which figures at the altitudinal limit, are always subordinate in cover and usually in height, though broadleaved associates are more extensive and diverse on richer soils and, like the usually sparse shrub layer, show regional climate-related variation. The field layer can be species-rich.



### Corresponding alliances in EuroVegChecklist 2016

- <> FAG-02A Aremonio-Fagion (Horvat 1950) Borhidi in Török et al. 1989
- > FAG-06B Dentario quinquefoliae-Fagion Didukh 1996
- <> FAG-06A *Fagion orientalis* Soó 1964
- <> FAG-02B *Fagion sylvaticae* Luquet 1926
- <> FAG-02C *Geranio striati*-Fagion Gentile 1970

### Characteristic species combination

Diagnostic species (phi coefficient \* 100)

<i>Fagus sylvatica</i>	31
<i>Galium odoratum</i>	30
<i>Lamium galeobdolon</i>	21
<i>Viola reichenbachiana</i>	18
<i>Cardamine bulbifera</i>	17

<i>Mercurialis perennis</i>	17
<i>Acer pseudoplatanus</i>	17
<i>Carex sylvatica</i>	17
<i>Dryopteris filix-mas</i>	16

Constant species (percentage frequencies)

<i>Fagus sylvatica</i>	99
<i>Galium odoratum</i>	51
<i>Acer pseudoplatanus</i>	43
<i>Viola reichenbachiana</i>	41
<i>Oxalis acetosella</i>	41
<i>Lamium galeobdolon</i>	41
<i>Dryopteris filix-mas</i>	40
<i>Hedera helix</i> aggr.	36
<i>Fraxinus excelsior</i>	35
<i>Mercurialis perennis</i>	34
<i>Rubus fruticosus</i> aggr.	33
<i>Lactuca muralis</i>	31
<i>Athyrium filix-femina</i>	30
<i>Corylus avellana</i>	29
<i>Carex sylvatica</i>	28
<i>Picea abies</i>	26
<i>Anemone nemorosa</i>	26
<i>Abies alba</i>	26
<i>Poa nemoralis</i>	25
<i>Euphorbia amygdaloides</i>	25
<i>Geranium robertianum</i>	24
<i>Carpinus betulus</i>	24
<i>Fragaria vesca</i>	23
<i>Prenanthes purpurea</i>	22
<i>Brachypodium sylvaticum</i>	21
<i>Sorbus aucuparia</i>	20
<i>Melica uniflora</i>	20
<i>Hieracium murorum</i>	20
<i>Sanicula europaea</i>	19
<i>Senecio nemorensis</i> aggr.	18
<i>Milium effusum</i>	18
<i>Lonicera xylosteum</i>	18
<i>Acer campestre</i>	18
<i>Quercus petraea</i>	17
<i>Polygonatum multiflorum</i>	17
<i>Crataegus monogyna</i>	17
<i>Carex digitata</i>	17
<i>Cardamine bulbifera</i>	17
<i>Rubus idaeus</i>	16
<i>Paris quadrifolia</i>	16
<i>Hepatica nobilis</i>	16
<i>Sorbus aria</i> aggr.	15
<i>Solidago virgaurea</i>	15
<i>Prunus avium</i>	15
<i>Lathyrus vernus</i>	15
<i>Daphne mezereum</i>	15
<i>Ajuga reptans</i>	15
<i>Acer platanoides</i>	15
<i>Rosa arvensis</i>	13
<i>Polygonatum verticillatum</i>	13
<i>Epilobium montanum</i>	13
<i>Asarum europaeum</i>	13
<i>Actaea spicata</i>	13

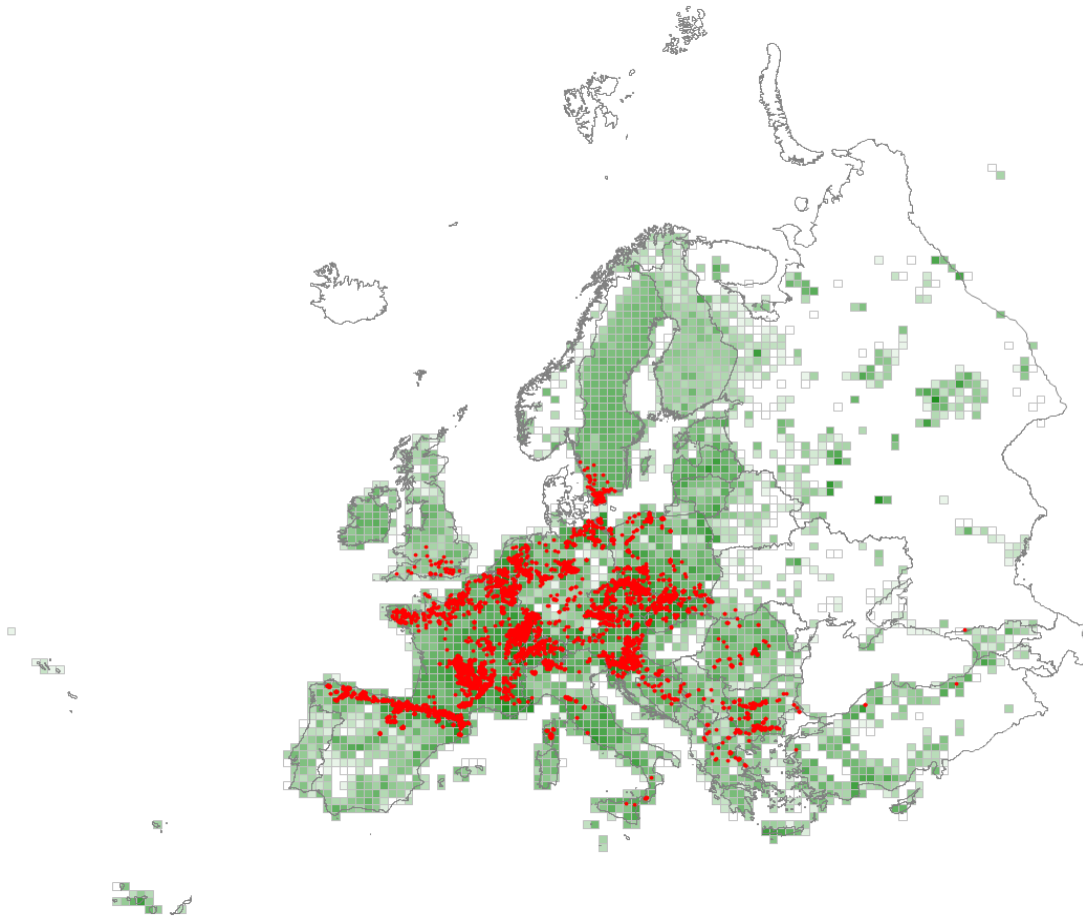
<i>Urtica dioica</i>	12
<i>Sambucus nigra</i>	12
<i>Quercus robur</i>	12
<i>Phyteuma spicatum</i>	12
<i>Neottia nidus-avis</i>	12
<i>Maianthemum bifolium</i>	12
<i>Luzula luzuloides</i>	12
<i>Circaea lutetiana</i>	12
<i>Vicia sepium</i>	11
<i>Polytrichastrum formosum</i>	11
<i>Polystichum aculeatum</i>	11
<i>Ilex aquifolium</i>	11

Dominant species (percentage frequencies of occurrences with cover > 25%)

<i>Fagus sylvatica</i>	98
<i>Hedera helix</i> aggr.	7
<i>Galium odoratum</i>	6

## T18 – *Fagus* forest on acid soils

Forest dominated by beech (*Fagus sylvatica* and *Fagus orientalis*) on oligotrophic, base-poor mineral soils. It occurs through the Atlantic and continental areas of Europe and, at higher altitudes, in the submediterranean zone. Associated broadleaved trees are few and always subordinate in cover, though oaks may be co-dominant. Evergreen conifers like fir (*Abies alba*) and, at the altitudinal limit, spruce (*Picea abies*) can figure as minority canopy components. The field layer is generally species-poor.



### Corresponding alliances in EuroVegChecklist 2016

- > FAG-01C Galio rotundifolii-Fagion Gamisans 1975
- > FAG-01B Ilici-Fagion sylvaticae Br.-Bl. 1967
- <> FAG-01A Luzulo-Fagion sylvaticae Lohmeyer et Tx. in Tx. 1954

### Characteristic species combination

Diagnostic species (phi coefficient \* 100)

<i>Fagus sylvatica</i>	31
<i>Polytrichastrum formosum</i>	22
<i>Luzula luzuloides</i>	19
<i>Dicranella heteromalla</i>	16
<i>Quercus petraea</i>	15

Constant species (percentage frequencies)

<i>Fagus sylvatica</i>	100
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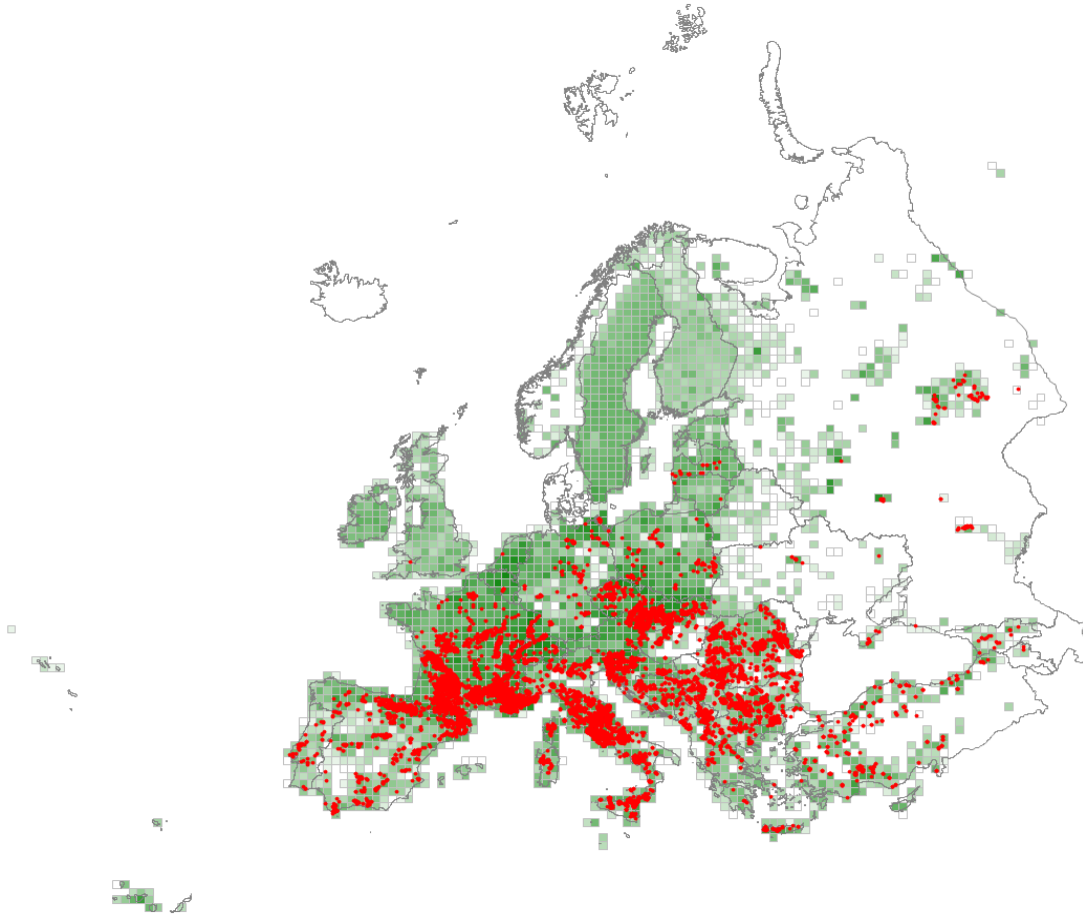
<i>Avenella flexuosa</i>	56
<i>Vaccinium myrtillus</i>	50
<i>Polytrichastrum formosum</i>	48
<i>Sorbus aucuparia</i>	37
<i>Pteridium aquilinum</i>	35
<i>Luzula luzuloides</i>	34
<i>Quercus petraea</i>	32
<i>Picea abies</i>	30
<i>Rubus fruticosus</i> aggr.	28
<i>Oxalis acetosella</i>	28
<i>Hieracium murorum</i>	27
<i>Dicranum scoparium</i>	26
<i>Ilex aquifolium</i>	23
<i>Abies alba</i>	23
<i>Carex pilulifera</i>	22
<i>Quercus robur</i>	20
<i>Hypnum cupressiforme</i> aggr.	19
<i>Athyrium filix-femina</i>	19
<i>Maianthemum bifolium</i>	18
<i>Prenanthes purpurea</i>	17
<i>Lonicera periclymenum</i>	17
<i>Betula pendula</i>	17
<i>Pinus sylvestris</i>	16
<i>Dryopteris dilatata</i>	16
<i>Dicranella heteromalla</i>	16
<i>Acer pseudoplatanus</i>	16
<i>Poa nemoralis</i>	15
<i>Luzula sylvatica</i>	15
<i>Veronica officinalis</i>	14
<i>Solidago virgaurea</i>	14
<i>Rubus idaeus</i>	14
<i>Luzula pilosa</i>	14
<i>Hedera helix</i> aggr.	14
<i>Dryopteris carthusiana</i>	13
<i>Corylus avellana</i>	13
<i>Calamagrostis arundinacea</i>	13
<i>Castanea sativa</i>	12
<i>Atrichum undulatum</i>	12
<i>Melampyrum pratense</i>	11
<i>Leucobryum glaucum</i>	11
<i>Frangula alnus</i>	11
<i>Carpinus betulus</i>	11
<i>Blechnum spicant</i>	11

Dominant species (percentage frequencies of occurrences with cover > 25%)

<i>Fagus sylvatica</i>	100
<i>Vaccinium myrtillus</i>	11
<i>Avenella flexuosa</i>	8
<i>Quercus petraea</i>	6

## T19 – Temperate and submediterranean thermophilous deciduous forest

These thermophilous broadleaved deciduous forests form a wide, but interrupted, belt across the submediterranean zone of Europe, with milder winters and warmer drought-prone summers than sustain the broadleaved temperate forests, but colder, intermittently frosty and snowy winters than are typical for the evergreen broadleaved forests and scrub of the Mediterranean. To the north, they tend to occupy low-altitude, drier and warmer sites, and to the south, rainier sites at higher altitudes.



### Corresponding alliances in EuroVegChecklist 2016

- > PUB-01E *Aceri granatensis-Quercion fagineae* (Rivas Goday, Rigual et Rivas-Mart. 1960) Rivas-Mart. 1987
- > PUB-01C *Aceri tatarici-Quercion Zólyomi* 1957
- > PUB-01G *Carpinion orientalis* Horvat 1958
- > PUB-01L *Crataego laevigatae-Quercion cerridis* Arrigoni 1997
- > PUB-01I *Elytrigio nodosae-Quercion pubescentis* Didukh 1996
- > PUB-01F *Fraxino orni-Ostryion* Tomažič 1940
- > PUB-01D *Lathyro pisiformis-Quercion roboris* Solomeshch et Grigoriev in Willner et al. 2015
- > PUB-01P *Melitto albidae-Quercion* Barbero et Quézel 1976
- > PUB-01K *Physospermo-Quercion petraeae* A.O. Horvát 1976
- > PUB-01M *Pino calabricae-Quercion congestae* S. Brullo et al. 1999
- > PUB-01N *Quercion confertae* Horvat 1958
- > PUB-01A *Quercion petraeae* Issler 1931
- > PUB-01O *Quercion petraeo-cerridis* Lakušić et B. Jovanović in B. Jovanović et al. ex Čarni et Mucina 2015
- > PUB-01B *Quercion pubescenti-petraeae* Br.-Bl. 1932 nom. mut.

> PUB-01H Syringo-Carpinion orientalis Jakucs (1959) 1960

### Characteristic species combination

#### Diagnostic species (phi coefficient \* 100)

<i>Quercus cerris</i>	24
<i>Quercus pubescens</i>	24
<i>Cornus mas</i>	23
<i>Sorbus torminalis</i>	22
<i>Aegonychon purpureocaeruleum</i>	20
<i>Quercus frainetto</i>	20
<i>Lathyrus niger</i>	20
<i>Acer campestre</i>	19
<i>Ligustrum vulgare</i>	18
<i>Crataegus monogyna</i>	18
<i>Viburnum lantana</i>	16
<i>Carpinus orientalis</i>	16
<i>Fraxinus ornus</i>	16
<i>Melittis melissophyllum</i>	15

#### Constant species (percentage frequencies)

<i>Crataegus monogyna</i>	60
<i>Quercus pubescens</i>	53
<i>Hedera helix</i> aggr.	42
<i>Ligustrum vulgare</i>	38
<i>Acer campestre</i>	35
<i>Prunus spinosa</i>	33
<i>Dactylis glomerata</i>	33
<i>Cornus sanguinea</i>	33
<i>Rubia peregrina</i>	31
<i>Rosa canina</i> aggr.	30
<i>Brachypodium sylvaticum</i>	30
<i>Fraxinus ornus</i>	29
<i>Teucrium chamaedrys</i>	28
<i>Sorbus torminalis</i>	26
<i>Viburnum lantana</i>	25
<i>Quercus cerris</i>	25
<i>Juniperus communis</i> subsp. <i>communis</i>	25
<i>Corylus avellana</i>	25
<i>Brachypodium pinnatum</i>	25
<i>Fragaria vesca</i>	24
<i>Quercus petraea</i>	23
<i>Cornus mas</i>	23
<i>Clinopodium vulgare</i>	23
<i>Dioscorea communis</i>	22
<i>Carex flacca</i>	22
<i>Ruscus aculeatus</i>	20
<i>Poa nemoralis</i>	20
<i>Vincetoxicum hirundinaria</i>	19
<i>Rubus ulmifolius</i>	19
<i>Carpinus betulus</i>	19
<i>Veronica chamaedrys</i> aggr.	18
<i>Rubus fruticosus</i> aggr.	18
<i>Tanacetum corymbosum</i>	17
<i>Prunus avium</i>	17
<i>Clematis vitalba</i>	17
<i>Sorbus aria</i> aggr.	16
<i>Melittis melissophyllum</i>	16

<i>Festuca heterophylla</i>	16
<i>Euphorbia cyparissias</i>	16
<i>Stachys officinalis</i>	15
<i>Ostrya carpinifolia</i>	15
<i>Lonicera xylosteum</i>	15
<i>Hippocrepis emerus</i>	15
<i>Geum urbanum</i>	15
<i>Rosa arvensis</i>	14
<i>Melica uniflora</i>	14
<i>Lathyrus niger</i>	14
<i>Hieracium murorum</i>	14
<i>Euphorbia amygdaloides</i>	14
<i>Euonymus europaeus</i>	14
<i>Aegonychon purpureocaeruleum</i>	14
<i>Viola reichenbachiana</i>	13
<i>Viola hirta</i>	13
<i>Pyrus communis</i>	13
<i>Fraxinus excelsior</i>	13
<i>Cruciata glabra</i>	13
<i>Viola alba</i>	12
<i>Quercus robur</i>	12
<i>Polygonatum odoratum</i>	12
<i>Galium mollugo</i> aggr.	12
<i>Campanula persicifolia</i>	12
<i>Acer monspessulanum</i>	12
<i>Ulmus minor</i>	11
<i>Rhamnus cathartica</i>	11
<i>Quercus ilex</i>	11
<i>Origanum vulgare</i>	11
<i>Hypericum perforatum</i>	11
<i>Fagus sylvatica</i>	11
<i>Carpinus orientalis</i>	11
<i>Buxus sempervirens</i>	11

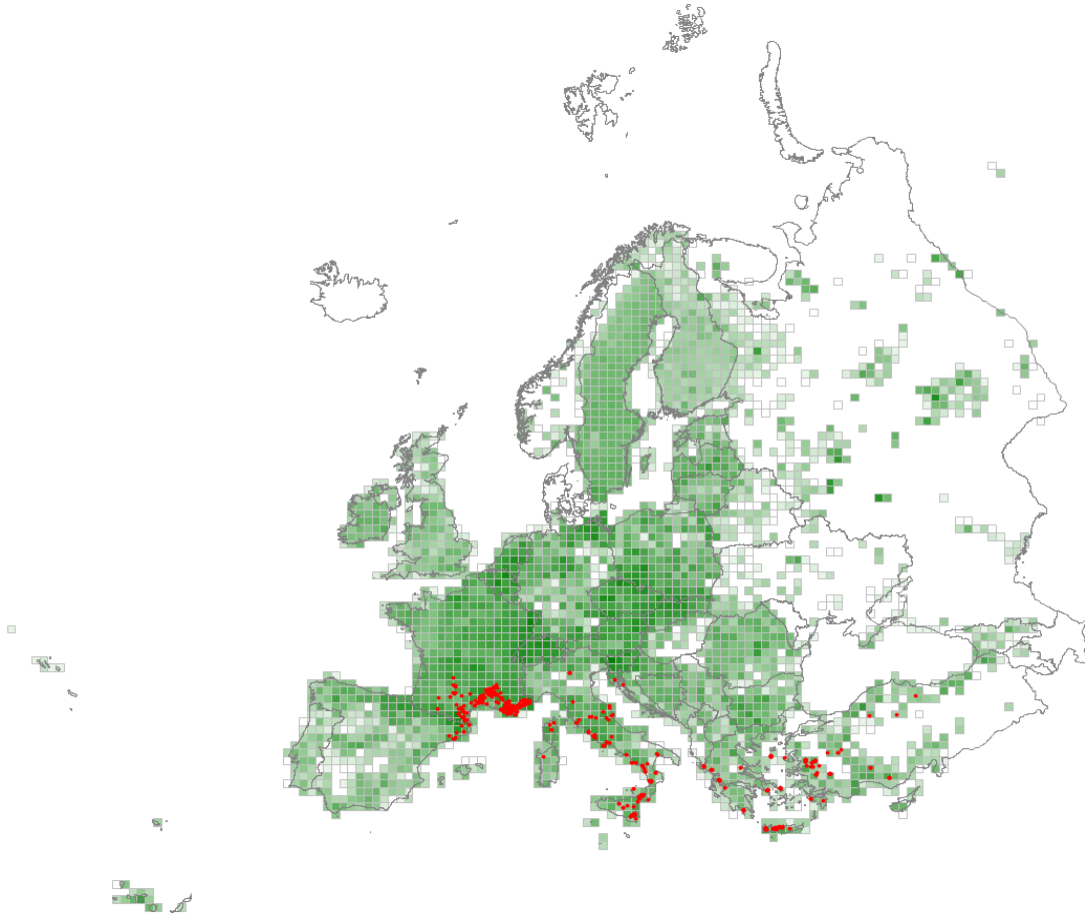
Dominant species (percentage frequencies of occurrences with cover > 25%)

<i>Quercus pubescens</i>	37
<i>Quercus cerris</i>	14
<i>Quercus petraea</i>	12
<i>Hedera helix</i> aggr.	11
<i>Ostrya carpinifolia</i>	8
<i>Buxus sempervirens</i>	8
<i>Brachypodium pinnatum</i>	7
<i>Quercus robur</i>	6
<i>Carpinus orientalis</i>	5



## T1A – Mediterranean thermophilous deciduous forest

Mediterranean deciduous forests usually dominated by *Quercus pubescens* or, in the Eastern Mediterranean, by *Quercus ithaburensis* subsp. *macrolepis*. The canopy is open, either pure or with other oaks. Stands are mostly developed on shallow soil, usually at altitudes of less than 700 m.



### Corresponding alliances in EuroVegChecklist 2016

- > PUB-01T *Quercion macrolepidis* Zohary ex Di Pietro et al. ined.

### Characteristic species combination

Diagnostic species (phi coefficient \* 100)

<i>Quercus pubescens</i>	40
<i>Quercus ithaburensis</i>	34
<i>Quercus ilex</i>	29
<i>Rubia peregrina</i>	25
<i>Sorbus domestica</i>	24
<i>Phillyrea latifolia</i>	23
<i>Ruscus aculeatus</i>	22
<i>Lonicera etrusca</i>	21
<i>Asparagus acutifolius</i>	21
<i>Rosa sempervirens</i>	20
<i>Pistacia terebinthus</i>	19
<i>Arbutus unedo</i>	18
<i>Clematis flammula</i>	18

<i>Viburnum tinus</i>	17
<i>Acer monspessulanum</i>	16
<i>Smilax aspera</i>	15
<i>Osyris alba</i>	15
<i>Rhamnus alaternus</i>	15

Constant species (percentage frequencies)

<i>Quercus pubescens</i>	89
<i>Rubia peregrina</i>	76
<i>Quercus ilex</i>	63
<i>Asparagus acutifolius</i>	55
<i>Hedera helix</i> aggr.	50
<i>Ruscus aculeatus</i>	44
<i>Rubus ulmifolius</i>	42
<i>Phillyrea latifolia</i>	42
<i>Crataegus monogyna</i>	41
<i>Smilax aspera</i>	40
<i>Dactylis glomerata</i>	36
<i>Teucrium chamaedrys</i>	35
<i>Juniperus oxycedrus</i> aggr.	34
<i>Erica arborea</i>	29
<i>Arbutus unedo</i>	29
<i>Brachypodium sylvaticum</i>	27
<i>Rhamnus alaternus</i>	26
<i>Lonicera etrusca</i>	26
<i>Pistacia terebinthus</i>	25
<i>Clematis flammula</i>	25
<i>Viburnum tinus</i>	24
<i>Thymus vulgaris</i>	23
<i>Rosa sempervirens</i>	23
<i>Cornus sanguinea</i>	23
<i>Carex halleriana</i>	23
<i>Prunus spinosa</i>	22
<i>Carex flacca</i>	22
<i>Lonicera implexa</i>	21
<i>Juniperus communis</i> subsp. <i>communis</i>	21
<i>Brachypodium retusum</i>	21
<i>Brachypodium pinnatum</i>	21
<i>Sorbus domestica</i>	20
<i>Osyris alba</i>	20
<i>Ligustrum vulgare</i>	20
<i>Phillyrea angustifolia</i>	18
<i>Dorycnium pentaphyllum</i>	18
<i>Buxus sempervirens</i>	18
<i>Brachypodium phoenicoides</i>	18
<i>Asplenium adiantum-nigrum</i>	18
<i>Spartium junceum</i>	17
<i>Rosa canina</i> aggr.	17
<i>Pistacia lentiscus</i>	17
<i>Euphorbia characias</i>	17
<i>Dioscorea communis</i>	17
<i>Aphyllanthes monspeliensis</i>	17
<i>Viola alba</i>	16
<i>Hippocrepis emerus</i>	16
<i>Bituminaria bituminosa</i>	16
<i>Acer monspessulanum</i>	16
<i>Quercus coccifera</i>	15
<i>Pinus halepensis</i>	15
<i>Fraxinus ornus</i>	15

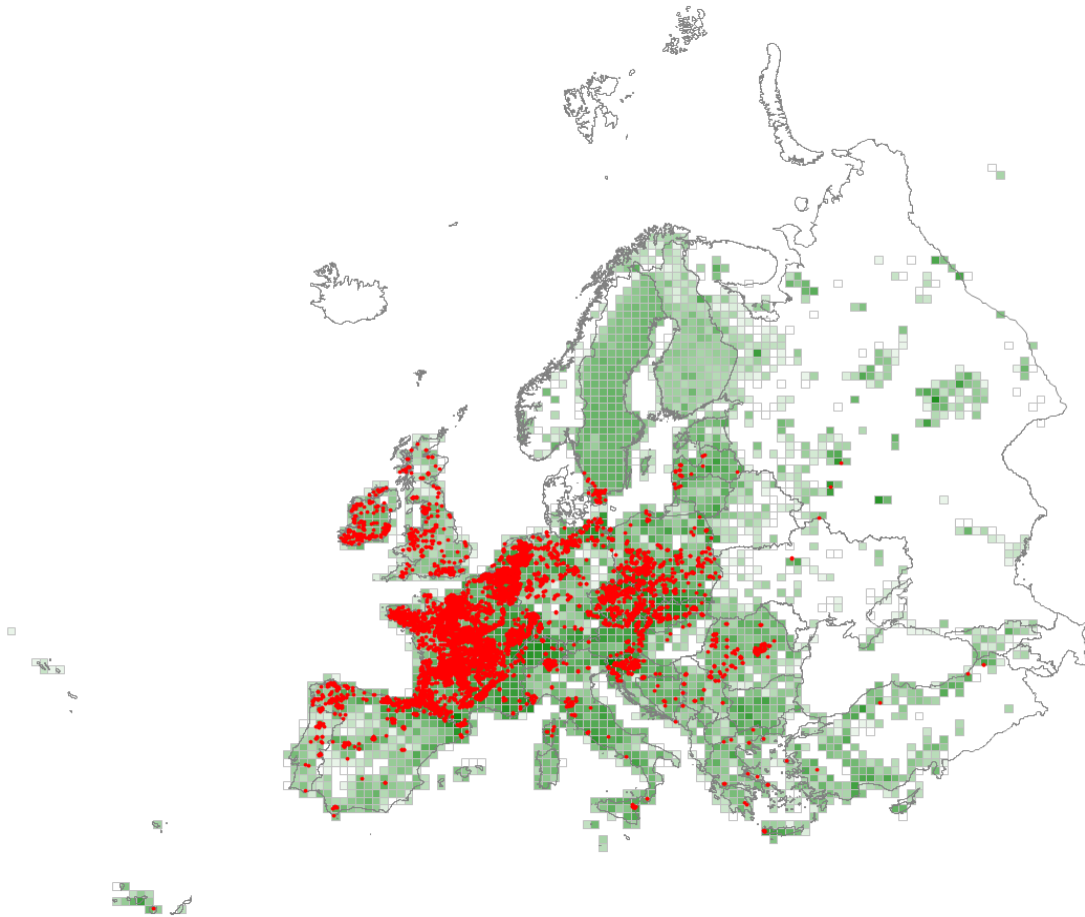
<i>Quercus ithaburensis</i>	14
<i>Amelanchier ovalis</i>	14
<i>Pteridium aquilinum</i>	13
<i>Bromopsis erecta</i>	13
<i>Clinopodium vulgare</i>	12
<i>Clematis vitalba</i>	12
<i>Cistus salviifolius</i>	12
<i>Carex distachya</i>	12
<i>Viburnum lantana</i>	11
<i>Stachys officinalis</i>	11
<i>Sanguisorba minor</i> aggr.	11
<i>Prunus mahaleb</i>	11
<i>Festuca ovina</i>	11

Dominant species (percentage frequencies of occurrences with cover > 25%)

<i>Quercus pubescens</i>	85
<i>Quercus ilex</i>	25
<i>Erica arborea</i>	17
<i>Quercus ithaburensis</i>	13
<i>Hedera helix</i> aggr.	13
<i>Buxus sempervirens</i>	11
<i>Phillyrea latifolia</i>	9
<i>Viburnum tinus</i>	8
<i>Ruscus aculeatus</i>	7
<i>Smilax aspera</i>	6
<i>Juniperus oxycedrus</i> aggr.	6
<i>Rubia peregrina</i>	5
<i>Arbutus unedo</i>	5

## T1B – Acidophilous *Quercus* forest

Oak-dominated forest (mainly *Quercus robur* and *Quercus petraea* but also other regional species) of acid soils through the Atlantic and continental regions, where European beech (*Fagus sylvatica*) is a potential competitor and extending northwards into the boreal zone, where Scots pine (*Pinus sylvestris*) increasingly figures in the canopy. Associated floras are generally rather poor but show some regional distinctiveness and towards the very humid western Atlantic seaboard have extraordinary richness of ferns and cryptogams.



### Corresponding alliances in EuroVegChecklist 2016

- > QUE-01C Agrostio-Quercion petraeae Scamoni et Passarge 1959
- > QUE-01E Castaneo-Quercion petraeae Soó 1964
- > QUE-01A Hymenophyllo-Quercion petraeae Pallas 2000
- > QUE-01D Quercion pyrenaicae Rivas Goday ex Rivas-Martínez 1965
- <> QUE-01B Quercion roboris Malcuit 1929

### Characteristic species combination

Diagnostic species (phi coefficient \* 100)

<i>Quercus petraea</i>	27
<i>Castanea sativa</i>	21
<i>Polytrichastrum formosum</i>	20
<i>Lonicera periclymenum</i>	20
<i>Quercus robur</i>	16

Constant species (percentage frequencies)

<i>Quercus petraea</i>	54
<i>Pteridium aquilinum</i>	54
<i>Avenella flexuosa</i>	50
<i>Quercus robur</i>	49
<i>Lonicera periclymenum</i>	47
<i>Rubus fruticosus</i> aggr.	46
<i>Polytrichastrum formosum</i>	45
<i>Fagus sylvatica</i>	40
<i>Castanea sativa</i>	35
<i>Ilex aquifolium</i>	34
<i>Frangula alnus</i>	34
<i>Betula pendula</i>	34
<i>Sorbus aucuparia</i>	30
<i>Vaccinium myrtillus</i>	29
<i>Hedera helix</i> aggr.	29
<i>Dicranum scoparium</i>	26
<i>Corylus avellana</i>	25
<i>Teucrium scorodonia</i>	24
<i>Carex pilulifera</i>	24
<i>Molinia caerulea</i> aggr.	23
<i>Melampyrum pratense</i>	22
<i>Carpinus betulus</i>	22
<i>Calluna vulgaris</i>	22
<i>Holcus mollis</i>	21
<i>Hypnum cupressiforme</i> aggr.	20
<i>Pinus sylvestris</i>	19
<i>Thuidium tamariscinum</i>	17
<i>Pseudoscleropodium purum</i>	14
<i>Luzula luzuloides</i>	14
<i>Hieracium murorum</i>	14
<i>Cytisus scoparius</i>	14
<i>Crataegus monogyna</i>	13
<i>Agrostis capillaris</i>	13
<i>Poa nemoralis</i>	12
<i>Leucobryum glaucum</i>	12
<i>Betula pubescens</i>	12
<i>Prunus avium</i>	11
<i>Pleurozium schreberi</i>	11

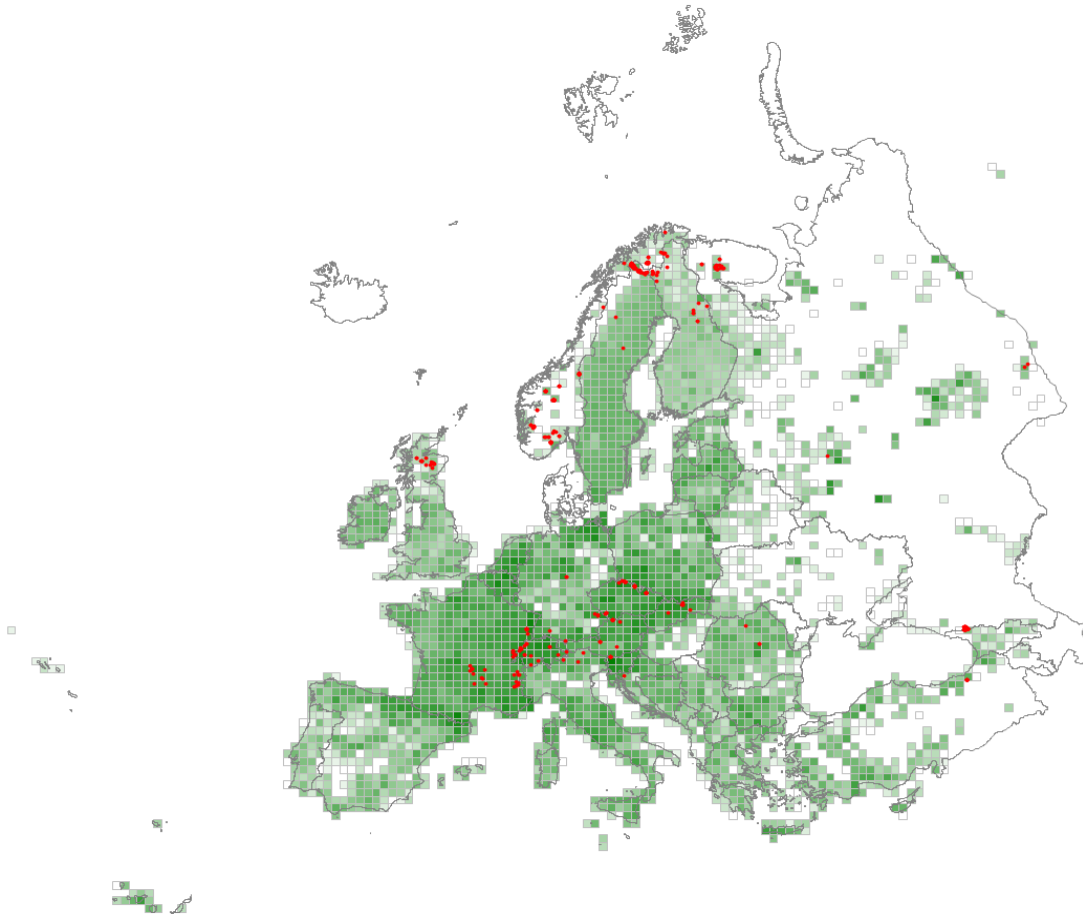
Dominant species (percentage frequencies of occurrences with cover > 25%)

<i>Quercus petraea</i>	46
<i>Quercus robur</i>	37
<i>Pteridium aquilinum</i>	19
<i>Castanea sativa</i>	17
<i>Avenella flexuosa</i>	12
<i>Vaccinium myrtillus</i>	10
<i>Rubus fruticosus</i> aggr.	10
<i>Lonicera periclymenum</i>	6
<i>Molinia caerulea</i> aggr.	5

## T1C – Temperate and boreal mountain *Betula* and *Populus tremula* forest on mineral soils

Open, low canopy climax birch (*Betula litwinowii*, *Betula pubescens* var. *glabrata*, *Betula pubescens* var. *pumila*) and aspen (*Populus tremula*) forests with a heathy or herb-rich field layer in the boreal zone, temperate mountain ranges including the Caucasus, and temperate zone of Eastern European lowlands.

**Remark:** Non-mountain closed, secondary birch and aspen forests of the boreal and temperate zones of Eastern Europe also belong to this habitat, which may require a change of the habitat name.



### Corresponding alliances in EuroVegChecklist 2016

- > PIC-04B Empetro hermaphroditi-Betulion pumilae Mucina, Willner et Grabherr ined.
- <> BRA-02A Fragario vescae-Populion tremulae Willner et Mucina ined.
- <> QUE-02B Lonicero periclymeni-Betulion pubescentis Géhu 2006
- <> VIR-04A Rhododendro caucasicus-Betulion litwinowii Onipchenko 2002
- <> BRA-01C Trollio europaei-Pinion sylvestris Fedorov in Ermakov et al. 2000
- <> BRA-01B Veronico teucris-Pinion sylvestris Ermakov et Solomeshch in Ermakov et al. 2000

### Characteristic species combination

Diagnostic species (phi coefficient \* 100)

<i>Betula litwinowii</i>	24
<i>Betula pubescens</i> var. <i>glabrata</i>	23
<i>Betula pubescens</i>	23

<i>Cladonia degenerans</i>	20
<i>Betula pubescens</i> var. <i>pumila</i>	20
<i>Rhododendron caucasicum</i>	19
<i>Sciuro-hypnum reflexum</i>	18
<i>Vaccinium vitis-idaea</i>	16
<i>Vaccinium myrtillus</i>	16
<i>Linnaea borealis</i>	15
<i>Phyllodoce caerulea</i>	15

Constant species (percentage frequencies)

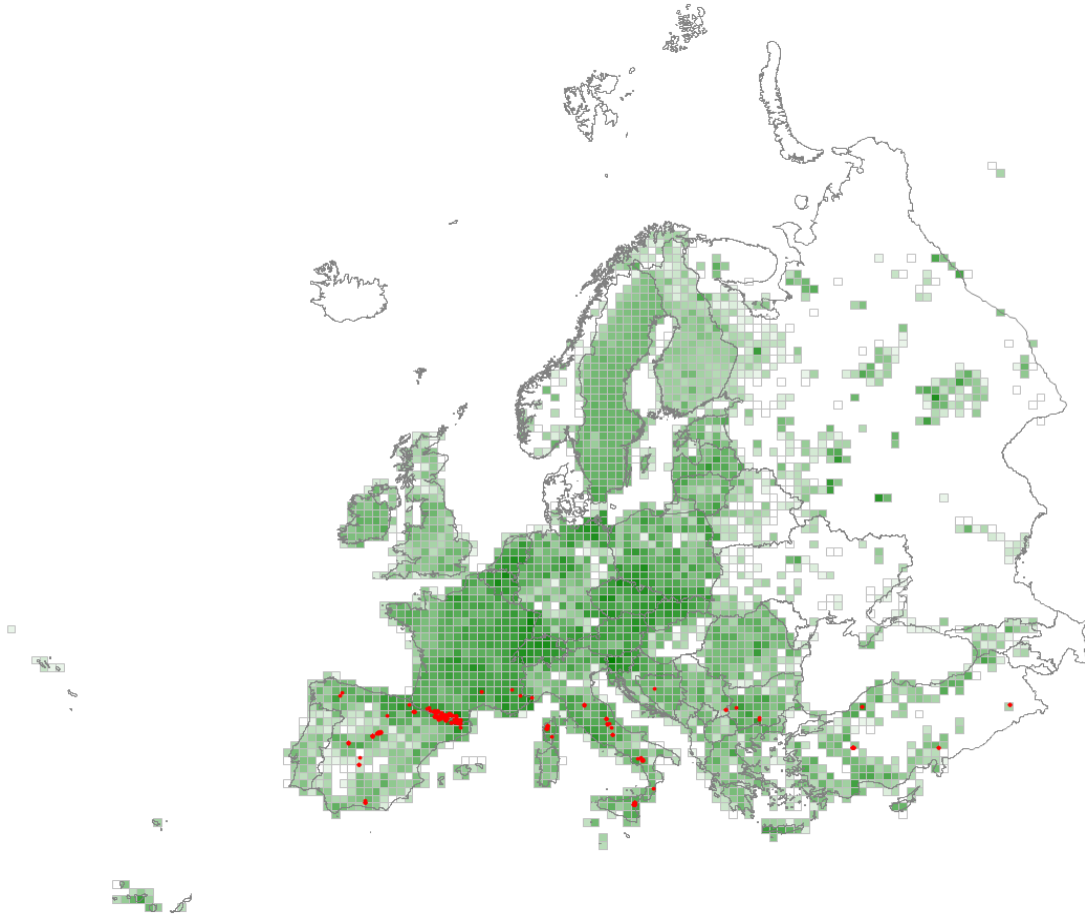
<i>Vaccinium myrtillus</i>	72
<i>Betula pubescens</i>	68
<i>Vaccinium vitis-idaea</i>	61
<i>Avenella flexuosa</i>	61
<i>Sorbus aucuparia</i>	39
<i>Solidago virgaurea</i>	37
<i>Empetrum nigrum</i> aggr.	37
<i>Dicranum scoparium</i>	34
<i>Juniperus communis</i> subsp. <i>communis</i>	32
<i>Pleurozium schreberi</i>	30
<i>Hylocomium splendens</i>	29
<i>Trientalis europaea</i>	28
<i>Vaccinium uliginosum</i>	25
<i>Linnaea borealis</i>	24
<i>Picea abies</i>	22
<i>Gymnocarpium dryopteris</i>	20
<i>Oxalis acetosella</i>	19
<i>Lycopodium annotinum</i>	18
<i>Geranium sylvaticum</i> aggr.	18
<i>Festuca ovina</i>	16
<i>Populus tremula</i>	15
<i>Epilobium angustifolium</i>	14
<i>Rubus idaeus</i>	13
<i>Rhytidiadelphus triquetrus</i>	13
<i>Polytrichum juniperinum</i>	13
<i>Polytrichastrum formosum</i>	13
<i>Pinus sylvestris</i>	13
<i>Melampyrum pratense</i>	13
<i>Luzula pilosa</i>	13
<i>Cladonia rangiferina</i>	13
<i>Cladonia arbuscula</i> aggr.	13
<i>Cornus suecica</i>	12
<i>Betula nana</i>	12
<i>Anthoxanthum odoratum</i> aggr.	12
<i>Polytrichum commune</i>	11
<i>Maianthemum bifolium</i>	11
<i>Cladonia crispata</i>	11
<i>Calluna vulgaris</i>	11
<i>Barbilophozia lycopodioides</i>	11

Dominant species (percentage frequencies of occurrences with cover > 25%)

<i>Betula pubescens</i>	52
<i>Vaccinium myrtillus</i>	23
<i>Empetrum nigrum</i> aggr.	17
<i>Populus tremula</i>	10
<i>Betula pubescens</i> var. <i>glabrata</i>	8
<i>Hylocomium splendens</i>	7
<i>Betula litwinowii</i>	7
<i>Betula pubescens</i> var. <i>pumila</i>	5

## T1D – Southern European mountain *Betula* and *Populus tremula* forest on mineral soils

Diverse climax and paraclimax forests dominated by birch (*Betula pendula* and closely related species) or aspen (*Populus tremula*) on usually acidic mineral soils in humid ravines and gorges and on unstable substrates in the montane to subalpine belts of the Pyrenees, Corsica, Apennines, Sicily and the southern Balkans.



### Corresponding alliances in EuroVegChecklist 2016

- > PIC-04A Betulion carpatico-pubescentis Rivas-Mart. et M. Costa in Rivas-Mart. et al. 2002
- > QUE-02A Betulion fontquerio-celtibericae Rivas-Mart. et M. Costa in Rivas-Mart. et al. 2002
- <> BRA-02A Fragario vescae-Populion tremulae Willner et Mucina ined.

### Characteristic species combination

Diagnostic species (phi coefficient \* 100)

<i>Betula pendula</i> var. <i>fontqueri</i>	29
<i>Betula pendula</i>	22
<i>Populus tremula</i>	21
<i>Cruciata glabra</i>	19
<i>Hepatica nobilis</i>	17
<i>Lathyrus linifolius</i>	15

Constant species (percentage frequencies)

<i>Betula pendula</i>	62
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<i>Corylus avellana</i>	44
<i>Populus tremula</i>	41
<i>Fagus sylvatica</i>	39
<i>Avenella flexuosa</i>	39
<i>Pteridium aquilinum</i>	37
<i>Fragaria vesca</i>	36
<i>Cruciata glabra</i>	35
<i>Vaccinium myrtillus</i>	31
<i>Poa nemoralis</i>	30
<i>Juniperus communis</i> subsp. <i>communis</i>	29
<i>Hepatica nobilis</i>	29
<i>Sorbus aucuparia</i>	28
<i>Rubus fruticosus</i> aggr.	27
<i>Stellaria holostea</i>	26
<i>Salix caprea</i>	26
<i>Crataegus monogyna</i>	26
<i>Abies alba</i>	26
<i>Teucrium scorodonia</i>	23
<i>Rubus idaeus</i>	22
<i>Viola reichenbachiana</i>	21
<i>Pinus sylvestris</i>	21
<i>Fraxinus excelsior</i>	21
<i>Rosa canina</i> aggr.	20
<i>Sorbus aria</i> aggr.	19
<i>Ilex aquifolium</i>	19
<i>Brachypodium sylvaticum</i>	19
<i>Viola canina</i>	18
<i>Quercus petraea</i>	18
<i>Oxalis acetosella</i>	18
<i>Lathyrus linifolius</i>	18
<i>Calluna vulgaris</i>	18
<i>Veronica officinalis</i>	17
<i>Dactylis glomerata</i>	17
<i>Clinopodium vulgare</i>	17
<i>Lonicera xylosteum</i>	16
<i>Euphorbia amygdaloides</i>	16
<i>Dryopteris filix-mas</i>	16
<i>Veronica chamaedrys</i> aggr.	15
<i>Solidago virgaurea</i>	15
<i>Geranium robertianum</i>	15
<i>Athyrium filix-femina</i>	15
<i>Anthoxanthum odoratum</i> aggr.	15
<i>Melica uniflora</i>	14
<i>Luzula nivea</i>	14
<i>Vicia sepium</i>	13
<i>Urtica dioica</i>	13
<i>Prunus avium</i>	13
<i>Pinus uncinata</i>	13
<i>Laserpitium latifolium</i>	13
<i>Hieracium murorum</i>	13
<i>Epilobium montanum</i>	13
<i>Cytisus scoparius</i>	13
<i>Agrostis capillaris</i>	13
<i>Acer opalus</i> aggr.	13
<i>Stachys officinalis</i>	12
<i>Potentilla erecta</i>	12
<i>Buxus sempervirens</i>	12
<i>Quercus pubescens</i>	11
<i>Prenanthes purpurea</i>	11

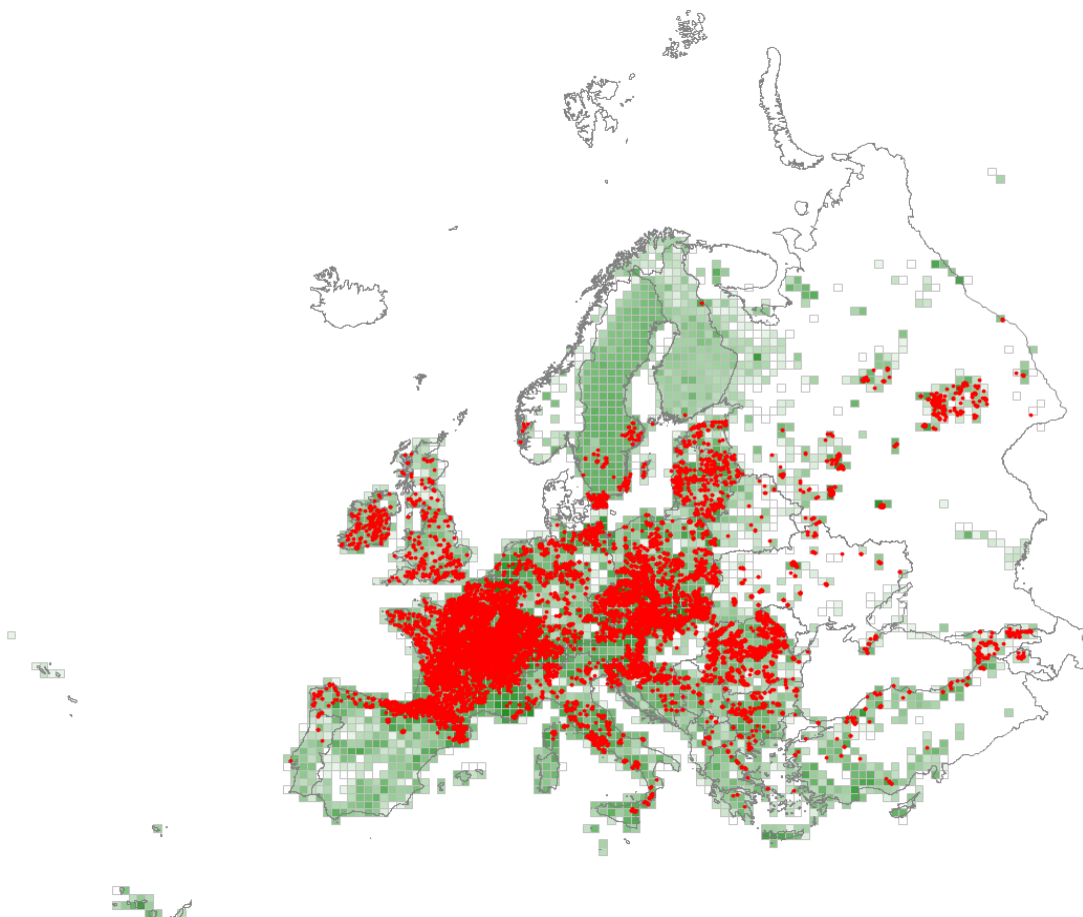
<i>Juniperus communis</i> subsp. <i>nana</i>	11
<i>Galium odoratum</i>	11
<i>Festuca heterophylla</i>	11
<i>Erica arborea</i>	11
<i>Dryopteris affinis</i> aggr.	11

Dominant species (percentage frequencies of occurrences with cover > 25%)

<i>Betula pendula</i>	59
<i>Populus tremula</i>	31
<i>Corylus avellana</i>	21
<i>Vaccinium myrtillus</i>	14
<i>Pteridium aquilinum</i>	12
<i>Betula pendula</i> var. <i>fontqueri</i>	9
<i>Avenella flexuosa</i>	9
<i>Buxus sempervirens</i>	6
<i>Salix cinerea</i> subsp. <i>oleifolia</i>	5
<i>Rubus fruticosus</i> aggr.	5
<i>Fagus sylvatica</i>	5
<i>Erica arborea</i>	5

## T1E – *Carpinus* and *Quercus* mesic deciduous forest

Deciduous broadleaved forests typical of brown or grey soils of quite low to high base-status and moderate to high nutrient content. They occur across the lowlands and foothills of the temperate zone of Western, Central, Eastern and Southern Europe, with local extensions into regions characterised by submediterranean and boreal climate. Partially this includes alluvial *Quercus/Carpinus*-dominated forests in mountain valleys with infrequent inundation. The canopy is usually of mixed composition with oaks figuring prominently, notably *Quercus petraea* and *Quercus robur* but with regional contributions from other oaks, along with *Acer campestre*, *Acer platanoides*, *Carpinus betulus*, *Fraxinus excelsior*, *Tilia cordata*, *Tilia tomentosa* and *Ulmus glabra*. Non-riparian and non-ravine forests of *Acer platanoides*, *Fraxinus excelsior*, *Tilia cordata* and *Ulmus glabra* (without *Quercus* species and *Carpinus betulus*) also belong to this habitat. The canopy can have a complex, multi-layered structure including shrubs and lianas while the herb layer can be species-rich with much regional variation in composition.



