

This is an extract from the following report:

# Review of grassland habitats and development of distribution maps of heathland, scrub and tundra habitats of EUNIS habitats classification

*Report EEA/NSV/15/005*

## **TABLE OF CONTENTS**

### **2 Determination and floristic composition of EUNIS grassland habitat types on the basis of in situ vegetation measurements throughout Europe**

- 2.1 Background
- 2.2 Vegetation-plot data as a scientific basis for habitat classification
- 2.3 Update of crosswalks between EUNIS grassland habitat types and EuroVegChecklist
- 2.4 The floristic composition of EUNIS grassland habitat types at the level of alliances of the EuroVegChecklist

### **3 Reviewing the EUNIS grassland habitat types**

- 3.1 Background
- 3.2 Review of the EUNIS grassland habitat types
- 3.3 Proposed changes in the EUNIS grassland habitat types

**Appendix A:** An updated crosswalk EUNIS grassland habitat types (B1.4, E1-E6) to the 2013 EuroVegChecklist syntaxa

**Appendix B:** An updated crosswalk Syntaxa to EUNIS grassland habitat types (B1.4, E1-E6)

**Appendix C:** Fact sheets EUNIS grassland habitat types

## **2 Determination and floristic composition of EUNIS grassland habitat types on the basis of in situ vegetation measurements throughout Europe**

### **2.1 Background**

The present study is based on cross-walking two different European classification systems, which were developed more or less independently and for different purposes. On the one hand, there is the classification of vegetation types provided by phytosociology, the tradition which uses fine-scale vegetation-plot data on plant species composition and cover for 'bottom-up' fine-grained delimitation and characterisation of plant associations (Braun-Blanquet 1928; Tüxen 1937). On the other hand, there is the classification of habitat types, providing a pan-European reference system for policy making with a common unit description within a hierarchical classification, presently known as the EUNIS habitat classification (Davies & Moss 1999; Davies et al. 2004; Moss 2008).

The vegetation classification in particular is facing a new era, as a result of the availability nowadays of high-capacity computers and software packages for processing phytosociological data. During the last century, numerous studies have resulted in a large number of formally described associations, alliances, orders and classes throughout Europe, but their delimitation usually remained incomplete and contentious due to various theoretical constraints and methodological problems. In an attempt to achieve a respectable level of stability, the European Vegetation Survey (EVS) developed in the early years of the 21st century the first overview of European vegetation units at the levels of alliances, orders and classes, published as *The Diversity of European Vegetation* (Rodwell et al. 2002). From that moment onwards, the overview of European syntaxa has undergone substantial expert revision by a team under the leadership of Professor Ladislav Mucina. The new product, the EuroVegChecklist, is more comprehensive (covering all Europe as well as territories such as the Azores, Canary Islands, Cyprus, Caucasus and Greenland), scientifically robust, better grounded within current phytosociological understanding, and more meaningful for application within the user community. The 2013 version of this EuroVegChecklist was used for the EUNIS woodland habitat revision (Schaminée et al. 2013) and, after further revision, was submitted to the journal *Applied Vegetation Science* for publication in 2013 and resubmitted after review in June 2014 (Mucina et al. 2014).

## **2.2 Vegetation-plot data as a scientific basis for habitat classification**

As described in the project plan (*Research proposal EEA/NSV/15/005*), plot samples as collected by phytosociologists (Braun-Blanquet 1928, Mueller-Dombois & Ellenberg 1974) provide the most numerous and widely dispersed in-situ records of vegetation across Europe. Comprising at minimum a list of vascular plant species with an estimate of cover-abundance in plots ranging from less than 1 m<sup>2</sup> to a few hundreds m<sup>2</sup> (Chytrý & Otýpková 2003), such samples are usually dated and spatially located in a way that gives a record of the composition of vegetation at a particular time and place. In phytosociology, they have formed the basis of the classification of vegetation into associations organised into hierarchical systems, and have thus helped furnish inventories and maps of sites and accounts of the vegetation of countries and regions (e.g. Rodwell 1991 et seq.; Mucina et al. 1993; Schaminée et al. 1995 et seq.; Valachovič et al. 1995 et seq. Chytrý 2007 et seq.).