### Corresponding alliances in EuroVegChecklist 2016

- > FAG-03H Aconito lycoctoni-Tilion cordatae Solomeshch et Grigoriev in Willner et al. 2016
- > FAG-04B Astantio-Carpinion caucasicae Passarge 1981
- <> FAG-03A Carpinion betuli Issler 1931
- > FAG-03D Castaneo sativae-Carpinion orientalis Quézel, Barbero et Akman ex Quézel et al. 1993
- > FAG-04A Crataego-Carpinion caucasicae Passarge 1981
- > FAG-03C Erythronio-Carpinion (Horvat 1958) Marinček in Wallnöfer et al. 1993

- > FAG-03E Paeonio dauricae-Quercion petraeae Didukh 1996
- <> FAG-03B Pulmonario longifoliae-Quercion roboris Rivas-Mart. et Izco in Rivas-Mart. et al. 2002
- > FAG-03F Quercu roboris-Tilion cordatae Solomeshch et Laiviņš ex Bulokhov et Solomeshch in Bulokhov et Semenishchenkov 2015
- > FAG-03G Scillo sibericae-Quercion roboris Onyshchenko 2009

### Characteristic species combination

#### Diagnostic species (phi coefficient \* 100)

<i>Carpinus betulus</i>	34
<i>Acer campestre</i>	20
<i>Polygonatum multiflorum</i>	20
<i>Corylus avellana</i>	19
<i>Prunus avium</i>	18
<i>Tilia cordata</i>	18
<i>Quercus robur</i>	18
<i>Quercus petraea</i>	18
<i>Stellaria holostea</i>	17
<i>Rosa arvensis</i>	16
<i>Fraxinus excelsior</i>	16
<i>Crataegus laevigata</i>	16
<i>Carex sylvatica</i>	16
<i>Carex pilosa</i>	16

#### Constant species (percentage frequencies)

<i>Carpinus betulus</i>	62
<i>Corylus avellana</i>	58
<i>Hedera helix</i> aggr.	54
<i>Quercus robur</i>	53
<i>Crataegus monogyna</i>	46
<i>Rubus fruticosus</i> aggr.	44
<i>Fraxinus excelsior</i>	44
<i>Acer campestre</i>	38
<i>Quercus petraea</i>	36
<i>Fagus sylvatica</i>	34
<i>Brachypodium sylvaticum</i>	33
<i>Viola reichenbachiana</i>	32
<i>Prunus avium</i>	31
<i>Geum urbanum</i>	31
<i>Stellaria holostea</i>	29
<i>Lamium galeobdolon</i>	29
<i>Anemone nemorosa</i>	28
<i>Polygonatum multiflorum</i>	27
<i>Ligustrum vulgare</i>	27
<i>Cornus sanguinea</i>	27
<i>Carex sylvatica</i>	27
<i>Poa nemoralis</i>	26
<i>Fragaria vesca</i>	26
<i>Euonymus europaeus</i>	25
<i>Lonicera periclymenum</i>	24
<i>Dryopteris filix-mas</i>	24
<i>Rosa arvensis</i>	21
<i>Galium odoratum</i>	21
<i>Tilia cordata</i>	20
<i>Geranium robertianum</i>	20
<i>Euphorbia amygdaloides</i>	20
<i>Prunus spinosa</i>	19

<i>Milium effusum</i>	19
<i>Dactylis glomerata</i>	19
<i>Mercurialis perennis</i>	18
<i>Melica uniflora</i>	18
<i>Lonicera xylosteum</i>	18
<i>Ajuga reptans</i>	18
<i>Oxalis acetosella</i>	17
<i>Crataegus laevigata</i>	17
<i>Convallaria majalis</i>	17
<i>Atrichum undulatum</i>	17
<i>Veronica chamaedrys</i> aggr.	16
<i>Aegopodium podagraria</i>	16
<i>Urtica dioica</i>	15
<i>Sorbus torminalis</i>	15
<i>Ilex aquifolium</i>	15
<i>Asarum europaeum</i>	15
<i>Acer pseudoplatanus</i>	15
<i>Sorbus aucuparia</i>	14
<i>Pteridium aquilinum</i>	14
<i>Populus tremula</i>	14
<i>Polytrichastrum formosum</i>	14
<i>Lathyrus vernus</i>	14
<i>Eurhynchium striatum</i>	14
<i>Castanea sativa</i>	14
<i>Arum maculatum</i>	14
<i>Acer platanoides</i>	14
<i>Viburnum opulus</i>	13
<i>Thuidium tamariscinum</i>	13
<i>Sambucus nigra</i>	13
<i>Melica nutans</i>	13
<i>Lactuca muralis</i>	13
<i>Glechoma hederacea</i>	13
<i>Galium aparine</i>	13
<i>Ficaria verna</i>	13
<i>Deschampsia cespitosa</i> aggr.	13
<i>Betula pendula</i>	13
<i>Athyrium filix-femina</i>	13
<i>Vicia sepium</i>	12
<i>Ruscus aculeatus</i>	12
<i>Rosa canina</i> aggr.	12
<i>Moehringia trinervia</i>	12
<i>Luzula pilosa</i>	12
<i>Viburnum lantana</i>	11
<i>Sanicula europaea</i>	11
<i>Potentilla sterilis</i>	11
<i>Maianthemum bifolium</i>	11
<i>Carex digitata</i>	11
<i>Campanula trachelium</i>	11

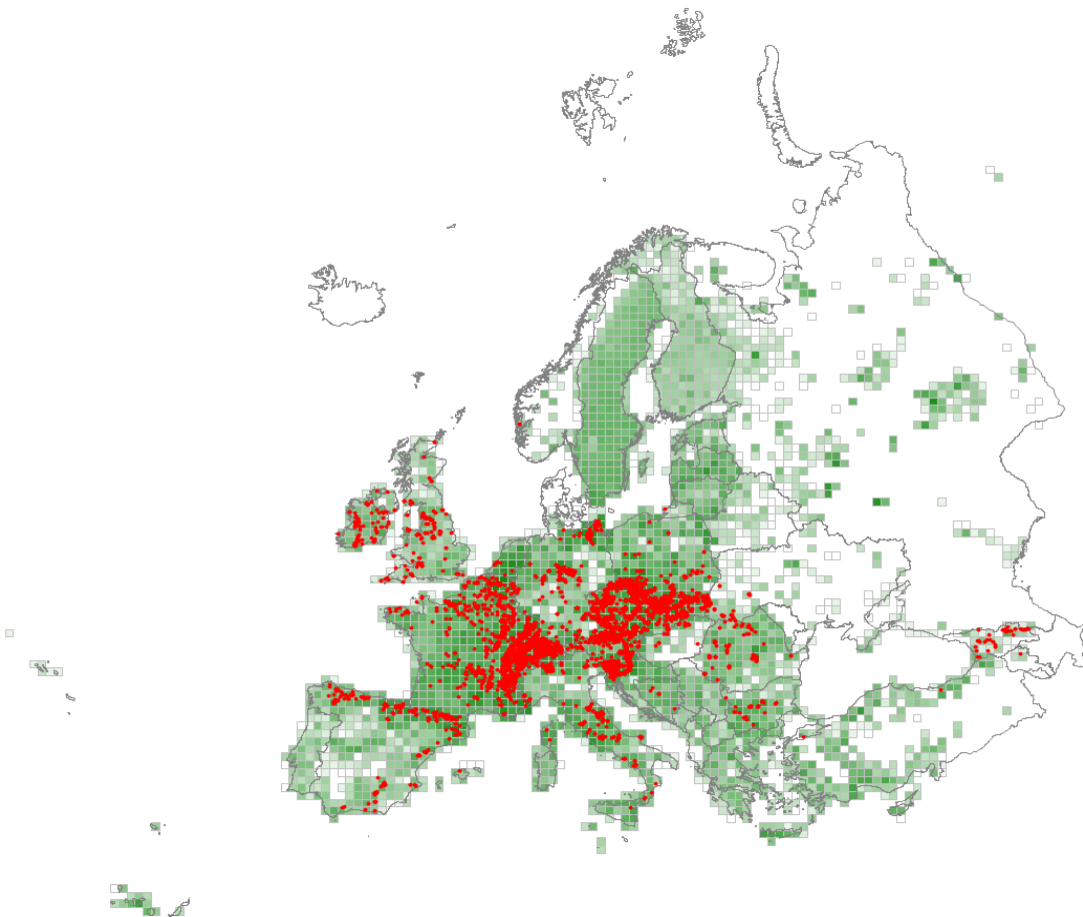
Dominant species (percentage frequencies of occurrences with cover > 25%)

<i>Carpinus betulus</i>	37
<i>Quercus robur</i>	30
<i>Quercus petraea</i>	21
<i>Hedera helix</i> aggr.	21
<i>Fraxinus excelsior</i>	15
<i>Corylus avellana</i>	14
<i>Rubus fruticosus</i> aggr.	11
<i>Tilia cordata</i>	7
<i>Anemone nemorosa</i>	7



## T1F – Ravine forest

Forests on steep slopes, frequently in ravines, where deep, well-drained and fertile soils develop which allow trees such as *Acer platanoides*, *Acer pseudoplatanus*, *Fraxinus excelsior*, *Fraxinus ornus*, *Ostrya carpinifolia*, *Tilia cordata*, *Tilia platyphyllos* and *Ulmus glabra*, to outcompete trees such as *Fagus sylvatica* and *Quercus* spp. The herb layer is dominated by luxuriant nitrophilous herbs such as *Aegopodium podagraria*, *Impatiens noli-tangere* and *Urtica dioica*, moisture-loving vernal plants like *Allium ursinum* and, on base-rich soils, *Brachypodium sylvaticum*, *Circaea lutetiana*, *Geranium robertianum* and *Mercurialis perennis*. In the southern part of its distribution, thermophilous species appear, such as *Arabis turrata*, *Cornus mas*, *Dioscorea communis* and *Ligustrum vulgare*. Another group of thermophilous species (e.g. *Anthericum ramosum*, *Cotoneaster integerrimus*, *Sesleria caerulea* and *Vincetoxicum hirundinaria*) is typical of steep rocky slopes.



### Corresponding alliances in EuroVegChecklist 2016

- > FAG-05C Dryopterido affinis-Fraxinion excelsioris Vanden Berghen ex Bœuf et al. in Bœuf 2011
- > FAG-05D Fraxino excelsioris-Acerion pseudoplatani P. Fukarek 1969
- > FAG-05B Melico-Tilion platyphylli Passarge et G. Hofmann 1968
- > FAG-05E Ostryo carpinifoliae-Tilion platyphylli (Košir et al. 2008) Čarni in Willner et al. 2016
- > FAG-05F Tilio pseudorubrae-Ostryion carpinifoliae S. Brullo et al. 2001
- <> FAG-05A Tilio-Acerion Klika 1955

## Characteristic species combination

### Diagnostic species (phi coefficient \* 100)

<i>Tilia platyphyllos</i>	35
<i>Acer pseudoplatanus</i>	35
<i>Ulmus glabra</i>	30
<i>Lamium galeobdolon</i>	27
<i>Mercurialis perennis</i>	26
<i>Lunaria rediviva</i>	25
<i>Fraxinus excelsior</i>	25
<i>Dryopteris filix-mas</i>	22
<i>Galium odoratum</i>	22
<i>Asplenium scolopendrium</i>	21
<i>Actaea spicata</i>	21
<i>Acer platanoides</i>	20
<i>Aruncus dioicus</i>	19
<i>Polystichum aculeatum</i>	19
<i>Corylus avellana</i>	18
<i>Asarum europaeum</i>	17
<i>Polygonatum multiflorum</i>	17
<i>Geranium robertianum</i>	16
<i>Fagus sylvatica</i>	16
<i>Lonicera xylosteum</i>	15

### Constant species (percentage frequencies)

<i>Acer pseudoplatanus</i>	84
<i>Fraxinus excelsior</i>	66
<i>Corylus avellana</i>	56
<i>Lamium galeobdolon</i>	55
<i>Dryopteris filix-mas</i>	54
<i>Fagus sylvatica</i>	52
<i>Mercurialis perennis</i>	50
<i>Geranium robertianum</i>	46
<i>Hedera helix</i> aggr.	41
<i>Oxalis acetosella</i>	37
<i>Galium odoratum</i>	37
<i>Urtica dioica</i>	36
<i>Tilia platyphyllos</i>	35
<i>Ulmus glabra</i>	34
<i>Sambucus nigra</i>	31
<i>Athyrium filix-femina</i>	31
<i>Rubus fruticosus</i> aggr.	30
<i>Senecio nemorensis</i> aggr.	28
<i>Lonicera xylosteum</i>	28
<i>Brachypodium sylvaticum</i>	28
<i>Carpinus betulus</i>	26
<i>Acer platanoides</i>	26
<i>Viola reichenbachiana</i>	24
<i>Polygonatum multiflorum</i>	24
<i>Poa nemoralis</i>	24
<i>Picea abies</i>	24
<i>Paris quadrifolia</i>	23
<i>Lactuca muralis</i>	23
<i>Geum urbanum</i>	22
<i>Crataegus monogyna</i>	22
<i>Asarum europaeum</i>	21
<i>Acer campestre</i>	21



<i>Polystichum aculeatum</i>	20
<i>Asplenium scolopendrium</i>	20
<i>Anemone nemorosa</i>	20
<i>Aegopodium podagraria</i>	20
<i>Actaea spicata</i>	20
<i>Impatiens noli-tangere</i>	19
<i>Sorbus aucuparia</i>	18
<i>Rubus idaeus</i>	18
<i>Carex sylvatica</i>	18
<i>Abies alba</i>	18
<i>Milium effusum</i>	17
<i>Fragaria vesca</i>	17
<i>Polypodium vulgare</i>	16
<i>Euonymus europaeus</i>	16
<i>Cornus sanguinea</i>	16
<i>Asplenium trichomanes</i>	16
<i>Arum maculatum</i>	16
<i>Tilia cordata</i>	15
<i>Stachys sylvatica</i>	15
<i>Salvia glutinosa</i>	15
<i>Dryopteris dilatata</i>	15
<i>Circaea lutetiana</i>	15
<i>Quercus robur</i>	14
<i>Prunus avium</i>	14
<i>Plagiomnium undulatum</i>	14
<i>Epilobium montanum</i>	14
<i>Campanula trachelium</i>	14
<i>Aruncus dioicus</i>	14
<i>Sorbus aria</i> aggr.	13
<i>Melica uniflora</i>	13
<i>Lunaria rediviva</i>	13
<i>Daphne mezereum</i>	13
<i>Carex digitata</i>	13
<i>Stellaria nemorum</i>	12
<i>Stellaria holostea</i>	12
<i>Quercus petraea</i>	12
<i>Pulmonaria officinalis</i>	12
<i>Primula elatior</i>	12
<i>Prenanthes purpurea</i>	12
<i>Petasites albus</i>	12
<i>Melica nutans</i>	12
<i>Lathyrus vernus</i>	12
<i>Hepatica nobilis</i>	12
<i>Galium aparine</i>	12
<i>Euphorbia amygdaloides</i>	12
<i>Clematis vitalba</i>	12
<i>Solidago virgaurea</i>	11
<i>Phyteuma spicatum</i>	11
<i>Moehringia trinervia</i>	11
<i>Cardamine bulbifera</i>	11
<i>Alliaria petiolata</i>	11
<i>Ajuga reptans</i>	11

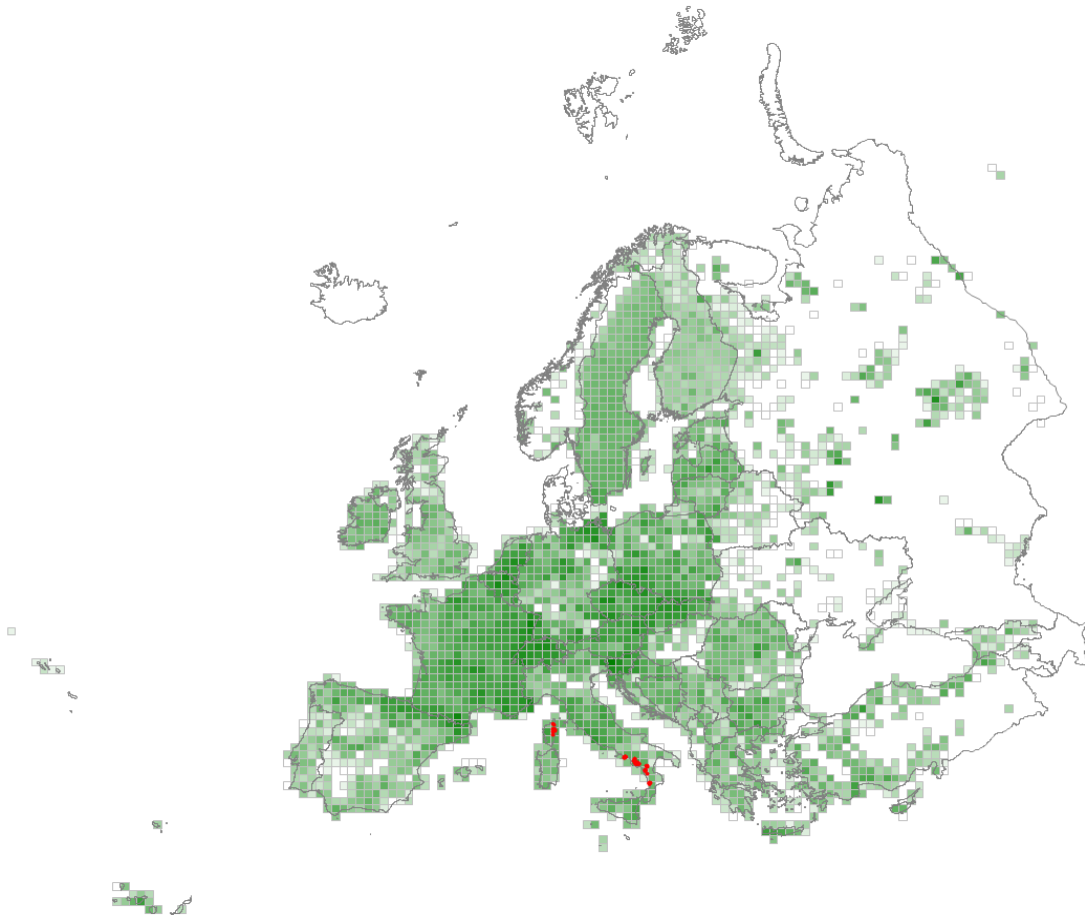
Dominant species (percentage frequencies of occurrences with cover > 25%)

<i>Acer pseudoplatanus</i>	52
<i>Fraxinus excelsior</i>	27
<i>Tilia platyphyllos</i>	16
<i>Mercurialis perennis</i>	12
<i>Corylus avellana</i>	11

<i>Hedera helix</i> aggr.	10
<i>Fagus sylvatica</i>	7
<i>Lamium galeobdolon</i>	5

## T1G – *Alnus cordata* forest

Temperate non-riparian, non-marshy forest dominated by Italian alder (*Alnus cordata*).



### Corresponding alliances in EuroVegChecklist 2016

- <> POP-02A *Alnion incanae* Pawłowski et al. 1928
- <> FAG-02C *Geranio striati-Fagion* Gentile 1970

### Characteristic species combination

Diagnostic species (phi coefficient \* 100)

<i>Alnus cordata</i>	95
<i>Polystichum setiferum</i>	39
<i>Anemone apennina</i>	38
<i>Ranunculus lanuginosus</i>	36
<i>Lamium flexuosum</i>	35
<i>Arisarum proboscideum</i>	33
<i>Geranium versicolor</i>	33
<i>Lathyrus venetus</i>	31
<i>Potentilla micrantha</i>	28
<i>Crepis leontodontoides</i>	28
<i>Helleborus lividus</i>	27
<i>Hypericum hircinum</i>	26
<i>Stachys sylvatica</i>	25
<i>Clematis vitalba</i>	24

<i>Festuca heterophylla</i>	23
<i>Colchicum neapolitanum</i>	23
<i>Geranium robertianum</i>	22
<i>Chaerophyllum temulum</i>	22
<i>Pteridium aquilinum</i>	22
<i>Allium pendulinum</i>	20
<i>Viola reichenbachiana</i>	20
<i>Calystegia silvatica</i>	20
<i>Rubus ulmifolius</i>	19
<i>Cymbalaria hepaticifolia</i>	19
<i>Brachypodium sylvaticum</i>	18
<i>Salix brutia</i>	18
<i>Bryonia dioica</i>	18
<i>Luzula forsteri</i>	18
<i>Asperula taurina</i>	17
<i>Asperula laevigata</i>	17
<i>Euphorbia semiperfoliata</i>	17
<i>Castanea sativa</i>	17
<i>Lactuca muralis</i>	17
<i>Aremonia agrimonoides</i>	17
<i>Oenanthe pimpinelloides</i>	17
<i>Salvia glutinosa</i>	17
<i>Carex pendula</i>	17
<i>Crocus imperati</i> aggr.	17
<i>Geranium nodosum</i>	17
<i>Viola alba</i>	16
<i>Fraxinus ornus</i>	16
<i>Scutellaria columnae</i>	16
<i>Geranium lucidum</i>	15
<i>Ficus carica</i>	15

Constant species (percentage frequencies)

<i>Alnus cordata</i>	100
<i>Pteridium aquilinum</i>	77
<i>Geranium robertianum</i>	61
<i>Rubus ulmifolius</i>	55
<i>Brachypodium sylvaticum</i>	55
<i>Polystichum setiferum</i>	52
<i>Hedera helix</i> aggr.	52
<i>Clematis vitalba</i>	52
<i>Crataegus monogyna</i>	48
<i>Viola reichenbachiana</i>	45
<i>Ranunculus lanuginosus</i>	42
<i>Poa trivialis</i>	42
<i>Stachys sylvatica</i>	39
<i>Lactuca muralis</i>	39
<i>Rubus fruticosus</i> aggr.	35
<i>Fragaria vesca</i>	32
<i>Festuca heterophylla</i>	32
<i>Stellaria media</i>	29
<i>Potentilla micrantha</i>	29
<i>Geum urbanum</i>	29
<i>Fraxinus ornus</i>	29
<i>Clinopodium vulgare</i>	29
<i>Castanea sativa</i>	29
<i>Urtica dioica</i>	26
<i>Quercus ilex</i>	26
<i>Lathyrus venetus</i>	26
<i>Dioscorea communis</i>	26

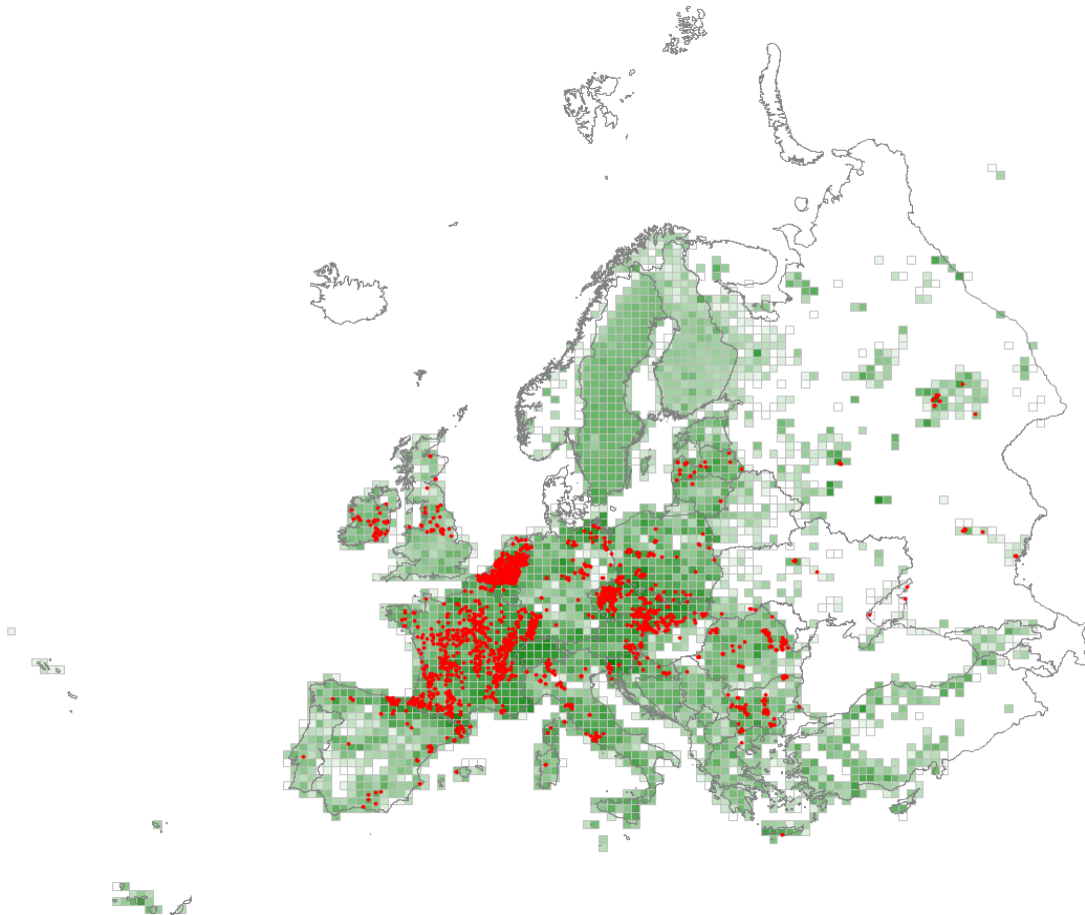
<i>Sanicula europaea</i>	23
<i>Rubia peregrina</i>	23
<i>Prunella vulgaris</i>	23
<i>Luzula forsteri</i>	23
<i>Lamium flexuosum</i>	23
<i>Helleborus lividus</i>	23
<i>Geranium versicolor</i>	23
<i>Galium aparine</i>	23
<i>Bellis perennis</i>	23
<i>Aremonia agrimonoides</i>	23
<i>Anemone apennina</i>	23
<i>Viola alba</i>	19
<i>Teucrium scorodonia</i>	19
<i>Salvia glutinosa</i>	19
<i>Ostrya carpinifolia</i>	19
<i>Melica uniflora</i>	19
<i>Chaerophyllum temulum</i>	19
<i>Daphne laureola</i>	19
<i>Dactylis glomerata</i>	19
<i>Crepis leontodontoides</i>	19
<i>Circaea lutetiana</i>	19
<i>Moehringia trinervia</i>	16
<i>Ilex aquifolium</i>	16
<i>Hypericum hircinum</i>	16
<i>Ficus carica</i>	16
<i>Cruciata laevipes</i>	16
<i>Carex pendula</i>	16
<i>Bryonia dioica</i>	16
<i>Acer opalus</i> aggr.	16
<i>Veronica montana</i>	13
<i>Symphytum tuberosum</i> aggr.	13
<i>Sambucus nigra</i>	13
<i>Rosa canina</i> aggr.	13
<i>Quercus cerris</i>	13
<i>Oenanthe pimpinelloides</i>	13
<i>Mercurialis perennis</i>	13
<i>Geranium lucidum</i>	13
<i>Euphorbia amygdaloides</i>	13
<i>Erica arborea</i>	13
<i>Cyclamen repandum</i>	13
<i>Cyclamen hederifolium</i>	13
<i>Cornus sanguinea</i>	13
<i>Arisarum proboscideum</i>	13
<i>Anthoxanthum odoratum</i> aggr.	13

Dominant species (percentage frequencies of occurrences with cover > 25%)

<i>Alnus cordata</i>	100
<i>Pteridium aquilinum</i>	35
<i>Rubus ulmifolius</i>	23
<i>Hedera helix</i> aggr.	13
<i>Brachypodium sylvaticum</i>	13
<i>Clematis vitalba</i>	10
<i>Rubus fruticosus</i> aggr.	6
<i>Ranunculus lanuginosus</i>	6

## T1H – Broadleaved deciduous plantation of non site-native trees

Cultivated deciduous broadleaved tree formations planted for the production of wood, composed of exotic species or of native tree species out of their natural range.



### Corresponding alliances in EuroVegChecklist 2016

- > ROB-02B *Balloto nigrae*-Robinion pseudoacaciae Hadač et Sofron 1980
- > ROB-02D *Euphorbio cyparissiae*-Robinion pseudoacaciae Vítková in Kolbek et al. 2003
- > ROB-02C *Chelidonio majoris*-Robinion pseudoacaciae Hadač et Sofron ex Vítková in Chytrý 2013

### Characteristic species combination

Diagnostic species (phi coefficient \* 100)

<i>Robinia pseudoacacia</i>	49
<i>Populus x canadensis</i>	25
<i>Quercus rubra</i>	22
<i>Sambucus nigra</i>	19

Constant species (percentage frequencies)

<i>Robinia pseudoacacia</i>	57
<i>Urtica dioica</i>	43
<i>Rubus fruticosus</i> aggr.	43
<i>Sambucus nigra</i>	41
<i>Hedera helix</i> aggr.	37
<i>Galium aparine</i>	37

<i>Crataegus monogyna</i>	37
<i>Geum urbanum</i>	33
<i>Quercus robur</i>	31
<i>Fraxinus excelsior</i>	27
<i>Corylus avellana</i>	26
<i>Euonymus europaeus</i>	22
<i>Prunus spinosa</i>	19
<i>Glechoma hederacea</i>	19
<i>Dactylis glomerata</i>	19
<i>Lonicera periclymenum</i>	18
<i>Cornus sanguinea</i>	18
<i>Brachypodium sylvaticum</i>	18
<i>Quercus rubra</i>	17
<i>Geranium robertianum</i>	17
<i>Rubus caesius</i>	16
<i>Rosa canina</i> aggr.	16
<i>Ligustrum vulgare</i>	15
<i>Prunus avium</i>	14
<i>Populus x canadensis</i>	14
<i>Poa trivialis</i>	14
<i>Carpinus betulus</i>	14
<i>Poa nemoralis</i>	13
<i>Chelidonium majus</i>	13
<i>Clematis vitalba</i>	13
<i>Castanea sativa</i>	13
<i>Acer campestre</i>	13
<i>Rubus ulmifolius</i>	12
<i>Alliaria petiolata</i>	12
<i>Acer pseudoplatanus</i>	12
<i>Ficaria verna</i>	11
<i>Dryopteris filix-mas</i>	11

Dominant species (percentage frequencies of occurrences with cover > 25%)

<i>Robinia pseudoacacia</i>	53
<i>Rubus fruticosus</i> aggr.	15
<i>Quercus rubra</i>	15
<i>Populus x canadensis</i>	13
<i>Hedera helix</i> aggr.	13
<i>Urtica dioica</i>	9
<i>Sambucus nigra</i>	7

## **T1J – Deciduous self-sown forest of non site-native trees**

[This habitat could not be formally defined in the expert system, because self-sown forests cannot be distinguished from plantations based on the vegetation-plot data.]

Non-planted stands dominated by non-native deciduous tree species such as *Acer negundo*, *Ailanthus altissima* and *Robinia pseudoacacia*.



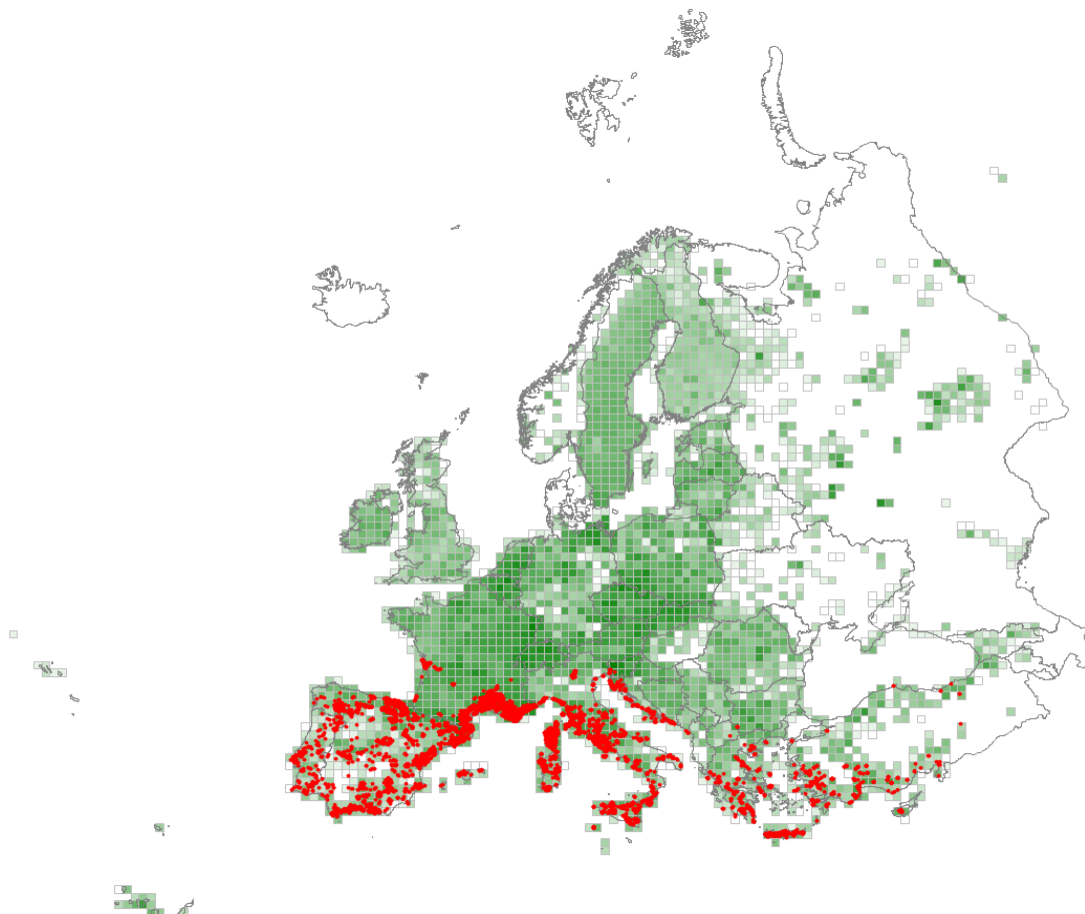
## **T1K – Broadleaved deciduous plantation of site-native trees**

[This habitat could not be formally defined in the expert system, because plantations of site-native trees cannot be distinguished from natural forests based on the vegetation-plot data.]

Cultivated stands of broadleaved deciduous trees planted for the production of wood, composed of site-native broadleaved deciduous tree species.

## T21 – Mediterranean evergreen *Quercus* forest

Forest dominated by evergreen broadleaved oaks (most widely *Quercus ilex*) with associated sclerophyllous and laurophyllous trees and shrubs in the summer-drought climate of the Mediterranean lowlands and foothills. The tree canopy is often low and much modified, with widespread transitions to maquis/matorral and open dehesa/montado wood pasture.



### Corresponding alliances in EuroVegChecklist 2016

- > QUI-01H Arbuto andrachnes-Quercion cocciferae Barbero et Quézel 1979
- > QUI-01G Cyclamini cretici-Quercion ilicis Barbero et Quézel in Quézel et al. 1993
- > QUI-01E Erico-Quercion ilicis S. Brullo et al. 1977
- <> QUI-01D Fraxino orni-Quercion ilicis Biondi, Casavecchia et Gigante in Biondi et al. 2013
- > QUI-01B Oleo sylvestris-Quercion rotundifoliae Barbero, Quézel et Rivas-Mart. in Rivas-Mart. et al. 1986 nom. invers. propos.
- > QUI-02C Quercion alnifoliae Barbero et Quézel ex Bergmeier, Mucina et Theurillat in Willner et al. 2015
- > QUI-01C Quercion broteroi Br.-Bl. et al. 1956 corr. Rivas-Mart. 1972
- > QUI-02A Quercion calliprini Zohary 1955
- > QUI-01A Quercion ilicis Br.-Bl. ex Molinier 1934

### Characteristic species combination

Diagnostic species (phi coefficient \* 100)

*Quercus ilex*

<i>Rubia peregrina</i>	22
<i>Quercus rotundifolia</i>	22
<i>Phillyrea latifolia</i>	20
<i>Arbutus unedo</i>	20
<i>Ruscus aculeatus</i>	19
<i>Quercus suber</i>	19
<i>Asparagus acutifolius</i>	16
<i>Smilax aspera</i>	16
<i>Carex distachya</i>	15
<i>Asplenium adiantum-nigrum</i>	15
<i>Lonicera implexa</i>	15

Constant species (percentage frequencies)

<i>Rubia peregrina</i>	68
<i>Quercus ilex</i>	59
<i>Asparagus acutifolius</i>	43
<i>Smilax aspera</i>	41
<i>Ruscus aculeatus</i>	39
<i>Phillyrea latifolia</i>	37
<i>Hedera helix</i> aggr.	34
<i>Arbutus unedo</i>	31
<i>Asplenium adiantum-nigrum</i>	27
<i>Quercus pubescens</i>	26
<i>Erica arborea</i>	26
<i>Crataegus monogyna</i>	26
<i>Brachypodium retusum</i>	26
<i>Quercus rotundifolia</i>	25
<i>Juniperus oxycedrus</i> aggr.	25
<i>Pistacia lentiscus</i>	24
<i>Rubus ulmifolius</i>	23
<i>Quercus coccifera</i>	23
<i>Lonicera implexa</i>	22
<i>Rhamnus alaternus</i>	21
<i>Dioscorea communis</i>	21
<i>Teucrium chamaedrys</i>	20
<i>Dactylis glomerata</i>	19
<i>Carex halleriana</i>	18
<i>Pistacia terebinthus</i>	17
<i>Fraxinus ornus</i>	17
<i>Daphne gnidium</i>	17
<i>Cistus salviifolius</i>	17
<i>Viburnum tinus</i>	16
<i>Quercus suber</i>	16
<i>Phillyrea angustifolia</i>	15
<i>Lonicera etrusca</i>	15
<i>Clematis flammula</i>	15
<i>Rosa sempervirens</i>	14
<i>Osyris alba</i>	14
<i>Carex distachya</i>	14
<i>Brachypodium sylvaticum</i>	14
<i>Thymus vulgaris</i>	13
<i>Viola alba</i>	12
<i>Euphorbia characias</i>	12
<i>Buxus sempervirens</i>	12
<i>Olea europaea</i>	11
<i>Myrtus communis</i>	11

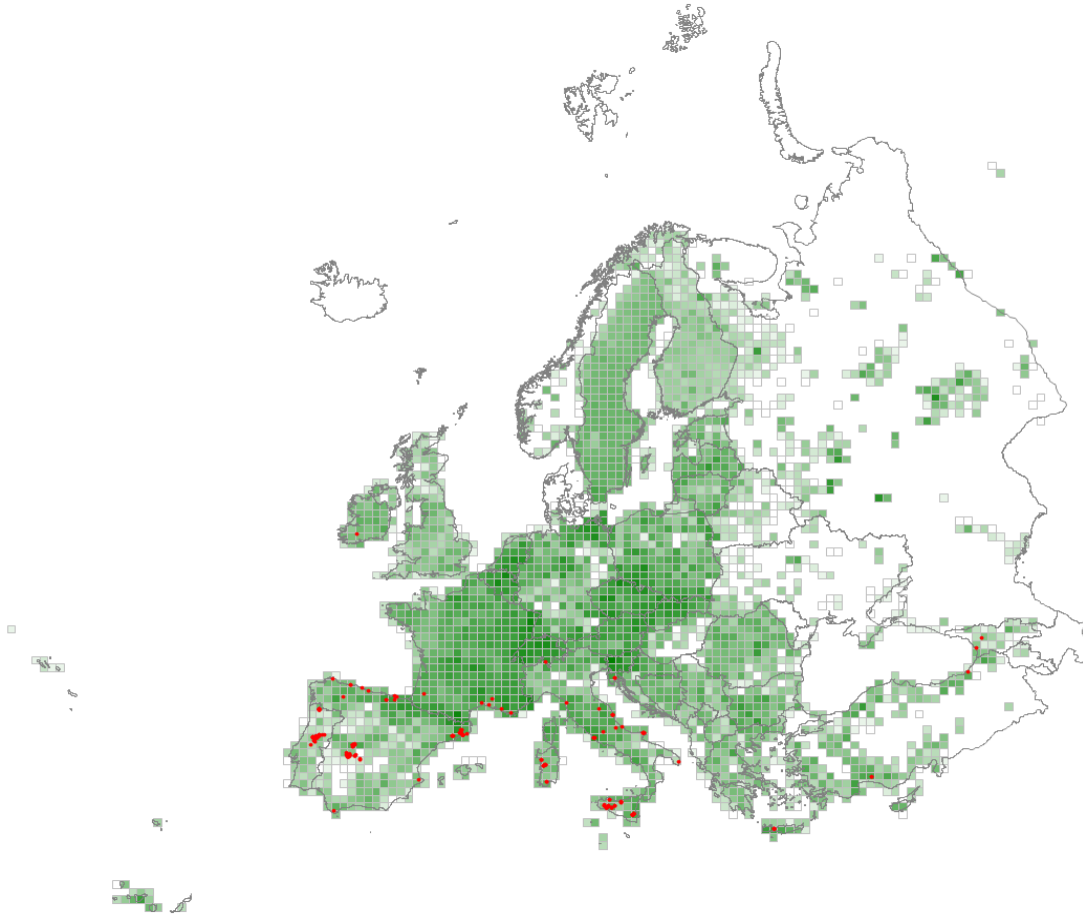
Dominant species (percentage frequencies of occurrences with cover > 25%)

<i>Quercus ilex</i>	55
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<i>Quercus rotundifolia</i>	23
<i>Quercus suber</i>	13
<i>Quercus coccifera</i>	10
<i>Hedera helix</i> aggr.	6
<i>Buxus sempervirens</i>	6
<i>Arbutus unedo</i>	5

## T22 – Mainland laurophyllous forest

Patches of evergreen laurophyllous forests and thickets dominated by bay (*Laurus nobilis*), firetree (*Morella faya*) and Portugal laurel (*Prunus lusitanica* subsp. *lusitanica*) in oceanic and hyper-humid situations, now surviving as small relics in sheltered situations like ravines along the Atlantic coast of Portugal and Spain and in Sardinia, southern Italy and Sicily. Typically species-poor with an associated flora similar to T21.



### Corresponding alliances in EuroVegChecklist 2016

- > QUI-011 Arbutus unedo-Laurus nobilis Rivas-Mart. et al. 1999

### Characteristic species combination

Diagnostic species (phi coefficient \* 100)

<i>Prunus lusitanica</i> subsp. <i>lusitanica</i>	56
<i>Laurus nobilis</i>	54
<i>Ruscus aculeatus</i>	28
<i>Celtis australis</i>	24
<i>Acanthus mollis</i>	24
<i>Viburnum tinus</i>	22
<i>Hedera helix</i> aggr.	22
<i>Asplenium adiantum-nigrum</i>	20
<i>Fraxinus angustifolia</i>	19
<i>Dioscorea communis</i>	19
<i>Polystichum setiferum</i>	17

<i>Orobanche hederæ</i>	17
<i>Hypericum androsaemum</i>	17
<i>Galium broterianum</i>	16
<i>Carex reuteriana</i>	16

Constant species (percentage frequencies)

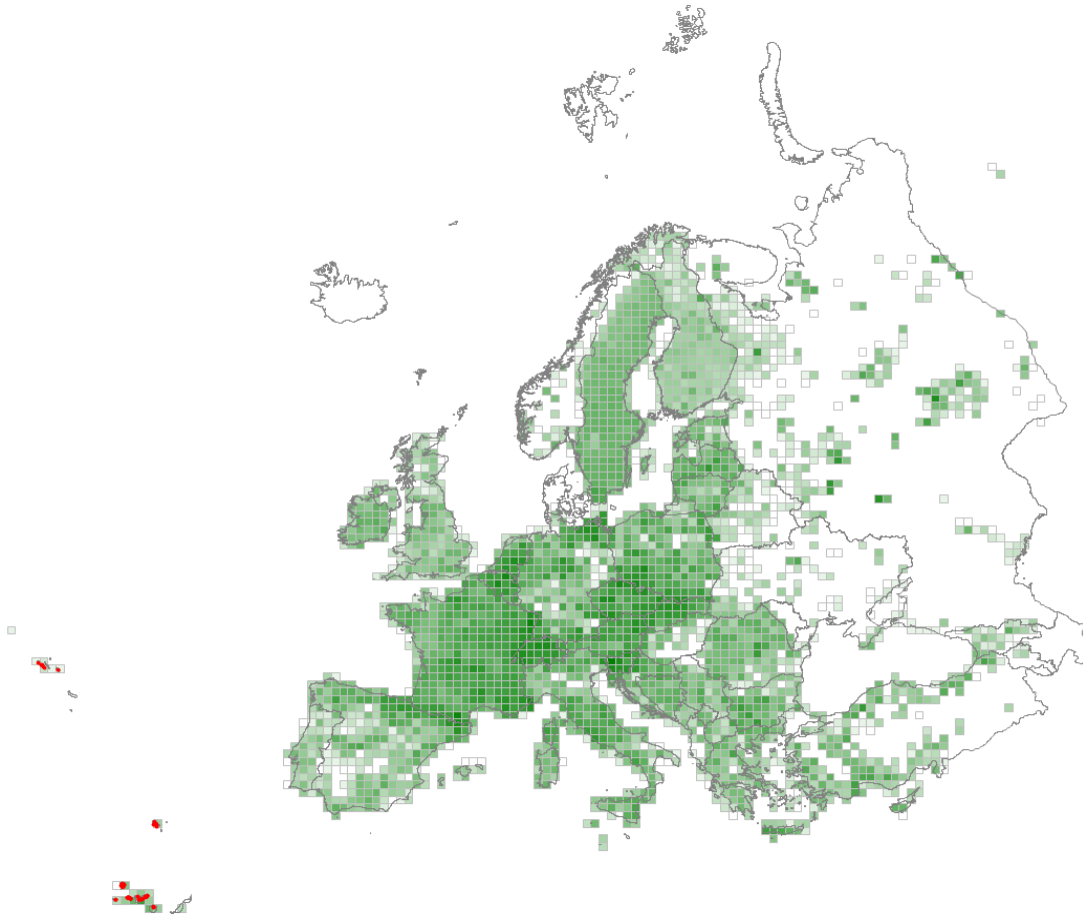
<i>Hedera helix</i> aggr.	79
<i>Laurus nobilis</i>	58
<i>Ruscus aculeatus</i>	57
<i>Rubus ulmifolius</i>	39
<i>Rubia peregrina</i>	39
<i>Dioscorea communis</i>	39
<i>Smilax aspera</i>	36
<i>Asplenium adiantum-nigrum</i>	36
<i>Prunus lusitanica</i> subsp. <i>lusitanica</i>	34
<i>Lonicera periclymenum</i>	33
<i>Viburnum tinus</i>	32
<i>Rubus fruticosus</i> aggr.	30
<i>Pteridium aquilinum</i>	26
<i>Athyrium filix-femina</i>	24
<i>Asparagus acutifolius</i>	24
<i>Polystichum setiferum</i>	23
<i>Brachypodium sylvaticum</i>	23
<i>Rhamnus alaternus</i>	22
<i>Alnus glutinosa</i>	22
<i>Fraxinus angustifolia</i>	20
<i>Quercus ilex</i>	19
<i>Clematis vitalba</i>	19
<i>Blechnum spicant</i>	19
<i>Arbutus unedo</i>	19
<i>Sambucus nigra</i>	17
<i>Crataegus monogyna</i>	17
<i>Corylus avellana</i>	17
<i>Arum italicum</i>	16
<i>Rosa sempervirens</i>	15
<i>Ficus carica</i>	15
<i>Asplenium trichomanes</i>	15
<i>Phillyrea latifolia</i>	14
<i>Ulmus minor</i>	13
<i>Ilex aquifolium</i>	13
<i>Teucrium scorodonia</i>	12
<i>Hypericum androsaemum</i>	12
<i>Frangula alnus</i>	12
<i>Dryopteris affinis</i> aggr.	12
<i>Celtis australis</i>	12
<i>Castanea sativa</i>	12
<i>Arisarum vulgare</i>	12
<i>Acanthus mollis</i>	12
<i>Vitis vinifera</i>	11
<i>Quercus pubescens</i>	11

Dominant species (percentage frequencies of occurrences with cover > 25%)

<i>Laurus nobilis</i>	56
<i>Prunus lusitanica</i> subsp. <i>lusitanica</i>	34
<i>Hedera helix</i> aggr.	19
<i>Ruscus aculeatus</i>	5
<i>Prunus lusitanica</i>	5
<i>Prunus laurocerasus</i>	5

## T23 – Macaronesian laurophyllous forest

Evergreen laurophyllous forest (laurisilva) on deep soils in the hyper-humid, frost-free fog belt mainly on the northern slopes in the mountains on some Macaronesian islands. The tree and shrub canopy is very diverse and rich in endemics, with striking differences related to climatic conditions across the different island groups, local topography and long isolation of the floras.