Various enquiries within and outside the EVS (Ewald 2001; Schaminée et al. 2009) have provided an insight into the patterns of accumulation of vegetation plots across Europe over the past 90 years. The latest estimates (based on data from 32 countries) suggest that more than 4.3 million vegetation descriptions have been recorded. Most of plots have been made in the countries of central and western Europe, particularly Germany, the Netherlands and France, but considerable numbers were also estimated for Poland, Spain, the Czech Republic, Italy, the United Kingdom and Austria (Schaminée et al. 2009).

The development of compatible software tools, one of the EVS core work objectives, has greatly encouraged the development of national and regional vegetation databases and fostered the creation of a network facilitating data exchange and research collaborations, and assisted the emergence of supra-national vegetation revisions and overviews over the last twenty years. The major software tool for database development has been TURBOVEG (Hennekens & Schaminée 2001), now accepted as an international standard for data input, storage, management and retrieval, and installed in over 30 countries in Europe and beyond. Complementary to TURBOVEG, the JUICE program (Tichý 2002) has added a wide range of analytical tools for data sets that can comprise thousands of relevés.

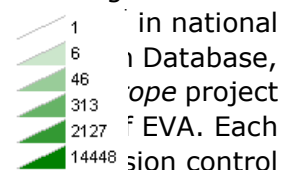
The most recent study designed to collect estimates of the total number of vegetation plots in Europe (Schaminée et al. 2009), revealed that more than 1.8 million relevés had been already computerised, 75% of which were found in centralised databases of countries or regions. Of all captured relevés, 59% were available in TURBOVEG format. Further key steps have now been taken by many EVS members to locate and capture additional plots, and to centralise data storage of such plots. In 2011, the Global Index of Vegetation-Plot

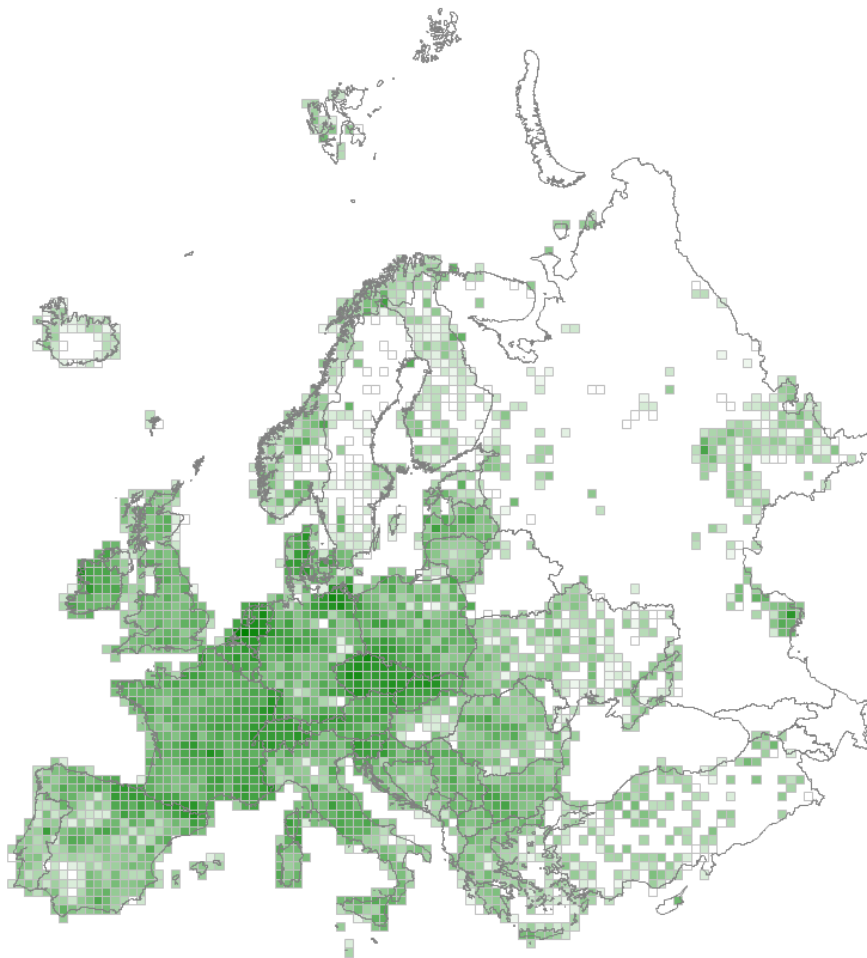
Databases platform (GIVD) was launched (Dengler et al. 2011) to provide a meta-resource of electronic databases whose hosts are willing in principle to share the captured data. At present (18 Feb 2016; <http://www.givd.info/>), 237 databases with 3,160,243 vegetation plots have been registered, a large proportion of them providing records of European vegetation. The GIVD platform also assists in revealing gaps in the coverage and/or availability of the vegetation plot data.

Another young initiative – the European Vegetation Archive (EVA) – yielded a centralised database of vegetation plots by storing copies of national and regional databases on a single software platform using a unified taxonomic reference database. Data storing in EVA does not affect the ongoing independent development of the source databases. EVA Data Property and Governance Rules ([www.euroveg.org/eva-database](http://www.euroveg.org/eva-database)), approved in 2012, guarantee that data property rights of the original contributors are respected. By December 2015, 62 databases from all European regions, including the largest examples, joined EVA. The centralised database contained in total 1,126,004 vegetation plots from most European regions, especially from western, central and southern Europe (see Figure 2.1). However, there is a remarkable lack of data from Scandinavia and eastern European countries, i.e. European regions with less strong or interrupted phytosociological traditions. The majority of these plots (87%) have geographic coordinates. The vegetation-plot records are stored in EVA in three access regimes: free (available to anybody), semi-restricted (available in principle to the group of other data contributors) and restricted (available in principle to the group of other data contributors based on specific consent). These three access regimes are represented respectively by 6%, 82% and 12% of the total EVA database (Chytrý et al. 2016).

A prototype of the database management software TURBOVEG 3 was developed for joint management of multiple databases that use different species lists. This software also includes procedures for handling data requests, selections and provisions according to the approved EVA Rules. A specific challenge for EVA is combining multiple species lists based on different taxonomic and regional databases. This is managed using the SynBio, which was initially established for the purposes of the SynBio Europe project and is now further developed and extended within the framework of EVA. Each relevé in EVA has a unique Global Unified Identifier (GUID), which will be used to keep track of date changes. Several specific projects devoted to detailed diversity assessment of selected vegetation types started within the EVA initiative in 2014. A prototype project for the EVA initiative is the Braun-Blanquet Project, aiming at the compilation and analysis of floristic and geographical information on European vegetation types. The project, led by Dr. Borja Jiménez-Alfaro, is dedicated to Josias Braun-Blanquet, whose legacy has been the inspiration for collecting large datasets of vegetation-plot data in Europe

([http://www.sci.muni.cz/botany/vegsci/braun\\_blanquet.php?lang=en](http://www.sci.muni.cz/botany/vegsci/braun_blanquet.php?lang=en)).





*Figure 2.1. Density of georeferenced plots in 50 x 50 km grid cells.*

The vegetation-plot data used in the Braun-Blanquet Project form the basis for determining and providing the floristic composition of grassland vegetation data, in a similar fashion as in the EEA 2014 project on heathland, scrub and tundra habitat types (Schaminée et al. 2014), and in the EEA 2013 project on woodland habitat types (Schaminée et al. 2013). As indicated before, the main input has come from computerized databases set up at many places throughout Europe.

The task to revise the EUNIS grassland habitat types is based on the current version of EUNIS level 3 and the 2013 version of the EuroVegChecklist, as presented at the Annual Symposium of the International Association for Vegetation Science (IAVS) in Perth in September 2014 and submitted to the international journal *Applied Vegetation Science* for publication.