### Corresponding alliances in EuroVegChecklist 2016

- > AZO-02A Dryopterido azoricae-Laurion azoricae Rivas-Mart. et al. 2002
- > LAU-02A Ixantho viscosae-Laurion azoricae Oberd. ex Santos in Rivas-Mart. et al. 1977
- > AZO-02B Myrico fayae-Pittosporion undulati Lüpnitz 1976
- > LAU-02B Sibthorpio peregrinae-Clethrion arborea Capelo et al. 2000
- > LAU-02C Visneo mocanerae-Apollonion barbujanae Rivas-Mart. in Capelo et al. 2000

### Characteristic species combination

Diagnostic species (phi coefficient \* 100)

<i>Laurus azorica</i>	58
<i>Persea indica</i>	49
<i>Dryopteris oligodonta</i>	45
<i>Morella faya</i>	44
<i>Apollonias barbujana</i>	42
<i>Ilex canariensis</i>	41
<i>Pericallis papyracea</i>	38

<i>Ageratina adenophora</i>	35
<i>Ageratina riparia</i>	35
<i>Canarina canariensis</i>	33
<i>Semele androgyna</i>	31
<i>Ixanthus viscosus</i>	31
<i>Ocotea foetens</i>	30
<i>Dryopteris crispifolia</i>	30
<i>Asplenium hemionitis</i>	30
<i>Pericallis appendiculata</i>	30
<i>Cryptotaenia elegans</i>	30
<i>Ilex perado</i>	29
<i>Urtica morifolia</i>	28
<i>Jasminum odoratissimum</i>	28
<i>Hypericum xylosteifolium</i>	27
<i>Drymochloa donax</i>	26
<i>Pteris incompleta</i>	26
<i>Polypodium cambricum</i> subsp. <i>azoricum</i>	25
<i>Galium scabrum</i>	25
<i>Asplenium anceps</i>	25
<i>Prunus lusitanica</i> subsp. <i>hixa</i>	25
<i>Picconia azorica</i>	25
<i>Picconia excelsa</i>	24
<i>Hypericum glandulosum</i>	24
<i>Laurus novocanariensis</i>	23
<i>Asparagus scoparius</i>	23
<i>Zantedeschia aethiopica</i>	23
<i>Dracunculus canariensis</i>	23
<i>Bosea yervamora</i>	23
<i>Dryopteris intermedia</i>	22
<i>Diplazium caudatum</i>	21
<i>Erica arborea</i>	21
<i>Rubus bollei</i>	21
<i>Parietaria debilis</i>	20
<i>Cedronella canariensis</i>	20
<i>Viburnum tinus</i>	19
<i>Hypericum grandifolium</i>	19
<i>Pittosporum undulatum</i>	19
<i>Dryopteris guanchica</i>	19
<i>Aichryson laxum</i>	18
<i>Sideritis canariensis</i>	17
<i>Scrophularia calliantha</i>	17
<i>Rubus palmensis</i>	17
<i>Isoplexis canariensis</i>	17
<i>Chamaemeles coriacea</i>	17
<i>Eriobotrya japonica</i>	17
<i>Elaphoglossum semicylindricum</i>	17
<i>Dryopteris aitoniana</i>	17
<i>Convolvulus massonii</i>	17
<i>Carex canariensis</i>	17
<i>Bellis azorica</i>	17
<i>Arceuthobium azoricum</i>	17
<i>Aeonium glutinosum</i>	17
<i>Asplenium adiantum-nigrum</i>	17
<i>Rhamnus crenulata</i>	17
<i>Polypodium cambricum</i> subsp. <i>macaronesicum</i>	17
<i>Carex hochstetterana</i>	17
<i>Sambucus palmensis</i>	17
<i>Phyllis nobla</i>	17
<i>Gesnouinia arborea</i>	17



<i>Globularia salicina</i>	17
<i>Rhamnus glandulosa</i>	17
<i>Limonium angustebracteatum</i>	17
<i>Phoenix dactylifera</i>	16
<i>Vinca major</i>	16
<i>Frangula azorica</i>	16
<i>Smilax canariensis</i>	15
<i>Euphorbia mellifera</i>	15

Constant species (percentage frequencies)

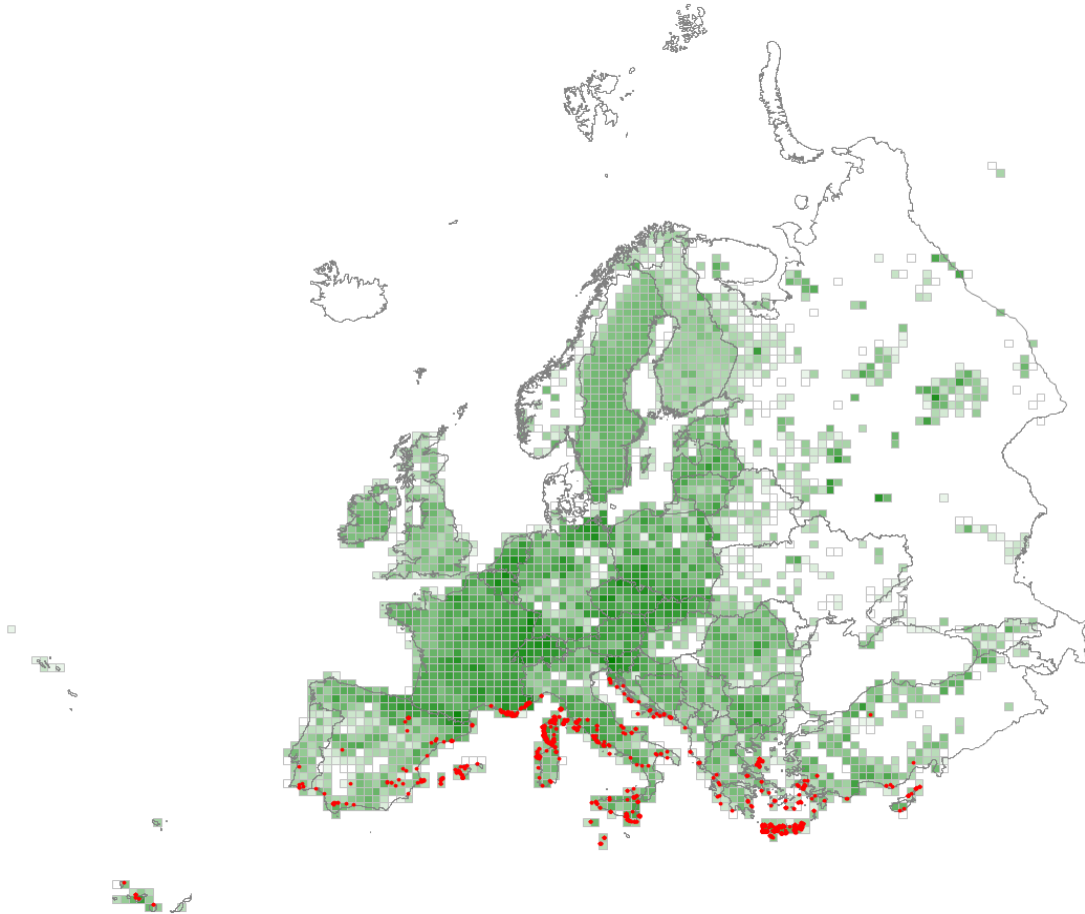
<i>Morella faya</i>	58
<i>Laurus azorica</i>	58
<i>Erica arborea</i>	52
<i>Pteridium aquilinum</i>	48
<i>Ilex canariensis</i>	39
<i>Dryopteris oligodonta</i>	39
<i>Brachypodium sylvaticum</i>	30
<i>Asplenium adiantum-nigrum</i>	30
<i>Viburnum tinus</i>	27
<i>Rubia peregrina</i>	27
<i>Persea indica</i>	27
<i>Hedera helix aggr.</i>	27
<i>Ageratina adenophora</i>	27
<i>Rubus ulmifolius</i>	24
<i>Galium scabrum</i>	24
<i>Apollonias barbujana</i>	24
<i>Ilex perado</i>	21
<i>Phyllis nobla</i>	18
<i>Pericallis papyracea</i>	18
<i>Hypericum xylosteifolium</i>	18
<i>Hypericum grandifolium</i>	18
<i>Globularia salicina</i>	18
<i>Erica scoparia</i>	18
<i>Davallia canariensis</i>	18
<i>Urtica morifolia</i>	15
<i>Semele androgyna</i>	15
<i>Rubia fruticosa</i>	15
<i>Polypodium cambricum</i> subsp. <i>macaronesticum</i>	15
<i>Picconia excelsa</i>	15
<i>Laurus novocanariensis</i>	15
<i>Ixanthus viscosus</i>	15
<i>Diplazium caudatum</i>	15
<i>Dioscorea communis</i>	15
<i>Smilax aspera</i>	12
<i>Ranunculus cortusifolius</i>	12
<i>Polystichum setiferum</i>	12
<i>Pinus canariensis</i>	12
<i>Pericallis appendiculata</i>	12
<i>Ocotea foetens</i>	12
<i>Maytenus umbellata</i>	12
<i>Jasminum odoratissimum</i>	12
<i>Dryopteris intermedia</i>	12
<i>Cryptotaenia elegans</i>	12
<i>Canarina canariensis</i>	12
<i>Blechnum spicant</i>	12
<i>Bituminaria bituminosa</i>	12
<i>Aichryson laxum</i>	12
<i>Ageratina riparia</i>	12

Dominant species (percentage frequencies of occurrences with cover > 25%)

<i>Laurus azorica</i>	45
<i>Morella faya</i>	15
<i>Dryopteris oligodonta</i>	15
<i>Apollonias barbujana</i>	12
<i>Viburnum tinus</i>	9
<i>Picconia excelsa</i>	9
<i>Persea indica</i>	9
<i>Laurus novocanariensis</i>	9
<i>Erica arborea</i>	9
<i>Pteridium aquilinum</i>	6
<i>Ocotea foetens</i>	6
<i>Ilex canariensis</i>	6
<i>Hedera helix</i> aggr.	6
<i>Diplazium caudatum</i>	6

## T24 – *Olea europaea*-*Ceratonia siliqua* forest

Olive (*Olea europaea*), carob (*Ceratonia siliqua*) and mastic (*Pistacia lentiscus*) forest or bush with a closed tree canopy in the drought-prone lowlands and foothills of the Mediterranean and Macaronesia.



### Corresponding alliances in EuroVegChecklist 2016

- <> QUI-04L Ceratonio-Pistacion lentisci Zohary et Orshan 1959
- <> OLE-01A Mayteno canariensis-Juniperion canariensis Santos et F. Galván ex Santos 1983 corr. Rivas-Mart. et al. 1993
- > OLE-01C Oleo maderensis-Maytenion umbellatae Capelo et al. 2000
- <> QUI-04H Oleo-Ceratonion siliquae Br.-Bl. ex Guinochet et Drouineau 1944
- > OLE-01B Retamion rhodorhizoidis Del Arco et al. 2009

### Characteristic species combination

Diagnostic species (phi coefficient \* 100)

<i>Pistacia lentiscus</i>	38
<i>Olea europaea</i>	28
<i>Ceratonia siliqua</i>	25
<i>Prasium majus</i>	19
<i>Smilax aspera</i>	18
<i>Arisarum vulgare</i>	16
<i>Asparagus acutifolius</i>	15

Constant species (percentage frequencies)

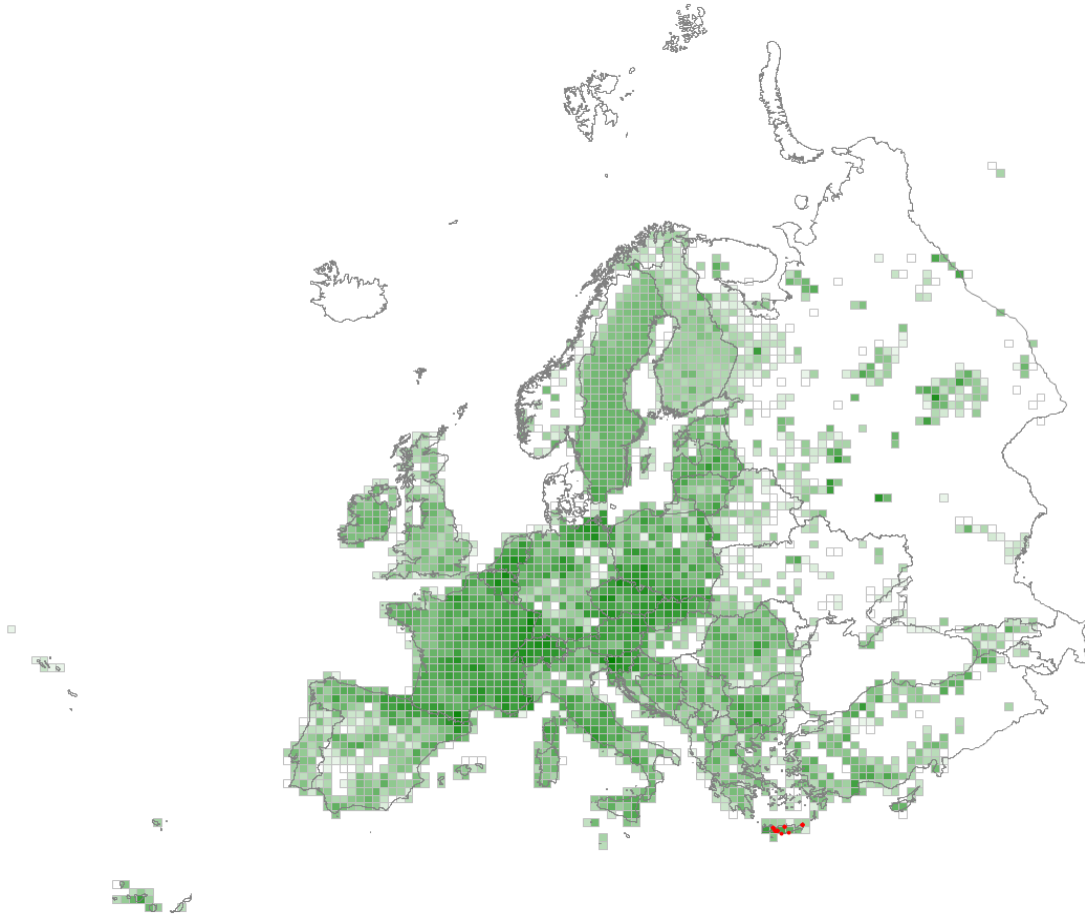
<i>Pistacia lentiscus</i>	97
<i>Smilax aspera</i>	46
<i>Olea europaea</i>	43
<i>Rubia peregrina</i>	40
<i>Asparagus acutifolius</i>	40
<i>Brachypodium retusum</i>	39
<i>Prasium majus</i>	28
<i>Arisarum vulgare</i>	27
<i>Ceratonia siliqua</i>	23
<i>Rhamnus alaternus</i>	22
<i>Juniperus phoenicea</i>	22
<i>Myrtus communis</i>	21
<i>Phillyrea latifolia</i>	20
<i>Lonicera implexa</i>	20
<i>Pinus halepensis</i>	18
<i>Phillyrea angustifolia</i>	17
<i>Dactylis glomerata</i>	17
<i>Calicotome villosa</i>	17
<i>Cistus monspeliensis</i>	16
<i>Drimia maritima</i> aggr.	15
<i>Quercus ilex</i>	14
<i>Quercus coccifera</i>	14
<i>Piptatherum miliaceum</i>	14
<i>Clematis flammula</i>	14
<i>Thymbra capitata</i>	13
<i>Rhamnus lycioides</i>	13
<i>Rosmarinus officinalis</i>	12
<i>Sonchus bulbosus</i>	11
<i>Cistus salviifolius</i>	11
<i>Asparagus aphyllus</i>	11

Dominant species (percentage frequencies of occurrences with cover > 25%)

<i>Pistacia lentiscus</i>	93
<i>Ceratonia siliqua</i>	10
<i>Brachypodium retusum</i>	6
<i>Smilax aspera</i>	5

## T25 – *Phoenix theophrasti* vegetation

Sparse groves with the palm tree *Phoenix theophrasti*, found on the island of Crete and in south-western Anatolia. The habitat may be riparian (with the palm forming temporarily inundated gallery forest along permanent fresh or brackish waters) or related to seasonally or episodically flooded valleys.



### Corresponding alliances in EuroVegChecklist 2016

<> NER-01F Rubo sancti-Nerion oleandri Brullo et al. 2004

### Characteristic species combination

Diagnostic species (phi coefficient \* 100)

<i>Phoenix theophrasti</i>	100
<i>Juncus heldreichianus</i>	56
<i>Ballota pseudodictamnus</i>	44
<i>Oxalis pes-caprae</i>	42
<i>Centaurea redempta</i>	38
<i>Nerium oleander</i>	37
<i>Malva unguiculata</i>	29
<i>Anthemis chia</i>	29
<i>Capparis spinosa</i>	28
<i>Arisarum vulgare</i>	27
<i>Petromarula pinnata</i>	27
<i>Arum concinatum</i>	26
<i>Asparagus aphyllus</i>	26

<i>Malcolmia flexuosa</i>	26
<i>Arum creticum</i>	26
<i>Vitex agnus-castus</i>	26
<i>Tordylium apulum</i>	25
<i>Parietaria cretica</i>	25
<i>Brassica cretica</i>	24
<i>Urtica pilulifera</i>	24
<i>Theligonum cynocrambe</i>	23
<i>Anogramma leptophylla</i>	23
<i>Phlomis lanata</i>	23
<i>Orlaya daucoides</i>	23
<i>Silene sedoides</i>	22
<i>Geranium purpureum</i>	22
<i>Ceratonia siliqua</i>	22
<i>Cichorium spinosum</i>	22
<i>Salvia fruticosa</i>	21
<i>Asphodeline lutea</i>	21
<i>Stachys spinulosa</i>	21
<i>Eucalyptus camaldulensis</i>	21
<i>Securigera securidaca</i>	20
<i>Urospermum picroides</i>	20
<i>Piptatherum miliaceum</i>	19
<i>Carex hispida</i>	19
<i>Ficus carica</i>	19
<i>Dracunculus vulgaris</i>	19
<i>Alcea biennis</i>	19
<i>Cirsium creticum</i>	18
<i>Aristolochia cretica</i>	18
<i>Cynosurus effusus</i>	17
<i>Lotus preslii</i>	17
<i>Leontodon tuberosus</i>	16
<i>Notobasis syriaca</i>	16
<i>Rubus sanctus</i>	15
<i>Pistacia lentiscus</i>	15

Constant species (percentage frequencies)

<i>Phoenix theophrasti</i>	100
<i>Arisarum vulgare</i>	45
<i>Pistacia lentiscus</i>	40
<i>Oxalis pes-caprae</i>	40
<i>Nerium oleander</i>	40
<i>Juncus heldreichianus</i>	40
<i>Geranium purpureum</i>	35
<i>Smilax aspera</i>	30
<i>Piptatherum miliaceum</i>	30
<i>Ballota pseudodictamnus</i>	30
<i>Asparagus aphyllus</i>	30
<i>Tordylium apulum</i>	25
<i>Schoenus nigricans</i>	25
<i>Anagallis arvensis</i>	25
<i>Vitex agnus-castus</i>	20
<i>Urospermum picroides</i>	20
<i>Trifolium campestre</i>	20
<i>Theligonum cynocrambe</i>	20
<i>Sonchus bulbosus</i>	20
<i>Scirpoides holoschoenus</i>	20
<i>Reichardia picroides</i>	20
<i>Myrtus communis</i>	20
<i>Leontodon tuberosus</i>	20

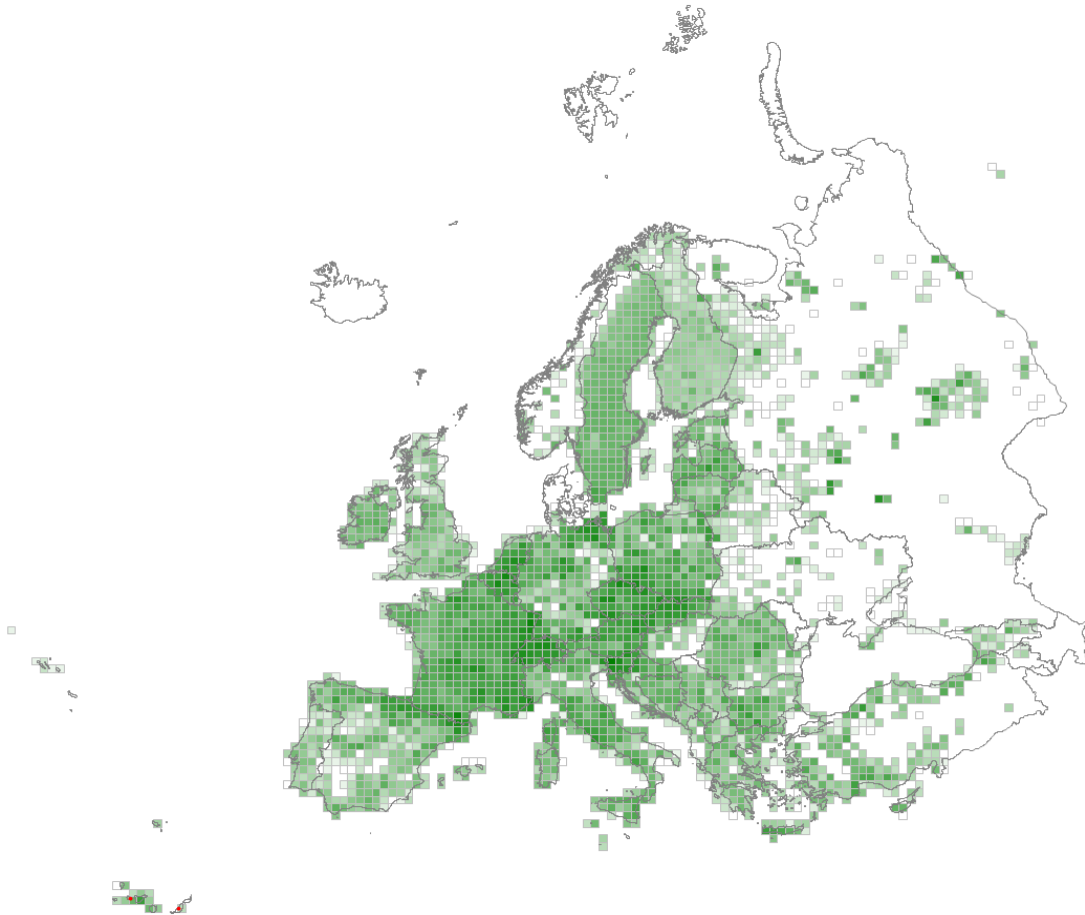
<i>Ficus carica</i>	20
<i>Dioscorea communis</i>	20
<i>Ceratonia siliqua</i>	20
<i>Anthemis chia</i>	20
<i>Trifolium stellatum</i>	15
<i>Spartium junceum</i>	15
<i>Silene sedoides</i>	15
<i>Sarcopoterium spinosum</i>	15
<i>Samolus valerandi</i>	15
<i>Salvia fruticosa</i>	15
<i>Prasium majus</i>	15
<i>Phlomis lanata</i>	15
<i>Petromarula pinnata</i>	15
<i>Parietaria cretica</i>	15
<i>Orlaya daucoides</i>	15
<i>Malcolmia flexuosa</i>	15
<i>Leopoldia comosa</i>	15
<i>Galium aparine</i>	15
<i>Euphorbia dendroides</i>	15
<i>Drimia maritima aggr.</i>	15
<i>Cynodon dactylon</i>	15
<i>Centaurea redempta</i>	15
<i>Capparis spinosa</i>	15
<i>Bituminaria bituminosa</i>	15
<i>Asphodeline lutea</i>	15
<i>Asparagus acutifolius</i>	15

Dominant species (percentage frequencies of occurrences with cover > 25%)

<i>Phoenix theophrasti</i>	100
<i>Nerium oleander</i>	20
<i>Pistacia lentiscus</i>	5
<i>Juncus heldreichianus</i>	5
<i>Eucalyptus camaldulensis</i>	5

## T26 – *Phoenix canariensis* vegetation

Sparse *Phoenix canariensis* groves (palmares) of colluvial deposits, mostly on flat mid-slope sites or at the base of irregular temporary streams. Endemic to the Canary Islands, they are dependent on brief, temporary water-tables present in sporadic torrential flows during the winter. Thus, they are azonal vegetation in the dry to arid infra- and thermomediterranean belts.



### Corresponding alliances in EuroVegChecklist 2016

- > OLE-01D *Phoenicion canariensis* Rivas-Mart. et Del Arco in Rivas-Mart. et al. 2011

### Characteristic species combination

Diagnostic species (phi coefficient \* 100)

<i>Phoenix canariensis</i>	97
<i>Sideritis cretica</i>	82
<i>Descurainia millefolia</i>	80
<i>Vicia cirrhosa</i>	79
<i>Echium aculeatum</i>	77
<i>Euphorbia berthelotii</i>	74
<i>Periploca angustifolia</i>	56
<i>Micromeria varia</i>	54
<i>Pallenis spinosa</i>	52
<i>Phagnalon saxatile</i>	52
<i>Dittrichia viscosa</i>	51
<i>Ricinus communis</i>	48



<i>Nicotiana glauca</i>	45
<i>Cistus monspeliensis</i>	35
<i>Hyparrhenia hirta</i>	34
<i>Lycium intricatum</i>	31
<i>Bituminaria bituminosa</i>	31
<i>Euphorbia regis-jubae</i>	26
<i>Launaea arborescens</i>	26

Constant species (percentage frequencies)

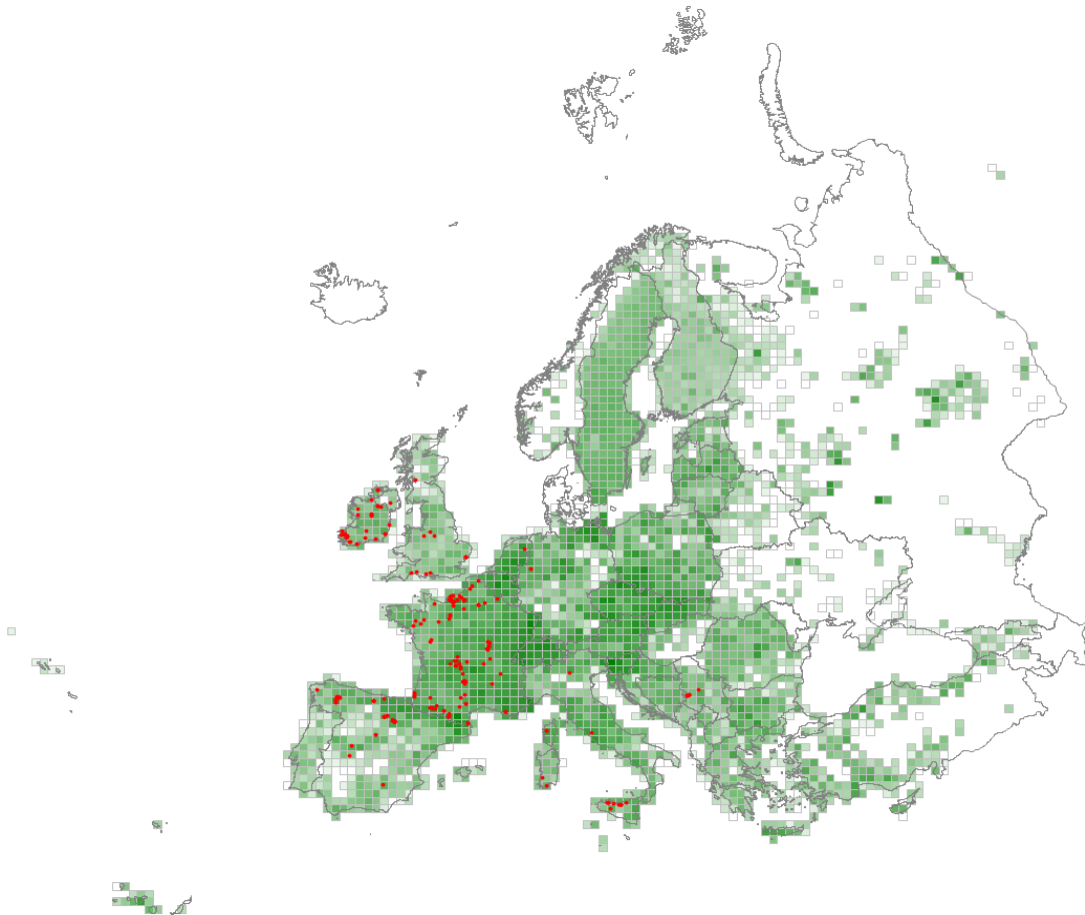
<i>Phoenix canariensis</i>	100
<i>Dittrichia viscosa</i>	100
<i>Vicia cirrhosa</i>	67
<i>Sideritis cretica</i>	67
<i>Phagnalon saxatile</i>	67
<i>Periploca angustifolia</i>	67
<i>Pallenis spinosa</i>	67
<i>Micromeria varia</i>	67
<i>Hyparrhenia hirta</i>	67
<i>Euphorbia berthelotii</i>	67
<i>Echium aculeatum</i>	67
<i>Descurainia millefolia</i>	67
<i>Cistus monspeliensis</i>	67
<i>Bituminaria bituminosa</i>	67
<i>Ricinus communis</i>	33
<i>Nicotiana glauca</i>	33
<i>Lycium intricatum</i>	33
<i>Launaea arborescens</i>	33
<i>Euphorbia regis-jubae</i>	33

Dominant species (percentage frequencies of occurrences with cover > 25%)

<i>Phoenix canariensis</i>	100
<i>Dittrichia viscosa</i>	33

## T27 – *Ilex aquifolium* forest

Patches of holly (*Ilex aquifolium*) occurring in scattered localities across European forests, especially in the temperate zone and in the Mediterranean mountains.



### Corresponding alliances in EuroVegChecklist 2016

- <> FAG-03A Carpinion betuli Issler 1931
- <> FAG-02B Fagion sylvaticae Luquet 1926
- <> QUI-01D Fraxino ornī-Quercion ilicis Biondi, Casavecchia et Gigante in Biondi et al. 2013
- <> FAG-01A Luzulo-Fagion sylvaticae Lohmeyer et Tx. in Tx. 1954
- <> FAG-03B Pulmonario longifoliae-Quercion roboris Rivas-Mart. et Izco in Rivas-Mart. et al. 2002
- <> QUE-01B Quercion roboris Malcuit 1929

### Characteristic species combination

Diagnostic species (phi coefficient \* 100)

<i>Ilex aquifolium</i>	46
<i>Isothecium myosuroides</i>	23
<i>Lonicera periclymenum</i>	18
<i>Quercus petraea</i>	16

Constant species (percentage frequencies)

<i>Ilex aquifolium</i>	100
<i>Hedera helix</i> aggr.	55

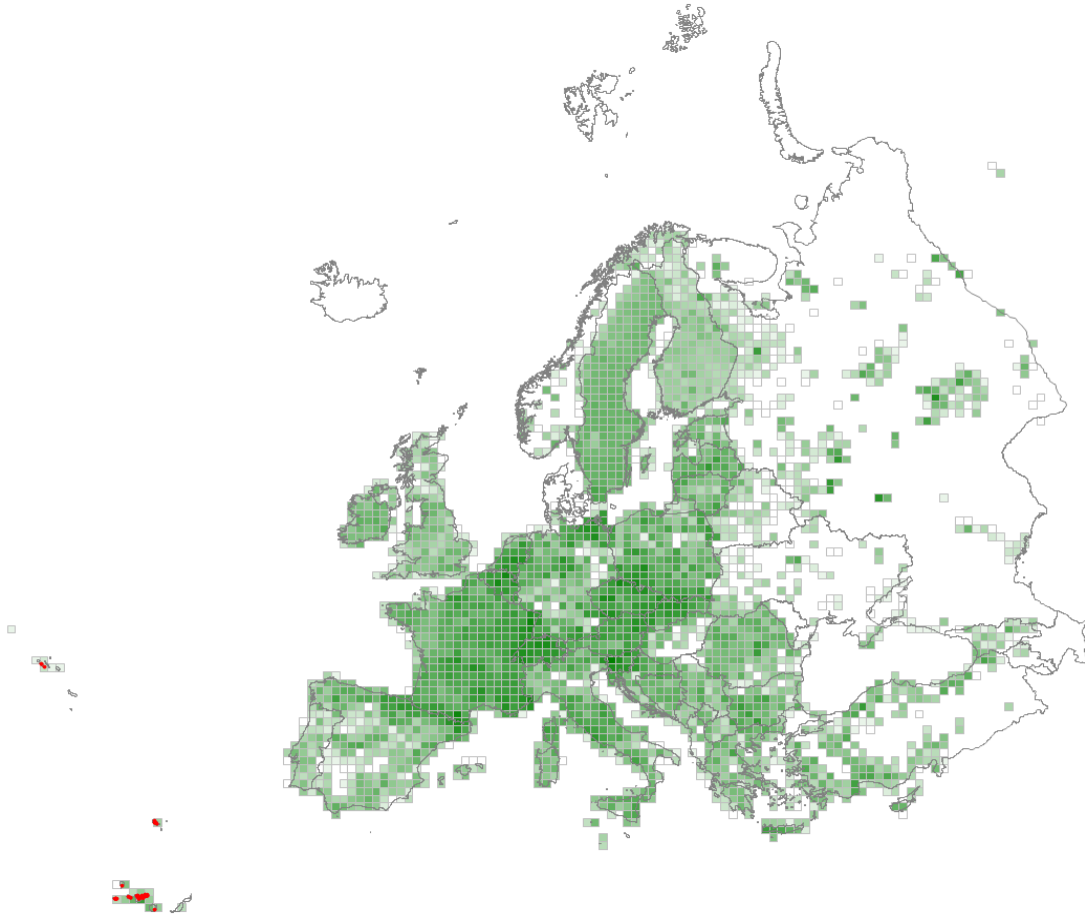
<i>Pteridium aquilinum</i>	51
<i>Fagus sylvatica</i>	49
<i>Lonicera periclymenum</i>	42
<i>Rubus fruticosus</i> aggr.	40
<i>Quercus petraea</i>	32
<i>Corylus avellana</i>	32
<i>Crataegus monogyna</i>	28
<i>Quercus robur</i>	27
<i>Sorbus aucuparia</i>	24
<i>Polytrichastrum formosum</i>	24
<i>Thuidium tamariscinum</i>	23
<i>Vaccinium myrtillus</i>	21
<i>Avenella flexuosa</i>	21
<i>Dryopteris dilatata</i>	19
<i>Betula pubescens</i>	19
<i>Hypnum cupressiforme</i> aggr.	18
<i>Oxalis acetosella</i>	17
<i>Fraxinus excelsior</i>	17
<i>Rubus ulmifolius</i>	15
<i>Mnium hornum</i>	15
<i>Isoetes macrospora</i>	15
<i>Geranium robertianum</i>	15
<i>Dicranum scoparium</i>	15
<i>Castanea sativa</i>	15
<i>Blechnum spicant</i>	15
<i>Teucrium scorodonia</i>	14
<i>Sanicula europaea</i>	14
<i>Ruscus aculeatus</i>	13
<i>Frangula alnus</i>	13
<i>Betula pendula</i>	13
<i>Kindbergia praelonga</i>	12
<i>Dryopteris filix-mas</i>	12
<i>Dioscorea communis</i>	12
<i>Rosa canina</i> aggr.	11
<i>Prunus spinosa</i>	11
<i>Luzula sylvatica</i>	11
<i>Eurhynchium striatum</i>	11
<i>Brachypodium sylvaticum</i>	11

Dominant species (percentage frequencies of occurrences with cover > 25%)

<i>Ilex aquifolium</i>	100
<i>Quercus petraea</i>	15
<i>Fagus sylvatica</i>	15
<i>Quercus robur</i>	11
<i>Hedera helix</i> aggr.	11
<i>Pteridium aquilinum</i>	7

## T28 – Macaronesian heathy forest

Small-stature woodland (high matorral) variously dominated by arborescent ericoids, strawberry tree (*Arbutus canariensis*) and Canary holly (*Ilex canariensis*) in situations that range from cold and hyper-humid slopes and exposed fog-bound outcrops to sub-humid and dry foothills of Madeira and the Canary Islands.



### Corresponding alliances in EuroVegChecklist 2016

- > LAU-01E Euphorbion melliferae Capelo et al. 2003
- <> AZO-01A Juniperion brevifoliae Sjögren 1973
- <> LAU-01A Myrico fayae-Ericion arborea Oberd. 1965
- <> LAU-01B Polysticho falcinelli-Ericion arborea Rivas-Mart. et al. 2002

### Characteristic species combination

Diagnostic species (phi coefficient \* 100)

<i>Morella faya</i>	56
<i>Ilex canariensis</i>	42
<i>Arbutus canariensis</i>	41
<i>Galium scabrum</i>	37
<i>Erica arborea</i>	36
<i>Habenaria tridactylites</i>	35
<i>Dryopteris oligodonta</i>	31
<i>Laurus novocanariensis</i>	28
<i>Vaccinium padifolium</i>	26
<i>Luzula canariensis</i>	26

<i>Urtica morifolia</i>	25
<i>Smilax canariensis</i>	23
<i>Gennaria diphylla</i>	23
<i>Heberdenia excelsa</i>	22
<i>Aichryson punctatum</i>	21
<i>Visnea mocanera</i>	21
<i>Ranunculus minor</i>	21
<i>Gaudinia coarctata</i>	21
<i>Pericallis tussilaginis</i>	20
<i>Lathyrus odoratus</i>	20
<i>Erica scoparia</i>	20
<i>Aeonium ciliatum</i>	19
<i>Hypericum canariense</i>	19
<i>Viburnum tinus</i>	19
<i>Hypericum grandifolium</i>	19
<i>Pericallis murrayi</i>	19
<i>Ilex perado</i>	18
<i>Ixanthus viscosus</i>	18
<i>Davallia canariensis</i>	18
<i>Cistus symphytifolius</i>	18
<i>Cistus chinamadensis</i>	17
<i>Asplenium adiantum-nigrum</i>	15

Constant species (percentage frequencies)

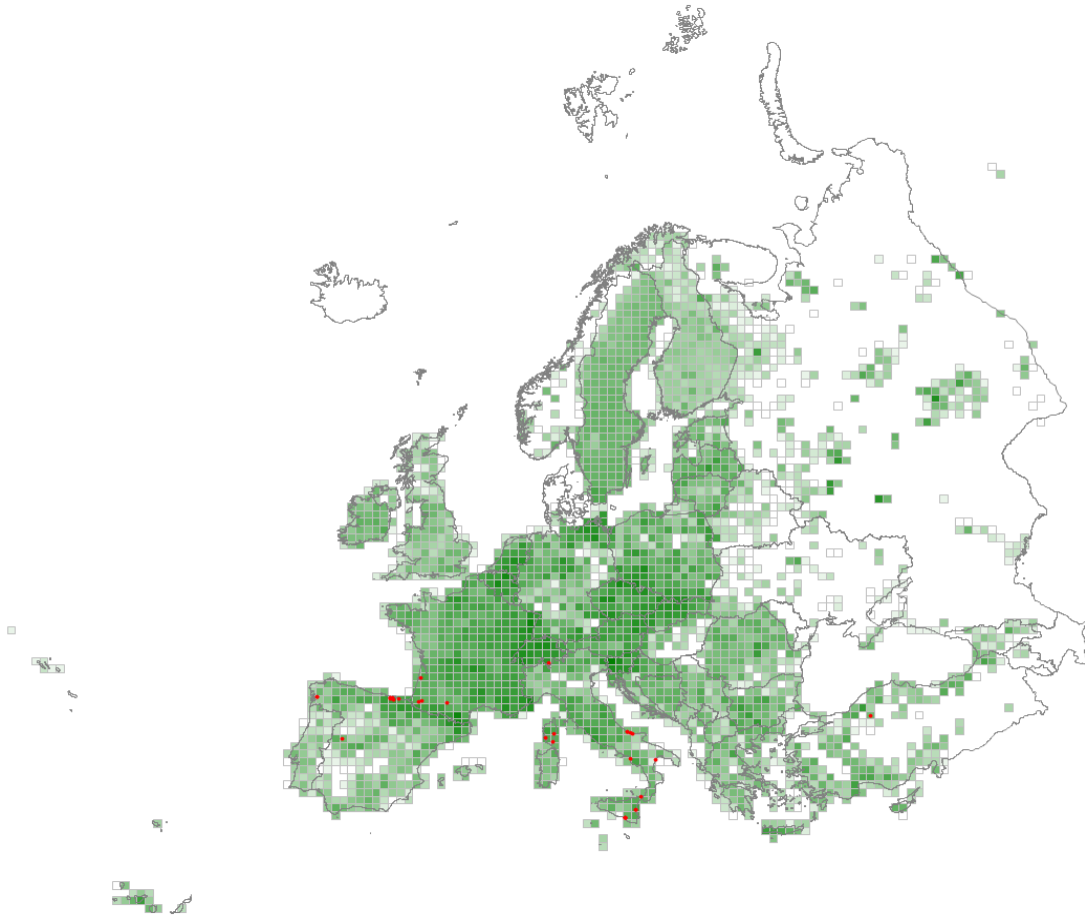
<i>Erica arborea</i>	86
<i>Morella faya</i>	73
<i>Ilex canariensis</i>	41
<i>Pteridium aquilinum</i>	36
<i>Galium scabrum</i>	36
<i>Erica scoparia</i>	32
<i>Viburnum tinus</i>	27
<i>Dryopteris oligodonta</i>	27
<i>Asplenium adiantum-nigrum</i>	27
<i>Davallia canariensis</i>	23
<i>Arbutus canariensis</i>	23
<i>Pinus canariensis</i>	18
<i>Laurus novocanariensis</i>	18
<i>Hypericum grandifolium</i>	18
<i>Habenaria tridactylites</i>	18
<i>Cistus symphytifolius</i>	18
<i>Urtica morifolia</i>	14
<i>Rubus ulmifolius</i>	14
<i>Phyllis nobla</i>	14
<i>Micromeria hyssopifolia</i>	14
<i>Laurus azorica</i>	14
<i>Ilex perado</i>	14
<i>Hypericum canariense</i>	14
<i>Daphne gnidium</i>	14
<i>Brachypodium sylvaticum</i>	14

Dominant species (percentage frequencies of occurrences with cover > 25%)

<i>Erica arborea</i>	64
<i>Erica scoparia</i>	27
<i>Cistus symphytifolius</i>	14
<i>Morella faya</i>	9
<i>Arbutus canariensis</i>	9

## T29 – Broadleaved evergreen plantation of non site-native trees

Cultivated evergreen broad-leaved tree formations planted for the production of wood, composed of exotic species, of native species out of their natural range, or of native species planted in clearly unnatural stands, often as monocultures.



### Characteristic species combination

Diagnostic species (phi coefficient \* 100)

<i>Acacia saligna</i>	44
<i>Eucalyptus globulus</i>	38
<i>Acacia melanoxylon</i>	29
<i>Pinus radiata</i>	27
<i>Pseudarrhenatherum longifolium</i>	27
<i>Eucalyptus camaldulensis</i>	26
<i>Astragalus solandri</i>	20
<i>Astragalus lagopoides</i>	20
<i>Astracantha diphtherites</i>	20
<i>Trachycarpus fortunei</i>	20
<i>Hypericum lysimachioides</i>	20
<i>Conringia persica</i>	20
<i>Acacia karroo</i>	20
<i>Astragalus oreades</i>	19
<i>Centaurea sphaerocephala</i>	18
<i>Acacia dealbata</i>	18
<i>Pinus pinaster</i>	16
<i>Centaurea debeauxii</i>	16
<i>Lonicera japonica</i>	16

<i>Cytisus cantabricus</i>	16
<i>Alcea acaulis</i>	16
<i>Agrostemma gracile</i>	15
<i>Retama monosperma</i>	15
<i>Ambrosia maritima</i>	15

Constant species (percentage frequencies)

<i>Rubus ulmifolius</i>	42
<i>Pteridium aquilinum</i>	42
<i>Acacia saligna</i>	29
<i>Smilax aspera</i>	25
<i>Rubia peregrina</i>	25
<i>Pinus pinaster</i>	25
<i>Hedera helix</i> aggr.	25
<i>Quercus robur</i>	21
<i>Eucalyptus globulus</i>	21
<i>Teucrium scorodonia</i>	17
<i>Pseudarrhenatherum longifolium</i>	17
<i>Piptatherum miliaceum</i>	17
<i>Holcus lanatus</i>	17
<i>Erica arborea</i>	17
<i>Dactylis glomerata</i>	17
<i>Calluna vulgaris</i>	17
<i>Asparagus acutifolius</i>	17
<i>Arbutus unedo</i>	17
<i>Viola riviniana</i>	12
<i>Ulex europaeus</i>	12
<i>Rubus fruticosus</i> aggr.	12
<i>Robinia pseudoacacia</i>	12
<i>Phillyrea angustifolia</i>	12
<i>Eupatorium cannabinum</i>	12
<i>Eucalyptus camaldulensis</i>	12
<i>Dioscorea communis</i>	12
<i>Castanea sativa</i>	12
<i>Carex flacca</i>	12
<i>Brachypodium sylvaticum</i>	12
<i>Anthoxanthum odoratum</i> aggr.	12

Dominant species (percentage frequencies of occurrences with cover > 25%)

<i>Acacia saligna</i>	25
<i>Rubus ulmifolius</i>	21
<i>Pteridium aquilinum</i>	17
<i>Eucalyptus globulus</i>	17
<i>Eucalyptus camaldulensis</i>	8
<i>Centaurea sphaerocephala</i>	8
<i>Acacia melanoxylon</i>	8

## **T2A – Broadleaved evergreen plantation of site-native trees**

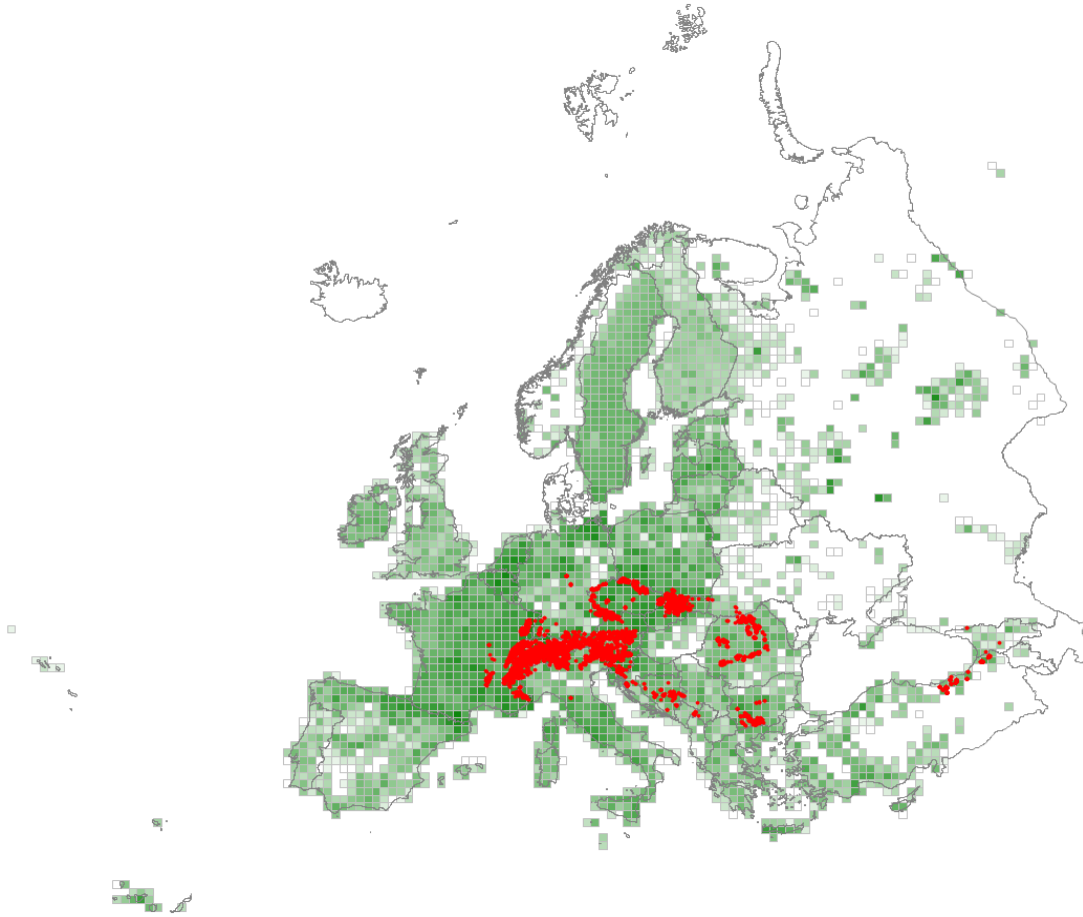
[This habitat could not be formally defined in the expert system, because plantations of site-native trees cannot be distinguished from natural forests based on the vegetation-plot data.]

Cultivated stands of broadleaved evergreen trees planted for the production of wood, composed of site-native broadleaved evergreen tree species.



## T31 – Temperate mountain *Picea* forest

Evergreen coniferous forest dominated by spruce, including *Picea abies* in most temperate European mountain systems, relict *Picea omorika* in a restricted area in the Dinaric Mountains, and *Picea orientalis* in the Caucasus. Fir (*Abies alba*, *Abies nordmanniana*) can be admixed on acidic, even very oligotrophic, wet, cold or rocky soils in the montane and subalpine belts of the temperate mountain ranges of Europe.