## 2.3 Update of crosswalks between EUNIS grassland habitats and EuroVegChecklist

The crosswalk between the EUNIS habitat types and phytosociological alliances, prepared for the 2012 report on the development of vegetation syntaxa crosswalks to EUNIS habitat classification (Schaminée et al. 2012),

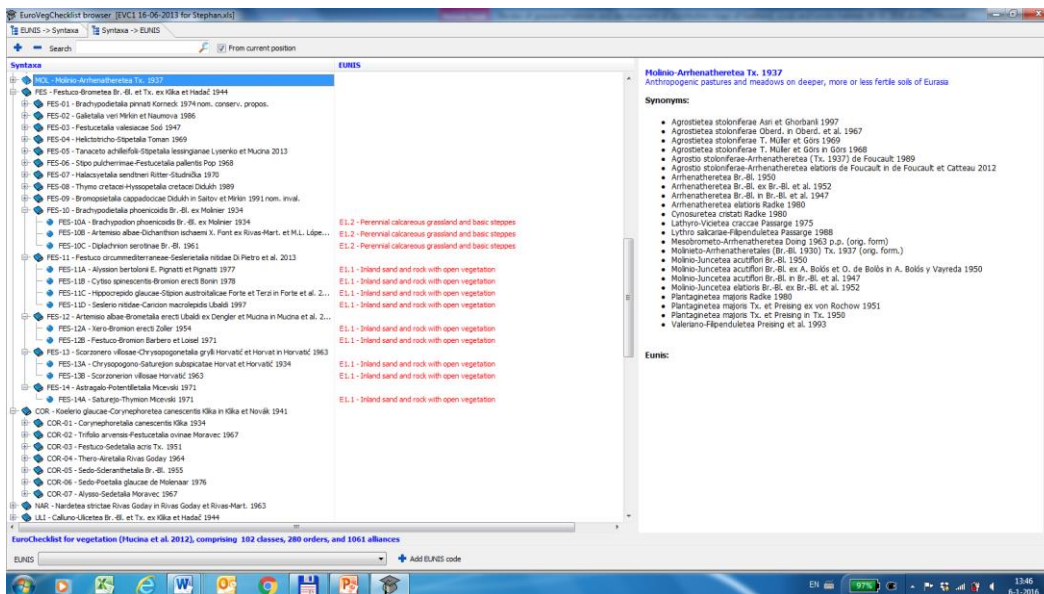


Figure 2.2. EuroVegChecklist browser with tab "Syntaxa -> EUNIS" open, based on the 2013 version of the EuroVegChecklist.

was based on a version of the EuroVegChecklist from July 2012 but this was subjected to further modifications after that date until it was ultimately submitted for publication on 30 March 2013. In the process of peer reviewing, the checklist has been further updated, based on the latest taxonomic discussions and insights. The submitted version of EuroVegChecklist recognizes 101 classes, 279 orders and 1,052 alliances. The document comprises 274 pages of text and several electronic appendices, including indicator species of classes, glossary of terms, bibliographic appendices, desktop browser and analytical tools. There are 32 authors from 16 countries. The overview also includes more than 4,000 scientific synonyms that provide the connection with vegetation types published in the past (Mucina et al. 2014).

In order to work with the updated version of European vegetation classification in the current project, we revised the EUNIS-syntaxa crosswalk to match the

submitted version of EuroVegChecklist. Ladislav Mucina, the senior author of EuroVegChecklist, took part in this revision. This revision reflected the merging of some alliances, the splitting of others, the introduction of new alliances and changes in the delimitation of some alliances that influenced established matches to the EUNIS habitat types.