### Corresponding alliances in EuroVegChecklist 2016

- <> PIC-06B Abieti-Piceion (Br.-Bl. in Br.-Bl. et al. 1939) Soó 1964
- <> PIC-02A Aconito rubicundi-Abietion sibiricae Anenkhonov et Chytrý 1998
- <> ASA-01A Aconito septentrionalis-Piceion obovatae Solomeshch, Grigoriev, Khaziakhmetov et Baisheva in Martynenko et al. 2008
- > ERI-01D Erico carnea-Piceion omorikae Mucina et Čarni in Mucina et al. 2016
- <> PIC-06A Chrysanthemo rotundifolii-Piceion (Krajina 1933) Březina et Hadač in Hadač 1962
- <> PIC-01A Piceion excelsae Pawłowski et al. 1928

### Characteristic species combination

Diagnostic species (phi coefficient \* 100)

<i>Picea abies</i>	28
<i>Oxalis acetosella</i>	22
<i>Prenanthes purpurea</i>	22
<i>Abies alba</i>	20

<i>Lonicera nigra</i>	19
<i>Hieracium murorum</i>	19
<i>Melampyrum sylvaticum</i>	19
<i>Veronica urticifolia</i>	19
<i>Luzula luzulina</i>	18
<i>Luzula sylvatica</i>	18
<i>Sorbus aucuparia</i>	18
<i>Polygonatum verticillatum</i>	18
<i>Homogyne alpina</i>	17
<i>Calamagrostis villosa</i>	16
<i>Vaccinium myrtillus</i>	16
<i>Polytrichastrum formosum</i>	15

Constant species (percentage frequencies)

<i>Picea abies</i>	99
<i>Vaccinium myrtillus</i>	71
<i>Oxalis acetosella</i>	67
<i>Sorbus aucuparia</i>	65
<i>Hieracium murorum</i>	48
<i>Dicranum scoparium</i>	45
<i>Fagus sylvatica</i>	42
<i>Abies alba</i>	42
<i>Avenella flexuosa</i>	39
<i>Athyrium filix-femina</i>	39
<i>Rubus idaeus</i>	36
<i>Prenanthes purpurea</i>	36
<i>Polytrichastrum formosum</i>	34
<i>Luzula sylvatica</i>	34
<i>Hylocomium splendens</i>	34
<i>Solidago virgaurea</i>	33
<i>Fragaria vesca</i>	33
<i>Homogyne alpina</i>	32
<i>Dryopteris dilatata</i>	32
<i>Dryopteris filix-mas</i>	31
<i>Acer pseudoplatanus</i>	31
<i>Maianthemum bifolium</i>	30
<i>Senecio nemorensis</i> aggr.	27
<i>Vaccinium vitis-idaea</i>	26
<i>Rhytidiadelphus triquetrus</i>	26
<i>Melampyrum sylvaticum</i>	26
<i>Polygonatum verticillatum</i>	24
<i>Luzula luzuloides</i>	23
<i>Calamagrostis villosa</i>	23
<i>Lactuca muralis</i>	22
<i>Gymnocarpium dryopteris</i>	21
<i>Veronica urticifolia</i>	20
<i>Pleurozium schreberi</i>	20
<i>Viola reichenbachiana</i>	19
<i>Lonicera nigra</i>	19
<i>Lamium galeobdolon</i>	19
<i>Veronica officinalis</i>	18
<i>Rubus fruticosus</i> aggr.	18
<i>Phyteuma spicatum</i>	17
<i>Larix decidua</i>	17
<i>Corylus avellana</i>	17
<i>Valeriana tripteris</i>	16
<i>Daphne mezereum</i>	16
<i>Ajuga reptans</i>	16
<i>Paris quadrifolia</i>	15

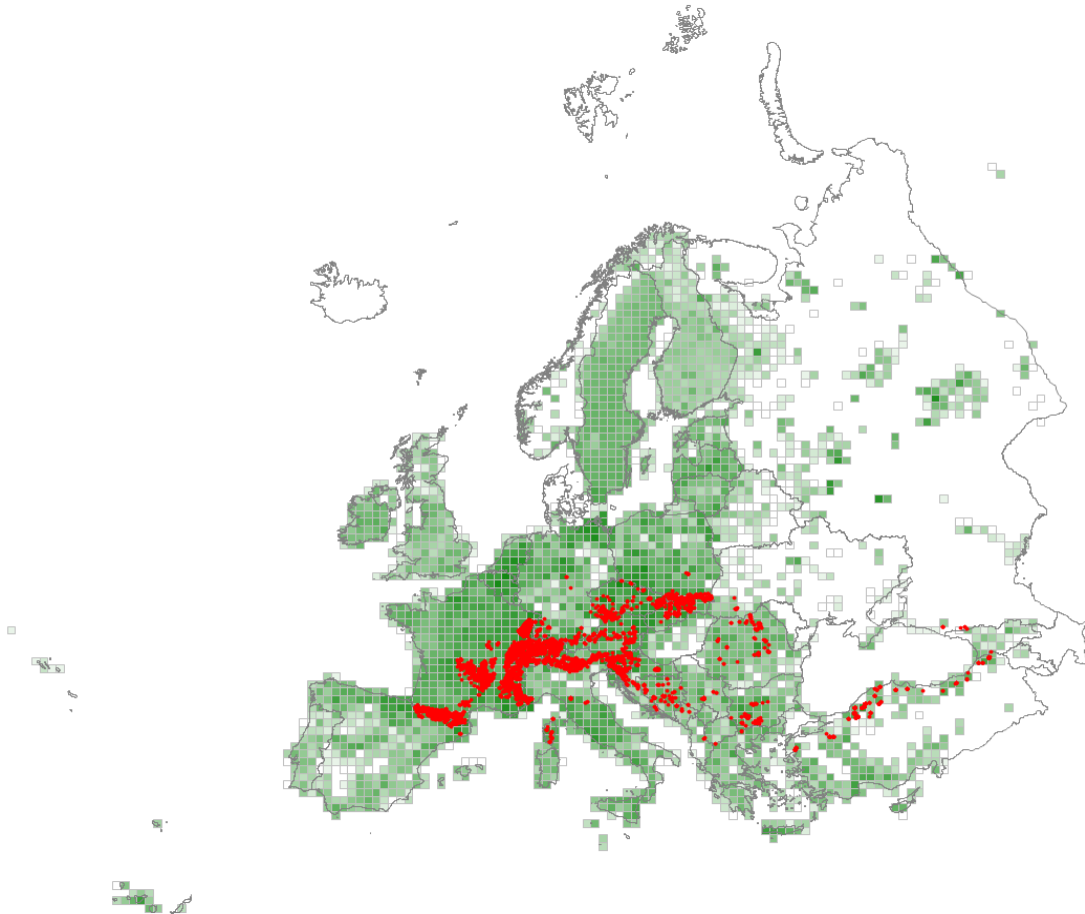
<i>Gentiana asclepiadea</i>	15
<i>Epilobium montanum</i>	15
<i>Calamagrostis arundinacea</i>	15
<i>Rosa pendulina</i>	14
<i>Galium odoratum</i>	14
<i>Dryopteris carthusiana</i>	14
<i>Carex digitata</i>	14
<i>Viola biflora</i>	13
<i>Sorbus aria</i> aggr.	13
<i>Mercurialis perennis</i>	13
<i>Melica nutans</i>	13
<i>Luzula luzulina</i>	13
<i>Geranium robertianum</i>	13
<i>Carex sylvatica</i>	13
<i>Adenostyles alliariae</i>	13
<i>Sanicula europaea</i>	12
<i>Sambucus racemosa</i>	12
<i>Rubus saxatilis</i>	12
<i>Plagiochila asplenioides</i>	12
<i>Petasites albus</i>	12
<i>Lycopodium annotinum</i>	12
<i>Luzula pilosa</i>	12
<i>Lonicera xylosteum</i>	12
<i>Calamagrostis varia</i>	12
<i>Poa nemoralis</i>	11
<i>Orthilia secunda</i>	11
<i>Luzula nivea</i>	11
<i>Hypnum cupressiforme</i> aggr.	11
<i>Huperzia selago</i>	11
<i>Galium rotundifolium</i>	11
<i>Fraxinus excelsior</i>	11
<i>Ctenidium molluscum</i>	11

Dominant species (percentage frequencies of occurrences with cover > 25%)

<i>Picea abies</i>	99
<i>Vaccinium myrtillus</i>	18
<i>Oxalis acetosella</i>	7
<i>Hylocomium splendens</i>	7
<i>Calamagrostis villosa</i>	5

## T32 – Temperate mountain *Abies* forest

Forests of European silver fir (*Abies alba*) in temperate mountains, often with European beech (*Fagus sylvatica*), and Norway spruce (*Picea abies*) where site conditions are harsher at higher altitudes. In the southern Black Sea region and the Caucasus, the dominant species is Caucasian fir (*Abies nordmanniana*), often with an admixture of Oriental beech (*Fagus orientalis*) and Oriental spruce (*Picea orientalis*). At most sites, fir forests occur on acidic soils though extending on to more base-rich and mesotrophic soils where distinctive contingents of herbs augment or replace the usually heathy field layer.



### Corresponding alliances in EuroVegChecklist 2016

- <> PIC-06B Abieti-Piceion (Br.-Bl. in Br.-Bl. et al. 1939) Soó 1964
- <> PIC-02A Aconito rubicundi-Abietion sibiricae Anenkhonov et Chytrý 1998
- <> ASA-01A Aconito septentrionalis-Piceion obovatae Solomeshch, Grigoriev, Khaziakhmetov et Baisheva in Martynenko et al. 2008
- <> FAG-02A Aremonio-Fagion (Horvat 1950) Borhidi in Török et al. 1989
- > PIC-06C Calamagrostio-Abietion Horvat 1962 nom. invers. propos.
- <> FAG-06A Fagion orientalis Soó 1964
- <> FAG-02B Fagion sylvaticae Luquet 1926
- <> FAG-02C Geranio striati-Fagion Gentile 1970
- <> PIC-06A Chrysanthemo rotundifolii-Piceion (Krajina 1933) Březina et Hadač in Hadač 1962
- <> FAG-01A Luzulo-Fagion sylvaticae Lohmeyer et Tx. in Tx. 1954

## Characteristic species combination

### Diagnostic species (phi coefficient \* 100)

<i>Abies alba</i>	48
<i>Prenanthes purpurea</i>	30
<i>Lonicera nigra</i>	25
<i>Fagus sylvatica</i>	23
<i>Oxalis acetosella</i>	22
<i>Drymochloa sylvatica</i>	21
<i>Galium odoratum</i>	21
<i>Dryopteris filix-mas</i>	20
<i>Polygonatum verticillatum</i>	19
<i>Athyrium filix-femina</i>	18
<i>Veronica urticifolia</i>	17
<i>Senecio nemorensis</i> aggr.	17
<i>Picea abies</i>	17
<i>Luzula nivea</i>	17
<i>Hieracium murorum</i>	16
<i>Acer pseudoplatanus</i>	16
<i>Lamium galeobdolon</i>	16
<i>Sambucus racemosa</i>	16
<i>Hordelymus europaeus</i>	15
<i>Viola reichenbachiana</i>	15
<i>Sorbus aucuparia</i>	15

### Constant species (percentage frequencies)

<i>Abies alba</i>	98
<i>Fagus sylvatica</i>	75
<i>Oxalis acetosella</i>	67
<i>Picea abies</i>	62
<i>Sorbus aucuparia</i>	56
<i>Prenanthes purpurea</i>	48
<i>Dryopteris filix-mas</i>	48
<i>Athyrium filix-femina</i>	47
<i>Vaccinium myrtillus</i>	45
<i>Rubus idaeus</i>	43
<i>Rubus fruticosus</i> aggr.	43
<i>Hieracium murorum</i>	40
<i>Acer pseudoplatanus</i>	40
<i>Fragaria vesca</i>	38
<i>Galium odoratum</i>	36
<i>Viola reichenbachiana</i>	35
<i>Corylus avellana</i>	35
<i>Lamium galeobdolon</i>	32
<i>Senecio nemorensis</i> aggr.	31
<i>Polytrichastrum formosum</i>	31
<i>Lactuca muralis</i>	31
<i>Dicranum scoparium</i>	30
<i>Dryopteris dilatata</i>	29
<i>Geranium robertianum</i>	28
<i>Solidago virgaurea</i>	27
<i>Avenella flexuosa</i>	27
<i>Polygonatum verticillatum</i>	26
<i>Hylocomium splendens</i>	26
<i>Lonicera nigra</i>	25
<i>Carex sylvatica</i>	25
<i>Maianthemum bifolium</i>	24
<i>Epilobium montanum</i>	23
<i>Sorbus aria</i> aggr.	22

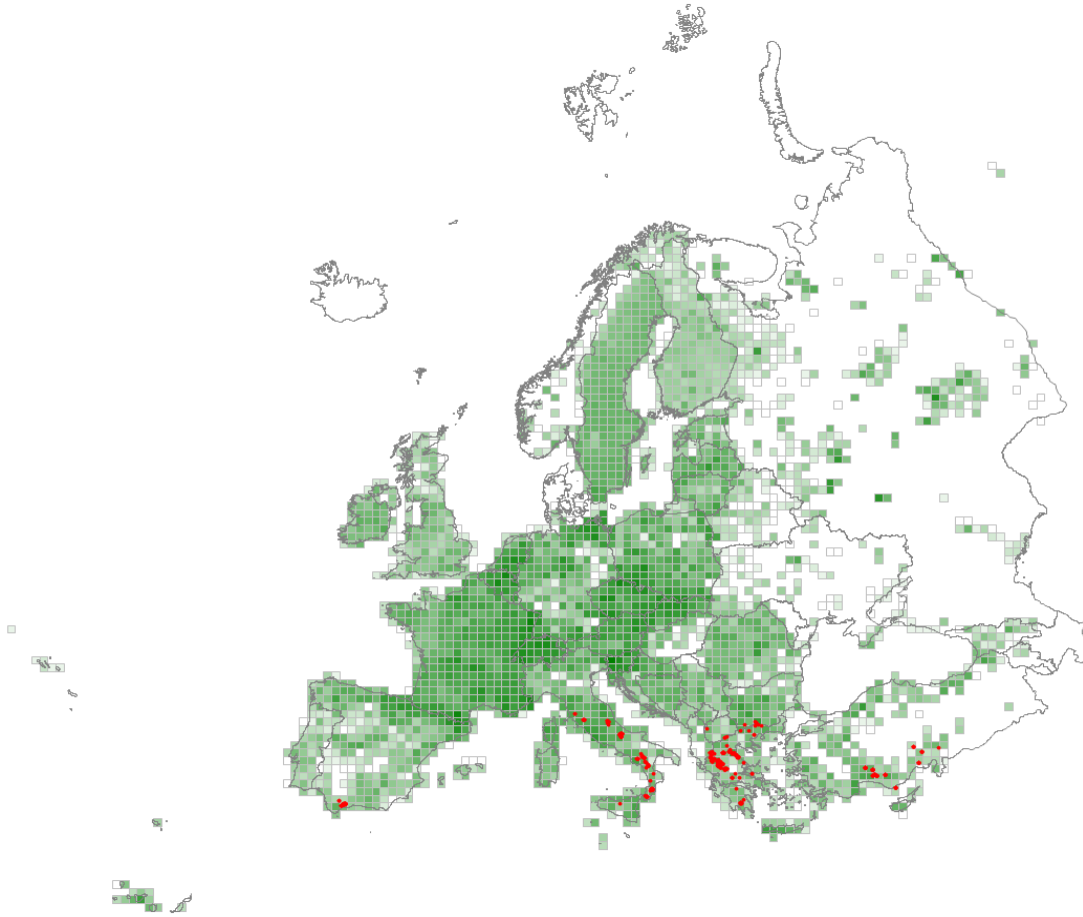
<i>Paris quadrifolia</i>	22
<i>Fraxinus excelsior</i>	22
<i>Mercurialis perennis</i>	21
<i>Sanicula europaea</i>	20
<i>Lonicera xylosteum</i>	20
<i>Dryopteris carthusiana</i>	20
<i>Ajuga reptans</i>	20
<i>Veronica officinalis</i>	19
<i>Luzula sylvatica</i>	19
<i>Carex digitata</i>	19
<i>Veronica urticifolia</i>	18
<i>Thuidium tamariscinum</i>	18
<i>Rhytidiadelphus triquetrus</i>	18
<i>Sambucus racemosa</i>	17
<i>Phyteuma spicatum</i>	17
<i>Luzula nivea</i>	17
<i>Galium rotundifolium</i>	17
<i>Drymochloa sylvatica</i>	17
<i>Hedera helix</i> aggr.	15
<i>Gymnocarpium dryopteris</i>	15
<i>Rosa pendulina</i>	14
<i>Luzula pilosa</i>	14
<i>Luzula luzuloides</i>	14
<i>Euphorbia amygdaloides</i>	14
<i>Actaea spicata</i>	14
<i>Plagiomnium undulatum</i>	13
<i>Ilex aquifolium</i>	13
<i>Eurhynchium striatum</i>	13
<i>Daphne mezereum</i>	13
<i>Atrichum undulatum</i>	13
<i>Hepatica nobilis</i>	12
<i>Rhytidiadelphus loreus</i>	11
<i>Pteridium aquilinum</i>	11
<i>Polystichum aculeatum</i>	11
<i>Pinus sylvestris</i>	11
<i>Petasites albus</i>	11
<i>Neottia nidus-avis</i>	11
<i>Melica nutans</i>	11
<i>Lathyrus vernus</i>	11
<i>Hypnum cupressiforme</i> aggr.	11
<i>Brachypodium sylvaticum</i>	11

Dominant species (percentage frequencies of occurrences with cover > 25%)

<i>Abies alba</i>	98
<i>Fagus sylvatica</i>	17
<i>Picea abies</i>	13
<i>Vaccinium myrtillus</i>	9
<i>Oxalis acetosella</i>	9
<i>Rubus fruticosus</i> aggr.	6
<i>Hylocomium splendens</i>	6

### T33 – Mediterranean mountain *Abies* forest

Evergreen coniferous forests of more sunless or fog-bound slopes and gullies in the lower to mid altitudinal belts of Mediterranean mountains where firs of very limited distribution dominate in highly distinctive relic stands: Spanish fir (*Abies pinsapo*), Greek fir (*Abies cephalonica*), King Boris fir (*Abies borisii-regis*), Apennine or Sicilian stands of silver fir (*Abies alba*) and Sicilian fir (*Abies nebrodensis*).



#### Corresponding alliances in EuroVegChecklist 2016

- > PUB-01S Abietion cephalonicae Horvat et al. 1974
- <> FAG-02C Geranio striati-Fagion Gentile 1970
- > PUB-01Q Paeonio broteroi-Abietion pinsapo (Rivas-Mart. 1987) Rivas-Mart. et al. 2002

#### Characteristic species combination

Diagnostic species (phi coefficient \* 100)

<i>Abies borisii-regis</i>	61
<i>Aremonia agrimonoides</i>	40
<i>Galium rotundifolium</i>	30
<i>Helleborus odorus</i>	28
<i>Abies pinsapo</i>	24
<i>Abies cephalonica</i>	23
<i>Clinopodium grandiflorum</i>	23
<i>Sanicula europaea</i>	23
<i>Geranium versicolor</i>	21

<i>Digitalis laevigata</i>	21
<i>Cardamine chelidonia</i>	20
<i>Lactuca muralis</i>	20
<i>Lathyrus laxiflorus</i>	20
<i>Ranunculus brutius</i>	19
<i>Campanula spatulata</i>	19
<i>Doronicum orientale</i>	18
<i>Trifolium pignanii</i>	18
<i>Juniperus drupacea</i>	18
<i>Drymochloa drymeja</i>	18
<i>Daphne laureola</i>	17
<i>Epipactis helleborine</i>	17
<i>Sedum cepaea</i>	17
<i>Hieracium bracteolatum</i>	17
<i>Acer cappadocicum</i> aggr.	17
<i>Trisetum laconicum</i>	15
<i>Trigonella pamphylica</i>	15
<i>Luzula forsteri</i>	15
<i>Epipactis leptochila</i>	15

Constant species (percentage frequencies)

<i>Aremonia agrimonoides</i>	52
<i>Abies borisii-regis</i>	49
<i>Lactuca muralis</i>	45
<i>Pteridium aquilinum</i>	44
<i>Fagus sylvatica</i>	44
<i>Brachypodium sylvaticum</i>	41
<i>Galium rotundifolium</i>	39
<i>Rubus fruticosus</i> aggr.	38
<i>Fragaria vesca</i>	38
<i>Sanicula europaea</i>	34
<i>Viola reichenbachiana</i>	33
<i>Veronica chamaedrys</i> aggr.	27
<i>Juniperus oxycedrus</i> aggr.	27
<i>Abies alba</i>	27
<i>Daphne laureola</i>	24
<i>Poa nemoralis</i>	23
<i>Hedera helix</i> aggr.	23
<i>Melica uniflora</i>	21
<i>Helleborus odoratus</i>	21
<i>Clinopodium vulgare</i>	21
<i>Ostrya carpinifolia</i>	20
<i>Luzula forsteri</i>	20
<i>Epipactis helleborine</i>	20
<i>Silene italica</i> aggr.	19
<i>Geranium robertianum</i>	19
<i>Galium odoratum</i>	19
<i>Euphorbia amygdaloides</i>	19
<i>Ilex aquifolium</i>	18
<i>Campanula spatulata</i>	18
<i>Dactylis glomerata</i>	17
<i>Pinus nigra</i>	15
<i>Geranium versicolor</i>	15
<i>Doronicum orientale</i>	15
<i>Cardamine bulbifera</i>	15
<i>Acer pseudoplatanus</i>	15
<i>Luzula sylvatica</i>	14
<i>Lapsana communis</i>	14
<i>Clinopodium grandiflorum</i>	14



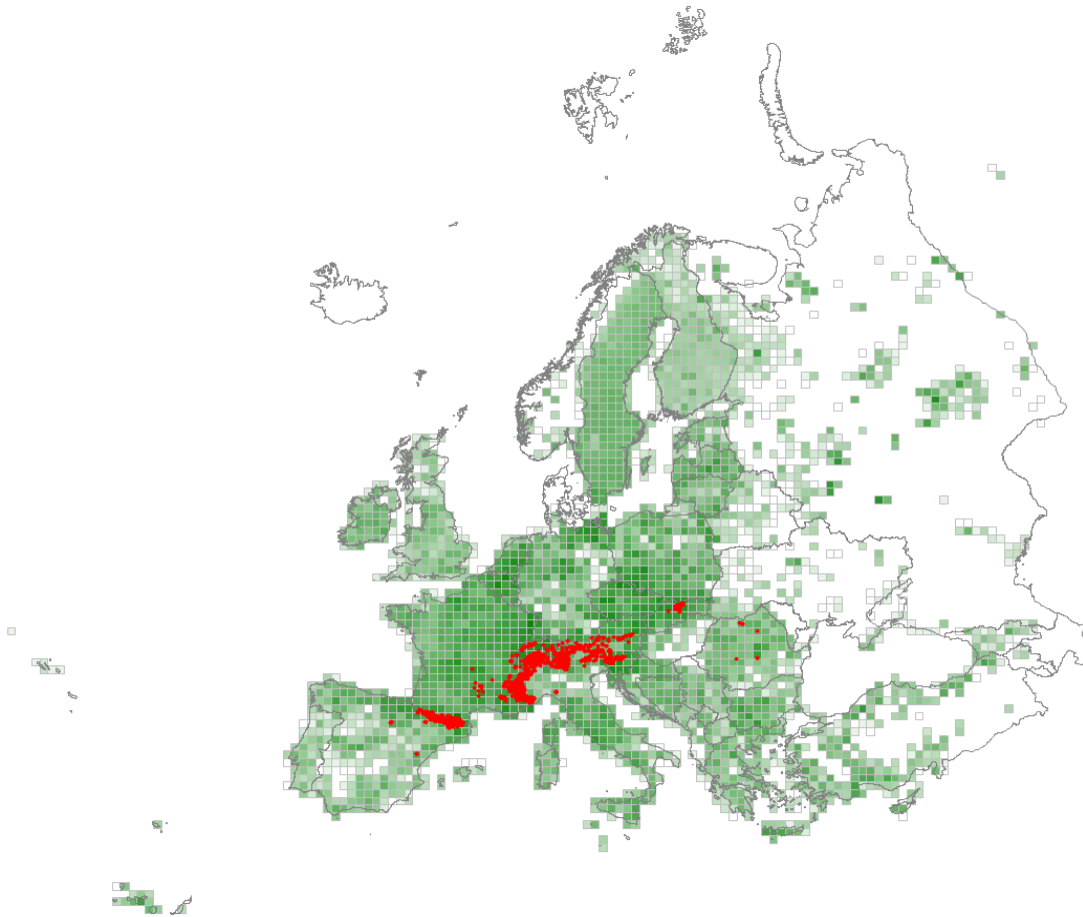
<i>Lathyrus laxiflorus</i>	13
<i>Cynosurus echinatus</i>	13
<i>Acer opalus</i> aggr.	13
<i>Viola alba</i>	12
<i>Sanguisorba minor</i> aggr.	12
<i>Ruscus aculeatus</i>	12
<i>Quercus coccifera</i>	12
<i>Myosotis sylvatica</i>	12
<i>Lathyrus venetus</i>	12
<i>Epilobium montanum</i>	12
<i>Drymochloa drymeja</i>	12
<i>Rosa canina</i> aggr.	11
<i>Potentilla micrantha</i>	11
<i>Neottia nidus-avis</i>	11
<i>Hieracium murorum</i>	11

Dominant species (percentage frequencies of occurrences with cover > 25%)

<i>Abies borisii-regis</i>	49
<i>Abies alba</i>	27
<i>Fagus sylvatica</i>	19
<i>Abies cilicica</i>	10
<i>Pteridium aquilinum</i>	7
<i>Abies cephalonica</i>	7
<i>Abies pinsapo</i>	6

## T34 – Temperate subalpine *Larix*, *Pinus cembra* and *Pinus uncinata* forest

Coniferous, in part deciduous, forest of European larch (*Larix decidua*) or Arolla pine (*Pinus cembra*) in the middle subalpine belt of temperate mountains in the central Alps and Carpathians with long but shallow snow-lie and a short growing season. Dwarf mountain pine (*Pinus mugo*), spruce (*Picea abies*), silver fir (*Abies alba*), rhododendrons and other sub-shrubs are never more than subordinate, but various whitebeam (*Sorbus*) species are characteristic associates.



### Corresponding alliances in EuroVegChecklist 2016

- <> ERI-01A Erico carnea-Pinion Br.-Bl. in Br.-Bl. et al. 1939 nom. invers. propos.
- <> PIC-01A Piceion excelsae Pawłowski et al. 1928
- > PIC-06D Seslerio caeruleae-Pinion uncinatae Vigo 1974

### Characteristic species combination

Diagnostic species (phi coefficient \* 100)

<i>Larix decidua</i>	48
<i>Pinus uncinata</i>	41
<i>Pinus cembra</i>	37
<i>Rhododendron ferrugineum</i>	34
<i>Homogyne alpina</i>	20
<i>Calamagrostis villosa</i>	19
<i>Festuca flavescens</i>	18
<i>Lonicera caerulea</i>	16

*Melampyrum sylvaticum* 15

Constant species (percentage frequencies)

<i>Vaccinium myrtillus</i>	65
<i>Larix decidua</i>	61
<i>Sorbus aucuparia</i>	46
<i>Picea abies</i>	44
<i>Avenella flexuosa</i>	44
<i>Rhododendron ferrugineum</i>	42
<i>Vaccinium vitis-idaea</i>	41
<i>Pinus uncinata</i>	39
<i>Homogyne alpina</i>	38
<i>Hieracium murorum</i>	31
<i>Dicranum scoparium</i>	31
<i>Oxalis acetosella</i>	30
<i>Hylocomium splendens</i>	29
<i>Juniperus communis</i> subsp. <i>nana</i>	28
<i>Solidago virgaurea</i>	27
<i>Juniperus communis</i> subsp. <i>communis</i>	26
<i>Calamagrostis villosa</i>	26
<i>Sesleria caerulea</i>	25
<i>Rhytiadelphus triquetrus</i>	25
<i>Pinus cembra</i>	25
<i>Luzula sylvatica</i>	24
<i>Rubus idaeus</i>	21
<i>Melampyrum sylvaticum</i>	21
<i>Pleurozium schreberi</i>	20
<i>Geranium sylvaticum</i> aggr.	20
<i>Rosa pendulina</i>	19
<i>Valeriana tripteris</i>	17
<i>Fragaria vesca</i>	17
<i>Hepatica nobilis</i>	16
<i>Anthoxanthum odoratum</i> aggr.	16
<i>Abies alba</i>	16
<i>Lotus corniculatus</i>	15
<i>Campanula scheuchzeri</i>	15
<i>Viola biflora</i>	14
<i>Vaccinium uliginosum</i>	14
<i>Polystichum lonchitis</i>	14
<i>Luzula nivea</i>	14
<i>Sorbus chamaemespilus</i>	13
<i>Sorbus aria</i> aggr.	13
<i>Prenanthes purpurea</i>	13
<i>Lonicera caerulea</i>	13
<i>Euphorbia cyparissias</i>	13
<i>Daphne mezereum</i>	13
<i>Carduus defloratus</i> aggr.	13
<i>Calluna vulgaris</i>	13
<i>Calamagrostis varia</i>	13
<i>Veratrum album</i>	12
<i>Valeriana montana</i>	12
<i>Rubus saxatilis</i>	12
<i>Potentilla erecta</i>	12
<i>Gymnocarpium dryopteris</i>	12
<i>Bellidiastrum michelii</i>	12
<i>Alnus viridis</i>	12
<i>Polytrichastrum formosum</i>	11
<i>Poa alpina</i>	11
<i>Festuca rubra</i> aggr.	11

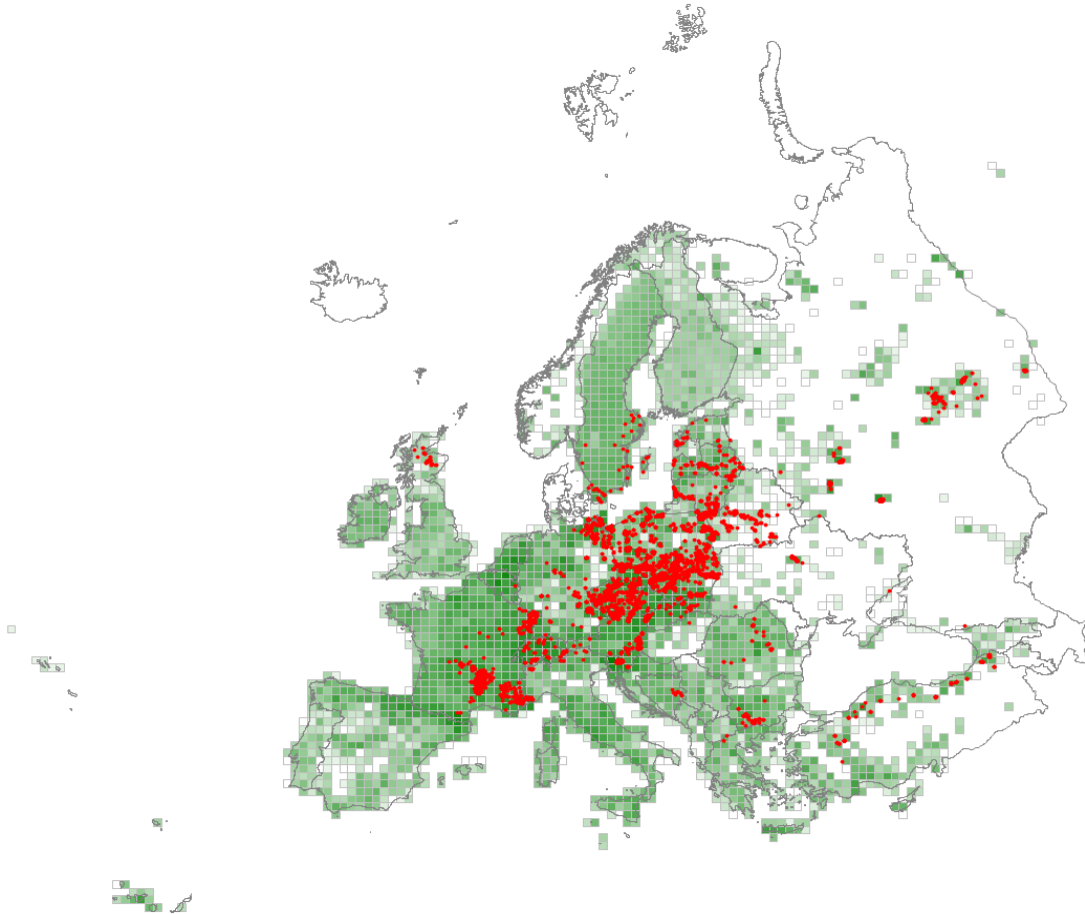
<i>Carlina acaulis</i>	11
<i>Campanula rotundifolia</i>	11
<i>Arctostaphylos uva-ursi</i>	11
<i>Achillea millefolium</i> aggr.	11

Dominant species (percentage frequencies of occurrences with cover > 25%)

<i>Larix decidua</i>	45
<i>Pinus uncinata</i>	34
<i>Vaccinium myrtillus</i>	28
<i>Rhododendron ferrugineum</i>	20
<i>Pinus cembra</i>	11
<i>Hylocomium splendens</i>	7
<i>Calamagrostis villosa</i>	6

## T35 – Temperate continental *Pinus sylvestris* forest

Forests dominated by Scots pine (*Pinus sylvestris*), often with some birch (*Betula pendula*, *Betula pubescens*), aspen (*Populus tremula*) and common juniper (*Juniperus communis*), on acidic to base-rich soils through the north temperate and hemiboreal zones.



### Corresponding alliances in EuroVegChecklist 2016

- > BRA-01A Caragano fruticis-Pinion sylvestris Solomeshch et al. 2002
- <> PIC-03A Dicrano-Pinion sylvestris (Libbert 1933) W. Matuszkiewicz 1962 nom. conserv. propos.
- > PYR-02A Festuco-Pinion sylvestris Passarge 1968
- > PYR-03A Koelerio glaucae-Pinion sylvestris Ermakov 1999
- > PYR-01A Ononido rotundifoliae-Pinion sylvestris Br.-Bl. 1950
- <> BRA-01C Trollio europaei-Pinion sylvestris Fedorov in Ermakov et al. 2000
- <> BRA-01B Veronico teucrii-Pinion sylvestris Ermakov et Solomeshch in Ermakov et al. 2000

### Characteristic species combination

Diagnostic species (phi coefficient \* 100)

<i>Pinus sylvestris</i>	27
<i>Dicranum polysetum</i>	17
<i>Betula pendula</i>	15

Constant species (percentage frequencies)

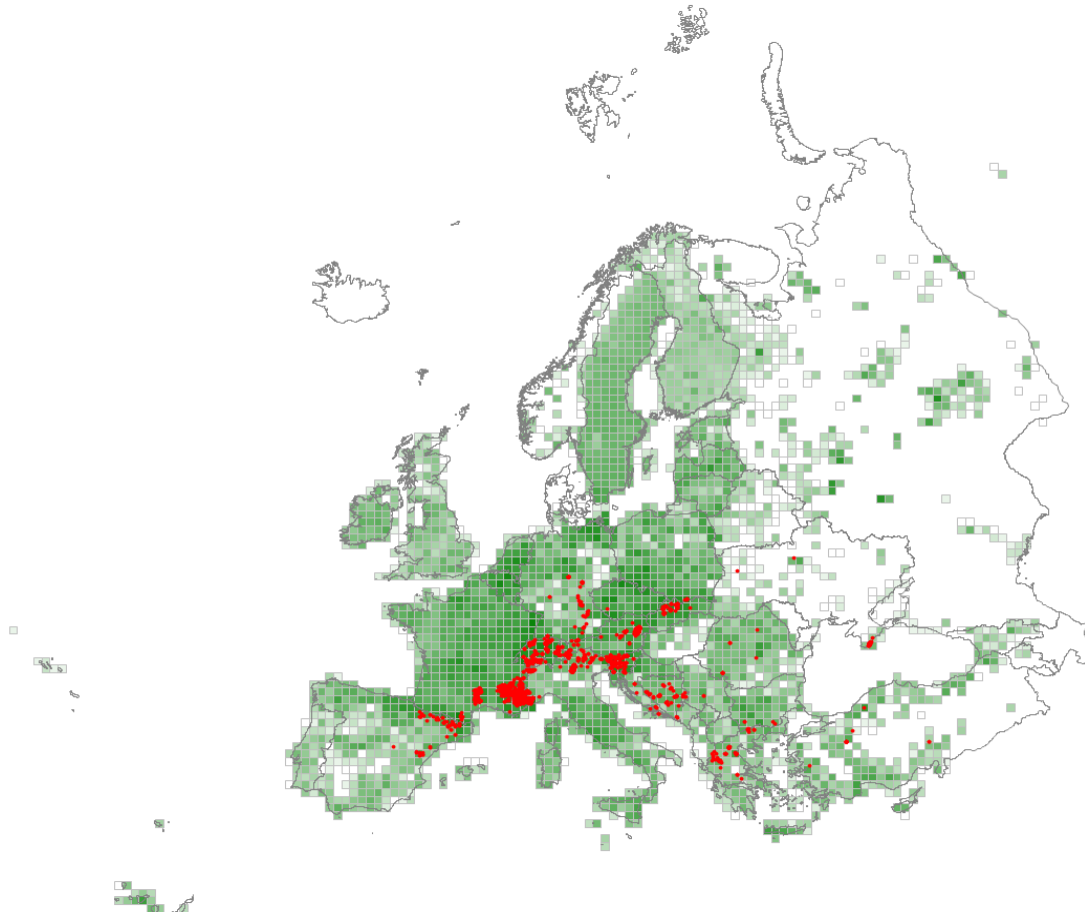
<i>Pinus sylvestris</i>	100
<i>Vaccinium myrtillus</i>	56
<i>Pleurozium schreberi</i>	55
<i>Betula pendula</i>	44
<i>Sorbus aucuparia</i>	41
<i>Vaccinium vitis-idaea</i>	39
<i>Quercus robur</i>	39
<i>Calluna vulgaris</i>	38
<i>Avenella flexuosa</i>	38
<i>Picea abies</i>	36
<i>Frangula alnus</i>	31
<i>Festuca ovina</i>	31
<i>Melampyrum pratense</i>	30
<i>Juniperus communis</i> subsp. <i>communis</i>	30
<i>Dicranum scoparium</i>	29
<i>Hylocomium splendens</i>	25
<i>Luzula pilosa</i>	22
<i>Dicranum polysetum</i>	22
<i>Quercus petraea</i>	21
<i>Fragaria vesca</i>	20
<i>Fagus sylvatica</i>	20
<i>Agrostis capillaris</i>	20
<i>Pteridium aquilinum</i>	19
<i>Pilosella officinarum</i>	19
<i>Rubus idaeus</i>	18
<i>Solidago virgaurea</i>	17
<i>Veronica officinalis</i>	16
<i>Rubus fruticosus</i> aggr.	16
<i>Polytrichastrum formosum</i>	16
<i>Calamagrostis arundinacea</i>	16
<i>Rumex acetosella</i>	15
<i>Hieracium murorum</i>	15
<i>Trientalis europaea</i>	14
<i>Hypnum cupressiforme</i> aggr.	14
<i>Dryopteris carthusiana</i>	14
<i>Calamagrostis epigejos</i>	14
<i>Populus tremula</i>	13
<i>Leucobryum glaucum</i>	13
<i>Convallaria majalis</i>	13
<i>Pohlia nutans</i>	12
<i>Maianthemum bifolium</i>	12
<i>Anthoxanthum odoratum</i> aggr.	12
<i>Corylus avellana</i>	11

Dominant species (percentage frequencies of occurrences with cover > 25%)

<i>Pinus sylvestris</i>	97
<i>Pleurozium schreberi</i>	25
<i>Vaccinium myrtillus</i>	21
<i>Avenella flexuosa</i>	8
<i>Hylocomium splendens</i>	6
<i>Calluna vulgaris</i>	5

## T36 – Temperate and submediterranean montane *Pinus sylvestris*-*Pinus nigra* forest

Evergreen coniferous forests, generally dominated by either Scots pine (*Pinus sylvestris*) or black pine (*Pinus nigra* and, towards the southern limit, various subspecies), less commonly with some Norway spruce (*Picea abies*) and deciduous associates, often in isolated and small stands on base-rich soils through the mountains of the temperate and submediterranean zones.



### Corresponding alliances in EuroVegChecklist 2016

- <> ERI-01A *Erico carnea*-Pinion Br.-Bl. in Br.-Bl. et al. 1939 nom. invers. propos.
- > ERI-01F *Erico-Fraxin* orni Horvat 1959 nom. invers. propos.
- > ERI-01E *Fraxino orni*-Pinion *nigrae* Em 1978
- > ERI-01G *Chamaecytis*o *hirsuti*-Pinion *pallasianae* Barbero et Quézel 1976 nom. invers. propos.
- > ERI-02B *Libanotido intermediae*-Pinion *sylvestris* Didukh 2003
- > ERI-02A *Pinion pallasianae* Korzhenevsky 1998
- > ERI-01B *Pulsatillo slavicae*-Pinion Fajmonová 1978
- > ERI-01C *Seslerio rigidae*-Pinion Coldea ex Mucina et Čarni in Mucina et al. 2016

### Characteristic species combination

Diagnostic species (phi coefficient \* 100)

<i>Amelanchier ovalis</i>	35
<i>Polygala chamaebuxus</i>	29
<i>Sorbus aria</i> aggr.	28
<i>Epipactis atrorubens</i>	28

<i>Berberis vulgaris</i>	22
<i>Viburnum lantana</i>	22
<i>Pinus nigra</i>	22
<i>Teucrium chamaedrys</i>	21
<i>Pinus sylvestris</i>	21
<i>Calamagrostis varia</i>	21
<i>Buphthalmum salicifolium</i>	19
<i>Achnatherum calamagrostis</i>	19
<i>Carex humilis</i>	18
<i>Juniperus communis</i> subsp. <i>communis</i>	18
<i>Lavandula angustifolia</i>	18
<i>Erica carnea</i>	18
<i>Anthericum ramosum</i>	18
<i>Carex alba</i>	17
<i>Cytisophyllum sessilifolium</i>	17
<i>Cotoneaster tomentosus</i>	16
<i>Teucrium montanum</i>	16
<i>Leontodon incanus</i> aggr.	16
<i>Genista cinerea</i>	16
<i>Hieracium pictum</i>	15

Constant species (percentage frequencies)

<i>Pinus sylvestris</i>	79
<i>Teucrium chamaedrys</i>	66
<i>Amelanchier ovalis</i>	63
<i>Juniperus communis</i> subsp. <i>communis</i>	59
<i>Sorbus aria</i> aggr.	56
<i>Carex humilis</i>	42
<i>Pinus nigra</i>	37
<i>Quercus pubescens</i>	35
<i>Viburnum lantana</i>	34
<i>Teucrium montanum</i>	34
<i>Sesleria caerulea</i>	34
<i>Brachypodium pinnatum</i>	34
<i>Euphorbia cyparissias</i>	33
<i>Polygala chamaebuxus</i>	32
<i>Calamagrostis varia</i>	31
<i>Lotus corniculatus</i>	30
<i>Hieracium murorum</i>	29
<i>Epipactis atrorubens</i>	28
<i>Crataegus monogyna</i>	26
<i>Picea abies</i>	25
<i>Erica carnea</i>	25
<i>Berberis vulgaris</i>	25
<i>Vincetoxicum hirundinaria</i>	24
<i>Sanguisorba minor</i> aggr.	23
<i>Anthericum ramosum</i>	23
<i>Buxus sempervirens</i>	22
<i>Buphthalmum salicifolium</i>	22
<i>Lavandula angustifolia</i>	21
<i>Hippocrepis emerus</i>	20
<i>Globularia cordifolia</i>	20
<i>Dorycnium pentaphyllum</i>	20
<i>Corylus avellana</i>	20
<i>Carex flacca</i>	20
<i>Bromopsis erecta</i>	20
<i>Hippocrepis comosa</i>	19
<i>Fragaria vesca</i>	19
<i>Fagus sylvatica</i>	19



<i>Cornus sanguinea</i>	19
<i>Campanula rotundifolia</i>	19
<i>Pimpinella saxifraga</i>	18
<i>Lonicera xylosteum</i>	18
<i>Ligustrum vulgare</i>	18
<i>Carlina vulgaris</i> aggr.	18
<i>Carex halleriana</i>	18
<i>Genista pilosa</i>	17
<i>Cytisophyllum sessilifolium</i>	17
<i>Ostrya carpinifolia</i>	16
<i>Carlina acaulis</i>	16
<i>Carduus defloratus</i> aggr.	16
<i>Achnatherum calamagrostis</i>	16
<i>Rosa canina</i> aggr.	15
<i>Peucedanum oreoselinum</i>	15
<i>Hepatica nobilis</i>	15
<i>Helianthemum nummularium</i>	15
<i>Galium lucidum</i>	15
<i>Acer opalus</i> aggr.	15
<i>Tortella tortuosa</i>	14
<i>Pilosella officinarum</i>	14
<i>Fraxinus ornus</i>	14
<i>Carex alba</i>	14
<i>Scabiosa columbaria</i> aggr.	13
<i>Aphyllanthes monspeliensis</i>	13
<i>Viola hirta</i>	12
<i>Solidago virgaurea</i>	12
<i>Rubia peregrina</i>	12
<i>Rhamnus saxatilis</i>	12
<i>Prunella grandiflora</i>	12
<i>Polygonatum odoratum</i>	12
<i>Genista cinerea</i>	12
<i>Fraxinus excelsior</i>	12
<i>Dactylis glomerata</i>	12
<i>Cyclamen purpurascens</i>	12
<i>Coronilla minima</i>	12
<i>Centaurea scabiosa</i>	12
<i>Astragalus monspessulanus</i>	12
<i>Asperula cynanchica</i>	12
<i>Anthyllis vulneraria</i>	12
<i>Thymus vulgaris</i>	11
<i>Thymus serpyllum</i>	11
<i>Sorbus aucuparia</i>	11
<i>Prunus spinosa</i>	11
<i>Prunus mahaleb</i>	11
<i>Phyteuma orbiculare</i>	11
<i>Molinia caerulea</i> aggr.	11
<i>Leontodon incanus</i> aggr.	11
<i>Hieracium bifidum</i>	11
<i>Helleborus foetidus</i>	11
<i>Galium mollugo</i> aggr.	11
<i>Festuca ovina</i>	11
<i>Brachypodium rupestre</i>	11
<i>Arctostaphylos uva-ursi</i>	11
<i>Acer pseudoplatanus</i>	11

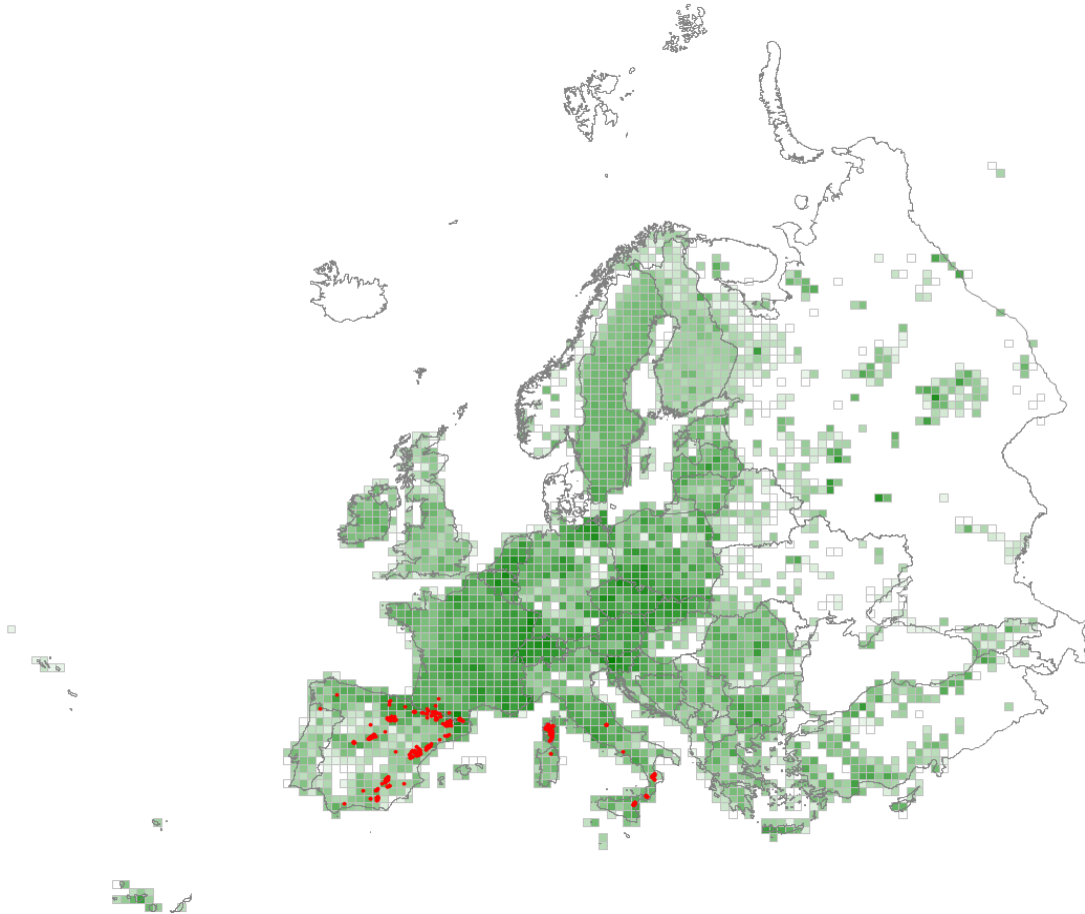
Dominant species (percentage frequencies of occurrences with cover > 25%)

<i>Pinus sylvestris</i>	69
<i>Pinus nigra</i>	28

<i>Erica carnea</i>	13
<i>Buxus sempervirens</i>	12
<i>Sesleria caerulea</i>	10
<i>Carex humilis</i>	8
<i>Brachypodium pinnatum</i>	8

## T37 – Mediterranean montane *Pinus sylvestris*-*Pinus nigra* forest

Evergreen coniferous forest of more drought-prone situations at scattered localities through the mountains of the Mediterranean, dominated by black pine (*Pinus nigra*) and, except on Mediterranean islands, sometimes with subordinate Scots pine (*Pinus sylvestris*), both species often occurring as vicariant forms in different localities.



### Corresponding alliances in EuroVegChecklist 2016

- > SAB-01D Avenello ibericae-Pinion ibericae Rivas-Mart. et J.A. Molina in Rivas-Mart. et al. 1999
- > SAB-03A Berberido aetnensis-Pinion laricionis (S. Brullo et al. 2001) Mucina et Theurillat in Mucina et al. 2016
- > SAB-01C Junipero hemisphaericae-Pinion sylvestris Rivas-Mart. 1983
- > SAB-01A Junipero-Pinion sylvestris Rivas Goday in Rivas Goday et Borja 1961 nom. invers. propos.

### Characteristic species combination

Diagnostic species (phi coefficient \* 100)

<i>Pinus nigra</i>	38
<i>Viola willkommii</i>	27
<i>Ononis aragonensis</i>	21
<i>Festuca braun-blanquetii</i>	20
<i>Helleborus lividus</i>	17
<i>Galium rotundifolium</i>	16
<i>Linaria nivea</i>	15

Constant species (percentage frequencies)

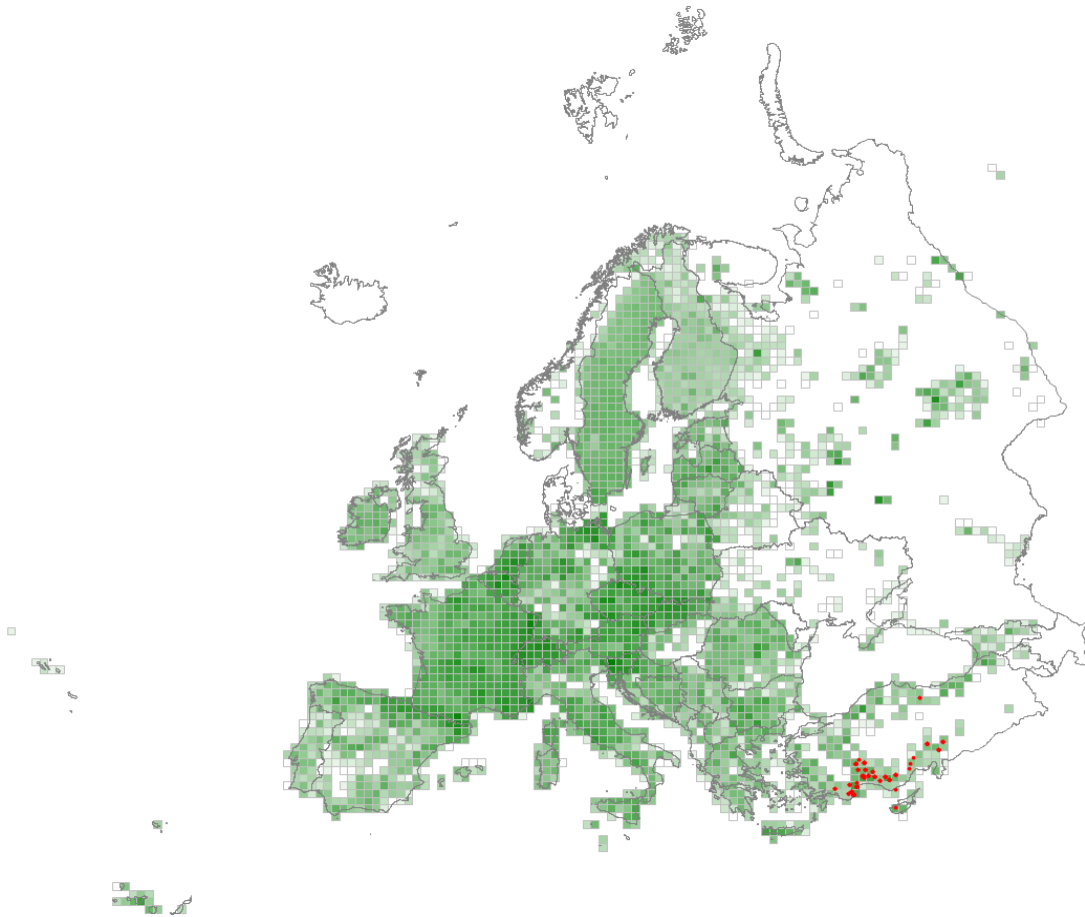
<i>Pinus nigra</i>	64
<i>Pinus sylvestris</i>	48
<i>Pteridium aquilinum</i>	32
<i>Juniperus communis</i> subsp. <i>communis</i>	32
<i>Avenella flexuosa</i>	30
<i>Juniperus communis</i> subsp. <i>nana</i>	28
<i>Cruciata glabra</i>	26
<i>Amelanchier ovalis</i>	25
<i>Galium rotundifolium</i>	22
<i>Crataegus monogyna</i>	22
<i>Hieracium murorum</i>	21
<i>Hepatica nobilis</i>	21
<i>Buxus sempervirens</i>	21
<i>Fragaria vesca</i>	19
<i>Helleborus foetidus</i>	18
<i>Veronica officinalis</i>	17
<i>Anthoxanthum odoratum</i> aggr.	17
<i>Ilex aquifolium</i>	15
<i>Brachypodium sylvaticum</i>	15
<i>Rubus ulmifolius</i>	14
<i>Pilosella officinarum</i>	14
<i>Helleborus lividus</i>	14
<i>Fagus sylvatica</i>	14
<i>Brachypodium pinnatum</i>	14
<i>Arrhenatherum elatius</i>	14
<i>Rubia peregrina</i>	13
<i>Quercus ilex</i>	13
<i>Hedera helix</i> aggr.	13
<i>Genista scorpius</i>	13
<i>Erica arborea</i>	13
<i>Digitalis purpurea</i>	13
<i>Calluna vulgaris</i>	13
<i>Viola willkommii</i>	12
<i>Helictochloa marginata</i>	12
<i>Erinacea anthyllis</i>	12
<i>Berberis vulgaris</i>	12
<i>Arctostaphylos uva-ursi</i>	12
<i>Teucrium chamaedrys</i>	11
<i>Luzula forsteri</i>	11
<i>Lavandula latifolia</i>	11
<i>Festuca heterophylla</i>	11
<i>Acer opalus</i> aggr.	11

Dominant species (percentage frequencies of occurrences with cover > 25%)

<i>Pinus nigra</i>	60
<i>Pinus sylvestris</i>	40
<i>Buxus sempervirens</i>	11
<i>Pteridium aquilinum</i>	10
<i>Avenella flexuosa</i>	9
<i>Juniperus communis</i> subsp. <i>nana</i>	5

## T38 – Mediterranean montane *Cedrus* forest

Forests dominated by cedars (*Cedrus atlantica* or *Cedrus libani*) found on mountains of North Africa, Lebanon, Syria, Asiatic Turkey and Cyprus.



### Corresponding alliances in EuroVegChecklist 2016

- <> PIC-01B Pinion peucis Horvat 1950
- > PUB-02A Querco-Cedrion libani Barbero et al. 1974

### Characteristic species combination

Diagnostic species (phi coefficient \* 100)

<i>Cedrus libani</i>	96
<i>Euphorbia kotschyana</i>	56
<i>Lamium garganicum</i>	53
<i>Bunium microcarpum</i>	52
<i>Lonicera nummulariifolia</i>	49
<i>Abies cilicica</i>	48
<i>Viola heldreichiana</i>	46
<i>Silene aegyptiaca</i>	45
<i>Juniperus excelsa</i>	43
<i>Lactuca hispida</i>	39
<i>Anthemis rosea</i>	38
<i>Galium peplidifolium</i>	38
<i>Geum heterocarpum</i>	37
<i>Doronicum orientale</i>	36

<i>Arabis laxa</i>	35
<i>Ononis adenotricha</i>	34
<i>Geranium tuberosum</i>	34
<i>Cruciata taurica</i>	33
<i>Cynoglossum montanum</i>	31
<i>Lactuca variabilis</i>	31
<i>Campanula involuocrata</i>	30
<i>Brizochloa humilis</i>	30
<i>Berberis crataegina</i>	29
<i>Alyssum strigosum</i>	28
<i>Milium vernale</i>	27
<i>Veronica macrostachya</i>	27
<i>Cotoneaster nummularius</i>	27
<i>Veronica cuneifolia</i>	26
<i>Myosotis lithospermifolia</i>	26
<i>Salvia potentillifolia</i>	25
<i>Lamium macrodon</i>	25
<i>Scutellaria brevibracteata</i>	25
<i>Erysimum pycnophyllum</i>	25
<i>Securigera libanotica</i>	25
<i>Ziziphora capitata</i>	25
<i>Verbascum glomerulosum</i>	25
<i>Silene caramanica</i>	25
<i>Potentilla kotschyana</i>	25
<i>Astragalus mesogitanus</i>	25
<i>Trifolium caudatum</i>	24
<i>Ranunculus argyreus</i>	24
<i>Ornithogalum armeniacum</i>	24
<i>Anemone blanda</i>	24
<i>Ferula elaeochytris</i>	24
<i>Asyneuma amplexicaule</i>	24
<i>Quercus libani</i>	24
<i>Bunium paucifolium</i>	24
<i>Eremopoa capillaris</i>	24
<i>Astragalus oxytropifolius</i>	24
<i>Leontodon oxylepis</i>	23
<i>Eranthis hyemalis</i>	23
<i>Vicia tenuifolia</i>	23
<i>Origanum minutiflorum</i>	23
<i>Hypericum scabrum</i>	23
<i>Corydalis tauricola</i>	23
<i>Ranunculus reuterianus</i>	22
<i>Linaria corifolia</i>	22
<i>Odontites aucheri</i>	22
<i>Crocus biflorus</i>	22
<i>Viola sieheana</i>	21
<i>Noccaea iberidea</i>	21
<i>Cerastium fragillimum</i>	21
<i>Clinopodium graveolens</i>	21
<i>Pilosella auriculoides</i>	21
<i>Lecokia cretica</i>	20
<i>Helichrysum plicatum</i>	20
<i>Sorbus umbellata</i>	19
<i>Lathyrus laxiflorus</i>	19
<i>Pinus nigra</i>	19
<i>Cyclamen cilicium</i>	19
<i>Veronica syriaca</i>	18
<i>Veronica dichrus</i>	18
<i>Verbascum myriocarpum</i>	18

<i>Trigonella lycica</i>	18
<i>Stachys woronowii</i>	18
<i>Senecio doriiformis</i>	18
<i>Sedum cyprium</i>	18
<i>Scrophularia xanthoglossa</i>	18
<i>Scorzonera tomentosa</i>	18
<i>Scorzonera lacera</i>	18
<i>Salvia pilifera</i>	18
<i>Phelipanche cilicica</i>	18
<i>Petrorhagia alpina</i>	18
<i>Onosma rutila</i>	18
<i>Onopordum caricum</i>	18
<i>Lathyrus variabilis</i>	18
<i>Galium isauricum</i>	18
<i>Elymus divaricatus</i>	18
<i>Cynoglottis chetikiana</i>	18
<i>Crocus baytopiorum</i>	18
<i>Colchicum burttii</i>	18
<i>Clypeola ciliata</i>	18
<i>Cicer anatolicum</i>	18
<i>Campanula axillaris</i>	18
<i>Arum rupicola</i>	18
<i>Arabis ionocalyx</i>	18
<i>Arabis alpina</i>	18
<i>Allium orientale</i>	18
<i>Acantholimon caesareum</i>	18
<i>Vicia anatolica</i>	18
<i>Tripleurospermum elongatum</i>	18
<i>Trifolium pannonicum</i>	18
<i>Noccaea oppositifolia</i>	18
<i>Noccaea haussknechtii</i>	18
<i>Hesperis armena</i>	18
<i>Euphorbia pestalozzae</i>	18
<i>Dorystoechas hastata</i>	18
<i>Astragalus sparsipilis</i>	18
<i>Anthemis pauciloba</i>	18
<i>Torilis leptophylla</i>	18
<i>Pilosella procera</i>	18
<i>Paeonia kesrouanensis</i>	18
<i>Euphorbia denticulata</i>	18
<i>Asyneuma michauxioides</i>	18
<i>Astragalus cadmicus</i>	18
<i>Thymus cilicicus</i>	18
<i>Medicago fischeriana</i>	18
<i>Lathyrus cilicicus</i>	18
<i>Ferulago pauciradiata</i>	18
<i>Crepis macropus</i>	18
<i>Veronica pectinata</i>	18
<i>Salvia frigida</i>	18
<i>Helleborus vesicarius</i>	18
<i>Galanthus elwesii</i>	18
<i>Ferulago aucheri</i>	18
<i>Astragalus macrourus</i>	18
<i>Asyneuma linifolium</i>	17
<i>Verbascum orgyale</i>	17
<i>Medicago brachycarpa</i>	17
<i>Odontarrhena cyprica</i>	17
<i>Digitalis cariensis</i>	17
<i>Bellevalia tauri</i>	17

<i>Brunnera orientalis</i>	17
<i>Veronica orientalis</i>	17
<i>Cephalanthera epipactoides</i>	17
<i>Gagea granatellii</i>	17
<i>Vinca herbacea</i>	17
<i>Saponaria kotschyi</i>	17
<i>Teucrium kotschyianum</i>	17
<i>Onopordum sibthorpiatum</i>	17
<i>Isatis tinctoria</i>	17
<i>Agrimonia repens</i>	17
<i>Geranium macrostylum</i>	17
<i>Lotus aegaeus</i>	16
<i>Silene italica</i> aggr.	16
<i>Quercus alnifolia</i>	16
<i>Dianthus crinitus</i>	16
<i>Bryonia multiflora</i>	16
<i>Astragalus fraxinifolius</i>	16
<i>Taraxacum hybernum</i>	16
<i>Rubia lauræ</i>	16
<i>Noccaea microstyla</i>	16
<i>Cicer isauricum</i>	16
<i>Symphytum brachycalyx</i>	16
<i>Cyanus bourgaei</i>	16
<i>Verbascum lasianthum</i>	16
<i>Pilosella macrotricha</i>	16
<i>Viola parvula</i>	16
<i>Callipeltis cucullaria</i>	16
<i>Arabis deflexa</i>	16
<i>Juniperus foetidissima</i>	16
<i>Pinus brutia</i>	15
<i>Epilobium lanceolatum</i>	15
<i>Asperula involucrata</i>	15
<i>Lepidium chalepense</i>	15
<i>Euphorbia macroclada</i>	15
<i>Daphne oleoides</i>	15
<i>Achillea grandifolia</i>	15
<i>Isatis cappadocica</i>	15
<i>Euphorbia rigida</i>	15
<i>Dianthus zonatus</i>	15
<i>Galium consanguineum</i>	15
<i>Acer hyrcanum</i>	15

Constant species (percentage frequencies)

<i>Cedrus libani</i>	100
<i>Lamium garganicum</i>	45
<i>Euphorbia kotschyana</i>	45
<i>Dactylis glomerata</i>	42
<i>Teucrium chamaedrys</i>	39
<i>Poa bulbosa</i>	35
<i>Juniperus excelsa</i>	35
<i>Pinus nigra</i>	32
<i>Bunium microcarpum</i>	32
<i>Abies cilicica</i>	32
<i>Lonicera nummulariifolia</i>	29
<i>Doronicum orientale</i>	29
<i>Silene aegyptiaca</i>	26
<i>Arabis alpina</i>	26
<i>Viola heldreichiana</i>	23
<i>Silene italica</i> aggr.	23



<i>Galium peplidifolium</i>	23
<i>Daphne oleoides</i>	23
<i>Cruciata taurica</i>	23
<i>Vicia tenuifolia</i>	19
<i>Juniperus oxycedrus</i> aggr.	19
<i>Geranium tuberosum</i>	19
<i>Myosotis alpestris</i>	16
<i>Milium vernale</i>	16
<i>Lactuca hispida</i>	16
<i>Geum heterocarpum</i>	16
<i>Fraxinus ornus</i>	16
<i>Festuca valesiaca</i> aggr.	16
<i>Dorycnium pentaphyllum</i>	16
<i>Cerastium brachypetalum</i>	16
<i>Brizochloa humilis</i>	16
<i>Berberis crataegina</i>	16
<i>Anthemis rosea</i>	16
<i>Anisantha tectorum</i>	16
<i>Alyssum strigosum</i>	16
<i>Securigera varia</i>	13
<i>Sanguisorba minor</i> aggr.	13
<i>Rosa canina</i> aggr.	13
<i>Pinus brutia</i>	13
<i>Ononis adenotricha</i>	13
<i>Noccaea perfoliata</i>	13
<i>Lathyrus laxiflorus</i>	13
<i>Cotoneaster nummularius</i>	13
<i>Clinopodium vulgare</i>	13
<i>Campanula involucrata</i>	13
<i>Astragalus angustifolius</i>	13
<i>Arabis laxa</i>	13
<i>Anthemis cretica</i>	13
<i>Anemone blanda</i>	13

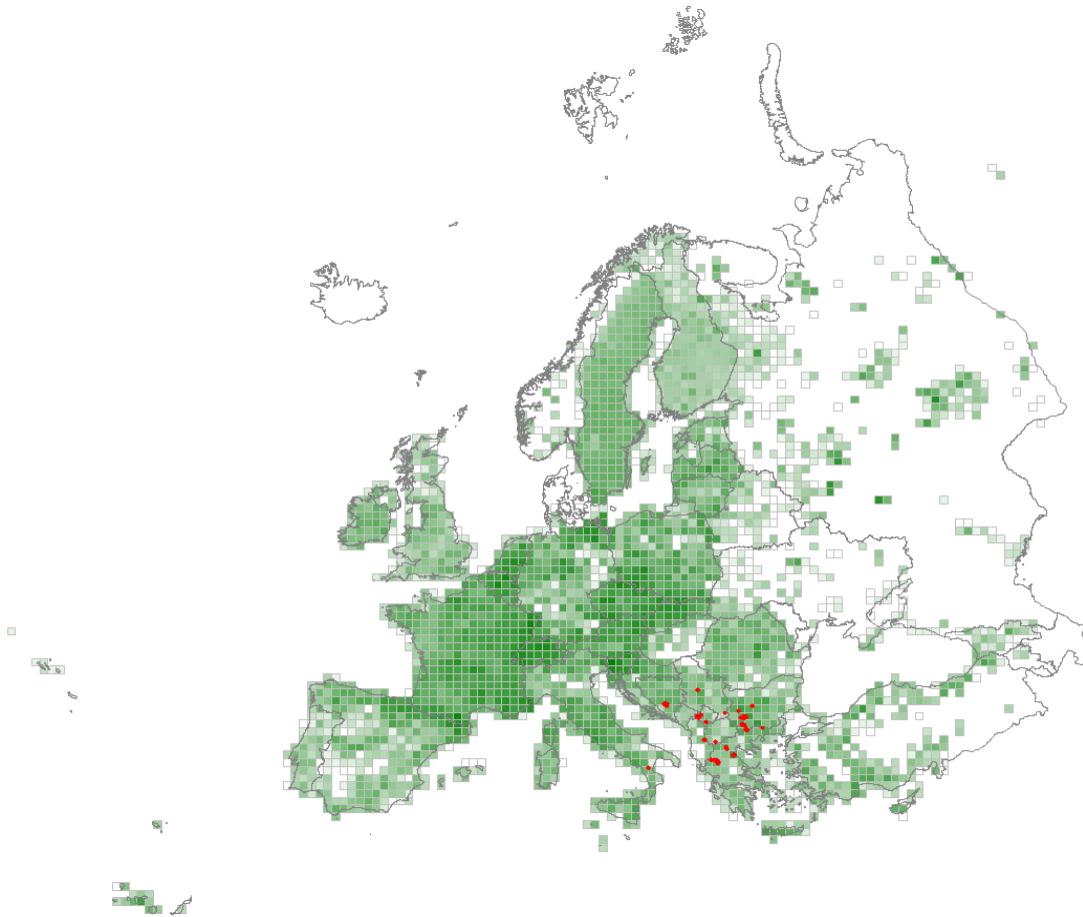
Dominant species (percentage frequencies of occurrences with cover > 25%)

<i>Cedrus libani</i>	100
<i>Pinus nigra</i>	10

### T39 – Mediterranean and Balkan subalpine *Pinus heldreichii*-*Pinus peuce* forest

Evergreen coniferous forest of timberlines in the mountains of the Balkans and southern Italy, dominated by Bosnian pine (*Pinus heldreichii*) on base-rich soils in more sunny and drought-prone situations or by Macedonian pine (*Pinus peuce*) mostly on siliceous soils.

**Remark:** This habitat should be divided into two, one dominated by *Pinus heldreichii* and the other by *Pinus peuce*, because the ecology and floristic composition of these two pine forests are very different.



#### Corresponding alliances in EuroVegChecklist 2016

- <> QUI-01F Genisto pilosae-Pinion pinastri Biondi et Vagge 2015
- > ERI-01H Pinion heldreichii Horvat 1946
- <> PIC-01B Pinion peucis Horvat 1950

#### Characteristic species combination

Diagnostic species (phi coefficient \* 100)

<i>Pinus heldreichii</i>	79
<i>Pinus peuce</i>	52
<i>Moehringia pendula</i>	36
<i>Scabiosa cinerea</i>	29
<i>Senecio thapsoides</i>	27
<i>Amphoricarpos neumayerianus</i>	27
<i>Cherleria baldaccii</i>	26
<i>Aremonia agrimonoides</i>	26

<i>Thesium auriculatum</i>	24
<i>Daphne blagayana</i>	24
<i>Geranium macrorrhizum</i>	23
<i>Cotoneaster nebrodensis</i>	22
<i>Cyanus pindicola</i>	21
<i>Carum appuanum</i>	21
<i>Verbascum nicolai</i>	20
<i>Leucanthemum chloroticum</i>	20
<i>Campanula sparsa</i>	20
<i>Pulmonaria rubra</i>	19
<i>Euphorbia amygdaloides</i>	19
<i>Festuca penzesii</i>	19
<i>Gentiana dinarica</i>	18
<i>Scabiosa taygetea</i>	18
<i>Luzula luzulina</i>	18
<i>Sesleria robusta</i>	16
<i>Hieracium pannosum</i>	16
<i>Sesleria juncifolia</i>	16
<i>Asperula aristata</i>	16
<i>Calamagrostis arundinacea</i>	15

Constant species (percentage frequencies)

<i>Pinus heldreichii</i>	69
<i>Fagus sylvatica</i>	46
<i>Vaccinium myrtillus</i>	42
<i>Hieracium murorum</i>	38
<i>Euphorbia amygdaloides</i>	38
<i>Fragaria vesca</i>	35
<i>Pinus peuce</i>	33
<i>Aremonia agrimonoides</i>	33
<i>Lactuca muralis</i>	31
<i>Poa nemoralis</i>	29
<i>Juniperus communis</i> subsp. <i>communis</i>	29
<i>Calamagrostis arundinacea</i>	29
<i>Brachypodium pinnatum</i>	29
<i>Asperula aristata</i>	23
<i>Veronica chamaedrys</i> aggr.	21
<i>Rosa pendulina</i>	21
<i>Picea abies</i>	21
<i>Luzula sylvatica</i>	21
<i>Juniperus communis</i> subsp. <i>nana</i>	21
<i>Clinopodium alpinum</i>	21
<i>Sorbus aucuparia</i>	19
<i>Rubus idaeus</i>	19
<i>Galium lucidum</i>	19
<i>Viola reichenbachiana</i>	17
<i>Veronica officinalis</i>	17
<i>Valeriana montana</i>	17
<i>Teucrium montanum</i>	17
<i>Sesleria juncifolia</i>	17
<i>Scabiosa cinerea</i>	17
<i>Primula veris</i>	17
<i>Pilosella hoppeana</i>	17
<i>Oxalis acetosella</i>	17
<i>Moehringia pendula</i>	17
<i>Festuca heterophylla</i>	17
<i>Erica carnea</i>	17
<i>Dryopteris filix-mas</i>	17
<i>Daphne oleoides</i>	17

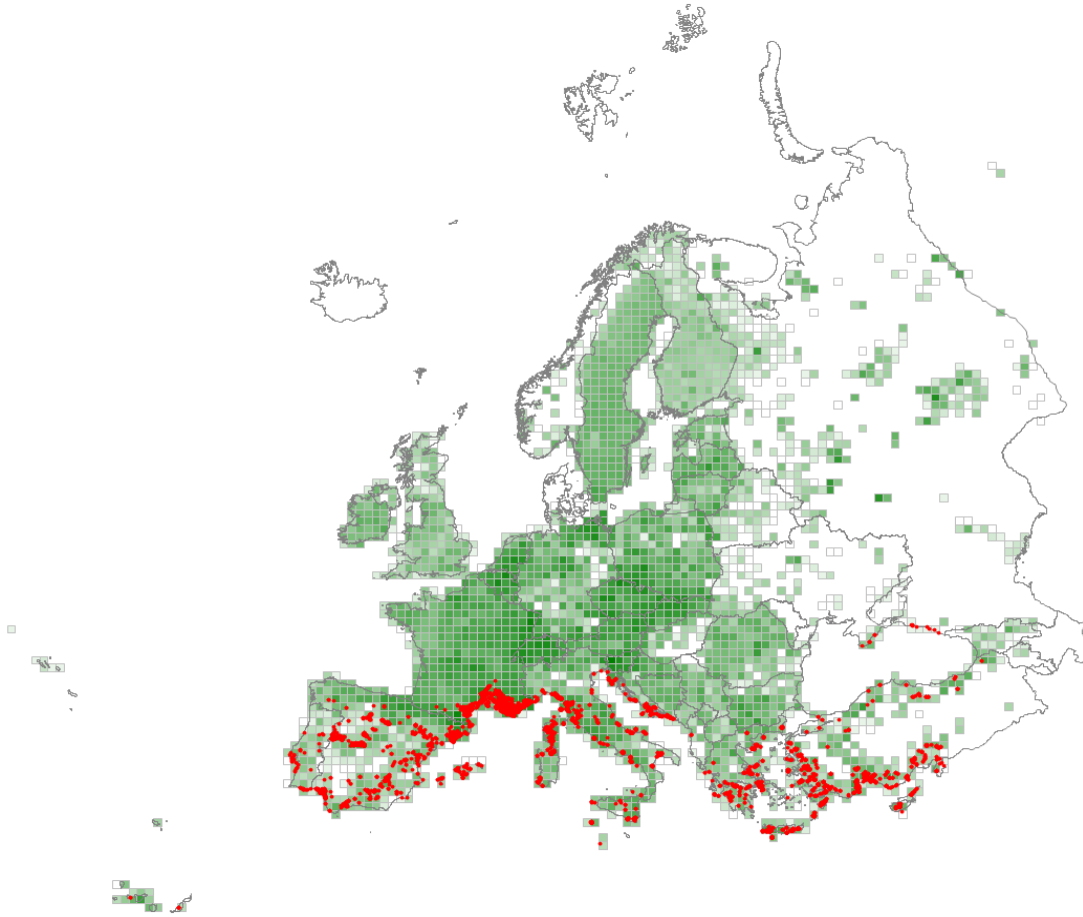
<i>Daphne mezereum</i>	17
<i>Thymus praecox</i>	15
<i>Solidago virgaurea</i>	15
<i>Pinus nigra</i>	15
<i>Luzula luzuloides</i>	15
<i>Lilium martagon</i>	15
<i>Geranium macrorrhizum</i>	15
<i>Dactylis glomerata</i>	15
<i>Buxus sempervirens</i>	15
<i>Brachypodium sylvaticum</i>	15
<i>Avenella flexuosa</i>	15
<i>Abies alba</i>	15
<i>Trifolium alpestre</i>	12
<i>Tanacetum corymbosum</i>	12
<i>Silene vulgaris</i>	12
<i>Luzula luzulina</i>	12
<i>Galium rotundifolium</i>	12
<i>Clinopodium vulgare</i>	12
<i>Campanula glomerata</i>	12

Dominant species (percentage frequencies of occurrences with cover > 25%)

<i>Pinus heldreichii</i>	69
<i>Pinus peuce</i>	31
<i>Vaccinium myrtillus</i>	10
<i>Calamagrostis arundinacea</i>	8
<i>Festuca varia</i>	6
<i>Buxus sempervirens</i>	6
<i>Brachypodium sylvaticum</i>	6
<i>Brachypodium pinnatum</i>	6

### T3A – Mediterranean lowland to submontane *Pinus* forest

Evergreen coniferous forest dominated by various thermophilous pines: maritime pine (*Pinus pinaster* in the Western Mediterranean and winter-mild Atlantic regions), Aleppo pine (*Pinus halepensis*), stone pine (*Pinus pinea* all around the Southern European coasts, and in some places also inland), and Aegean pine (*Pinus brutia* in Greece, Cyprus and Anatolia), the first three often favouring unstable substrates or pre-climax situations. All of these forests are fire-prone.



#### Corresponding alliances in EuroVegChecklist 2016

- > QUI-03B Alkanno baeticae-Pinion halepensis Mucina et Dimopoulos in Mucina et al. 2009
- > PUB-01J Campanulo sibiricae-Pinion brutiae Litvinskaya et Postarnak ex Mucina in Mucina et al. 2016
- <> QUI-01F Genisto pilosae-Pinion pinastri Biondi et Vagge 2015
- <> QUI-03D Pinion pineae Feinbrun 1959
- <> QUI-03A Pistacio lentisci-Pinion halepensis Biondi, Blasi, Galdenzi, Pesaresi et Vagge in Biondi et al. 2014
- <> QUI-03A Pistacio lentisci-Pinion halepensis Biondi, Blasi, Galdenzi, Pesaresi et Vagge in Biondi et al. 2014
- > QUI-03C Salvio fruticosae-Pinion brutiae Konstantinidis, Mucina et Bergmeier ined.

#### Characteristic species combination

Diagnostic species (phi coefficient \* 100)

*Pinus halepensis*

<i>Pinus brutia</i>	25
<i>Quercus coccifera</i>	18
<i>Pinus pinaster</i>	18

Constant species (percentage frequencies)

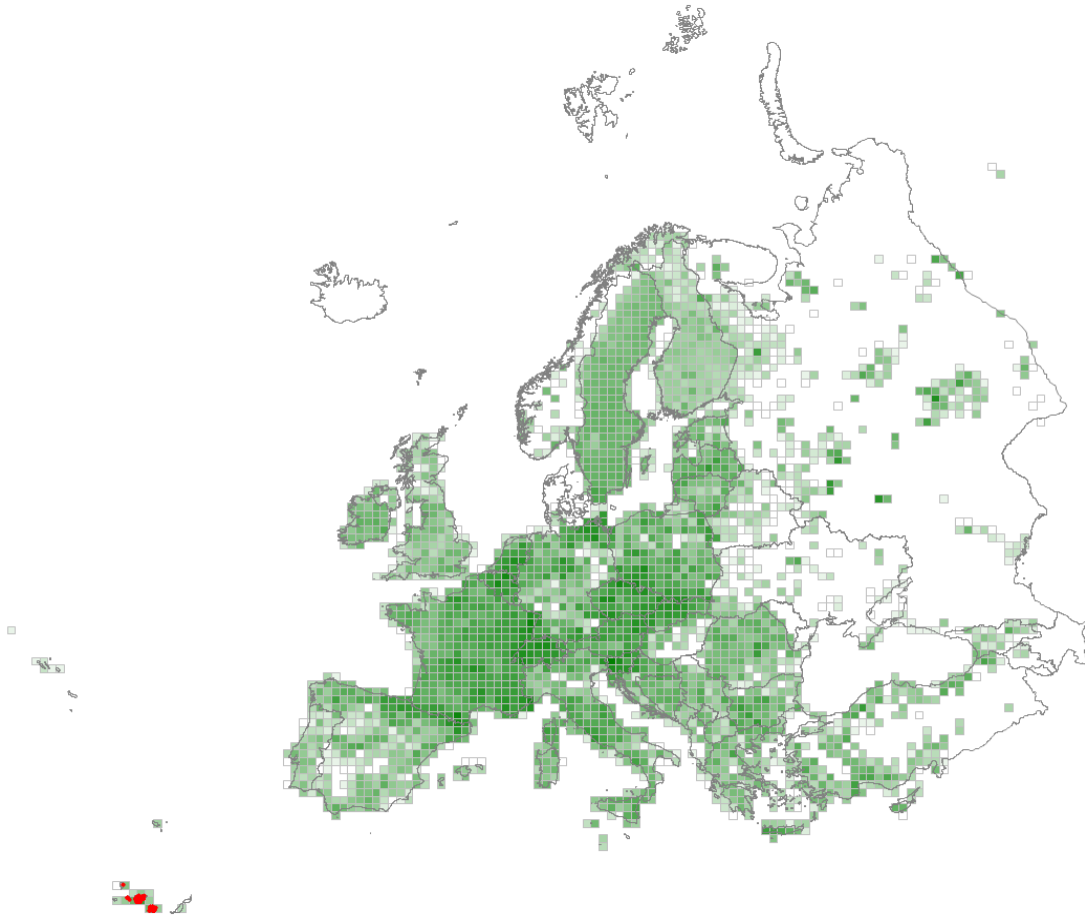
<i>Pinus halepensis</i>	46
<i>Rubia peregrina</i>	39
<i>Juniperus oxycedrus</i> aggr.	33
<i>Pistacia lentiscus</i>	32
<i>Quercus coccifera</i>	31
<i>Brachypodium retusum</i>	31
<i>Quercus ilex</i>	29
<i>Asparagus acutifolius</i>	29
<i>Smilax aspera</i>	28
<i>Pinus pinaster</i>	28
<i>Cistus salviifolius</i>	26
<i>Rosmarinus officinalis</i>	25
<i>Dactylis glomerata</i>	25
<i>Phillyrea latifolia</i>	23
<i>Phillyrea angustifolia</i>	22
<i>Pinus brutia</i>	21
<i>Arbutus unedo</i>	21
<i>Thymus vulgaris</i>	20
<i>Cistus creticus</i>	19
<i>Quercus pubescens</i>	18
<i>Dorycnium pentaphyllum</i>	18
<i>Lonicera implexa</i>	17
<i>Erica arborea</i>	17
<i>Teucrium polium</i> aggr.	15
<i>Rhamnus alaternus</i>	15
<i>Olea europaea</i>	15
<i>Daphne gnidium</i>	15
<i>Pistacia terebinthus</i>	14
<i>Myrtus communis</i>	14
<i>Teucrium chamaedrys</i>	13
<i>Aphyllanthes monspeliensis</i>	13
<i>Staehelina dubia</i>	12
<i>Rubus ulmifolius</i>	12
<i>Pinus pinea</i>	12
<i>Juniperus phoenicea</i>	12
<i>Helichrysum stoechas</i>	12
<i>Clematis flammula</i>	12
<i>Cistus albidus</i>	12
<i>Carex halleriana</i>	12
<i>Hedera helix</i> aggr.	11
<i>Cistus monspeliensis</i>	11

Dominant species (percentage frequencies of occurrences with cover > 25%)

<i>Pinus halepensis</i>	43
<i>Pinus pinaster</i>	24
<i>Pinus brutia</i>	20
<i>Pinus pinea</i>	11
<i>Brachypodium retusum</i>	7
<i>Rosmarinus officinalis</i>	6
<i>Pistacia lentiscus</i>	6
<i>Erica arborea</i>	6

## T3B – *Pinus canariensis* forest

Forest of endemic Canarian pine (*Pinus canariensis*) occurring mostly at high altitudes in dry, sunny situations above the fog belt, locally on foothill rock outcrops and old lava flows, in the western Canary Islands.



### Corresponding alliances in EuroVegChecklist 2016

- > CAN-01A Cisto symphyfolii-Pinion canariensis Rivas Goday et Esteve ex Esteve 1969

### Characteristic species combination

Diagnostic species (phi coefficient \* 100)

<i>Pinus canariensis</i>	74
<i>Cytisus proliferus</i>	58
<i>Cistus symphytifolius</i>	53
<i>Micromeria benthamii</i>	40
<i>Adenocarpus viscosus</i>	32
<i>Bystropogon organifolius</i>	30
<i>Echium onosmifolium</i>	28
<i>Lotus holosericus</i>	23
<i>Aeonium spathulatum</i>	23
<i>Aeonium rubrolineatum</i>	23
<i>Sonchus platylepis</i>	23
<i>Descurainia gonzalesii</i>	23
<i>Descurainia preauxiana</i>	21
<i>Argyranthemum adauctum</i>	21

<i>Asphodelus aestivus</i>	21
<i>Pterocephalus lasiospermus</i>	20
<i>Lotus campylocladus</i>	19
<i>Tolpis proustii</i>	18
<i>Argyranthemum callichrysum</i>	18
<i>Micromeria pineolens</i>	16
<i>Lotus pyranthus</i>	16
<i>Echium webbii</i>	16
<i>Dicheranthus plocamoides</i>	16
<i>Micromeria lepida</i>	16
<i>Sonchus acaulis</i>	15

Constant species (percentage frequencies)

<i>Pinus canariensis</i>	100
<i>Cytisus proliferus</i>	70
<i>Cistus symphytifolius</i>	54
<i>Adenocarpus viscosus</i>	38
<i>Asphodelus aestivus</i>	27
<i>Erica arborea</i>	24
<i>Cistus monspeliensis</i>	24
<i>Pterocephalus lasiospermus</i>	22
<i>Micromeria benthamii</i>	22
<i>Bystropogon origanifolius</i>	19
<i>Morella faya</i>	14
<i>Cytisus supranubius</i>	14
<i>Andryala pinnatifida</i>	14
<i>Pteridium aquilinum</i>	11
<i>Erysimum scoparium</i>	11
<i>Daphne gnidium</i>	11
<i>Argyranthemum adauctum</i>	11

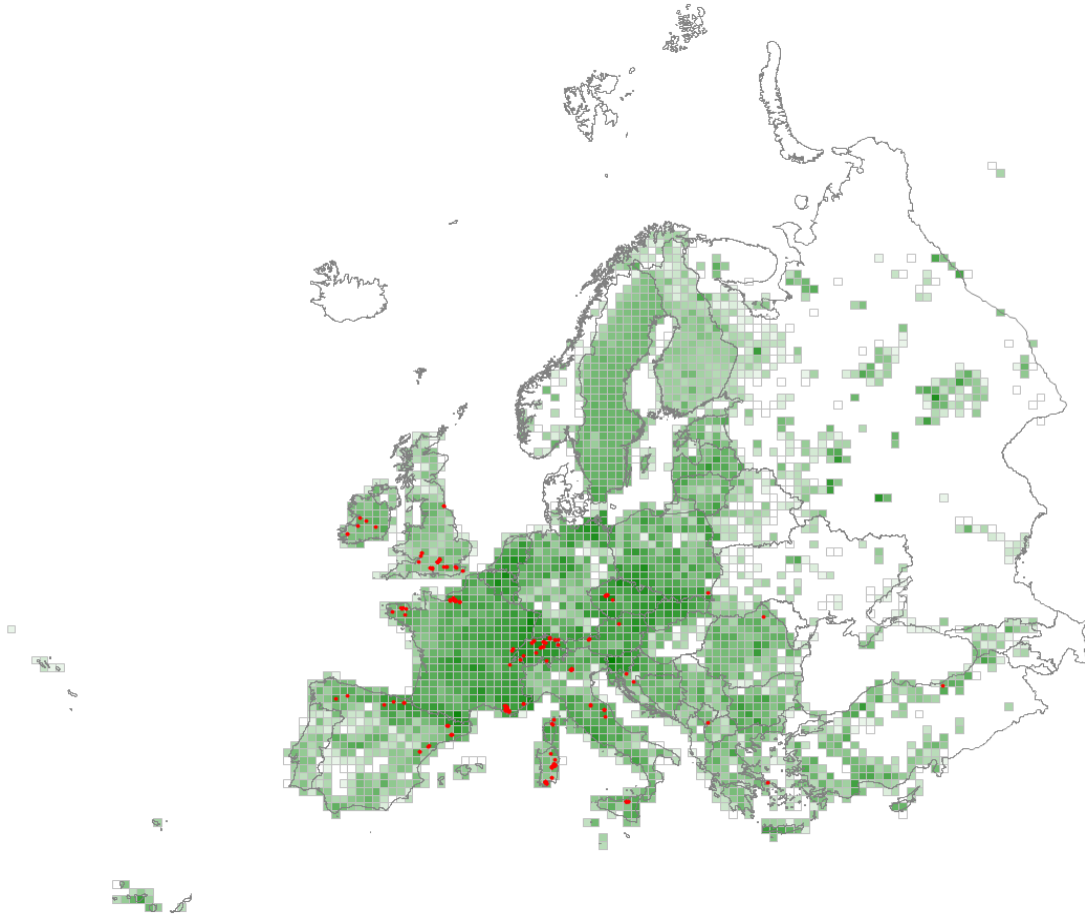
Dominant species (percentage frequencies of occurrences with cover > 25%)

<i>Pinus canariensis</i>	95
<i>Cistus symphytifolius</i>	27
<i>Cytisus proliferus</i>	24
<i>Erica arborea</i>	14
<i>Cistus monspeliensis</i>	11
<i>Lotus holosericus</i>	5
<i>Lotus campylocladus</i>	5



### T3C – *Taxus baccata* forest

Evergreen woodlands overwhelmingly dominated by yew (*Taxus baccata*), sometimes with holly (*Ilex aquifolium*), whitebeam (*Sorbus aria*) and box (*Buxus sempervirens*), maybe in halted successions or as senescent survivals, occurring very locally on base-rich soils in the Mediterranean and in the British Isles.



#### Corresponding alliances in EuroVegChecklist 2016

- <> FAG-03A Carpinion betuli Issler 1931
- <> FAG-02B Fagion sylvaticae Luquet 1926
- <> PUB-01R Lathyro veneti-Taxion baccatae Čarni et Mucina 2015
- <> FAG-05A Tilio-Acerion Klika 1955

#### Characteristic species combination

Diagnostic species (phi coefficient \* 100)

<i>Taxus baccata</i>	83
<i>Mercurialis perennis</i>	22
<i>Ilex aquifolium</i>	20
<i>Hedera helix</i> aggr.	20
<i>Daphne laureola</i>	18
<i>Tilia platyphyllos</i>	17
<i>Glechoma sardoa</i>	15

Constant species (percentage frequencies)

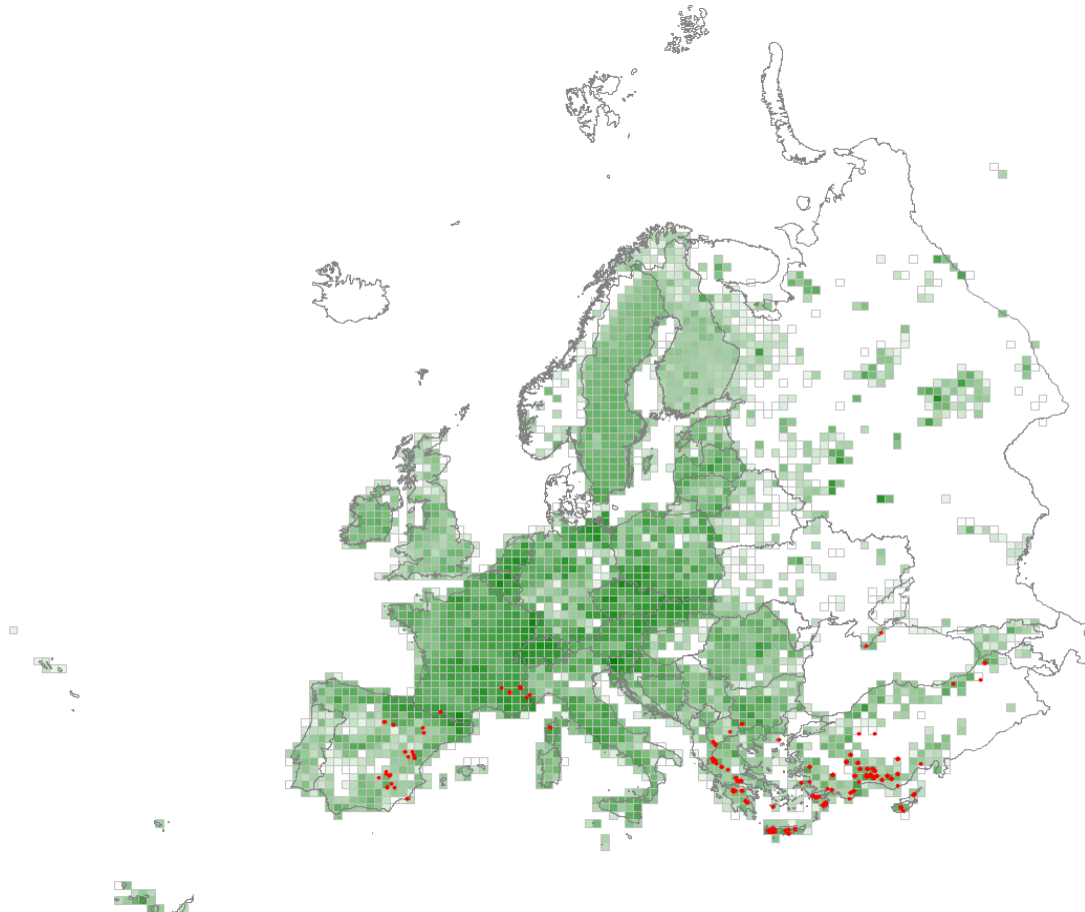
<i>Taxus baccata</i>	100
<i>Hedera helix</i> aggr.	71
<i>Fagus sylvatica</i>	48
<i>Ilex aquifolium</i>	45
<i>Mercurialis perennis</i>	42
<i>Corylus avellana</i>	40
<i>Rubus fruticosus</i> aggr.	36
<i>Viola reichenbachiana</i>	33
<i>Fraxinus excelsior</i>	33
<i>Sorbus aria</i> aggr.	29
<i>Daphne laureola</i>	25
<i>Acer pseudoplatanus</i>	25
<i>Brachypodium sylvaticum</i>	24
<i>Ruscus aculeatus</i>	21
<i>Quercus ilex</i>	21
<i>Lactuca muralis</i>	21
<i>Hieracium murorum</i>	21
<i>Hepatica nobilis</i>	20
<i>Euphorbia amygdaloides</i>	19
<i>Dryopteris filix-mas</i>	19
<i>Dioscorea communis</i>	19
<i>Crataegus monogyna</i>	19
<i>Acer opalus</i> aggr.	19
<i>Sambucus nigra</i>	18
<i>Geranium robertianum</i>	18
<i>Tilia platyphyllos</i>	17
<i>Lonicera xylosteum</i>	17
<i>Fragaria vesca</i>	17
<i>Clematis vitalba</i>	17
<i>Ligustrum vulgare</i>	16
<i>Abies alba</i>	16
<i>Ulmus glabra</i>	15
<i>Prenanthes purpurea</i>	15
<i>Melica uniflora</i>	15
<i>Sanicula europaea</i>	14
<i>Quercus robur</i>	14
<i>Carex digitata</i>	14
<i>Acer campestre</i>	14
<i>Viburnum lantana</i>	13
<i>Sorbus aucuparia</i>	13
<i>Solidago virgaurea</i>	13
<i>Polystichum aculeatum</i>	13
<i>Oxalis acetosella</i>	13
<i>Lilium martagon</i>	13
<i>Galium odoratum</i>	13
<i>Cyclamen repandum</i>	13
<i>Cornus sanguinea</i>	13
<i>Asplenium adiantum-nigrum</i>	13
<i>Prunus avium</i>	12
<i>Picea abies</i>	12
<i>Lamium galeobdolon</i>	12
<i>Anemone nemorosa</i>	12
<i>Viola alba</i>	11
<i>Rubia peregrina</i>	11
<i>Poa nemoralis</i>	11
<i>Carex flacca</i>	11
<i>Campanula trachelium</i>	11
<i>Arum maculatum</i>	11

Dominant species (percentage frequencies of occurrences with cover > 25%)

<i>Taxus baccata</i>	100
<i>Fagus sylvatica</i>	21
<i>Hedera helix</i> aggr.	13
<i>Ilex aquifolium</i>	6
<i>Corylus avellana</i>	6

## T3D – Mediterranean *Cupressaceae* forest

Evergreen forests and tall scrub of cypress (*Cupressus sempervirens*), junipers (*Juniperus drupacea*, *Juniperus excelsa*, *Juniperus foetidissima* and *Juniperus thurifera*) or alerce (*Tetraclinis articulata*) with a usually open canopy with scrubby understorey and herb-rich field layer, on shallow, usually base-rich soils, in dry, rocky situations scattered through the Mediterranean.