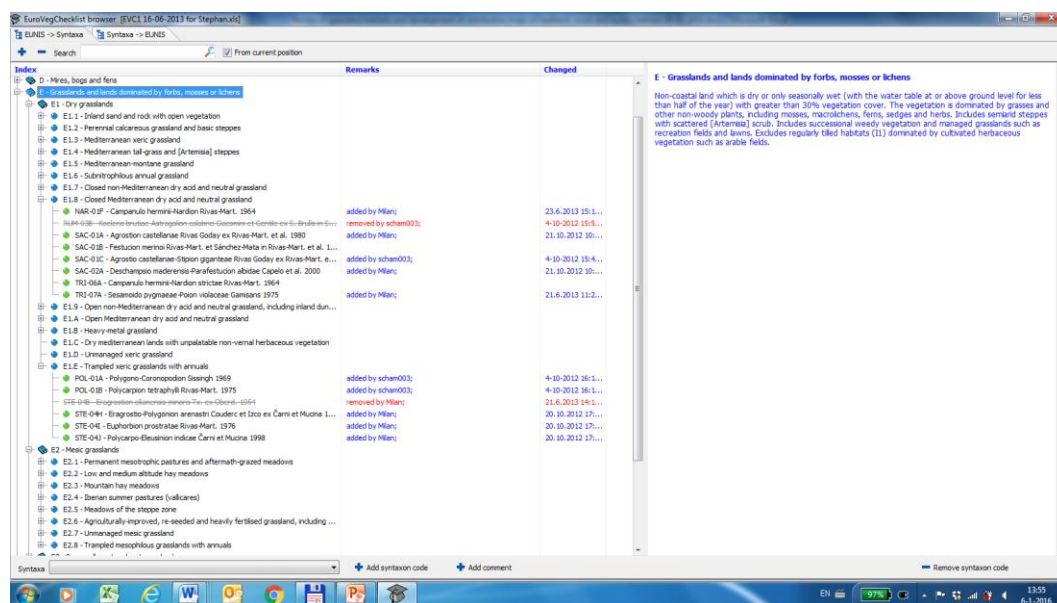


Figure 2.3. EuroVegChecklist browser with tab "EUNIS -> syntaxa" open, based on the 2013 version of the EuroVegChecklist.

To ease the workflow, a tool, called the EuroVegChecklist browser (see Figure 2.2 and Figure 2.3), has been developed for linking EUNIS habitats to alliances.

In relation to the definition of grasslands, the following EUNIS habitat types have been taken into account for the current task: B1.4 (Coastal stable dune grassland), B1.9 (Machair), and E (Grasslands and lands dominated by forbs, mosses or lichens). The syntaxa of the EuroVegChecklist that have been considered were selected on the basis of the crosswalks. The EUNIS categories E7 (Sparsely wooded grasslands) were not dealt with, as these types are complexes of different vegetation types. Some habitat types were omitted as they are not grasslands, such as E1.C (Dry mediterranean lands with unpalatable non vernal herbaceous vegetation) and E5.3 (*Pteridium aquilinum* fields), having not a clear definition, such as E1.D (Unmanaged xeric grassland), E2.7 (Unmanaged mesic grassland) and E2.8 (Trampled mesophilous grasslands with annuals), or are anthropogenic/agricultural habitats, such as E1.6 (Subnitrophilous annual grasslands), E2.6 (Agriculturally-improved, re-seeded and heavily fertilised grassland, including sports fields and grass lawns), E1.E (Trampled xeric grasslands with annuals) and E5.1

(Anthropogenic herb stands). In total, 32 EUNIS grassland habitat types were considered as target habitat types.

## **2.4 The floristic composition of EUNIS grassland habitat types at the level of alliances of the EuroVegChecklist**

The floristic composition of the EUNIS grassland types has been determined on the basis of the floristic composition of the corresponding phytosociological alliances, according to the revised crosswalk EUNIS-syntaxa (Appendix A). As a basis for the analysis, a database of 1,190,000 relevés has been compiled, in TURBOVEG format (see Paragraph 2.2), of which 370,000 relevés could be assigned to grasslands. The database for grasslands contains datasets from a wide range of data providers throughout Europe (Appendix H).

The procedure consists of two steps. In a first step, the relevés of these – regional and national – datasets were classified at the level of alliances of the 2013 EuroVegChecklist (submitted version). This was done by matching the original assignment of the relevés to alliances (in most cases reflecting the national or regional classification systems) to the syntaxonomical criteria applied in the European overview. At present, about 57% of the 1,190,000 relevés could be assigned to one of the alliances accepted in the 2013 EuroVegChecklist, 31% of which belong to grasslands. In a second step, the assignment to the EUNIS grassland habitat types was performed by merging the data of the alliances to the corresponding EUNIS type (according to the EUNIS-syntaxa crosswalk) and by averaging based on national constancy columns (not by simply adding up). Here we give an example to illustrate this. Let us presume that we have data from two countries for a certain alliance, from the Czech Republic and Spain. If the occurrence of species A is 50% of Czech relevés from a total of 1,000 (=500) and 10% of Spanish relevés from a total of 100 (=10), then by simply taking the total number of relevés, a total frequency of 46% (510 relevés from a total of 1,100) would be the outcome, which is mainly determined by the larger dataset of the Czech Republic. If we apply average frequencies, the result would be a mean frequency of 30%, which probably is more representative across a broader region of Europe. For Russia, separate constancy columns were made for different regions before averaging, not for the whole country, because it is extremely large.

In the crosswalk, 366 grassland alliances of the EuroVegChecklist have been assigned to one of the 32 EUNIS habitat types. At present, there are relevés for 242 of these alliances (i.e. 66%). Nevertheless, all 32 EUNIS grassland habitat types have been covered by real data (100%), in most cases providing a representative number of relevés in relation to the geographic distribution and commonness of each habitat type. The reasons for having no in-situ vegetation data for certain alliances are the following:



(1) Alliances from regions with general lack of phytosociological data. Some areas are still not well covered in the vegetation databases available for the Braun-Blanquet project, like the Boreal zone of Scandinavia and Russia, Ukraine, Caucasus, parts of Balkan, and Cyprus.

(2) Alliances recently described for the work developed in the EuroVegChecklist which have not been used before. Thus, the corresponding relevés in the original databases are not classified and correct assignment is difficult. This is the case especially for grassland alliances from Italy and the Balkans.

### **3 Reviewing the EUNIS grassland habitat types**

#### **3.1 Background**

The development of the EUNIS Habitat Classification (Davies & Moss 1999) afforded a fresh opportunity to provide a sound scientific cross-reference between widely accepted classification of European habitats and phytosociological definitions of vegetation types, as indicated in the *Introduction* (Chapter 1). Some 15 years ago, a team of the European Vegetation Survey (EVS) developed a crosswalk between phytosociological units to the level of the alliance and EUNIS habitats at level 3. *The Scientific Background to the EUNIS Habitat Classification* (Rodwell et al. 1998) provided the first overview of European vegetation types to the level of alliance, after which, in 2002, the booklet *The Diversity of European Vegetation* provided crosswalks from the EUNIS Level 3 habitats to the syntaxa and vice versa, accompanied by brief verbal descriptors of the vegetation units (Rodwell et al. 2002). In a recent EEA project, these crosswalks have been revised and updated (Schaminée et al. 2012).

Since the original crosswalk was developed (Rodwell et al. 2002), there have been only relatively modest changes to the terrestrial sections of the EUNIS Habitat Classification (Evans, personal communication). However, the overview of European syntaxa has undergone substantial expert revision, as discussed in Chapter 2. In Paragraph 2.3, information has been provided on the update of the EuroVegChecklist (version 2013) and the crosswalks between the EUNIS classification and this checklist.

#### **3.2 Review of the EUNIS grassland habitat types**

As mentioned above (Par. 2.3), the following EUNIS grassland habitat types were reviewed: B1.4 (Coastal stable dune grassland), B1.9 (Machair), and E (Grasslands and lands dominated by forbs, mosses or lichens). Within the E group, exceptions were made for E1.6, E1.C, E1.D, E1.E, E2.6, E2.7, E2.8, E5.1, E5.3 and E7, whereas for some other habitat types the proposal is made to merge them with types from other groups. The latter concerns the habitat types E1.4, E2.5 and E4.2 (see Table 3.1 and Appendix C for explanation). The reasons for exclusion are further explained in Paragraph 2.3; some of the types are not grasslands, others anthropogenic or vegetation complexes.

In line with the recommendations for improving the EUNIS forest habitat classification (Schaminée et al. 2013) and the heathland, tundra and scrub classification (Schaminée et al. 2014), similar conclusions can be drawn for the grasslands. They will involve two types of recommendations, one concerning the classification itself, with recommendations for new units, splitting and merging existing units, and one dealing with their naming (see the EEA 2013 report for further details).