### Corresponding alliances in EuroVegChecklist 2016

- > QUI-02B *Aceri sempervirentis-Cupression sempervirentis* Barbero et Quézel ex Quézel et al. 1993
- > SAB-03D *Berberido creticae-Juniperion foetidissimae* S. Brullo et al. 2001
- <> SAB-03C *Jasmino-Juniperion excelsae* Didukh, Vakarenko et Shelyag-Sosonko ex Didukh 1996
- > SAB-03B *Juniperion excelso-foetidissimae* Em ex Matevski et al. 2010
- > QUI-04G *Juniperion lagunae* Cano et al. 2007
- > SAB-01B *Juniperion thuriferae* Rivas-Mart. 1969
- <> QUI-04F *Pino pinastri-Juniperion phoeniceae* Pérez Latorre et Cabezudo in Pérez Latorre et al. 1998
- > QUI-04J *Rhamno graecae-Juniperion lyciae* M. Costa et al. 1984

### Characteristic species combination

Diagnostic species (phi coefficient \* 100)

<i>Cupressus sempervirens</i>	56
<i>Juniperus foetidissima</i>	38

<i>Juniperus thurifera</i>	35
<i>Juniperus excelsa</i>	29
<i>Galium monachinii</i>	22
<i>Quercus coccifera</i>	21
<i>Crepis fraasii</i>	20
<i>Pterocephalus perennis</i>	18
<i>Pinus brutia</i>	18
<i>Luzula nodulosa</i>	18
<i>Hypericum empetrifolium</i>	17
<i>Achnatherum bromoides</i>	17
<i>Scutellaria rupestris</i>	16
<i>Bellis longifolia</i>	16
<i>Acer sempervirens</i>	16
<i>Festuca jeanpertia</i>	15
<i>Arbutus andrachne</i>	15
<i>Cyclamen persicum</i>	15

Constant species (percentage frequencies)

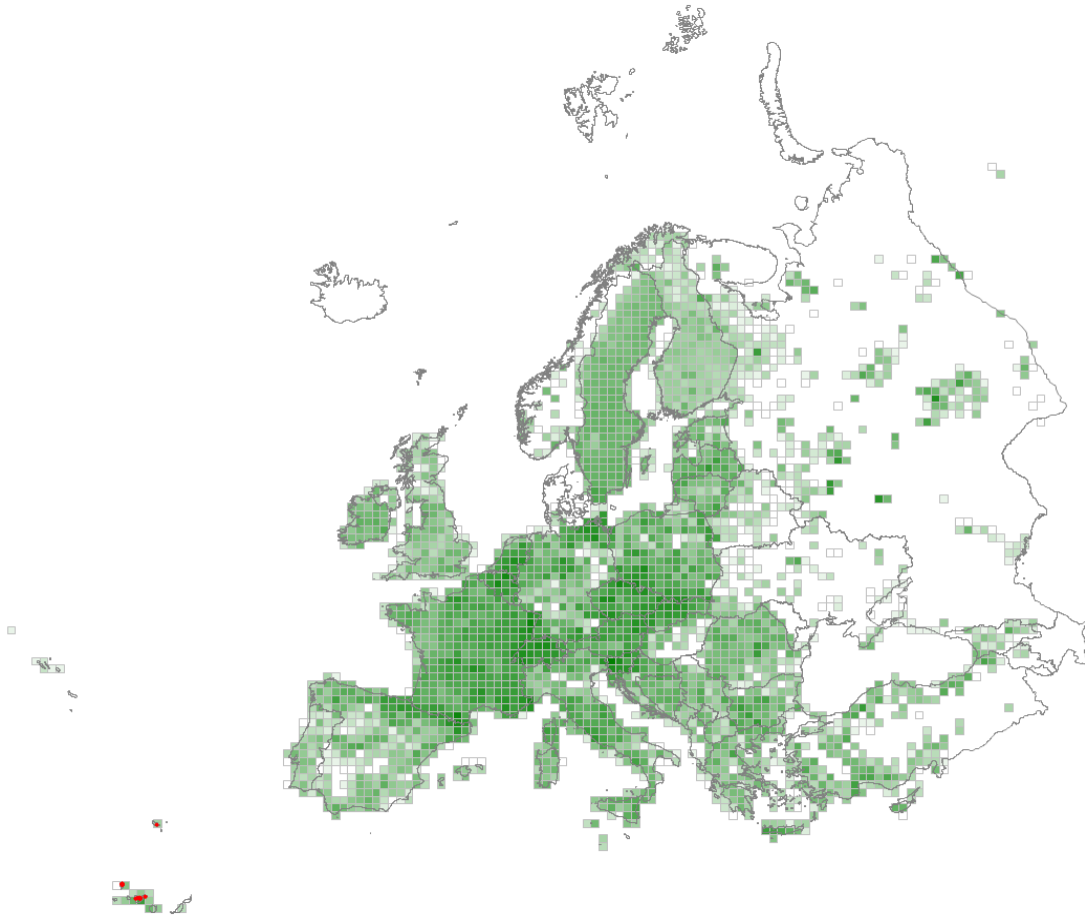
<i>Dactylis glomerata</i>	38
<i>Cupressus sempervirens</i>	37
<i>Quercus coccifera</i>	36
<i>Juniperus oxycedrus</i> aggr.	31
<i>Poa bulbosa</i>	26
<i>Juniperus excelsa</i>	24
<i>Teucrium chamaedrys</i>	23
<i>Juniperus foetidissima</i>	23
<i>Phillyrea latifolia</i>	18
<i>Juniperus thurifera</i>	18
<i>Teucrium polium</i> aggr.	17
<i>Melica ciliata</i> aggr.	17
<i>Achnatherum bromoides</i>	17
<i>Brachypodium retusum</i>	16
<i>Pinus brutia</i>	15
<i>Olea europaea</i>	15
<i>Drimys maritima</i> aggr.	14
<i>Cistus creticus</i>	14
<i>Hypericum empetrifolium</i>	13
<i>Rhamnus lycioides</i>	12
<i>Pistacia terebinthus</i>	12
<i>Pistacia lentiscus</i>	12
<i>Geranium purpureum</i>	12
<i>Daphne oleoides</i>	12
<i>Crepis fraasii</i>	12
<i>Cerastium brachypetalum</i>	11

Dominant species (percentage frequencies of occurrences with cover > 25%)

<i>Cupressus sempervirens</i>	36
<i>Juniperus excelsa</i>	21
<i>Juniperus thurifera</i>	17
<i>Juniperus foetidissima</i>	17
<i>Pinus brutia</i>	6
<i>Juniperus oxycedrus</i> aggr.	5

## T3E – Macaronesian *Juniperus* forest

Evergreen forests of endemic Macaronesian junipers (*Juniperus brevifolia* and *Juniperus cedrus*) in diverse habitats as sometimes very small isolated populations, each with a distinct associated floras.



### Corresponding alliances in EuroVegChecklist 2016

- <> AZO-01A *Juniperion brevifoliae* Sjögren 1973
- > CAN-01B *Juniperion cedri* Martín Osorio, Wildpret et Rivas-Mart. in Martín Osorio et al. 2007
- <> OLE-01A *Mayteno canariensis-Juniperion canariensis* Santos et F. Galván ex Santos 1983 corr. Rivas-Mart. et al. 1993

### Characteristic species combination

Diagnostic species (phi coefficient \* 100)

<i>Juniperus cedrus</i>	89
<i>Pimpinella cumbrae</i>	39
<i>Adenocarpus viscosus</i>	38
<i>Micromeria lachnophylla</i>	36
<i>Cheirolophus teydis</i>	35
<i>Cytisus supranubius</i>	32
<i>Aeonium pseudourbicum</i>	32
<i>Argyranthemum gracile</i>	28
<i>Echium wildpretii</i>	26
<i>Allagopappus canariensis</i>	25

<i>Allosorus fragilis</i>	25
<i>Lotus campylocladus</i>	23
<i>Cistus osbeckiifolius</i>	23
<i>Scilla haemorrhoidalis</i>	23
<i>Pterocephalus porphyranthus</i>	22
<i>Parietaria mauritanica</i>	22
<i>Prunus dulcis</i>	22
<i>Piptatherum coerulescens</i>	21
<i>Sideritis dendrochahorra</i>	20
<i>Seseli webbii</i>	19
<i>Asparagus umbellatus</i>	19
<i>Pterocephalus lasiospermus</i>	18
<i>Ferula linkii</i>	18
<i>Justicia hyssopifolia</i>	17
<i>Cytisus proliferus</i>	16
<i>Bufonia paniculata</i>	16
<i>Aristida adscensionis</i>	16
<i>Bystropogon origanifolius</i>	16
<i>Euphorbia regis-jubae</i>	16
<i>Cosentinia vellea</i>	15

Constant species (percentage frequencies)

<i>Juniperus cedrus</i>	100
<i>Adenocarpus viscosus</i>	45
<i>Cytisus supranubius</i>	35
<i>Pterocephalus lasiospermus</i>	20
<i>Piptatherum coerulescens</i>	20
<i>Pinus canariensis</i>	20
<i>Micromeria lachnophylla</i>	20
<i>Cheirolophus teydis</i>	20
<i>Euphorbia regis-jubae</i>	20
<i>Cytisus proliferus</i>	20
<i>Scilla haemorrhoidalis</i>	15
<i>Pimpinella cumbrae</i>	15
<i>Periploca angustifolia</i>	15
<i>Kleinia neriifolia</i>	15
<i>Hyparrhenia hirta</i>	15
<i>Asphodelus aestivus</i>	15
<i>Asparagus umbellatus</i>	15

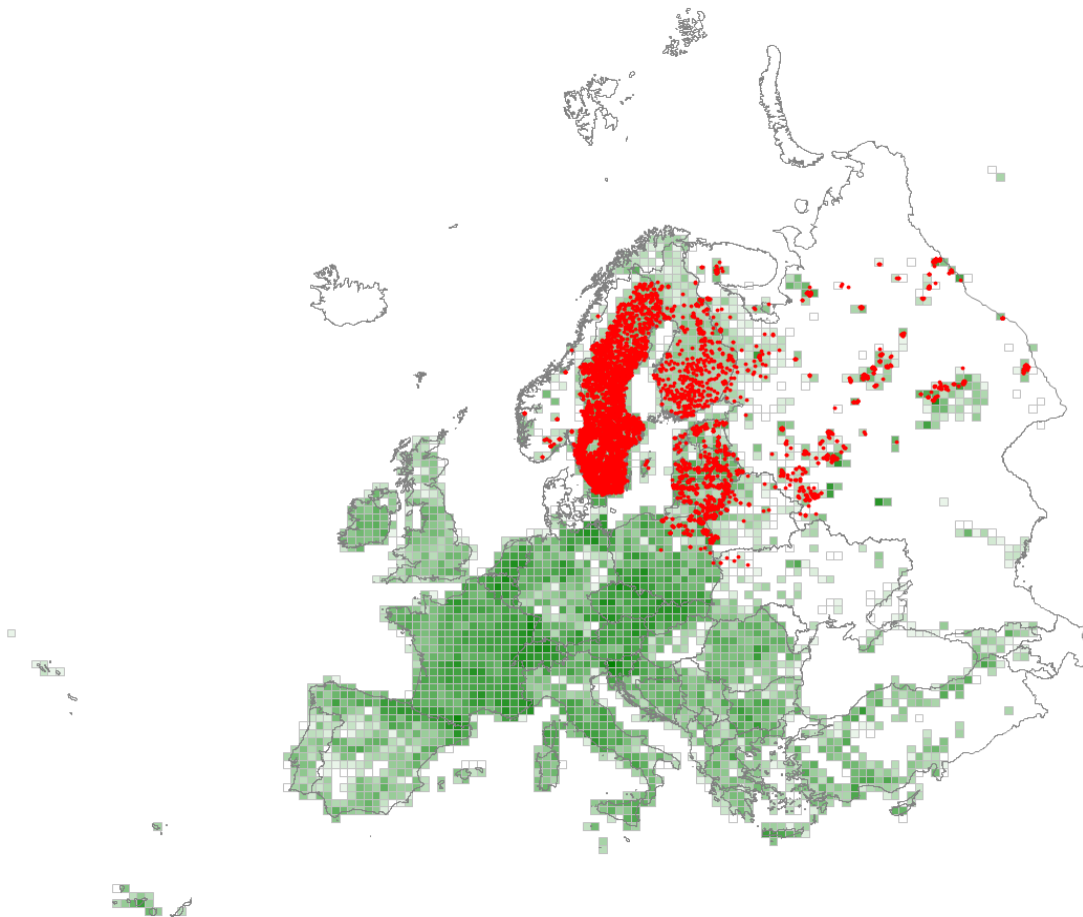
Dominant species (percentage frequencies of occurrences with cover > 25%)

<i>Juniperus cedrus</i>	100
<i>Adenocarpus viscosus</i>	20
<i>Micromeria lachnophylla</i>	15
<i>Cytisus proliferus</i>	10
<i>Cistus osbeckiifolius</i>	10
<i>Plantago webbii</i>	5
<i>Pimpinella cumbrae</i>	5
<i>Hyparrhenia hirta</i>	5
<i>Erica arborea</i>	5
<i>Cytisus supranubius</i>	5

## T3F – Dark taiga

Forest naturally dominated by spruce (*Picea abies* and *Picea obovata*), Siberian fir (*Abies sibirica*) or Siberian pine (*Pinus sibirica*) on more mesic, usually podzolic soils through the north-eastern continental and boreal regions, often with a subordinate deciduous broadleaf component (e.g. *Betula pendula* and *Betula pubescens*) and in places even some Scots pine (*Pinus sylvestris*) in the canopy and understorey. The field-layer has a significant participation of dwarf shrubs, bryophytes and lichens. Some forests with *Picea* or *Abies sibirica* can be rich in tall herbs.

**Remark:** Spruce forests of the hemiboreal and boreal zone on brown soils, with a species-rich herb layer consisting of nutrient-demanding forest herbs (e.g. *Aegopodium podagraria*, *Anemone nemorosa*, *Brachypodium sylvaticum*, *Hepatica nobilis*, *Hieracium lachenalii*, *Hieracium murorum*, *Lamium galeobdolon*, *Melica nutans*, *Mercurialis perennis*, *Mycelis muralis* and *Oxalis acetosella*) is very different from the taiga spruce forest with a predominance of dwarf shrubs and bryophytes in the field layer. These forests need to be considered as potential new habitat.



### Corresponding alliances in EuroVegChecklist 2016

- <> PIC-02A Aconito rubicundi-Abietion sibiricae Anenkhonov et Chytrý 1998
- <> PIC-05A Empetro-Piceion obovatae Morozova et al. 2008
- <> PIC-01A Piceion excelsae Pawłowski et al. 1928



## Characteristic species combination

### Diagnostic species (phi coefficient \* 100)

<i>Picea abies</i>	27
<i>Luzula pilosa</i>	27
<i>Hylocomium splendens</i>	26
<i>Trientalis europaea</i>	26
<i>Maianthemum bifolium</i>	25
<i>Pleurozium schreberi</i>	23
<i>Ptilium crista-castrensis</i>	23
<i>Sorbus aucuparia</i>	22
<i>Linnaea borealis</i>	21
<i>Betula pubescens</i>	21
<i>Vaccinium vitis-idaea</i>	19
<i>Vaccinium myrtillus</i>	19
<i>Melampyrum pratense</i>	17
<i>Gymnocarpium dryopteris</i>	16
<i>Equisetum sylvaticum</i>	15

### Constant species (percentage frequencies)

<i>Picea abies</i>	97
<i>Pleurozium schreberi</i>	86
<i>Vaccinium myrtillus</i>	84
<i>Hylocomium splendens</i>	83
<i>Sorbus aucuparia</i>	80
<i>Vaccinium vitis-idaea</i>	70
<i>Avenella flexuosa</i>	65
<i>Betula pubescens</i>	61
<i>Luzula pilosa</i>	57
<i>Maianthemum bifolium</i>	54
<i>Trientalis europaea</i>	53
<i>Pinus sylvestris</i>	53
<i>Oxalis acetosella</i>	39
<i>Melampyrum pratense</i>	38
<i>Solidago virgaurea</i>	33
<i>Linnaea borealis</i>	32
<i>Rubus idaeus</i>	31
<i>Ptilium crista-castrensis</i>	31
<i>Polytrichum commune</i>	29
<i>Gymnocarpium dryopteris</i>	26
<i>Betula pendula</i>	26
<i>Rubus saxatilis</i>	25
<i>Calamagrostis arundinacea</i>	25
<i>Populus tremula</i>	23
<i>Juniperus communis</i> subsp. <i>communis</i>	23
<i>Equisetum sylvaticum</i>	23
<i>Lycopodium annotinum</i>	19
<i>Frangula alnus</i>	19
<i>Orthilia secunda</i>	17
<i>Melampyrum sylvaticum</i>	17
<i>Epilobium angustifolium</i>	17
<i>Rhytidiadelphus triquetrus</i>	16
<i>Dryopteris carthusiana</i>	16
<i>Dicranum scoparium</i>	16
<i>Deschampsia cespitosa</i> aggr.	16
<i>Pteridium aquilinum</i>	15
<i>Empetrum nigrum</i> aggr.	15
<i>Corylus avellana</i>	15
<i>Carex digitata</i>	15

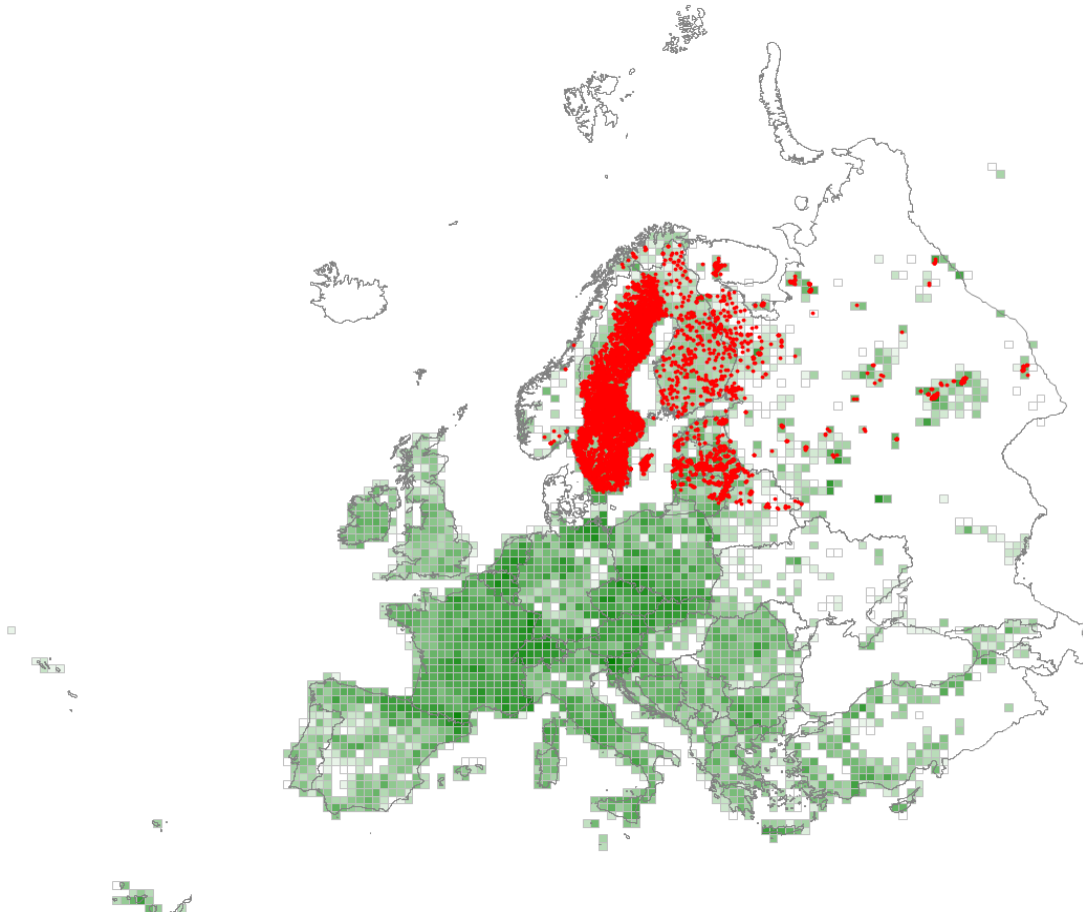
<i>Calluna vulgaris</i>	15
<i>Melica nutans</i>	14
<i>Geranium sylvaticum</i> aggr.	14
<i>Anemone nemorosa</i>	14
<i>Potentilla erecta</i>	12
<i>Dicranum polysetum</i>	12
<i>Quercus robur</i>	11
<i>Lactuca muralis</i>	11
<i>Fragaria vesca</i>	11

Dominant species (percentage frequencies of occurrences with cover > 25%)

<i>Picea abies</i>	91
<i>Hylocomium splendens</i>	16
<i>Pleurozium schreberi</i>	15
<i>Vaccinium myrtillus</i>	9
<i>Pinus sylvestris</i>	5
<i>Oxalis acetosella</i>	5

## T3G – *Pinus sylvestris* light taiga

Forest naturally dominated by Scots pine (*Pinus sylvestris*) but often with some birch (*Betula pendula* and *B. pubescens*). They occur on lithomorphous and podzolised, moderately dry soils throughout the European boreal zone. The field layer is rich in dwarf shrubs, bryophytes and lichens. There can be a specialised herbaceous flora on eskers.



### Corresponding alliances in EuroVegChecklist 2016

- > PIC-03B Cladonio stellaris-Pinion sylvestris Kielland-Lund ex Ermakov et Morozova 2011
- <> PIC-03A Dicrano-Pinion sylvestris (Libbert 1933) W. Matuszkiewicz 1962 nom. conserv. propos.

### Characteristic species combination

Diagnostic species (phi coefficient \* 100)

<i>Pinus sylvestris</i>	27
<i>Pleurozium schreberi</i>	25
<i>Vaccinium vitis-idaea</i>	25
<i>Hylocomium splendens</i>	24
<i>Picea abies</i>	22
<i>Ptilium crista-castrensis</i>	21
<i>Vaccinium myrtillus</i>	21
<i>Melampyrum pratense</i>	21
<i>Betula pubescens</i>	20

<i>Luzula pilosa</i>	19
<i>Linnaea borealis</i>	16
<i>Sorbus aucuparia</i>	15

Constant species (percentage frequencies)

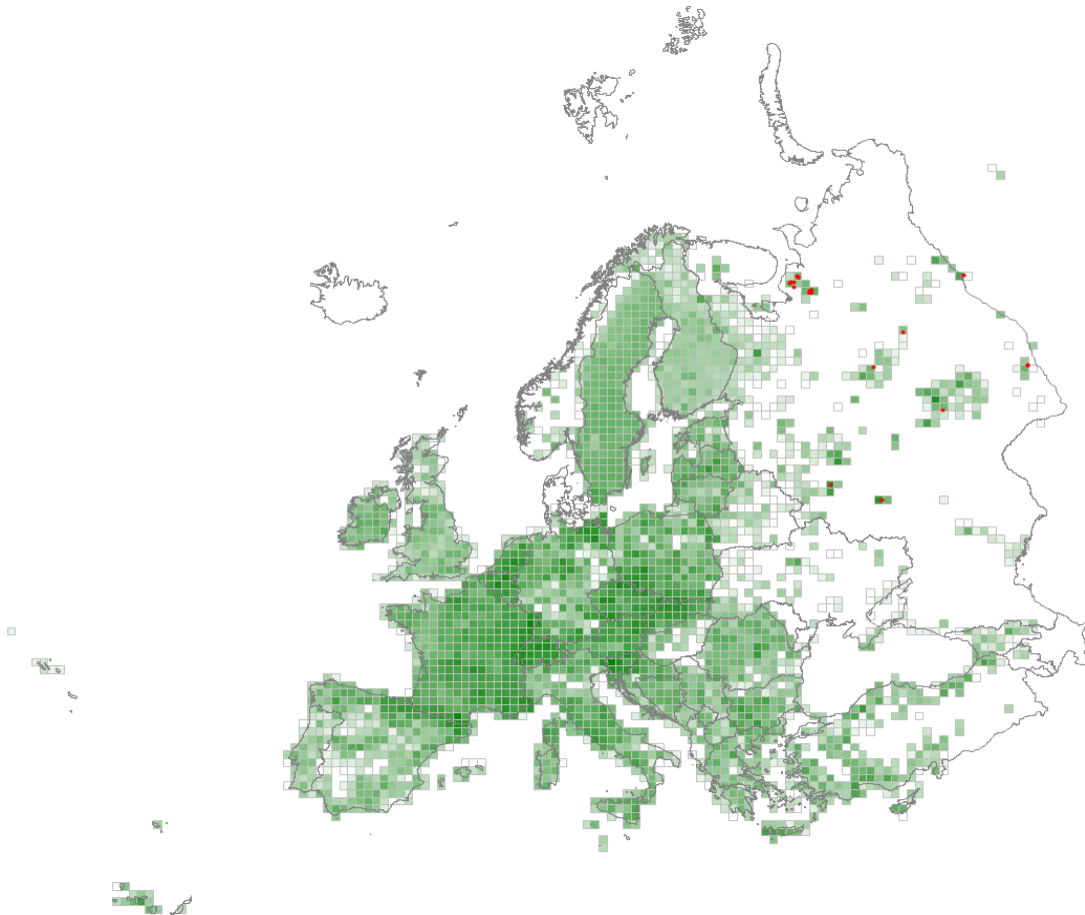
<i>Pinus sylvestris</i>	100
<i>Pleurozium schreberi</i>	93
<i>Vaccinium myrtillus</i>	91
<i>Vaccinium vitis-idaea</i>	90
<i>Picea abies</i>	81
<i>Hylocomium splendens</i>	77
<i>Avenella flexuosa</i>	63
<i>Betula pubescens</i>	60
<i>Sorbus aucuparia</i>	57
<i>Calluna vulgaris</i>	52
<i>Melampyrum pratense</i>	47
<i>Luzula pilosa</i>	41
<i>Juniperus communis</i> subsp. <i>communis</i>	40
<i>Empetrum nigrum</i> aggr.	39
<i>Trientalis europaea</i>	31
<i>Betula pendula</i>	30
<i>Ptilium crista-castrensis</i>	28
<i>Vaccinium uliginosum</i>	25
<i>Polytrichum commune</i>	25
<i>Linnaea borealis</i>	24
<i>Maianthemum bifolium</i>	23
<i>Solidago virgaurea</i>	21
<i>Populus tremula</i>	20
<i>Epilobium angustifolium</i>	19
<i>Dicranum polysetum</i>	17
<i>Calamagrostis arundinacea</i>	16
<i>Rubus idaeus</i>	15
<i>Frangula alnus</i>	15
<i>Cladonia stellaris</i>	13
<i>Rhododendron tomentosum</i>	12
<i>Pteridium aquilinum</i>	12
<i>Dicranum scoparium</i>	11

Dominant species (percentage frequencies of occurrences with cover > 25%)

<i>Pinus sylvestris</i>	89
<i>Pleurozium schreberi</i>	32
<i>Vaccinium myrtillus</i>	10
<i>Hylocomium splendens</i>	10

## T3H – *Larix* light taiga

Deciduous coniferous woodland of Siberian larch (*Larix sibirica*) in the boreal zone of North-Eastern Europe and western Siberia.



### Corresponding alliances in EuroVegChecklist 2016

<> PIC-05A Empetro-Piceion obovatae Morozova et al. 2008

### Characteristic species combination

Diagnostic species (phi coefficient \* 100)

<i>Larix sibirica</i>	99
<i>Rosa acicularis</i>	77
<i>Clematis alpina</i>	62
<i>Rubus arcticus</i>	53
<i>Lathyrus vernus</i>	52
<i>Crepis sibirica</i>	48
<i>Aconitum lycoctonum</i>	43
<i>Cirsium heterophyllum</i> aggr.	42
<i>Pyrola rotundifolia</i>	41
<i>Linnaea borealis</i>	40
<i>Rubus saxatilis</i>	37
<i>Vicia sylvatica</i>	36
<i>Trientalis europaea</i>	36
<i>Paeonia anomala</i>	36
<i>Epilobium angustifolium</i>	34

<i>Geranium sylvaticum</i> aggr.	34
<i>Saussurea alpina</i> aggr.	32
<i>Carex vaginata</i>	30
<i>Salix recurvigemmata</i>	29
<i>Moehringia lateriflora</i>	29
<i>Trisetum sibiricum</i>	29
<i>Calamagrostis obtusata</i>	28
<i>Melica nutans</i>	27
<i>Thalictrum simplex</i>	27
<i>Galium boreale</i>	26
<i>Lonicera caerulea</i>	26
<i>Lycopodium annotinum</i>	26
<i>Rhytidiadelphus triquetrus</i>	26
<i>Conioselinum tataricum</i>	25
<i>Betula pubescens</i>	25
<i>Maianthemum bifolium</i>	24
<i>Rhodobryum roseum</i>	24
<i>Hylocomium splendens</i>	24
<i>Dicranum majus</i>	24
<i>Equisetum pratense</i>	23
<i>Picea obovata</i>	23
<i>Vaccinium vitis-idaea</i>	23
<i>Delphinium elatum</i>	22
<i>Daphne mezereum</i>	22
<i>Trollius europaeus</i>	22
<i>Cirriphyllum piliferum</i>	22
<i>Vicia sepium</i>	22
<i>Mnium laevinerve</i>	21
<i>Melanelia septentrionalis</i>	21
<i>Angelica sylvestris</i>	20
<i>Abies sibirica</i>	20
<i>Luzula pilosa</i>	20
<i>Usnea filipendula</i>	20
<i>Dicranum polysetum</i>	20
<i>Thalictrum minus</i>	20
<i>Milium effusum</i>	20
<i>Bryoria fuscescens</i>	20
<i>Ptilium crista-castrensis</i>	19
<i>Lactuca macrophylla</i>	19
<i>Lathyrus gmelinii</i>	19
<i>Solidago virgaurea</i>	19
<i>Orthodicranum flagellare</i>	19
<i>Hieracium pseudirectum</i>	19
<i>Stellaria bungeana</i>	19
<i>Oxalis acetosella</i>	19
<i>Buellia punctata</i>	18
<i>Valeriana wolgensis</i>	18
<i>Bryoria capillaris</i>	18
<i>Ditrichum heteromallum</i>	18
<i>Brachythecium salebrosum</i>	18
<i>Pleurozium schreberi</i>	17
<i>Ranunculus propinquus</i>	17
<i>Pulmonaria mollis</i>	17
<i>Parmeliopsis hyperopta</i>	17
<i>Paris quadrifolia</i>	17
<i>Parasenecio hastatus</i>	17
<i>Plagiothecium laetum</i>	16
<i>Lathyrus pratensis</i>	16
<i>Ochrolechia tartarea</i>	16

<i>Juniperus communis</i> subsp. <i>communis</i>	16
<i>Orthilia secunda</i>	15
<i>Pinus sibirica</i>	15
<i>Salix starkeana</i>	15

Constant species (percentage frequencies)

<i>Larix sibirica</i>	100
<i>Vaccinium vitis-idaea</i>	83
<i>Hylocomium splendens</i>	78
<i>Trientalis europaea</i>	74
<i>Epilobium angustifolium</i>	74
<i>Betula pubescens</i>	74
<i>Lathyrus vernus</i>	70
<i>Geranium sylvaticum</i> aggr.	70
<i>Clematis alpina</i>	70
<i>Rubus saxatilis</i>	65
<i>Rosa acicularis</i>	65
<i>Pleurozium schreberi</i>	65
<i>Vaccinium myrtillus</i>	61
<i>Linnaea borealis</i>	61
<i>Solidago virgaurea</i>	57
<i>Oxalis acetosella</i>	57
<i>Rhytidiadelphus triquetrus</i>	52
<i>Maianthemum bifolium</i>	52
<i>Juniperus communis</i> subsp. <i>communis</i>	52
<i>Aconitum lycoctonum</i>	52
<i>Sorbus aucuparia</i>	43
<i>Melica nutans</i>	43
<i>Luzula pilosa</i>	43
<i>Avenella flexuosa</i>	43
<i>Angelica sylvestris</i>	43
<i>Rubus arcticus</i>	39
<i>Pyrola rotundifolia</i>	39
<i>Lycopodium annotinum</i>	39
<i>Cirsium heterophyllum</i> aggr.	39
<i>Vicia sepium</i>	35
<i>Saussurea alpina</i> aggr.	35
<i>Daphne mezereum</i>	35
<i>Thalictrum minus</i>	30
<i>Picea abies</i>	30
<i>Milium effusum</i>	30
<i>Lathyrus pratensis</i>	30
<i>Galium boreale</i>	30
<i>Vicia sylvatica</i>	26
<i>Trollius europaeus</i>	26
<i>Ptilium crista-castrensis</i>	26
<i>Paris quadrifolia</i>	26
<i>Melampyrum pratense</i>	26
<i>Dicranum polysetum</i>	26
<i>Dicranum majus</i>	26
<i>Crepis sibirica</i>	26
<i>Carex vaginata</i>	26
<i>Populus tremula</i>	22
<i>Polytrichum commune</i>	22
<i>Poa nemoralis</i>	22
<i>Pinus sylvestris</i>	22
<i>Orthilia secunda</i>	22
<i>Lonicera caerulea</i>	22
<i>Gymnocarpium dryopteris</i>	22

<i>Equisetum pratense</i>	22
<i>Rhodobryum roseum</i>	17
<i>Melampyrum sylvaticum</i>	17
<i>Festuca ovina</i>	17
<i>Equisetum sylvaticum</i>	17
<i>Dicranum scoparium</i>	17
<i>Cirriphyllum piliferum</i>	17
<i>Carex digitata</i>	17
<i>Calamagrostis arundinacea</i>	17
<i>Anthriscus sylvestris</i>	17
<i>Veratrum lobelianum</i>	13
<i>Thalictrum simplex</i>	13
<i>Stellaria nemorum</i>	13
<i>Stellaria holostea</i>	13
<i>Rubus idaeus</i>	13
<i>Ribes rubrum</i> aggr.	13
<i>Plagiothecium laetum</i>	13
<i>Picea obovata</i>	13
<i>Paeonia anomala</i>	13
<i>Hieracium lachenalii</i>	13
<i>Geum rivale</i>	13
<i>Fragaria vesca</i>	13
<i>Filipendula ulmaria</i>	13
<i>Elymus caninus</i>	13
<i>Dicranum fuscescens</i>	13
<i>Calamagrostis epigejos</i>	13
<i>Brachythecium salebrosum</i>	13
<i>Betula pendula</i>	13

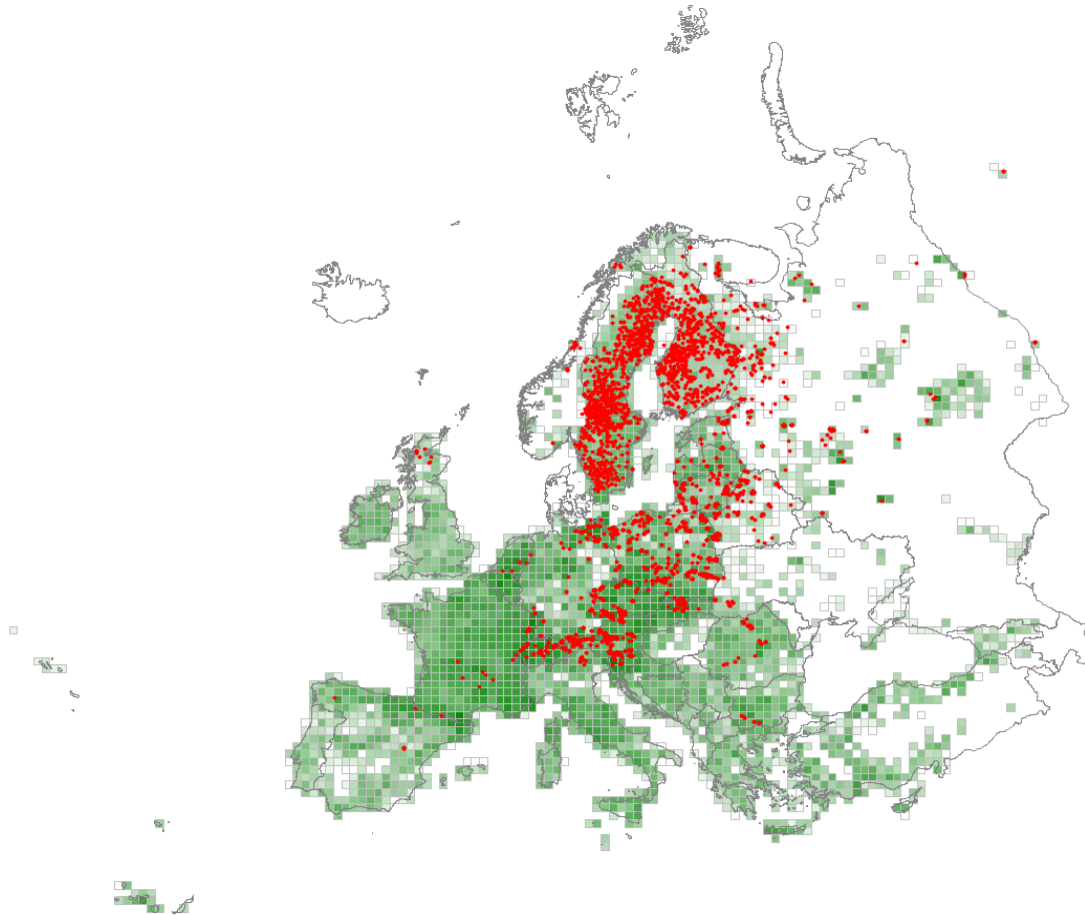
Dominant species (percentage frequencies of occurrences with cover > 25%)

<i>Larix sibirica</i>	91
<i>Hylocomium splendens</i>	52
<i>Pleurozium schreberi</i>	26
<i>Rhytidiadelphus triquetrus</i>	13
<i>Vaccinium vitis-idaea</i>	9
<i>Vaccinium myrtillus</i>	9
<i>Picea abies</i>	9
<i>Oxalis acetosella</i>	9
<i>Maianthemum bifolium</i>	9
<i>Juniperus communis</i> subsp. <i>communis</i>	9



## T3J – *Pinus* and *Larix* mire forest

Open woodland dominated by pine (*Pinus mugo* subsp. *rotundata*, *Pinus sylvestris*) or larch (*Larix decidua*, *L. sibirica*) on acid peat or around active bogs and poor fens with nutrient-poor ground waters occurring through the boreal zone and locally, where ground conditions permit, in the continental zone.



### Corresponding alliances in EuroVegChecklist 2016

- <> OXY-02B Sphagnion medii Kästner et Flössner 1933
- > PIC-07A Vaccinio uliginosi-Pinion sylvestris Passarge 1968

### Characteristic species combination

Diagnostic species (phi coefficient \* 100)

<i>Eriophorum vaginatum</i>	35
<i>Andromeda polifolia</i>	30
<i>Rhododendron tomentosum</i>	29
<i>Vaccinium uliginosum</i>	27
<i>Pinus sylvestris</i>	25
<i>Rubus chamaemorus</i>	24
<i>Vaccinium oxycoccus</i>	23
<i>Sphagnum magellanicum</i> aggr.	23
<i>Carex globularis</i>	22
<i>Sphagnum recurvum</i> aggr.	22
<i>Aulacomnium palustre</i>	20

<i>Pleurozium schreberi</i>	20
<i>Betula nana</i>	19
<i>Sphagnum fuscum</i>	19
<i>Empetrum nigrum</i> aggr.	18
<i>Betula pubescens</i>	18
<i>Polytrichum strictum</i>	18
<i>Chamaedaphne calyculata</i>	18
<i>Vaccinium microcarpum</i>	18
<i>Carex pauciflora</i>	17
<i>Vaccinium vitis-idaea</i>	16

Constant species (percentage frequencies)

<i>Pinus sylvestris</i>	91
<i>Eriophorum vaginatum</i>	75
<i>Pleurozium schreberi</i>	73
<i>Vaccinium uliginosum</i>	70
<i>Vaccinium myrtillus</i>	65
<i>Vaccinium vitis-idaea</i>	61
<i>Andromeda polifolia</i>	60
<i>Calluna vulgaris</i>	56
<i>Empetrum nigrum</i> aggr.	55
<i>Betula pubescens</i>	54
<i>Picea abies</i>	53
<i>Rubus chamaemorus</i>	46
<i>Rhododendron tomentosum</i>	45
<i>Sphagnum recurvum</i> aggr.	41
<i>Aulacomnium palustre</i>	40
<i>Vaccinium oxycoccus</i>	39
<i>Betula nana</i>	37
<i>Sphagnum magellanicum</i> aggr.	33
<i>Polytrichum strictum</i>	30
<i>Hylocomium splendens</i>	30
<i>Polytrichum commune</i>	29
<i>Carex globularis</i>	22
<i>Sphagnum fuscum</i>	20
<i>Melampyrum pratense</i>	20
<i>Molinia caerulea</i> aggr.	19
<i>Sphagnum capillifolium</i> aggr.	18
<i>Cladonia rangiferina</i>	18
<i>Drosera rotundifolia</i>	17
<i>Vaccinium microcarpum</i>	16
<i>Cladonia arbuscula</i> aggr.	15
<i>Carex pauciflora</i>	15
<i>Avenella flexuosa</i>	14
<i>Sorbus aucuparia</i>	12
<i>Juniperus communis</i> subsp. <i>communis</i>	12
<i>Chamaedaphne calyculata</i>	12
<i>Dicranum scoparium</i>	12
<i>Dicranum polysetum</i>	12
<i>Betula pendula</i>	12
<i>Sphagnum russowii</i>	11
<i>Eriophorum angustifolium</i>	11

Dominant species (percentage frequencies of occurrences with cover > 25%)

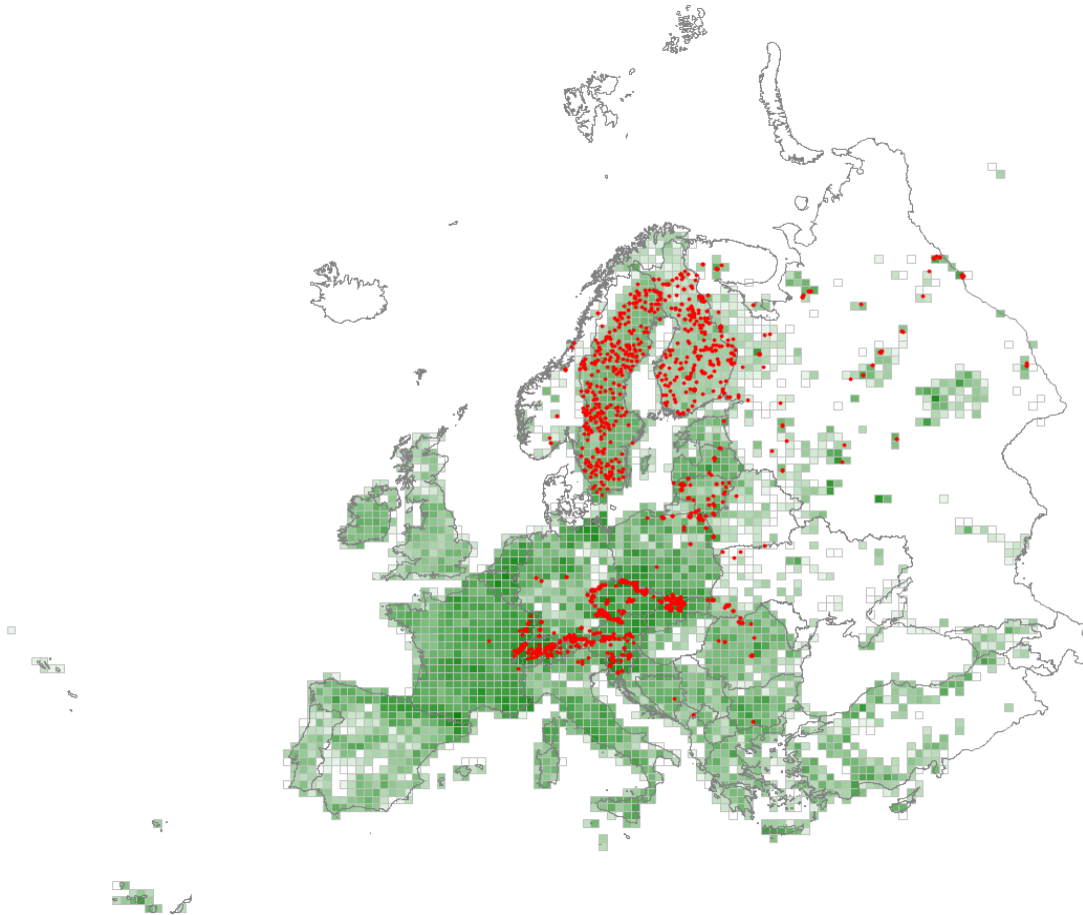
<i>Pinus sylvestris</i>	61
<i>Sphagnum recurvum</i> aggr.	20
<i>Vaccinium myrtillus</i>	12
<i>Pleurozium schreberi</i>	11
<i>Sphagnum fuscum</i>	10

<i>Eriophorum vaginatum</i>	10
<i>Sphagnum magellanicum</i> aggr.	8
<i>Pinus mugo</i> subsp. <i>mugo</i>	8
<i>Rhododendron tomentosum</i>	7
<i>Sphagnum capillifolium</i> aggr.	6
<i>Calluna vulgaris</i>	6
<i>Vaccinium uliginosum</i>	5

## T3K – *Picea* mire forest

Open woodland dominated by spruce (*Picea abies* or *P. obovata*) on acid peat or around active bogs and poor fens with nutrient-poor ground waters occurring through the boreal zone and locally, where ground conditions permit, in the continental zone.

**Remark:** Mire forests occurring in ombrotrophic conditions and those occurring in minerotrophic conditions (in fens or at sites influenced by spring water) can be considered as two different habitats characterised by a different floristic composition of the herb layer. This distinction can be seen not only within spruce forests but also within pine forests and larch forests.



### Corresponding alliances in EuroVegChecklist 2016

- > PIC-08A Calamagrostio canescentis-Piceion abietis Solomeshch in Willner et al. 2015
- > PIC-07B Eriophoro-Piceion abietis Passarge 1968

### Characteristic species combination

Diagnostic species (phi coefficient \* 100)

<i>Sphagnum girgensohnii</i>	37
<i>Carex globularis</i>	29
<i>Picea abies</i>	27
<i>Polytrichum commune</i>	27
<i>Equisetum sylvaticum</i>	24
<i>Vaccinium vitis-idaea</i>	22
<i>Vaccinium myrtillus</i>	21

<i>Pleurozium schreberi</i>	20
<i>Betula pubescens</i>	20
<i>Bazzania trilobata</i>	19
<i>Hylocomium splendens</i>	19
<i>Trientalis europaea</i>	17
<i>Lycopodium annotinum</i>	17
<i>Sphagnum russowii</i>	17
<i>Neottia cordata</i>	17

Constant species (percentage frequencies)

<i>Picea abies</i>	98
<i>Vaccinium myrtillus</i>	92
<i>Vaccinium vitis-idaea</i>	80
<i>Pleurozium schreberi</i>	73
<i>Hylocomium splendens</i>	62
<i>Polytrichum commune</i>	60
<i>Betula pubescens</i>	59
<i>Sorbus aucuparia</i>	51
<i>Avenella flexuosa</i>	42
<i>Pinus sylvestris</i>	41
<i>Trientalis europaea</i>	37
<i>Equisetum sylvaticum</i>	37
<i>Sphagnum girgensohnii</i>	34
<i>Dicranum scoparium</i>	33
<i>Maianthemum bifolium</i>	29
<i>Eriophorum vaginatum</i>	29
<i>Carex globularis</i>	29
<i>Vaccinium uliginosum</i>	28
<i>Rubus chamaemorus</i>	28
<i>Sphagnum recurvum</i> aggr.	27
<i>Melampyrum pratense</i>	27
<i>Lycopodium annotinum</i>	26
<i>Aulacomnium palustre</i>	26
<i>Empetrum nigrum</i> aggr.	25
<i>Oxalis acetosella</i>	22
<i>Linnaea borealis</i>	22
<i>Luzula pilosa</i>	20
<i>Juniperus communis</i> subsp. <i>communis</i>	19
<i>Calluna vulgaris</i>	18
<i>Sphagnum russowii</i>	17
<i>Sphagnum magellanicum</i> aggr.	17
<i>Sphagnum capillifolium</i> aggr.	16
<i>Solidago virgaurea</i>	16
<i>Orthilia secunda</i>	16
<i>Gymnocarpium dryopteris</i>	16
<i>Dryopteris carthusiana</i>	16
<i>Potentilla erecta</i>	15
<i>Polytrichastrum formosum</i>	15
<i>Molinia caerulea</i> aggr.	15
<i>Ptilium crista-castrensis</i>	14
<i>Dicranum polysetum</i>	14
<i>Frangula alnus</i>	13
<i>Dryopteris dilatata</i>	13
<i>Deschampsia cespitosa</i> aggr.	13
<i>Carex echinata</i>	13
<i>Calamagrostis villosa</i>	13
<i>Sphagnum palustre</i> aggr.	12
<i>Neottia cordata</i>	12
<i>Andromeda polifolia</i>	12

<i>Rhododendron tomentosum</i>	11
<i>Homogyne alpina</i>	11
<i>Epilobium angustifolium</i>	11
<i>Carex nigra</i>	11
<i>Bazzania trilobata</i>	11

Dominant species (percentage frequencies of occurrences with cover > 25%)

<i>Picea abies</i>	80
<i>Vaccinium myrtillus</i>	26
<i>Sphagnum girgensohnii</i>	22
<i>Sphagnum recurvum</i> aggr.	9
<i>Polytrichum commune</i>	8
<i>Pleurozium schreberi</i>	8
<i>Sphagnum capillifolium</i> aggr.	6
<i>Hylocomium splendens</i>	5

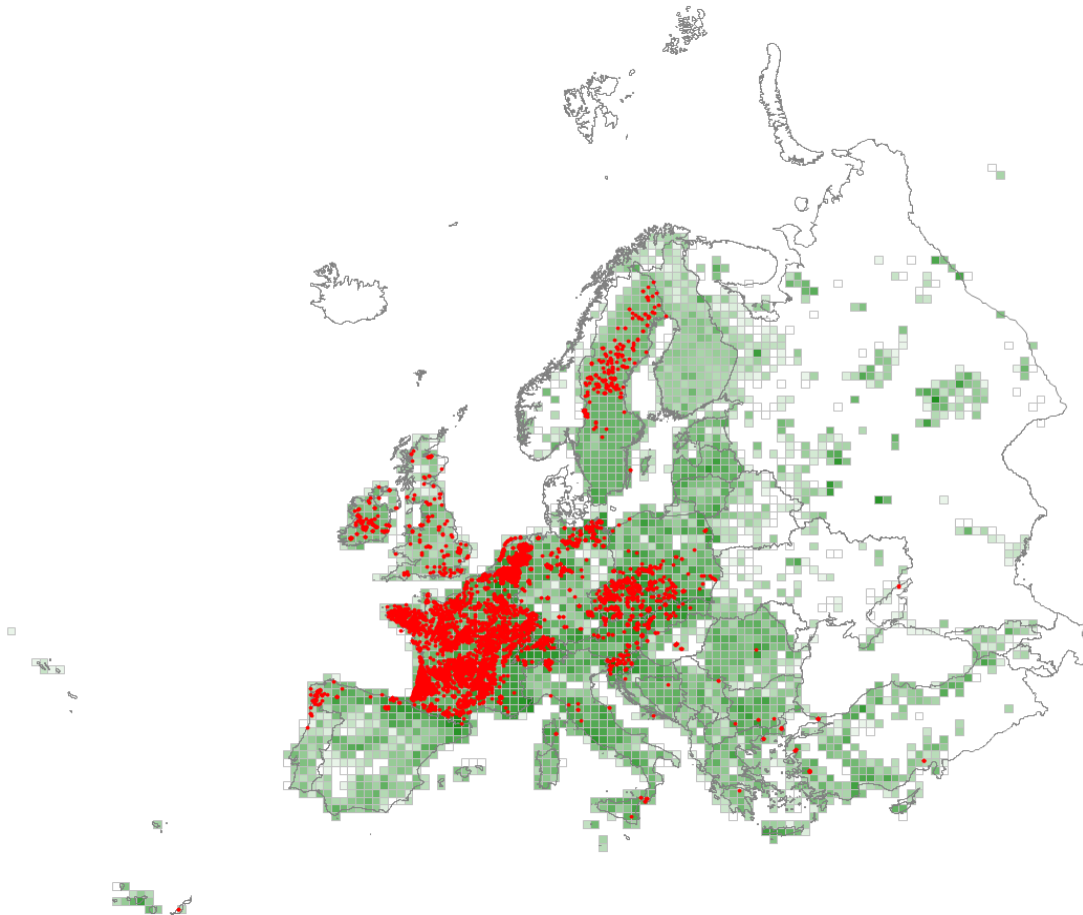
### **T3L – Coniferous self-sown forest of non site-native trees**

[This habitat could not be formally defined in the expert system, because self-sown forests cannot be distinguished from plantations based on the vegetation-plot data.]

Spontaneously established forests composed of exotic conifer species or of European conifers out of their natural range.

### T3M – Coniferous plantation of non site-native trees

Cultivated stands of coniferous trees planted for the production of wood, composed of exotic conifer species or of European conifers out of their natural range.