Our main conclusion is that the EUNIS habitat types are generally too broad and therefore should be divided. The proposed revision is mainly based on floristic composition, whereas EUNIS sometimes follows a division based on vegetation structure (for example open and closed grassland). Especially the order level in syntaxonomy proves to be appropriate for making distinctions. The proposed classification based on species composition brings grasslands together with a similar soil, hydrology and management. Quite often these grasslands are zonal and confined to a specific geographic region, which can be reflected in the name (boreal, continental, submediterranean, and so on). The term 'ultramafic' relates to serpentine rocks and related rocks with high concentrations of metals. The term 'annual grassland' is used for grasslands containing a large amount of annual species, in contrast with the term 'perennial grassland' for grasslands harbouring many perennial species.

Classification By comparing the existing EUNIS classification with the floristic composition of the assigned syntaxa, we found strong grounds for revising the EUNIS types B1.4, B1.9, E1.1, E1.2, E1.3, E1.5, E1.7, E1.8, E1.9, E2.1, E3.1, E3.2, E3.4, E3.5, E4.3, E4.4, E5.2, and E5.4. We further propose to add one new EUNIS habitat type, occurring on the Azores (E1.F Azorean open, dry, acid to neutral grassland), and to define the temperate inland salt marshes as an additional habitat type E6.3 within subgroup E6 (Inland salt steppes). Furthermore some changes in names are proposed (see Paragraph 3.3 and Table 3.1). Special attention is paid to B1.9 (Machair), as this habitat type might be concerned as a vegetation complex as well as – more restricted – grassland habitat type (see below).

Proposal for improvement of the EUNIS types:

*EUNIS B1.4 Coastal dune grassland.* These stable dune grasslands (grey dunes) should be split into three types, according to their geographic position, and distinguished by different species composition: B1.4a Atlantic and Baltic coastal dune grasslands, B1.4b Mediterranean and Macaronesian coastal dune grasslands, and B1.4c Black Sea coastal dune grasslands.

*EUNIS B1.9 Machair.* This habitat type actually is a complex of various habitat types that on themselves are already recognized within the EUNIS classification (X27). Nevertheless, because of their specific position in the coastal landscape and the strong interest for nature conservation (Machairs are a priority habitat type within Natura 2000, H21A0), machairs might be considered as a separate

EUNIS habitat type within Group B, referring to the grassland part of the machairs, that are generally considered as separate ecosystems (e.g. Ritchie 1976, Angus 2004). To indicate that only the grassland part of the machairs is considered within Group B, we propose to rename the habitat type into B1.9a Machair grasslands. Floristically these grasslands have the same content as the Irish and Scottish representatives of B1.4a Atlantic and Baltic coastal dune grasslands.

*EUNIS E1.1 Inland sand and rock with open vegetation.* EUNIS makes a high level distinction based on a sand and rock substrate, so there is a duplication of such grasslands with E1.9, where they figure as non-Mediterranean types of dry acid and neutral open grassland. From the lower level EUNIS types, it is clear that inland dunes (mobile sands fluvial dunes) better fit under E1.9, while vegetation on skeletal soil (rocks) and sandy steppes fit better here. We propose a division in ten types: E1.1a Pannonian and Pontic sandy steppe, E1.1b Temperate and boreal pioneer grassland on shallow soils on siliceous rock outcrops, E1.1c Boreal open, sub-thermophilous grassland on shallow soils on siliceous rocky outcrops, E1.1d Submediterranean and temperate pioneer grassland on calcareous and ultramafic rocky outcrops, E1.1e Submediterranean xeric open grassland of skeletal calcareous and ultramafic soils, E1.1f Continental dry rocky steppic grassland and dwarf scrub on chalk outcrops, E1.1g Perennial grassland on rocky outcrops at low altitudes in Central and Southeastern Europe, E1.1h Submontane to supramontane ultramafic rocky grassland of the Balkans, E1.1i Subatlantic and submediterranean perennial grassland on calcareous shallow soils, and E1.1j Dry steppic, submediterranean pasture of South-Eastern Europe.

*EUNIS E1.2 Perennial calcareous grassland and basic steppes.* This habitat type could be split into two types, representing grasslands of different floristic composition and occurring in different geographic regions: E1.2a Semi-dry perennial calcareous grassland and E1.2b Continental dry steppe. The first refer to the order *Brometalia*, the latter represents the order *Festucetalia valesiaca*.