#### Characteristic species combination

Diagnostic species (phi coefficient \* 100)

<i>Pseudotsuga menziesii</i>	34
<i>Rubus fruticosus</i> aggr.	16
<i>Pinus contorta</i>	16

Constant species (percentage frequencies)

<i>Rubus fruticosus</i> aggr.	59
<i>Quercus robur</i>	39
<i>Pteridium aquilinum</i>	35
<i>Pinus sylvestris</i>	33
<i>Avenella flexuosa</i>	33
<i>Betula pendula</i>	32
<i>Picea abies</i>	30
<i>Hedera helix</i> aggr.	30
<i>Pseudoscleropodium purum</i>	29
<i>Polytrichastrum formosum</i>	27
<i>Frangula alnus</i>	26
<i>Sorbus aucuparia</i>	25
<i>Lonicera periclymenum</i>	25
<i>Fagus sylvatica</i>	25
<i>Molinia caerulea</i> aggr.	24



<i>Calluna vulgaris</i>	24
<i>Pseudotsuga menziesii</i>	22
<i>Dicranum scoparium</i>	22
<i>Corylus avellana</i>	22
<i>Ilex aquifolium</i>	21
<i>Vaccinium myrtillus</i>	19
<i>Teucrium scorodonia</i>	19
<i>Pinus pinaster</i>	19
<i>Castanea sativa</i>	19
<i>Thuidium tamariscinum</i>	18
<i>Hypnum cupressiforme</i> aggr.	18
<i>Dryopteris carthusiana</i>	18
<i>Crataegus monogyna</i>	18
<i>Cytisus scoparius</i>	17
<i>Quercus petraea</i>	16
<i>Fraxinus excelsior</i>	16
<i>Dryopteris dilatata</i>	16
<i>Pleurozium schreberi</i>	15
<i>Ulex europaeus</i>	14
<i>Rubus idaeus</i>	14
<i>Dryopteris filix-mas</i>	14
<i>Carex pilulifera</i>	14
<i>Sambucus nigra</i>	13
<i>Pinus nigra</i>	13
<i>Oxalis acetosella</i>	13
<i>Erica cinerea</i>	12
<i>Carpinus betulus</i>	12
<i>Abies alba</i>	12
<i>Salix caprea</i>	11
<i>Prunus avium</i>	11
<i>Fragaria vesca</i>	11
<i>Dactylis glomerata</i>	11
<i>Acer pseudoplatanus</i>	11

Dominant species (percentage frequencies of occurrences with cover > 25%)

<i>Picea abies</i>	23
<i>Pseudotsuga menziesii</i>	18
<i>Pinus pinaster</i>	18
<i>Pinus sylvestris</i>	17
<i>Rubus fruticosus</i> aggr.	16
<i>Pteridium aquilinum</i>	16
<i>Pseudoscleropodium purum</i>	11
<i>Pinus nigra</i>	11
<i>Molinia caerulea</i> aggr.	10
<i>Hedera helix</i> aggr.	7
<i>Avenella flexuosa</i>	6

### **T3N – Coniferous plantation of site-native trees**

[This habitat could not be formally defined in the expert system, because plantations of site-native trees cannot be distinguished from natural forests based on the vegetation-plot data.]

Cultivated stands of coniferous trees planted for the production of wood, composed of site-native conifer species.

## **T41 – Early-stage natural and semi-natural forest and regrowth**

[This habitat could not be formally defined in the expert system, because successional stage is in most cases impossible to identify from the vegetation-plot data.]

Early stages of forest regrowth or newly-colonising forest composed predominantly of young individuals of high-forest species that are still less than 5 m in height. Includes young native forest replanted with indigenous trees and naturally-colonising stands of non-native trees.

## **T42 – Coppice and early-stage plantation**

[This habitat could not be formally defined in the expert system, because coppice management or early-stage plantation is impossible to identify from the vegetation-plot data.]

Forest treated as coppice without standards. Plantations with a dominant canopy of young trees that are still less than 5 m in height. Plantations of dwarf trees or shrubs cultivated for wood or small-tree production, with a regular whole-plant harvesting regime, including short-rotation *Salix* beds for biomass production, Christmas tree crops and tree nurseries.

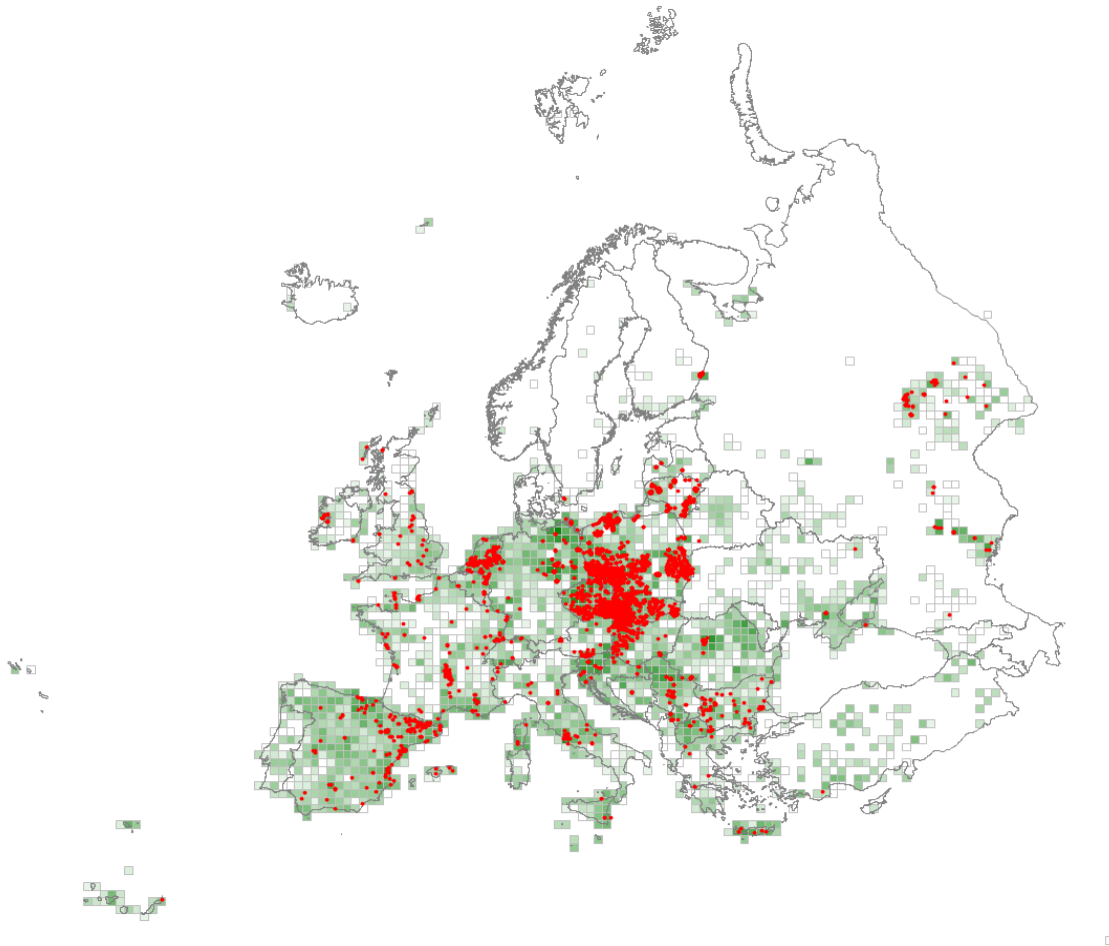
## **T43 – Recently felled areas**

[This habitat could not be formally defined in the expert system, because it cannot be distinguished from various shrubland habitats based on the vegetation-plot data.]

Clear-felled or burnt land that has previously supported a deciduous or coniferous forest. Includes forest with successional vegetation dominated by shrubs provided that these will soon be overtopped by a tree canopy. Clearings with herbaceous vegetation are considered part of R57 Herbaceous forest clearing vegetation although that may be a temporary stage before tree cover returns.

## V11 – Intensive unmixed crops

Cereal and other non-woody crops grown on large, unbroken surfaces in open field landscapes.



### Corresponding alliances in EuroVegChecklist 2016

- <> PAR-02E Anthemido ruthenicae-Sisymbrium orientalis V. Solomakha 1990
- <> PAR-02A Caucalidion lappulae von Rochow 1951
- <> DIG-01B Eragrostion Tx. in Oberd. 1954
- <> PAR-02H Erysimo repandi-Lycopsion orientalis V. Solomakha 1996
- <> PAR-01C Galeopsion bifidae Abramova in Mirkin et al. 1985
- <> PAR-02G Chenopodio albi-Descurainion sophiae V. Solomakha et al. in V. Solomakha 1988
- <> PAR-02I Lactucion tataricae Rudakov in Mirkin et al. 1985
- <> PAR-01B Oxalidion europeae Passarge 1978
- <> PAR-01A Scleranthion annui (Kruseman et Vlieger 1939) Sissingh in Westhoff et al. 1946
- <> DIG-01A Spergulo arvensis-Erodion cicutariae J.Tx. in Passarge 1964
- <> ART-03E Trifolio-Medicaginion sativae Balázs 1944
- <> PAR-02C Veronico-Euphorbion Sissingh in Passarge 1964

### Characteristic species combination

Diagnostic species (phi coefficient \* 100)

<i>Viola arvensis</i>	27
<i>Fallopia convolvulus</i>	25

<i>Triticum aestivum</i>	25
<i>Secale cereale</i>	24
<i>Chenopodium album</i> aggr.	21
<i>Hordeum vulgare</i>	21
<i>Thlaspi arvense</i>	21
<i>Veronica persica</i>	20
<i>Myosotis arvensis</i>	20
<i>Tripleurospermum maritimum</i> aggr.	20
<i>Apera spica-venti</i>	20
<i>Stellaria media</i>	19
<i>Capsella bursa-pastoris</i>	19
<i>Spergula arvensis</i>	19
<i>Cyanus segetum</i>	19
<i>Lamium purpureum</i>	17
<i>Solanum tuberosum</i>	17
<i>Cirsium arvense</i>	17
<i>Brassica napus</i>	16
<i>Avena sativa</i>	16
<i>Vicia hirsuta</i>	15

Constant species (percentage frequencies)

<i>Chenopodium album</i> aggr.	49
<i>Viola arvensis</i>	44
<i>Stellaria media</i>	44
<i>Fallopia convolvulus</i>	44
<i>Elytrigia repens</i> aggr.	43
<i>Cirsium arvense</i>	43
<i>Capsella bursa-pastoris</i>	40
<i>Tripleurospermum maritimum</i> aggr.	39
<i>Polygonum aviculare</i> aggr.	39
<i>Convolvulus arvensis</i>	32
<i>Equisetum arvense</i>	28
<i>Myosotis arvensis</i>	27
<i>Galium aparine</i>	26
<i>Apera spica-venti</i>	26
<i>Veronica persica</i>	25
<i>Persicaria lapathifolia</i>	24
<i>Taraxacum</i> sect. <i>Taraxacum</i>	23
<i>Cyanus segetum</i>	22
<i>Vicia sativa</i>	21
<i>Veronica arvensis</i>	21
<i>Achillea millefolium</i> aggr.	21
<i>Triticum aestivum</i>	20
<i>Spergula arvensis</i>	20
<i>Secale cereale</i>	20
<i>Lamium purpureum</i>	20
<i>Vicia hirsuta</i>	19
<i>Thlaspi arvense</i>	19
<i>Scleranthus annuus</i>	19
<i>Anagallis arvensis</i>	19
<i>Sonchus arvensis</i>	18
<i>Rumex acetosella</i>	18
<i>Plantago major</i>	18
<i>Galeopsis tetrahit</i> aggr.	18
<i>Persicaria maculosa</i>	16
<i>Papaver rhoeas</i>	16
<i>Ochlopoa annua</i>	16
<i>Echinochloa crus-galli</i>	16
<i>Solanum tuberosum</i>	15

<i>Euphorbia helioscopia</i>	15
<i>Artemisia vulgaris</i>	14
<i>Trifolium repens</i>	13
<i>Sinapis arvensis</i>	13
<i>Mentha arvensis</i>	13
<i>Lamium amplexicaule</i>	13
<i>Hordeum vulgare</i>	13
<i>Stachys palustris</i>	12
<i>Setaria pumila</i>	12
<i>Raphanus raphanistrum</i>	12
<i>Ranunculus repens</i>	12
<i>Galinsoga parviflora</i>	12
<i>Lapsana communis</i>	11
<i>Erodium cicutarium</i>	11

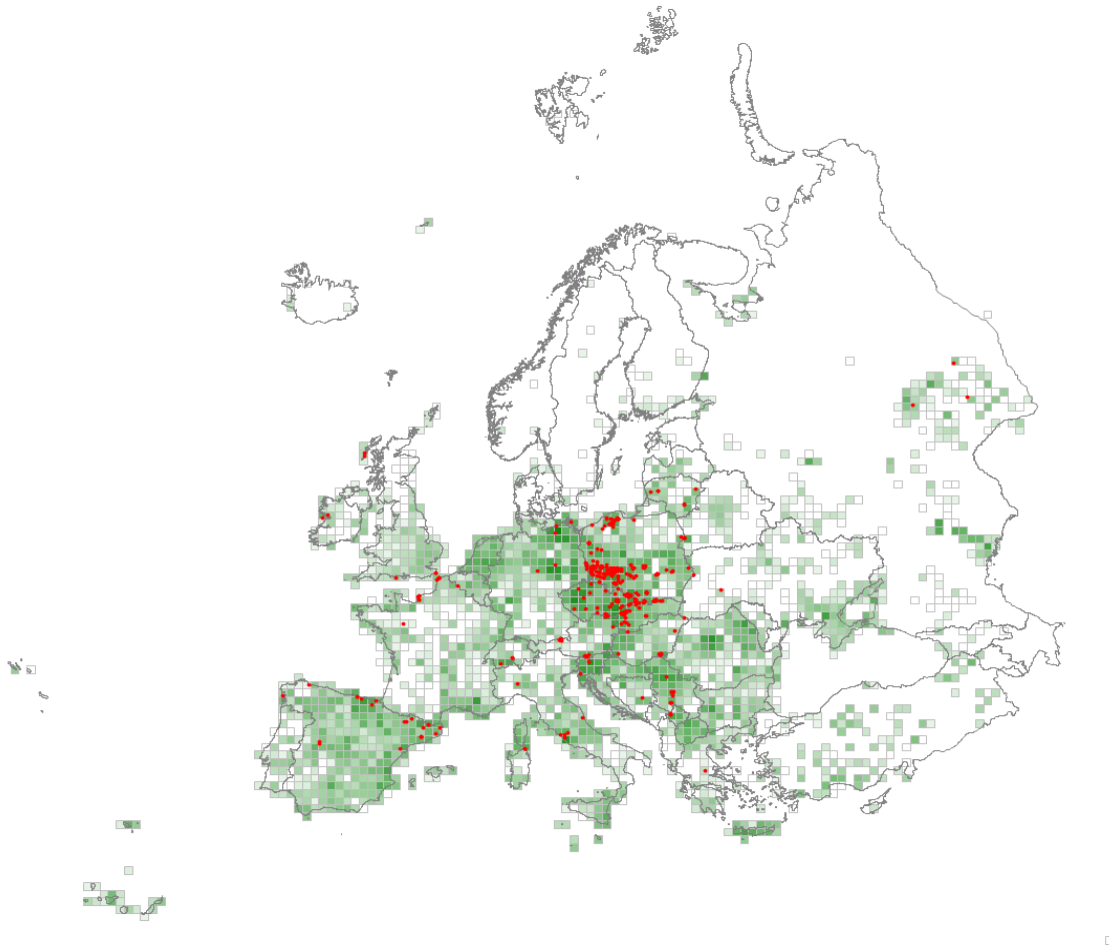
Dominant species (percentage frequencies of occurrences with cover > 25%)

<i>Triticum aestivum</i>	15
<i>Secale cereale</i>	15
<i>Solanum tuberosum</i>	12
<i>Hordeum vulgare</i>	8



## V12 – Mixed crops of market gardens and horticulture

Intensive cultivation of vegetables, flowers, small fruits, usually in alternating strips of different crops. Includes allotments and small-scale market gardens.



### Corresponding alliances in EuroVegChecklist 2016

- <> DIG-01B Eragrostion Tx. in Oberd. 1954
- <> PAR-03D Fumarion wirtgenii-agrariae S. Brullo in S. Brullo et Marcenò 1985
- <> PAR-01C Galeopsion bifidae Abramova in Mirkin et al. 1985
- <> PAR-02D Matricario chamomillae-Chenopodion albi Timár 1954
- <> PAR-01B Oxalidion europeae Passarge 1978
- <> PAR-03A Ridolfion segeti Nègre ex Rivas-Mart. et al. 1999
- <> PAR-03B Roemerion hybridae Rivas-Mart., Fernández-González et Loidi in Loidi et al. 1997
- <> PAR-03C Rumicion bucephalophori Nezdal 1989
- <> PAR-01A Scleranthion annui (Kruseman et Vlieger 1939) Sissingh in Westhoff et al. 1946
- <> DIG-01A Spergulo arvensis-Erodion cicutariae J.Tx. in Passarge 1964
- <> PAR-02C Veronico-Euphorbion Sissingh in Passarge 1964

### Characteristic species combination

Diagnostic species (phi coefficient \* 100)

<i>Solanum tuberosum</i>	55
<i>Galinsoga quadriradiata</i>	38
<i>Galinsoga parviflora</i>	36

<i>Beta vulgaris</i> subsp. <i>vulgaris</i>	35
<i>Armoracia rusticana</i>	34
<i>Chenopodium album</i> aggr.	34
<i>Zea mays</i>	31
<i>Veronica persica</i>	28
<i>Brassica rapa</i>	28
<i>Fallopia convolvulus</i>	28
<i>Lamium purpureum</i>	27
<i>Persicaria lapathifolia</i>	26
<i>Persicaria maculosa</i>	26
<i>Helianthus annuus</i>	24
<i>Papaver somniferum</i>	24
<i>Stellaria media</i>	23
<i>Euphorbia helioscopia</i>	23
<i>Raphanus sativus</i>	23
<i>Thlaspi arvense</i>	22
<i>Cucurbita pepo</i>	22
<i>Viola arvensis</i>	22
<i>Myosotis arvensis</i>	22
<i>Capsella bursa-pastoris</i>	21
<i>Setaria pumila</i>	20
<i>Echinochloa crus-galli</i>	20
<i>Sonchus arvensis</i>	20
<i>Cirsium arvense</i>	20
<i>Tripleurospermum maritimum</i> aggr.	19
<i>Anethum graveolens</i>	19
<i>Sinapis arvensis</i>	19
<i>Erysimum cheiranthoides</i>	19
<i>Amaranthus retroflexus</i>	18
<i>Oxalis stricta</i>	17
<i>Spergula arvensis</i>	17
<i>Equisetum arvense</i>	17
<i>Setaria viridis</i>	16
<i>Atriplex patula</i>	16
<i>Polygonum aviculare</i> aggr.	16
<i>Geranium pusillum</i>	16
<i>Brassica oleracea</i>	15
<i>Mentha arvensis</i>	15

Constant species (percentage frequencies)

<i>Chenopodium album</i> aggr.	77
<i>Stellaria media</i>	52
<i>Cirsium arvense</i>	50
<i>Fallopia convolvulus</i>	49
<i>Solanum tuberosum</i>	47
<i>Elytrigia repens</i> aggr.	47
<i>Persicaria lapathifolia</i>	45
<i>Capsella bursa-pastoris</i>	44
<i>Polygonum aviculare</i> aggr.	41
<i>Daucus carota</i>	40
<i>Tripleurospermum maritimum</i> aggr.	37
<i>Equisetum arvense</i>	37
<i>Echinochloa crus-galli</i>	37
<i>Convolvulus arvensis</i>	37
<i>Viola arvensis</i>	36
<i>Persicaria maculosa</i>	35
<i>Veronica persica</i>	34
<i>Galinsoga parviflora</i>	34
<i>Lamium purpureum</i>	30

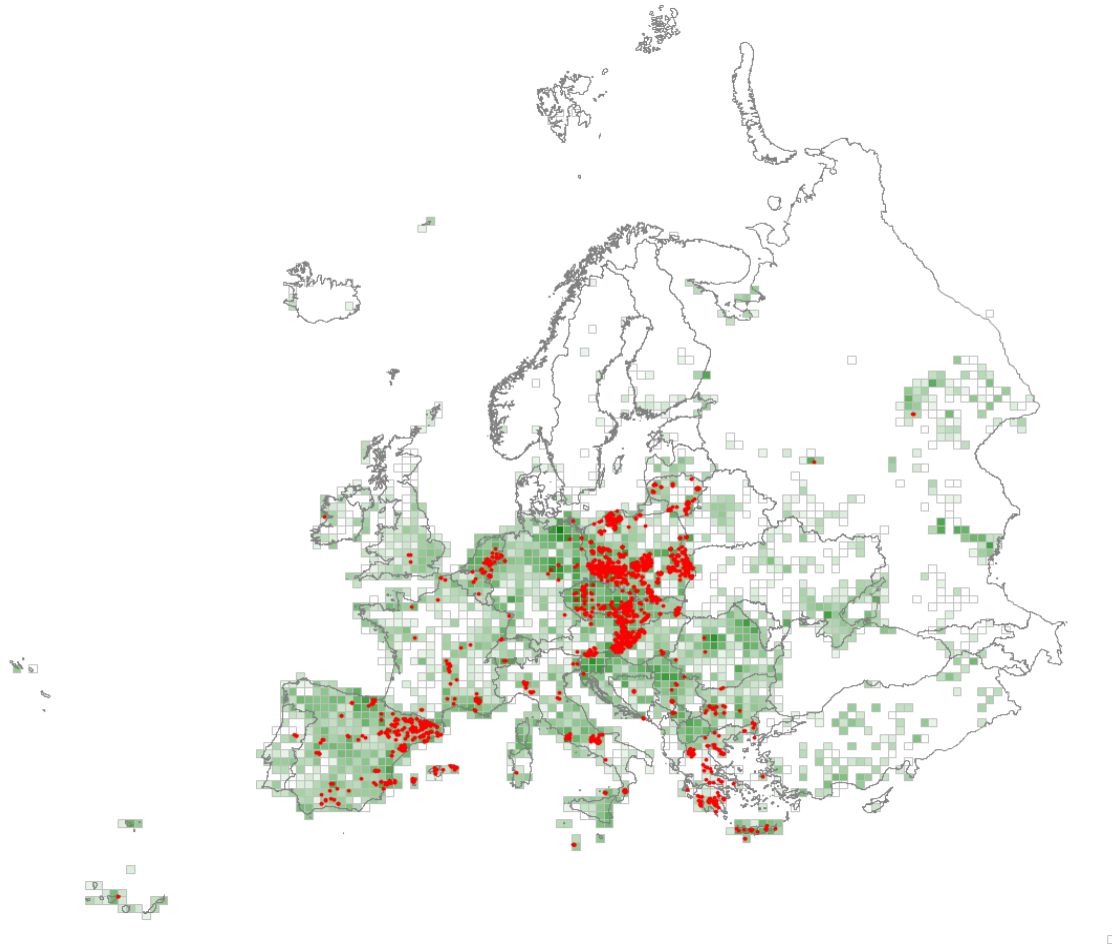
<i>Myosotis arvensis</i>	29
<i>Sonchus arvensis</i>	28
<i>Galinsoga quadriradiata</i>	27
<i>Euphorbia helioscopia</i>	26
<i>Taraxacum</i> sect. <i>Taraxacum</i>	25
<i>Galium aparine</i>	25
<i>Plantago major</i>	24
<i>Galeopsis tetrahit</i> aggr.	23
<i>Beta vulgaris</i> subsp. <i>vulgaris</i>	23
<i>Setaria pumila</i>	22
<i>Thlaspi arvense</i>	21
<i>Achillea millefolium</i> aggr.	21
<i>Sonchus oleraceus</i>	20
<i>Sinapis arvensis</i>	20
<i>Mentha arvensis</i>	20
<i>Anagallis arvensis</i>	20
<i>Sonchus asper</i>	19
<i>Ranunculus repens</i>	19
<i>Amaranthus retroflexus</i>	19
<i>Spergula arvensis</i>	18
<i>Setaria viridis</i>	18
<i>Armoracia rusticana</i>	18
<i>Vicia hirsuta</i>	17
<i>Stachys palustris</i>	17
<i>Raphanus raphanistrum</i>	17
<i>Ochlopoa annua</i>	17
<i>Cyanus segetum</i>	16
<i>Atriplex patula</i>	16
<i>Trifolium repens</i>	15
<i>Artemisia vulgaris</i>	15
<i>Zea mays</i>	14
<i>Rumex crispus</i>	14
<i>Lapsana communis</i>	14
<i>Gnaphalium uliginosum</i>	14
<i>Erysimum cheiranthoides</i>	14
<i>Vicia sativa</i>	13
<i>Rumex acetosella</i>	13
<i>Geranium pusillum</i>	13
<i>Erodium cicutarium</i>	13
<i>Silene latifolia</i>	12
<i>Lipandra polysperma</i>	12
<i>Veronica arvensis</i>	11
<i>Plantago lanceolata</i>	11
<i>Oxalis stricta</i>	11
<i>Lamium amplexicaule</i>	11
<i>Brassica rapa</i>	11
<i>Argentina anserina</i>	11
<i>Anthemis arvensis</i>	11

Dominant species (percentage frequencies of occurrences with cover > 25%)

<i>Solanum tuberosum</i>	27
<i>Beta vulgaris</i> subsp. <i>vulgaris</i>	16
<i>Zea mays</i>	11

## V13 – Arable land with unmixed crops grown by low-intensity agricultural methods

Traditionally and extensively cultivated crops, in particular, of cereals, harbouring a rich and threatened flora of field weeds including *Agrostemma githago*, *Calendula arvensis*, *Cyanus segetum*, *Glebionis segetum*, *Legousia speculum-veneris*, *Adonis* spp., *Consolida* spp., *Nigella* spp. and *Papaver* spp.



### Corresponding alliances in EuroVegChecklist 2016

- <> ART-03F Achilleion millefolii Abramova et Rudakov in Mirkin et al. 1985
- <> PAR-02E Anthemido ruthenicae-Sisymbrium orientalis V. Solomakha 1990
- <> PAR-02A Caucalidion lappulae von Rochow 1951
- <> DIG-01C Consolido-Eragrostion poididis Soó et Timár in Timár 1957
- <> DIG-01D Diplotaxidion erucoidis Br.-Bl. in Br.-Bl. et al. 1936
- <> DIG-01B Eragrostion Tx. in Oberd. 1954
- <> PAR-02H Erysimo repandi-Lycopsion orientalis V. Solomakha 1996
- <> PAR-03D Fumarion wirtgenii-agrariae S. Brullo in S. Brullo et Marcenò 1985
- <> PAR-01C Galeopsion bifidae Abramova in Mirkin et al. 1985
- <> PAR-02G Chenopodio albi-Descurainion sophiae V. Solomakha et al. in V. Solomakha 1988
- <> DIG-01E Chenopodion botryos S. Brullo et Marcenò 1980
- <> PAR-02I Lactucion tataricae Rudakov in Mirkin et al. 1985
- <> PAR-02F Lamio amplexicaule-Calepinion irregularis Bagrikova 1996
- <> PAR-02B Linion Rothmaler 1944
- <> PAR-02D Matricario chamomillae-Chenopodion albi Timár 1954
- <> PAR-01B Oxalidion europeae Passarge 1978
- <> PAR-03A Ridolfion segeti Nègre ex Rivas-Mart. et al. 1999

- <> PAR-03B Roemerion hybridae Rivas-Mart., Fernández-González et Loidi in Loidi et al. 1997
- <> PAR-03C Rumicion bucephalophori Nezadal 1989
- <> PAR-01A Scleranthion annui (Kruseman et Vlieger 1939) Sissingh in Westhoff et al. 1946
- <> DIG-01A Spergulo arvensis-Erodion cicutariae J.Tx. in Passarge 1964
- <> ART-03E Trifolio-Medicaginion sativae Balázs 1944
- <> PAR-02C Veronico-Euphorbion Sissingh in Passarge 1964

### Characteristic species combination

Diagnostic species (phi coefficient \* 100)

<i>Cyanus segetum</i>	49
<i>Secale cereale</i>	44
<i>Viola arvensis</i>	36
<i>Fallopia convolvulus</i>	31
<i>Triticum aestivum</i>	31
<i>Papaver rhoeas</i>	31
<i>Apera spica-venti</i>	29
<i>Scleranthus annuus</i>	28
<i>Hordeum vulgare</i>	27
<i>Agrostemma githago</i>	27
<i>Ranunculus arvensis</i>	27
<i>Anthemis arvensis</i>	26
<i>Raphanus raphanistrum</i>	26
<i>Papaver argemone</i>	26
<i>Aphanes arvensis</i>	25
<i>Myosotis arvensis</i>	24
<i>Buglossoides arvensis</i>	23
<i>Avena sativa</i>	23
<i>Silene noctiflora</i>	23
<i>Vicia hirsuta</i>	22
<i>Vicia sativa</i>	22
<i>Consolida regalis</i>	22
<i>Neslia paniculata</i>	21
<i>Galium tricornutum</i>	20
<i>Veronica persica</i>	20
<i>Spargula arvensis</i>	19
<i>Convolvulus arvensis</i>	19
<i>Sinapis arvensis</i>	18
<i>Polygonum aviculare</i> aggr.	18
<i>Capsella bursa-pastoris</i>	18
<i>Bifora testiculata</i>	18
<i>Stellaria media</i>	18
<i>Cota austriaca</i>	18
<i>Cirsium arvense</i>	18
<i>Chenopodium album</i> aggr.	18
<i>Veronica hederifolia</i>	18
<i>Veronica arvensis</i>	17
<i>Tripleurospermum maritimum</i> aggr.	17
<i>Anagallis arvensis</i>	17
<i>Thlaspi arvense</i>	16
<i>Stachys annua</i>	16
<i>Bromus secalinus</i>	15
<i>Vicia tetrasperma</i>	15
<i>Valerianella dentata</i>	15
<i>Triticosecale rimpai</i>	15
<i>Arabidopsis thaliana</i>	15

Constant species (percentage frequencies)

<i>Viola arvensis</i>	59
<i>Cyanus segetum</i>	55
<i>Fallopia convolvulus</i>	54
<i>Convolvulus arvensis</i>	51
<i>Polygonum aviculare</i> aggr.	47
<i>Cirsium arvense</i>	46
<i>Papaver rhoeas</i>	42
<i>Elytrigia repens</i> aggr.	42
<i>Stellaria media</i>	41
<i>Chenopodium album</i> aggr.	41
<i>Vicia sativa</i>	38
<i>Capsella bursa-pastoris</i>	38
<i>Apera spica-venti</i>	38
<i>Secale cereale</i>	36
<i>Scleranthus annuus</i>	36
<i>Anagallis arvensis</i>	36
<i>Anthemis arvensis</i>	35
<i>Tripleurospermum maritimum</i> aggr.	32
<i>Myosotis arvensis</i>	32
<i>Raphanus raphanistrum</i>	31
<i>Equisetum arvense</i>	30
<i>Veronica arvensis</i>	29
<i>Vicia hirsuta</i>	28
<i>Galium aparine</i>	26
<i>Triticum aestivum</i>	25
<i>Veronica persica</i>	24
<i>Rumex acetosella</i>	24
<i>Buglossoides arvensis</i>	24
<i>Achillea millefolium</i> aggr.	23
<i>Consolida regalis</i>	21
<i>Spergula arvensis</i>	20
<i>Sinapis arvensis</i>	20
<i>Aphanes arvensis</i>	20
<i>Lamium amplexicaule</i>	18
<i>Arenaria serpyllifolia</i>	18
<i>Arabidopsis thaliana</i>	18
<i>Hordeum vulgare</i>	17
<i>Galeopsis tetrahit</i> aggr.	17
<i>Veronica hederifolia</i>	16
<i>Thlaspi arvense</i>	16
<i>Taraxacum</i> sect. <i>Taraxacum</i>	16
<i>Ranunculus arvensis</i>	16
<i>Persicaria lapathifolia</i>	16
<i>Euphorbia helioscopia</i>	16
<i>Vicia tetrasperma</i>	15
<i>Sonchus arvensis</i>	15
<i>Plantago major</i>	15
<i>Medicago lupulina</i>	15
<i>Avena sativa</i>	15
<i>Agrostemma githago</i>	15
<i>Papaver argemone</i>	14
<i>Mentha arvensis</i>	14
<i>Lolium rigidum</i>	14
<i>Vicia villosa</i>	13
<i>Lamium purpureum</i>	13
<i>Galium tricornutum</i>	13
<i>Erodium cicutarium</i>	13

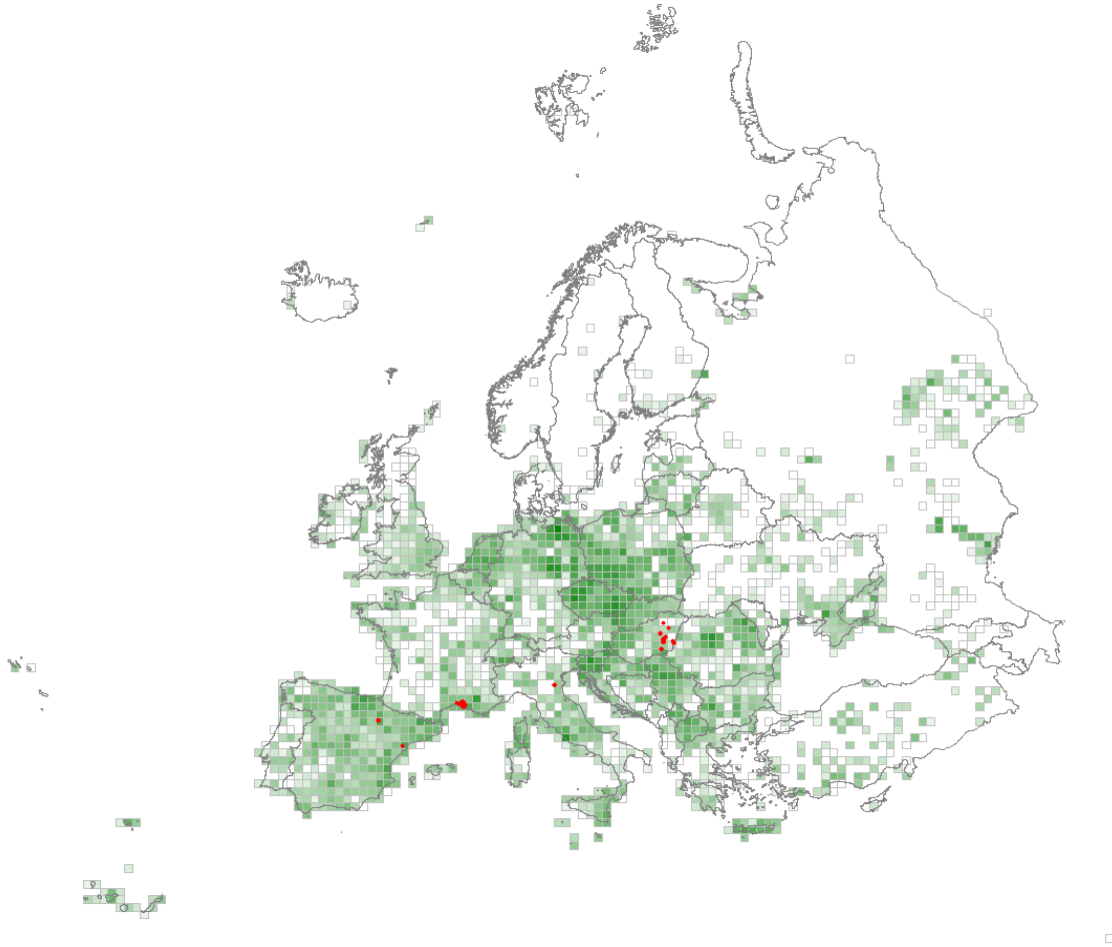
<i>Artemisia vulgaris</i>	13
<i>Sonchus asper</i>	12
<i>Silene noctiflora</i>	12
<i>Rumex crispus</i>	12
<i>Neslia paniculata</i>	12
<i>Euphorbia exigua</i>	12
<i>Sherardia arvensis</i>	11
<i>Scandix pecten-veneris</i> aggr.	11
<i>Persicaria maculosa</i>	11
<i>Lapsana communis</i>	11
<i>Erigeron canadensis</i>	11

Dominant species (percentage frequencies of occurrences with cover > 25%)

<i>Secale cereale</i>	29
<i>Triticum aestivum</i>	19
<i>Hordeum vulgare</i>	10
<i>Avena sativa</i>	8
<i>Solanum tuberosum</i>	5

## V14 – Inundated or inundatable cropland, including rice fields

Inundated or inundatable fields used for the cultivation of rice (*Oryza sativa*) and more rarely for other crops. When not too heavily treated, they may provide substitution habitats for some wetland faunal elements, in particular, birds, including ducks, rails and herons.



### Corresponding alliances in EuroVegChecklist 2016

= ORY-01A *Oryza sativae*-*Echinochloion oryzoidis* O. de Bolòs et Masclans 1955

### Characteristic species combination

Diagnostic species (phi coefficient \* 100)

<i>Oryza sativa</i>	99
<i>Schoenoplectus mucronatus</i>	77
<i>Typha angustifolia</i>	62
<i>Echinochloa oryzoides</i>	56
<i>Schoenoplectus supinus</i>	55
<i>Echinochloa crus-galli</i>	50
<i>Elatine hungarica</i>	44
<i>Alisma lanceolatum</i>	44
<i>Cyperus difformis</i>	39
<i>Elatine alsinastrum</i>	38
<i>Najas minor</i>	37
<i>Lindernia dubia</i>	37
<i>Lindernia procumbens</i>	35



<i>Chara globularis</i>	31
<i>Alisma plantago-aquatica</i>	31
<i>Elatine triandra</i>	31
<i>Cladophora fracta</i>	27
<i>Alisma gramineum</i>	27
<i>Typha latifolia</i>	26
<i>Lemna minor</i>	26
<i>Marsilea quadrifolia</i>	26
<i>Heteranthera reniformis</i>	24
<i>Ammannia robusta</i>	24
<i>Bolboschoenus maritimus</i>	21
<i>Eleocharis acicularis</i>	20
<i>Utricularia vulgaris</i>	19
<i>Eragrostis pilosa</i>	19
<i>Lythrum hyssopifolia</i>	18
<i>Limosella aquatica</i>	17
<i>Limnophila indica</i>	17
<i>Diplachne fascicularis</i>	17
<i>Lythrum portula</i>	16
<i>Symphyotrichum squamatum</i>	15

Constant species (percentage frequencies)

<i>Oryza sativa</i>	100
<i>Echinochloa crus-galli</i>	89
<i>Typha angustifolia</i>	78
<i>Schoenoplectus mucronatus</i>	61
<i>Alisma plantago-aquatica</i>	50
<i>Lemna minor</i>	47
<i>Schoenoplectus supinus</i>	36
<i>Bolboschoenus maritimus</i>	36
<i>Echinochloa oryzoides</i>	33
<i>Alisma lanceolatum</i>	33
<i>Typha latifolia</i>	31
<i>Najas minor</i>	28
<i>Eleocharis palustris</i>	28
<i>Chara globularis</i>	22
<i>Elatine hungarica</i>	22
<i>Eleocharis acicularis</i>	19
<i>Elatine alsinastrum</i>	19
<i>Utricularia vulgaris</i>	17
<i>Lindernia procumbens</i>	17
<i>Lindernia dubia</i>	17
<i>Elatine triandra</i>	17
<i>Cyperus difformis</i>	17
<i>Symphyotrichum squamatum</i>	14
<i>Spirodela polyrhiza</i>	14
<i>Phragmites australis</i>	14
<i>Persicaria maculosa</i>	14
<i>Mentha pulegium</i>	14
<i>Lythrum portula</i>	14
<i>Lythrum hyssopifolia</i>	14
<i>Alisma gramineum</i>	14
<i>Limosella aquatica</i>	11
<i>Cladophora fracta</i>	11

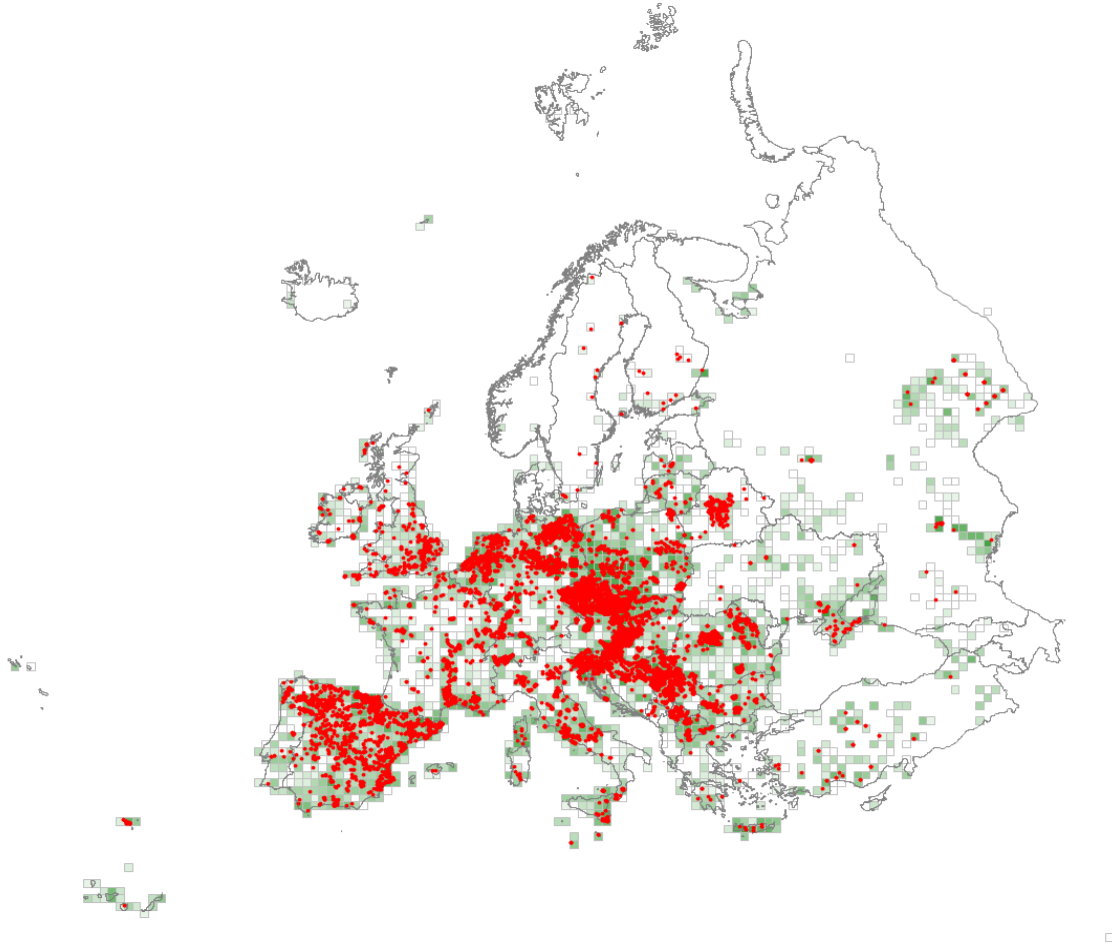
Dominant species (percentage frequencies of occurrences with cover > 25%)

<i>Oryza sativa</i>	97
<i>Najas minor</i>	19
<i>Marsilea quadrifolia</i>	6

<i>Lindernia dubia</i>	6
<i>Lemna minor</i>	6
<i>Echinochloa oryzoides</i>	6
<i>Echinochloa crus-galli</i>	6

## V15 – Bare tilled, fallow or recently abandoned arable land

Fields abandoned or left to rest, and other interstitial spaces on disturbed ground. Set-aside or abandoned arable land with forbs planted for purposes of soil protection, stabilisation, fertilisation or reclamation. Abandoned fields are colonised by numerous pioneer, introduced or nitrophilous plants. They provide habitats that can be used by animals of open spaces.



### Corresponding alliances in EuroVegChecklist 2016

- <> SIS-01A Atriplicion Passarge 1978 nom. conserv. propos.
- <> SIS-01B Cannabion sativae Golub et al. 2012
- <> PAR-01C Galeopsion bifidae Abramova in Mirkin et al. 1985
- <> PAR-02F Lamio amplexicaule-Calepinion irregularis Bagrikova 1996
- <> PAR-02D Matricario chamomillae-Chenopodion albi Timár 1954
- <> PAR-01B Oxalidion europeae Passarge 1978
- <> PAR-01A Scleranthion annui (Kruseman et Vlieger 1939) Sissingh in Westhoff et al. 1946
- <> SIS-01D Sisymbriion officinalis Tx. et al. ex von Rochow 1951
- <> PAR-02C Veronico-Euphorbion Sissingh in Passarge 1964

### Characteristic species combination

Diagnostic species (phi coefficient \* 100)

<i>Fallopia convolvulus</i>	24
<i>Viola arvensis</i>	23
<i>Veronica persica</i>	22

<i>Capsella bursa-pastoris</i>	22
<i>Stellaria media</i>	21
<i>Chenopodium album</i> aggr.	21
<i>Papaver rhoeas</i>	19
<i>Myosotis arvensis</i>	18
<i>Polygonum aviculare</i> aggr.	18
<i>Cyanus segetum</i>	17
<i>Ranunculus arvensis</i>	17
<i>Thlaspi arvense</i>	16
<i>Lamium purpureum</i>	16
<i>Cirsium arvense</i>	16
<i>Convolvulus arvensis</i>	16
<i>Sinapis arvensis</i>	16

Constant species (percentage frequencies)

<i>Chenopodium album</i> aggr.	48
<i>Stellaria media</i>	47
<i>Polygonum aviculare</i> aggr.	45
<i>Capsella bursa-pastoris</i>	45
<i>Convolvulus arvensis</i>	44
<i>Fallopia convolvulus</i>	43
<i>Cirsium arvense</i>	41
<i>Viola arvensis</i>	37
<i>Elytrigia repens</i> aggr.	32
<i>Veronica persica</i>	27
<i>Tripleurospermum maritimum</i> aggr.	27
<i>Papaver rhoeas</i>	26
<i>Anagallis arvensis</i>	26
<i>Myosotis arvensis</i>	24
<i>Ochlopoa annua</i>	23
<i>Galium aparine</i>	22
<i>Vicia sativa</i>	21
<i>Taraxacum</i> sect. <i>Taraxacum</i>	20
<i>Plantago major</i>	20
<i>Persicaria lapathifolia</i>	20
<i>Cyanus segetum</i>	20
<i>Veronica arvensis</i>	19
<i>Persicaria maculosa</i>	19
<i>Lamium purpureum</i>	18
<i>Sonchus oleraceus</i>	17
<i>Sinapis arvensis</i>	17
<i>Senecio vulgaris</i>	17
<i>Lamium amplexicaule</i>	17
<i>Echinochloa crus-galli</i>	17
<i>Sonchus asper</i>	16
<i>Euphorbia helioscopia</i>	16
<i>Equisetum arvense</i>	16
<i>Apera spica-venti</i>	16
<i>Thlaspi arvense</i>	15
<i>Sonchus arvensis</i>	15
<i>Vicia hirsuta</i>	14
<i>Setaria pumila</i>	14
<i>Scleranthus annuus</i>	14
<i>Raphanus raphanistrum</i>	14
<i>Galeopsis tetrahit</i> aggr.	14
<i>Anthemis arvensis</i>	14
<i>Spergula arvensis</i>	13
<i>Rumex acetosella</i>	13
<i>Veronica hederifolia</i>	12

<i>Ranunculus repens</i>	12
<i>Mentha arvensis</i>	12
<i>Galinsoga parviflora</i>	12
<i>Erodium cicutarium</i>	12
<i>Consolida regalis</i>	12
<i>Amaranthus retroflexus</i>	12
<i>Achillea millefolium</i> aggr.	12
<i>Trifolium repens</i>	11
<i>Rumex crispus</i>	11
<i>Ranunculus arvensis</i>	11
<i>Medicago lupulina</i>	11
<i>Matricaria chamomilla</i>	11
<i>Fumaria officinalis</i>	11
<i>Erigeron canadensis</i>	11
<i>Buglossoides arvensis</i>	11
<i>Arabidopsis thaliana</i>	11

## **V21 – Large-scale ornamental garden areas**

[None of the habitats within group V2 could be formally defined in the expert system, because cultivated areas in gardens or parks cannot be distinguished from various man-made habitats based on the vegetation-plot data.]

Cultivated areas of large-scale recreational gardens. The vegetation, usually composed mainly of introduced species or cultivars, can nevertheless include many native plants and supports a varied fauna when not intensively managed. Large-scale gardens are treated as habitat complexes (X23).

## **V22 – Small-scale ornamental and domestic garden areas**

Cultivated areas of ornamental gardens and small parks beside houses or in city squares. Kitchen gardens in the immediate vicinity of dwelling places. Excludes allotment gardens (V12). Small gardens are treated as habitat complexes (X22, X24, X25).

## **V23 – Recently abandoned garden areas**

Abandoned flowerbeds and vegetable plots in gardens are rapidly colonised by abundant weeds.



## **V31 – Agriculturally-improved, re-seeded and heavily fertilised grassland, including sports fields and grass lawns**

[This habitat could not be formally defined in the expert system, because these grasslands cannot be distinguished from other some other grassland habitats based on the vegetation-plot data.]

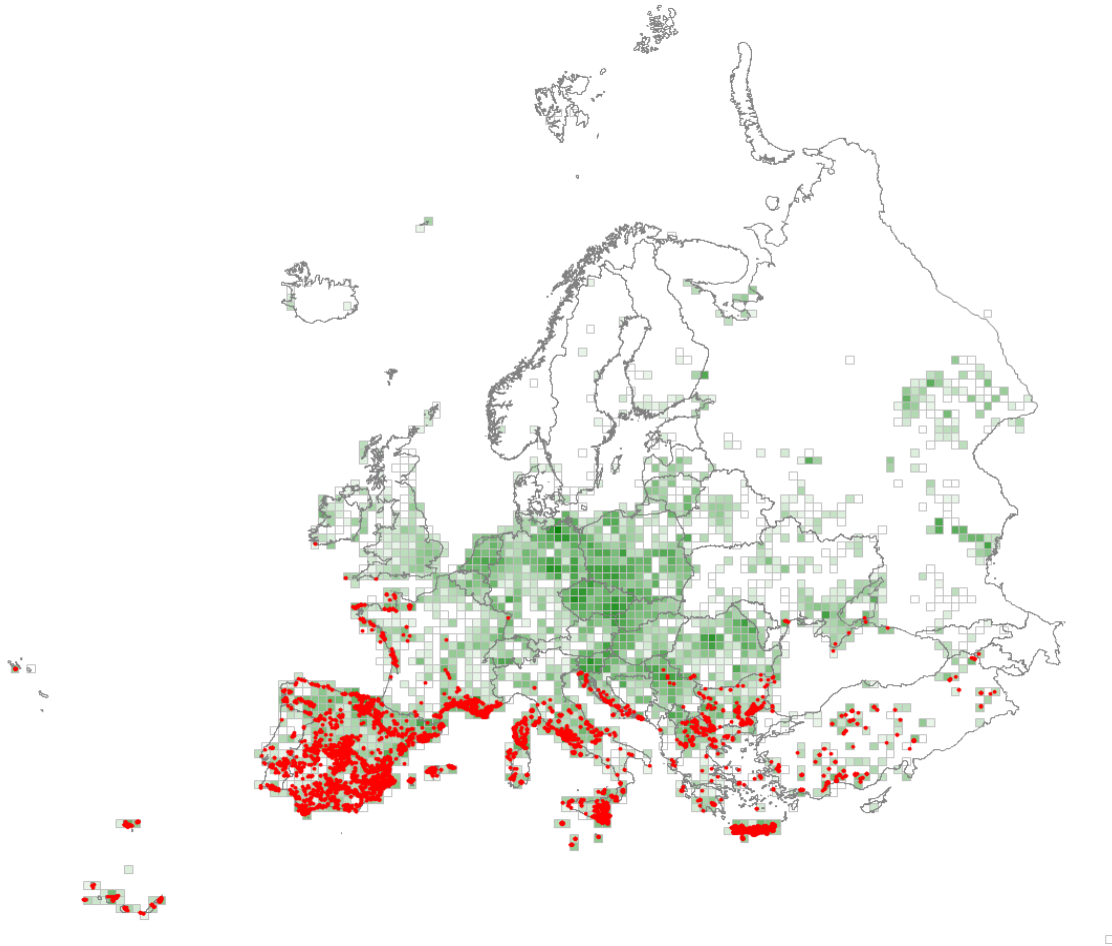
Land occupied by heavily fertilised or re-seeded permanent grassland, sometimes treated by selective herbicides, with very impoverished flora and fauna, used for grazing, soil protection and stabilisation, landscaping or recreation.

### **Corresponding alliances in EuroVegChecklist 2016**

- <> MOL-01C *Cynosurion cristati* Tx. 1947
- <> MOL-10A *Potentillion anserinae* Tx. 1947

## V32 – Mediterranean subnitrophilous annual grassland

Land dominated by annual grasses and herbs, on soils slightly enriched in nitrates, in the meso- and thermo-Mediterranean zones. Characteristic are annual species of *Aegilops*, *Avena*, *Bromus*, *Vulpia*, crucifers and leguminous plants. These annuals occur as pioneers of bare soils slightly nitrified by aeration or organic addition, along roads, on land-fills and in interstitial spaces of cultivation. They also replace the oligotrophic annual vegetation of Mediterranean xeric grasslands (R1D, R1F) under the influence of pastoral activities. Subnitrophilous annual grassland is widespread as a successional stage after cultivation. Woody re-colonisation may lead to maquis (S5) or garrigue (S6).



### Corresponding alliances in EuroVegChecklist 2016

- > CHE-01F *Hordeion murini* Br.-Bl. in Br.-Bl. et al. 1936
- > CHE-01H *Laguro ovati-Bromion rigidi* Géhu et Géhu-Franck 1985
- <> CHE-01K *Laguro ovati-Vulpion fasciculatae* Géhu et Biondi 1994
- > CHE-01I *Linario polygalifoliae-Vulpion alopecuri* Br.-Bl., Rozeira et Silva in Br.-Bl. et al. 1972
- > CHE-01J *Taeniathero-Aegilopion geniculatae* Rivas-Mart. et Izco 1977

### Characteristic species combination

Diagnostic species (phi coefficient \* 100)

<i>Anacyclus clavatus</i>	27
<i>Lolium rigidum</i>	23
<i>Biscutella auriculata</i>	23

<i>Hypocoum imberbe</i>	22
<i>Hordeum murinum</i>	22
<i>Fumaria parviflora</i>	21
<i>Calendula arvensis</i>	20
<i>Roemeria hybrida</i>	19
<i>Galium tricornutum</i>	19
<i>Papaver rhoeas</i>	18
<i>Papaver hybridum</i>	18
<i>Diplotaxis virgata</i>	17
<i>Vicia monantha</i>	17
<i>Vicia peregrina</i>	17
<i>Rapistrum rugosum</i>	16
<i>Anchusa azurea</i>	16
<i>Avena sterilis</i>	16
<i>Anisantha diandra</i>	16
<i>Sisymbrium crassifolium</i>	16
<i>Glebionis coronaria</i>	16
<i>Medicago polymorpha</i> aggr.	15
<i>Hypocoum pendulum</i>	15
<i>Euphorbia serrata</i>	15
<i>Eruca vesicaria</i>	15

Constant species (percentage frequencies)

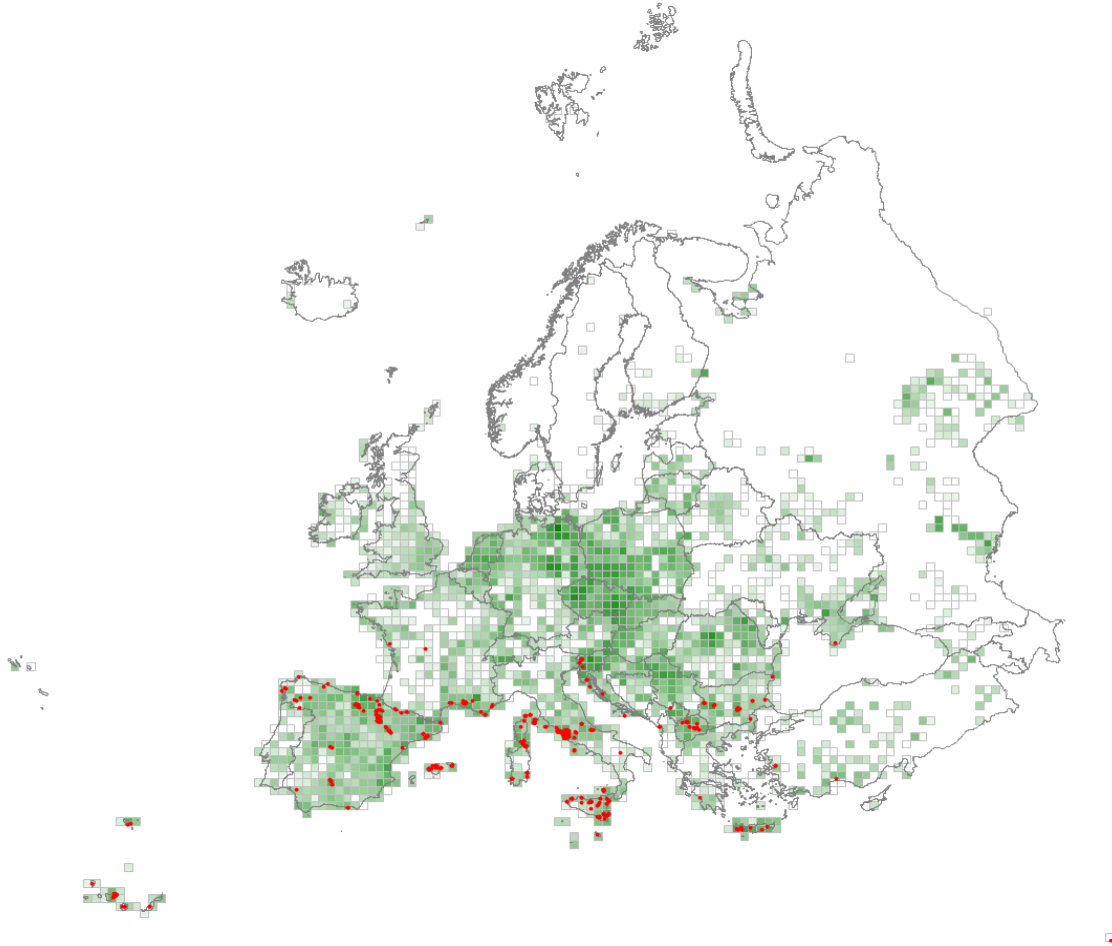
<i>Hordeum murinum</i>	30
<i>Convolvulus arvensis</i>	28
<i>Lolium rigidum</i>	26
<i>Papaver rhoeas</i>	24
<i>Avena barbata</i>	23
<i>Vicia sativa</i>	20
<i>Sonchus oleraceus</i>	20
<i>Anisantha madritensis</i>	18
<i>Bromus hordeaceus</i>	17
<i>Anagallis arvensis</i>	17
<i>Anacyclus clavatus</i>	17
<i>Eryngium campestre</i>	16
<i>Dactylis glomerata</i>	16
<i>Calendula arvensis</i>	16
<i>Sherardia arvensis</i>	15
<i>Plantago lanceolata</i>	15
<i>Medicago polymorpha</i> aggr.	15
<i>Avena sterilis</i>	14
<i>Trifolium campestre</i>	13
<i>Erodium cicutarium</i>	13
<i>Senecio vulgaris</i>	12
<i>Hedypnois rhagadioloides</i>	12
<i>Geranium molle</i>	12
<i>Galium tricornutum</i>	12
<i>Galactites tomentosus</i>	12
<i>Daucus carota</i>	12
<i>Cynodon dactylon</i>	12
<i>Anisantha diandra</i>	12
<i>Scandix pecten-veneris</i> aggr.	11
<i>Rostraria cristata</i>	11
<i>Raphanus raphanistrum</i>	11
<i>Euphorbia serrata</i>	11
<i>Anisantha sterilis</i>	11

Dominant species (percentage frequencies of occurrences with cover > 25%)

<i>Hordeum murinum</i>	7
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### V33 – Dry Mediterranean lands with unpalatable non-vernal herbaceous vegetation

Drylands with shrub cover greater than 10%, and with a large component of non-vernal unpalatable plants, including geophytes of the genera *Asphodelus* and *Drimia*, thistles such as *Carlina*, *Carthamus*, *Centaurea*, and *Onopordum*, and other plants such as *Ferula* and *Phlomis*, especially characteristic of the drier parts of the Mediterranean Basin but occurring elsewhere with suitable conditions such as the dry continental valleys of Switzerland. These habitats usually result from over-grazing of garrigue, which eliminates the shrubs.



#### Corresponding alliances in EuroVegChecklist 2016

- <> CHE-01A *Alyso granatensis*-*Brassicion barrelieri* Rivas-Mart. et Izco 1977
- <> ART-05B *Arundion collinae* S. Brullo, Giusso, Guarino et Sciandello in S. Brullo et al. 2010
- <> ART-05C *Bromo-Oryzopsis miliaceae* O. de Bolòs 1970
- <> CHE-01C *Cerintho majoris*-*Fedion cornucopiae* Rivas-Mart. et Izco ex Peinado et al. 1986
- <> CHE-01D *Echio-Galactition tomentosae* O. de Bolòs et Molinier 1969
- <> CHE-01E *Fedio-Convulvulion cupaniani* S. Brullo et Spampinato 1986
- <> ART-05D *Hyperico perforati*-*Ferulion communis* Vicente Orellana et Galán de Mera 2008
- <> ART-05A *Inulo viscosae*-*Agropyron repentis* Biondi et Allegrezza 1996
- <> ART-04B *Onopordion castellani* Br.-Bl. et O. de Bolòs 1958 corr. Rivas-Mart. et al. 2001
- <> ART-04C *Onopordion illyrici* Oberd. 1954
- <> CHE-01B *Resedo lanceolatae*-*Moricandion* Fernández Casas et M.E. Sánchez 1972
- <> ART-04D *Scolymion hispanici* Morariu 1967

- <> CHE-01L Securigero securidacae-Dasypyrrion villosi Cano-Ortiz, Biondi et Cano in Cano-Ortiz et al. ex Di Pietro in Di Pietro et al. 2015
- <> ART-04A Silybo mariani-Urticion piluliferae Sissingh ex Br.-Bl. et O. de Bolòs 1958

### Characteristic species combination

#### Diagnostic species (phi coefficient \* 100)

<i>Silybum marianum</i>	43
<i>Galactites tomentosus</i>	27
<i>Cynara cardunculus</i>	25
<i>Coleostephus myconis</i>	21
<i>Marrubium vulgare</i>	20
<i>Malva sylvestris</i>	19
<i>Foeniculum vulgare</i>	19
<i>Hordeum murinum</i>	19
<i>Carduus tenuiflorus</i>	19
<i>Carduus pycnocephalus</i>	19
<i>Onopordum illyricum</i>	18
<i>Centaurea calcitrapa</i>	18
<i>Echium plantagineum</i>	18
<i>Rumex pulcher</i>	18
<i>Scolymus grandiflorus</i>	17
<i>Carthamus lanatus</i>	16
<i>Stachys ocymastrum</i>	16
<i>Avena sterilis</i>	15

#### Constant species (percentage frequencies)

<i>Silybum marianum</i>	28
<i>Galactites tomentosus</i>	28
<i>Hordeum murinum</i>	27
<i>Dactylis glomerata</i>	27
<i>Daucus carota</i>	24
<i>Avena barbata</i>	23
<i>Foeniculum vulgare</i>	21
<i>Convolvulus arvensis</i>	21
<i>Plantago lanceolata</i>	19
<i>Eryngium campestre</i>	19
<i>Malva sylvestris</i>	17
<i>Carduus pycnocephalus</i>	17
<i>Sonchus oleraceus</i>	16
<i>Anisantha sterilis</i>	16
<i>Rumex pulcher</i>	14
<i>Dasypyrrum villosum</i>	14
<i>Carlina corymbosa</i> aggr.	14
<i>Avena sterilis</i>	14
<i>Anagallis arvensis</i>	14
<i>Geranium molle</i>	13
<i>Cichorium intybus</i>	13
<i>Carthamus lanatus</i>	13
<i>Anisantha madritensis</i>	13
<i>Sherardia arvensis</i>	12
<i>Pallenis spinosa</i>	12
<i>Marrubium vulgare</i>	12
<i>Galium aparine</i>	12
<i>Cynodon dactylon</i>	12
<i>Carduus tenuiflorus</i>	12
<i>Bromus hordeaceus</i>	12
<i>Vicia sativa</i>	11

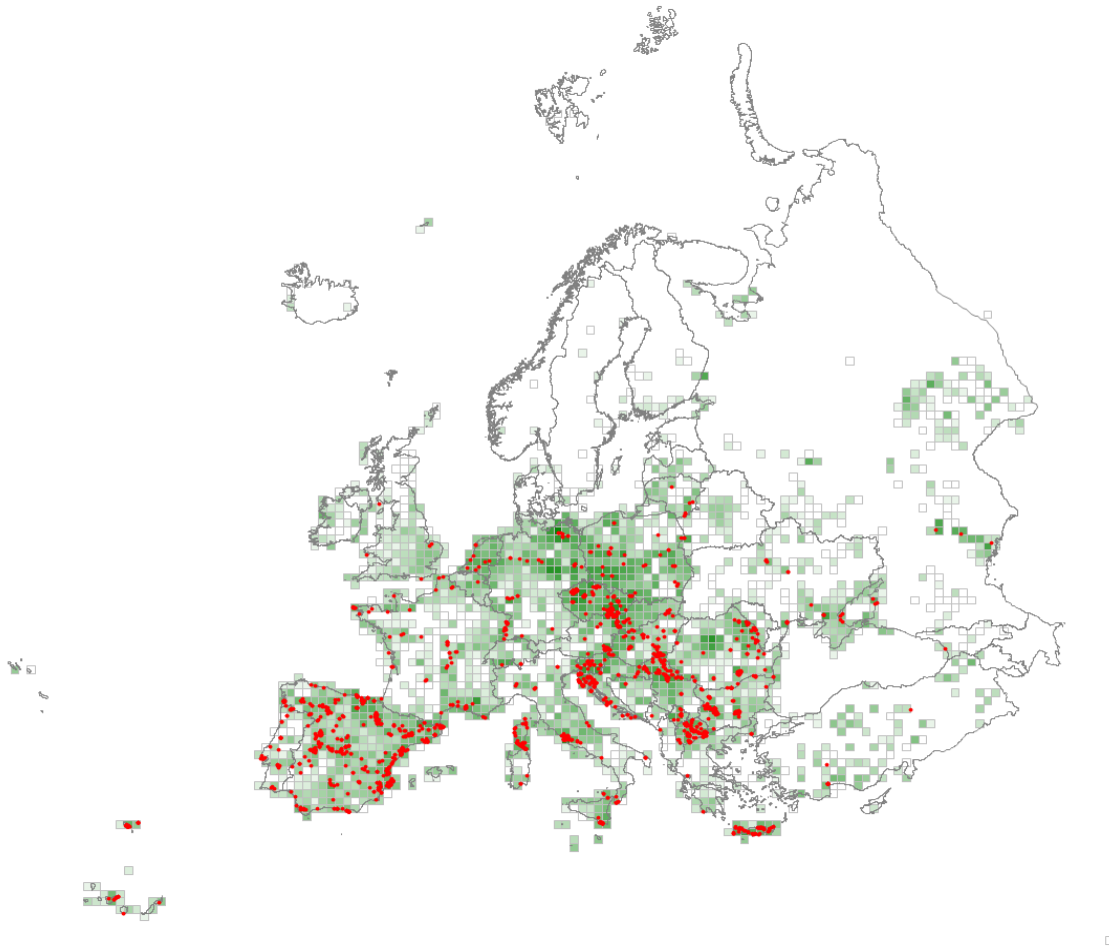
<i>Trifolium campestre</i>	11
<i>Papaver rhoeas</i>	11
<i>Medicago polymorpha</i> aggr.	11
<i>Lolium rigidum</i>	11
<i>Hypochaeris achyrophorus</i>	11
<i>Echium plantagineum</i>	11
<i>Dittrichia viscosa</i>	11
<i>Coleostephus myconis</i>	11
<i>Centaurea calcitrapa</i>	11
<i>Asphodelus ramosus</i>	11

Dominant species (percentage frequencies of occurrences with cover > 25%)

<i>Silybum marianum</i>	22
<i>Galactites tomentosus</i>	18
<i>Foeniculum vulgare</i>	8
<i>Asphodelus ramosus</i>	7
<i>Cynara cardunculus</i>	5
<i>Asphodelus albus</i>	5

## V34 – Trampled xeric grassland with annuals

Low annual grassland on dry and warm trampled localities, for example, the communities of the alliance *Polygono-Coronopodion* with *Cynodon dactylon*, *Eragrostis minor*, *Herniaria glabra*, *Herniaria hirsuta*, *Juncus tenuis*, *Lepidium coronopus*, *Lepidium ruderales*, *Lolium perenne*, *Matricaria discoidea*, *Plantago lanceolata*, *Plantago major*, *Poa annua* agg. and *Polygonum arenastrum*.



### Corresponding alliances in EuroVegChecklist 2016

- > DIG-02C Eragrostio-Polygonion arenastrum Couderc et Izco ex Čarni et Mucina 1998
- > DIG-02A Euphorbion prostratae Rivas-Mart. 1976
- > POL-01B Polycarpion tetraphylli Rivas-Mart. 1975
- > DIG-02B Polycarpo-Eleusinion indicae Čarni et Mucina 1998
- > POL-01A Polygono-Coronopodion Sissingh 1969

### Characteristic species combination

Diagnostic species (phi coefficient \* 100)

<i>Digitaria sanguinalis</i>	34
<i>Eragrostis minor</i>	31
<i>Portulaca oleracea</i>	29
<i>Sclerochloa dura</i>	26
<i>Setaria verticillata</i>	24
<i>Polygonum aviculare</i> aggr.	22

<i>Cynodon dactylon</i>	19
<i>Euphorbia maculata</i>	17
<i>Heliotropium europaeum</i>	17
<i>Euphorbia chamaesyce</i>	15
<i>Eleusine indica</i>	15

Constant species (percentage frequencies)

<i>Polygonum aviculare</i> aggr.	55
<i>Cynodon dactylon</i>	43
<i>Digitaria sanguinalis</i>	30
<i>Chenopodium album</i> aggr.	27
<i>Portulaca oleracea</i>	25
<i>Ochlopoa annua</i>	23
<i>Eragrostis minor</i>	22
<i>Convolvulus arvensis</i>	22
<i>Plantago coronopus</i> aggr.	21
<i>Erigeron canadensis</i>	19
<i>Lolium perenne</i>	18
<i>Capsella bursa-pastoris</i>	17
<i>Amaranthus retroflexus</i>	16
<i>Taraxacum</i> sect. <i>Taraxacum</i>	15
<i>Setaria viridis</i>	15
<i>Plantago major</i>	15
<i>Setaria pumila</i>	13
<i>Sclerochloa dura</i>	13
<i>Plantago lanceolata</i>	13
<i>Echinochloa crus-galli</i>	13
<i>Setaria verticillata</i>	12

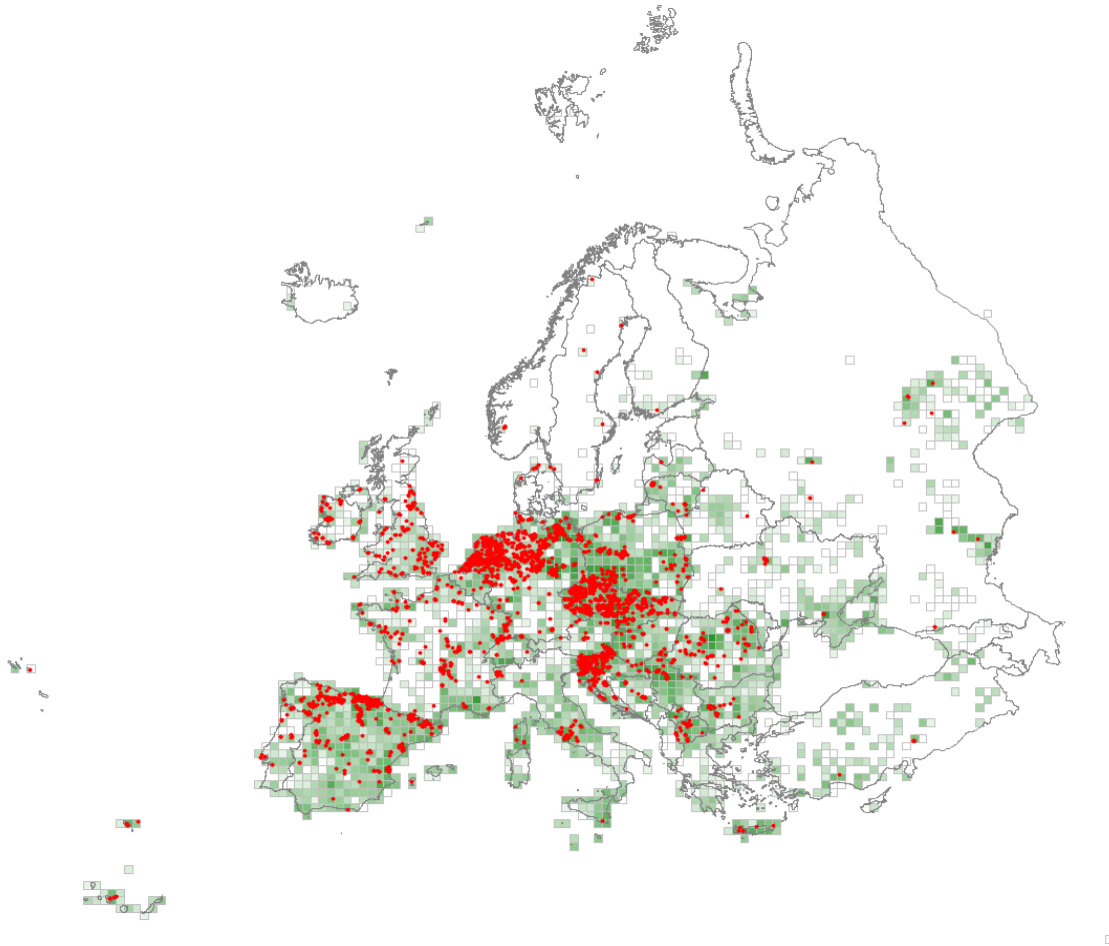
Dominant species (percentage frequencies of occurrences with cover > 25%)

<i>Cynodon dactylon</i>	11
<i>Polygonum aviculare</i> aggr.	9
<i>Sclerochloa dura</i>	7
<i>Digitaria sanguinalis</i>	7



## V35 – Trampled mesophilous grassland with annuals

Low annuals on mesic trampled localities, for example the communities of the alliance *Saginion procumbentis* with *Juncus bufonius*, *Poa annua* agg., *Poa supina*, *Sagina apetala*, *Sagina procumbens*, *Spergularia rubra* and *Veronica serpyllifolia*; in the submontane and montane belts, the vegetation may consist of *Poion supinae*.



### Corresponding alliances in EuroVegChecklist 2016

- > MOL-01D Alchemillo-Ranunculion repentis Passarge 1979
- > POL-01C Saginion procumbentis Tx. et Ohba in Géhu et al. 1972

### Characteristic species combination

Diagnostic species (phi coefficient \* 100)

<i>Matricaria discoidea</i>	47
<i>Ochlopoa annua</i>	41
<i>Polygonum aviculare</i> aggr.	30
<i>Plantago major</i>	29
<i>Bryum argenteum</i>	21
<i>Sagina procumbens</i>	20
<i>Lolium perenne</i>	20
<i>Lepidium coronopus</i>	18
<i>Capsella bursa-pastoris</i>	16

Constant species (percentage frequencies)

<i>Ochlopoa annua</i>	86
<i>Polygonum aviculare</i> aggr.	76
<i>Plantago major</i>	70
<i>Matricaria discoidea</i>	48
<i>Lolium perenne</i>	42
<i>Capsella bursa-pastoris</i>	33
<i>Taraxacum</i> sect. <i>Taraxacum</i>	29
<i>Trifolium repens</i>	27
<i>Bryum argenteum</i>	19
<i>Sagina procumbens</i>	18
<i>Plantago lanceolata</i>	14

Dominant species (percentage frequencies of occurrences with cover > 25%)

<i>Polygonum aviculare</i> aggr.	22
<i>Ochlopoa annua</i>	20
<i>Plantago major</i>	7
<i>Matricaria discoidea</i>	7

## V36 – Alpine and subalpine enriched grassland

[This habitat could not be formally defined in the expert system, because these grasslands cannot be distinguished from other some other grassland habitats based on the vegetation-plot data.]

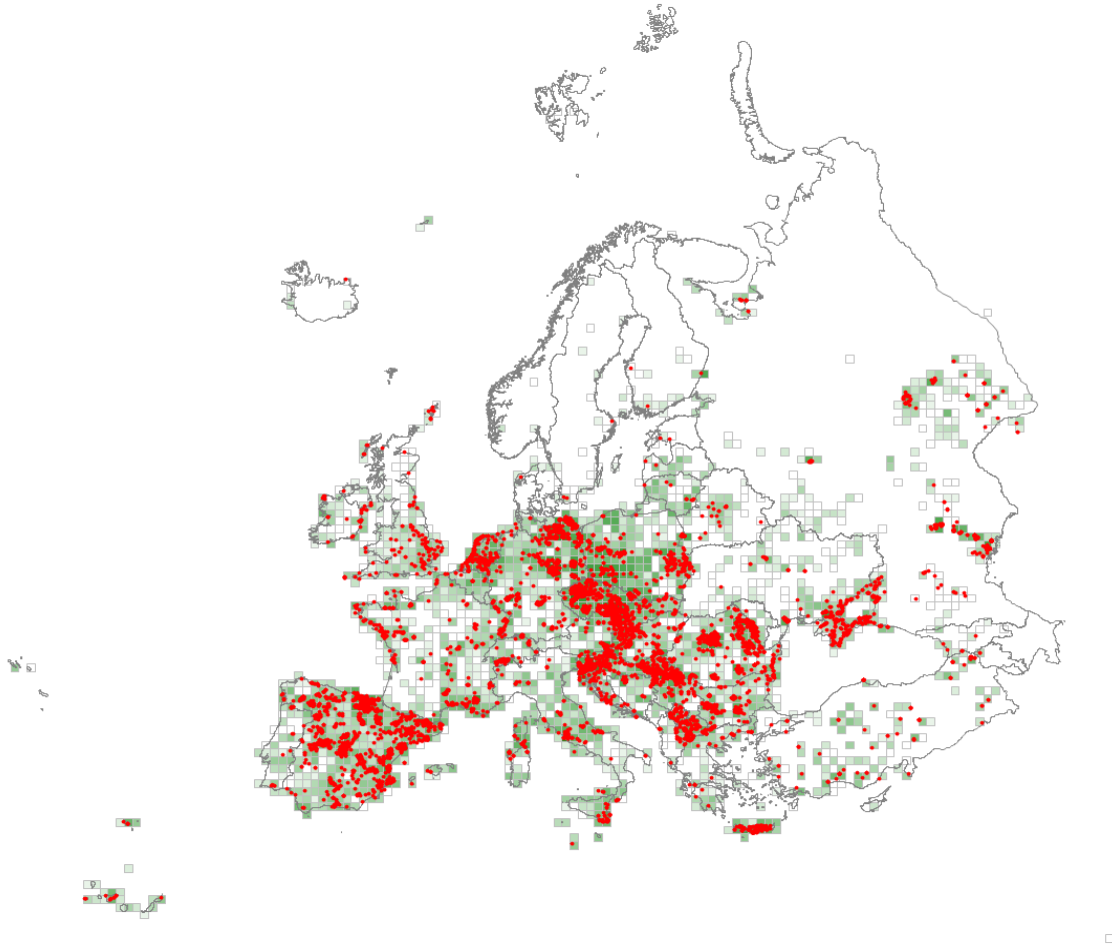
Enriched pastures of the subalpine and lower alpine levels of mountains with species such as *Phleum alpinum* and *Crepis aurea*. Enriched hay meadows are listed under R23.

### Corresponding alliances in EuroVegChecklist 2016

- <> MOL-03G *Astrantion maximae* Korotkov 2013
- <> MOL-03F *Helictotricho compressi-Bistortion officinalis* Didukh et Kuzemko 2009
- <> MOL-03E *Pancicion serbicae* Lakušić 1966
- <> MOL-03B *Poion alpinae* Gams ex Oberd. 1950
- <> MOL-03C *Poion supinae* Rivas-Mart. et Géhu 1978
- <> MOL-03A *Triseti flavescens-Polygonion bistortae* Br.-Bl. et Tx. ex Marschall 1947
- <> MOL-03D *Violion cornutae* Nègre 1972

## V37 – Annual anthropogenic herbaceous vegetation

Stands dominated by annual herbaceous plants developing on recently abandoned urban or agricultural land, on land that has been reclaimed, on transport networks, or on land used for waste disposal, typically in places that are frequently disturbed or were affected by a recent severe disturbance event.



### Corresponding alliances in EuroVegChecklist 2016

- > CHE-03C Allion triquetri O. de Bolòs 1967
- <> SIS-01A Atriplicion Passarge 1978 nom. conserv. propos.
- > CHE-01G Bromo-Hirschfeldion incanae Lohmeyer 1975
- <> SIS-01B Cannabion sativae Golub et al. 2012
- > CHE-03G Cardaminion graecae Biondi, Pinzi et Gubellini in Biondi et al. 2013
- <> DIG-01C Consolido-Eragrostion poidis Soó et Timár in Timár 1957
- <> DIG-01D Diplotaxidion eruroidis Br.-Bl. in Br.-Bl. et al. 1936
- <> DIG-01B Eragrostion Tx. in Oberd. 1954
- > SIS-02A Erysimo wittmannii-Hackelion Bernátová 1986
- > CHE-03H Euphorbio taurinensis-Geranion lucidi Matevski et Čarni in Mucina et al. 2009
- > CHE-03B Geranio pusilli-Anthriscion caucalidis Rivas-Mart. 1978
- > CHE-03A Geranio-Torilidion Lohmeyer et Trautmann 1970
- > CHE-02A Chenopodion muralis Br.-Bl. in Br.-Bl. et al. 1936
- > SIS-01C Malvion neglectae (Gutte 1972) Hejný 1978
- > CHE-03D Parietation lusitanico-mauritanicae Rivas-Mart. et al. 2002
- > DIG-01F Salsolion ruthenicae Philippi ex Oberd. 1983
- <> SIS-01D Sisymbriion officinalis Tx. et al. ex von Rochow 1951
- <> DIG-01G Tamarici ramosissimae-Salsolion australis Golub 1994

- > CHE-03E Valantio muralis-Galion muralis S. Brullo in S. Brullo et Marcenò 1985
- > CHE-03F Veronico-Urticion urentis S. Brullo in S. Brullo et Marcenò 1985

### Characteristic species combination

#### Diagnostic species (phi coefficient \* 100)

<i>Chenopodium album</i> aggr.	23
<i>Amaranthus retroflexus</i>	22
<i>Malva neglecta</i>	18
<i>Sisymbrium officinale</i>	16

#### Constant species (percentage frequencies)

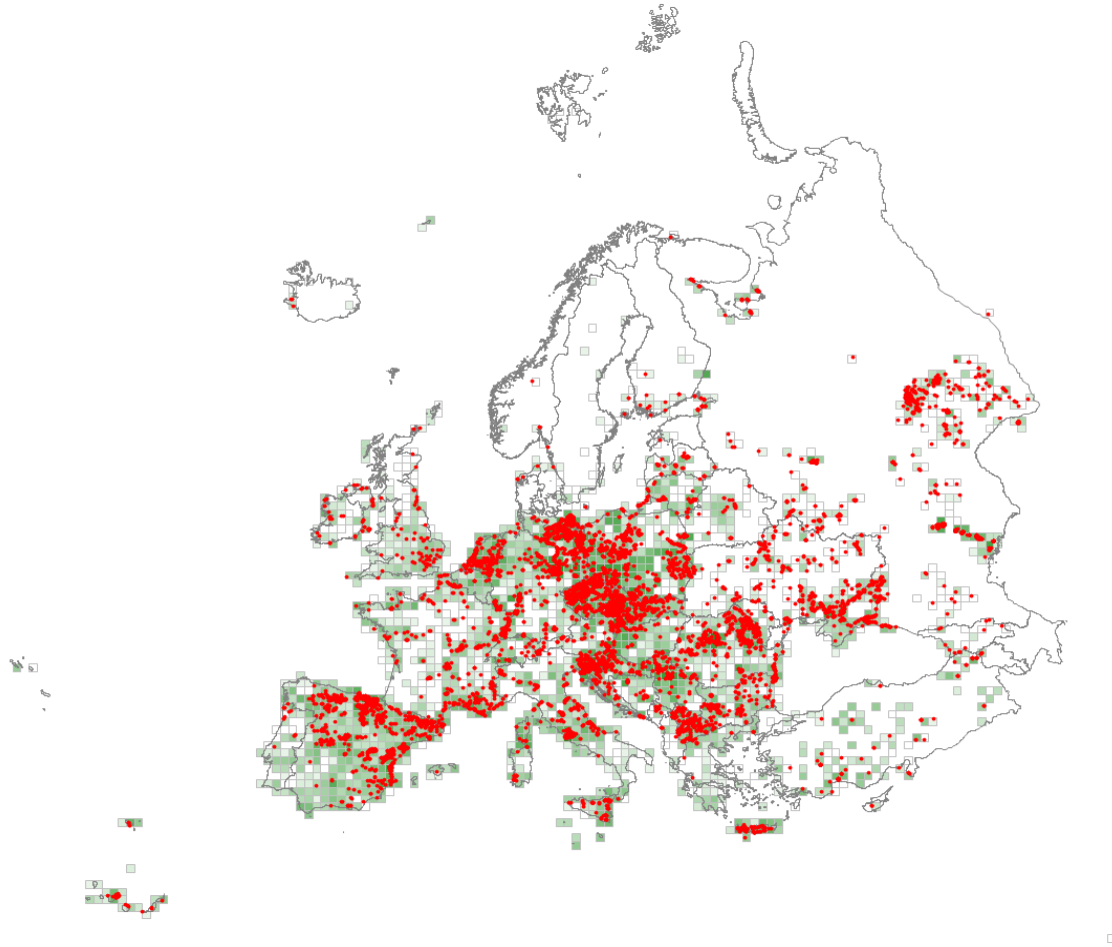
<i>Chenopodium album</i> aggr.	53
<i>Convolvulus arvensis</i>	36
<i>Polygonum aviculare</i> aggr.	33
<i>Capsella bursa-pastoris</i>	29
<i>Amaranthus retroflexus</i>	24
<i>Cirsium arvense</i>	22
<i>Stellaria media</i>	20
<i>Elytrigia repens</i> aggr.	20
<i>Erigeron canadensis</i>	18
<i>Taraxacum</i> sect. <i>Taraxacum</i>	17
<i>Sonchus oleraceus</i>	17
<i>Ochlopoa annua</i>	17
<i>Lolium perenne</i>	17
<i>Hordeum murinum</i>	17
<i>Echinochloa crus-galli</i>	17
<i>Tripleurospermum maritimum</i> aggr.	16
<i>Lactuca serriola</i>	16
<i>Solanum nigrum</i>	15
<i>Sisymbrium officinale</i>	15
<i>Plantago major</i>	14
<i>Artemisia vulgaris</i>	14
<i>Anisantha sterilis</i>	13
<i>Urtica dioica</i>	12
<i>Senecio vulgaris</i>	12
<i>Cynodon dactylon</i>	12
<i>Setaria viridis</i>	11
<i>Setaria pumila</i>	11
<i>Plantago lanceolata</i>	11
<i>Malva neglecta</i>	11
<i>Atriplex patula</i>	11

#### Dominant species (percentage frequencies of occurrences with cover > 25%)

<i>Chenopodium album</i> aggr.	7
<i>Hordeum murinum</i>	6

## V38 – Dry perennial anthropogenic herbaceous vegetation

Stands dominated by perennial herbaceous plants, frequently ruderals, developing on dry abandoned urban or agricultural land, on land that has been reclaimed, on transport networks, or on land used for waste disposal. These stands often replace annual anthropogenic herbaceous vegetation in the course of secondary succession.



### Corresponding alliances in EuroVegChecklist 2016

- > ART-03B *Artemisio absinthii-Agropyron intermedii* T. Müller et Görs 1969
- <> ART-03C *Artemisio marschallianae-Elytrigion intermedii* Korotchenko et Didukh 1997
- <> ART-05B *Arundion collinae* S. Brullo, Giusso, Guarino et Sciandello in S. Brullo et al. 2010
- <> ART-02A *Bassio-Artemision austriacae* Solomeshch in A. Ishbirdin et al. 1988
- <> ART-05C *Bromo-Oryzopsision miliaceae* O. de Bolòs 1970
- > ART-01D *Carduo carpetani-Cirsion odontolepidis* Rivas-Mart. et al. 1986
- > ART-01C *Cirsion richterano-chodati* (Rivas-Mart. in Rivas-Mart. et al. 1984) Rivas-Mart. et al. 1991
- <> ART-03A *Convolvulo arvensis-Agropyron repentis* Görs 1967
- > ART-01B *Dauco-Melilotion* Görs ex Rostański et Gutte 1971
- <> ART-05D *Hyperico perforati-Ferulion communis* Vicente Orellana et Galán de Mera 2008
- <> ART-05A *Inulo viscosae-Agropyron repentis* Biondi et Allegrezza 1996
- > ART-01E *Medicagini falcatae-Diplotaxidion tenuifoliae* Levon 1997
- > ART-01A *Onopordion acanthii* Br.-Bl. et al. 1936
- <> ART-04B *Onopordion castellani* Br.-Bl. et O. de Bolòs 1958 corr. Rivas-Mart. et al. 2001
- <> ART-04C *Onopordion illyrici* Oberd. 1954
- > ART-03D *Rorippo austriacae-Falcarion vulgaris* Levon 1997

- <> ART-04D Scolymion hispanici Morariu 1967  
 <> ART-04A Silybo mariani-Urticion piluliferae Sissingh ex Br.-Bl. et O. de Bolòs 1958

### Characteristic species combination

Diagnostic species (phi coefficient \* 100)

*Artemisia vulgaris* 18

Constant species (percentage frequencies)

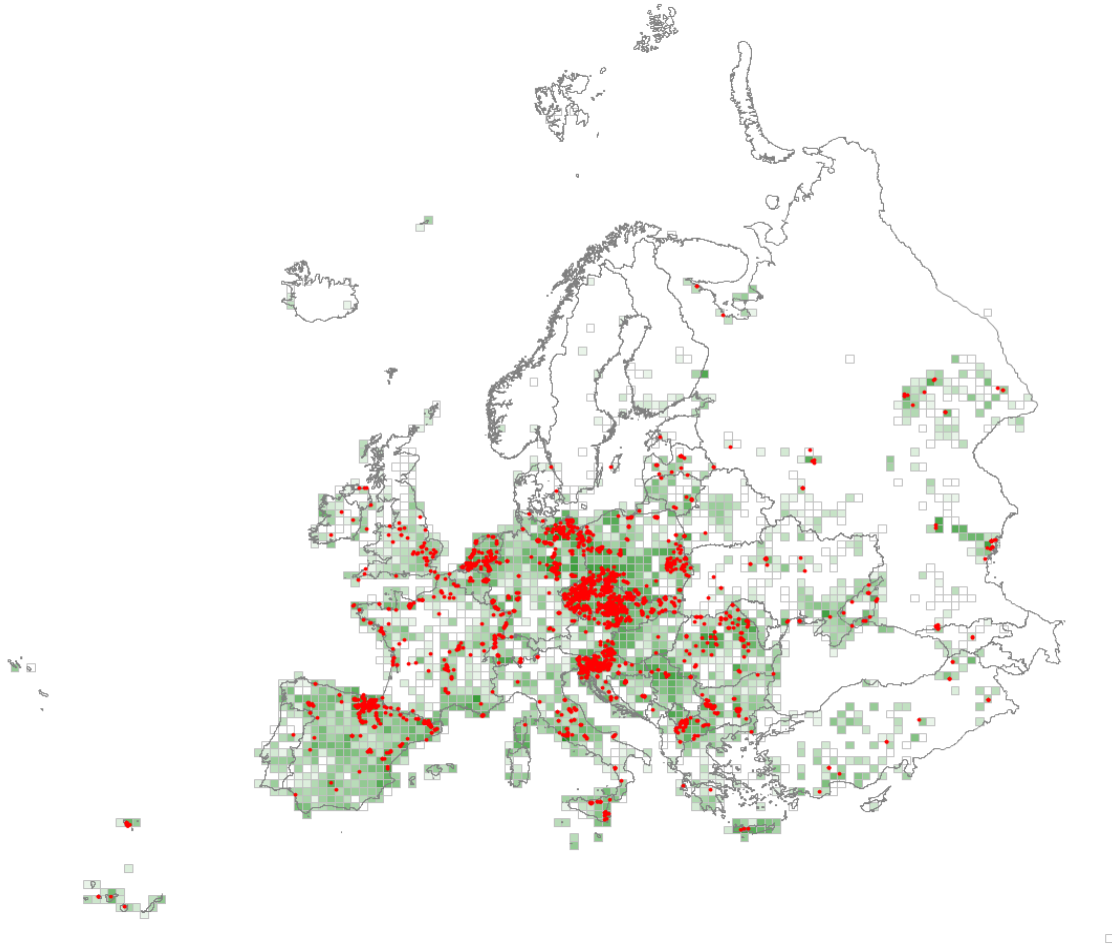
*Elytrigia repens* aggr. 38  
*Artemisia vulgaris* 31  
*Achillea millefolium* aggr. 27  
*Convolvulus arvensis* 25  
*Dactylis glomerata* 23  
*Poa pratensis* aggr. 21  
*Cirsium arvense* 21  
*Urtica dioica* 20  
*Plantago lanceolata* 19  
*Daucus carota* 19  
*Taraxacum* sect. *Taraxacum* 17  
*Erigeron canadensis* 17  
*Echium vulgare* 17  
*Medicago lupulina* 16  
*Cichorium intybus* 16  
*Tanacetum vulgare* 14  
*Calamagrostis epigejos* 14  
*Silene latifolia* 13  
*Hypericum perforatum* 13  
*Tripleurospermum maritimum* aggr. 12  
*Polygonum aviculare* aggr. 12  
*Lactuca serriola* 12  
*Chenopodium album* aggr. 12  
*Cirsium vulgare* 12  
*Plantago major* 11  
*Picris hieracioides* 11  
*Lolium perenne* 11  
*Ballota nigra* 11  
*Artemisia absinthium* 11  
*Arrhenatherum elatius* 11

Dominant species (percentage frequencies of occurrences with cover > 25%)

*Elytrigia repens* aggr. 8  
*Calamagrostis epigejos* 6

## V39 – Mesic perennial anthropogenic herbaceous vegetation

Stands dominated by perennial herbaceous plants, frequently ruderals, developing on mesic to slightly wet abandoned urban or agricultural land, on land that has been reclaimed, on transport networks, or on land used for waste disposal. These stands often replace annual anthropogenic herbaceous vegetation in the course of secondary succession.



### Corresponding alliances in EuroVegChecklist 2016

- <> EPI-02C Aegopodion podagrariae Tx. 1967 nom. conserv. propos.
- > EPI-04B Anthriscion nemorosae S. Brullo in S. Brullo et Marcenò 1985
- > EPI-03A Arction lappae Tx. 1937
- > EPI-03B Balloto-Conion maculati S. Brullo et Marcenò 1985
- > EPI-04A Geo urbani-Alliarion officinalis Lohmeyer et Oberd. in Görs et T. Müller 1969

### Characteristic species combination

Diagnostic species (phi coefficient \* 100)

<i>Ballota nigra</i>	22
<i>Lamium album</i>	21
<i>Urtica dioica</i>	20
<i>Chelidonium majus</i>	18
<i>Reynoutria japonica</i>	16
<i>Artemisia vulgaris</i>	15



Constant species (percentage frequencies)

<i>Urtica dioica</i>	71
<i>Galium aparine</i>	43
<i>Dactylis glomerata</i>	29
<i>Elytrigia repens</i> aggr.	26
<i>Artemisia vulgaris</i>	26
<i>Ballota nigra</i>	23
<i>Aegopodium podagraria</i>	23
<i>Geum urbanum</i>	20
<i>Anthriscus sylvestris</i>	20
<i>Taraxacum</i> sect. <i>Taraxacum</i>	19
<i>Heracleum sphondylium</i>	19
<i>Cirsium arvense</i>	19
<i>Chelidonium majus</i>	18
<i>Glechoma hederacea</i>	18
<i>Calystegia sepium</i>	18
<i>Poa trivialis</i>	16
<i>Lamium album</i>	15
<i>Rumex obtusifolius</i>	14
<i>Ranunculus repens</i>	14
<i>Arrhenatherum elatius</i>	13
<i>Alliaria petiolata</i>	13
<i>Stellaria media</i>	11
<i>Rubus caesius</i>	11
<i>Lapsana communis</i>	11
<i>Anisantha sterilis</i>	11
<i>Achillea millefolium</i> aggr.	11

Dominant species (percentage frequencies of occurrences with cover > 25%)

<i>Urtica dioica</i>	20
<i>Reynoutria japonica</i>	6
<i>Chaerophyllum aureum</i>	6

## **V41 – Hedgerows of non-native species**

[None of the habitats within group V4 could be formally defined in the expert system, because hedgerows cannot be distinguished from shrubland habitats based on the vegetation-plot data.]

Hedges planted with species not native in the vicinity. They may be exotics such as *Ligustrum ovalifolium* or European species outside their native range.

## **V42 – Highly-managed hedgerow of native species**

Regularly clipped hedges composed of native species that were planted as a hedge.

### **V43 – Species-rich hedgerow of native species**

Hedgerows composed mainly of native species, with on average at least five native woody species per 25 m length, excluding undershrubs such as *Rubus* sect. *Rubus* or climbers such as *Clematis vitalba* or *Hedera helix*. In Western Europe, many such hedges are thought to be medieval in origin.

#### **V44 – Species-poor hedgerow of native species**

Hedgerows composed mainly of native species, not neatly clipped or obviously planted as a hedge, with on average less than five woody species per 25 m length, excluding undershrubs such as *Rubus* sect. *Rubus* or climbers such as *Clematis vitalba* or *Hedera helix*.

## **V51 – Shrub plantation for whole-plant harvesting**

[None of the habitats within group V5 could be formally defined in the expert system, because some shrub plantations cannot be distinguished from spontaneously developed shrubland habitats based on the vegetation-plot data, whereas in other shrub plantations, only the herbaceous vegetation between the rows of planted shrubs is usually sampled in vegetation plots.]

Includes shrub nurseries and plantations for biomass production. Excludes tree nurseries and plantations of Christmas trees (T42).

## **V52 – Shrub plantation for leaf or branch harvest**

Includes tea (*Camellia sinensis*) plantations, and osier (*Salix viminalis*) beds grown for basket-making.

### **V53 – Shrub plantation for ornamental purposes or for fruit, other than vineyards**

Plantations of dwarf trees, shrubs, espaliers or perennial woody climbers other than grapevines, cultivated for fruit or flower production. They include, among others, berry-bearing bushes of *Ribes* and *Rubus*.



## **V54 – Vineyard**

Plantations of grapevine *Vitis vinifera*.

## **V61 – Broadleaved fruit and nut tree orchard**

[None of the habitats within group V6 could be formally defined in the expert system, because some tree-dominated man-made habitats cannot be distinguished from spontaneously developed tree-dominated habitats based on the vegetation-plot data, whereas in orchards, only the herbaceous vegetation between trees is usually sampled in vegetation plots.]

Stands of deciduous trees cultivated for fruit or flower production, providing permanent tree cover once mature. Extensively cultivated and old orchards are habitats supporting rich flora and fauna.

## **V62 – Evergreen orchard and grove**

Stands of broadleaved evergreen trees cultivated for fruit, mostly olive and citrus fruits, providing permanent tree cover once mature. Extensively cultivated and old groves are habitats supporting rich flora and fauna.

## **V63 – Line of planted trees**

More or less continuous lines of trees forming strips within a matrix of grassy or cultivated land or along roads, typically used for shelter or shading. Lines of trees differ from hedgerows (V4) in being composed of species that can grow to at least 5 m in height and are not regularly cut down to a height below 5 m.

## **V64 – Small deciduous broadleaved planted other wooded land**

Small plantations and intensively-managed woodland dominated by deciduous broadleaved trees less than 0.5 ha in area. If evergreen broadleaved species are present, they have a lower canopy cover than deciduous species.

## **V65 – Small evergreen broadleaved planted other wooded land**

Small plantations and intensively-managed woodland dominated by broadleaved evergreen trees less than 0.5 ha in area. If deciduous broadleaved species are present, they have a lower canopy cover than evergreen species.

## **V66 – Small coniferous planted other wooded land**

Small plantations and intensively-managed woodlands dominated by coniferous trees less than 0.5 ha in area. If broadleaved species are present, they have canopy cover less than 50%.