*EUNIS E1.3 Mediterranean xeric grassland.* This habitat type could be split according to geographical distribution and floristic composition, reflected at the class level. The first two types refer to closely grazed (*Poetea bulbosae*) and perennial grasslands (*Thero-Brachypodietea*), the third to annual-rich grasslands (*Stipo-Trachynietea distachyi*): E1.3a Mediterranean closely grazed dry grassland, E1.3b Mediterranean tall perennial dry grassland, and E1.3c Mediterranean annual-rich dry grassland.

*EUNIS E1.5 Mediterranean montane grassland.* This habitat type, with many endemic species, could be split into five types according to geographical distribution and the floristic composition. As such, there are different habitat types for the Iberian, Corsican and Sardinian, Greek and Anatolian, and Madeiran region, with a further split of the Iberian communities for siliceous and basiphilous communities: E1.5a Iberian oromediterranean siliceous dry

grassland, E1.5b Iberian oromediterranean basiphilous dry grassland, E1.5c Corsican and Sardinian oromediterranean siliceous dry grassland, E1.5d Greek and Anatolian oromediterranean siliceous dry grassland, and E1.5e Madeiran oromediterranean siliceous dry grassland.

*EUNIS E1.7 Closed non-Mediterranean dry acid and neutral grassland.* For this habitat type we propose a change of content and consequently a change of name. Excluded are specific boreal grasslands (E4.3) and steppic grassland (E1.2). The newly proposed type is more restricted: E1.7a Lowland to submontane, dry to mesic *Nardus* grassland.

*EUNIS E1.8 Mediterranean dry acid and neutral closed grassland.* Because of large overlap with other (oromediterranean) habitat types (E1.5, E1.7 and E1.A) we propose to restrict this habitat type to specific Iberian communities, belonging to the the order *Jasione sessiliflorae-Koelerietalia crassipedis*. In line with this change in content we propose a change of name: E1.8a Open Iberian supra-mediterranean dry acid and neutral grassland.

*EUNIS E1.9 Non-Mediterranean dry acid and neutral open grassland, including inland dune grassland.* We propose to restrict this habitat type to inland dune grasslands, and to split off the mobile sand communities (mainly *Corynephorion canescentis*) as a separate habitat type, in line with the Habitats Directive (H2330): E1.9a Oceanic to subcontinental inland sand grassland on dry acid and neutral soils, and E1.9b Inland mobile sand and dune with siliceous grassland.

*EUNIS E2.1 Permanent mesotrophic pastures and aftermath-grazed meadows.* We propose a change of content as the aftermath grazed meadows should be included in E2.2 and E2.3. Consequently, there will be a change in name: E2.1a Mesic permanent pastures of lowlands and mountains.

*EUNIS E3.1 Mediterranean tall humid grassland.* This habitat type should be restricted to the inland areas, as the coastal communities belong to habitat type B1.8 (Moist and wet dune slacks). Therefore we also propose a change of name: E3.1a Mediterranean tall humid inland grassland.

*EUNIS E3.2 Mediterranean short humid grassland.* This habitat type could be divided into two types, one of the lowlands and one for the mountains, going along with differences in floristic composition: E3.2a Mediterranean short moist grassland of lowlands, and E3.2b Mediterranean short moist grassland of mountains.

*EUNIS E3.4 Moist or wet mesotrophic to eutrophic grassland.* This habitat type could be split into two types, according to management (mowing versus grazing), and coinciding with a different species composition: E3.4a Moist or wet mesotrophic to eutrophic hay meadow, and E3.4b Moist or wet mesotrophic to eutrophic pasture.

*EUNIS E3.5 Moist or wet oligotrophic grassland.* We propose to restrict these wet oligotrophic grasslands to the non-Mediterranean regions, and consequently propose a new name: E3.5a Non-Mediterranean moist or wet oligotrophic grassland.

*EUNIS E4.3 Acid alpine and subalpine grassland.* We propose to split this habitat type into two types, according to their distinct geographical occurrence in the boreal-arctic and alpine zone respectively: E4.3a Boreal and arctic acidophilous alpine grassland, and E4.3b Temperate acidophilous alpine grassland.

*EUNIS E4.4 Calcareous alpine and subalpine grassland.* This habitat type could be split into two types, according to floristic composition and geographical distribution. The arctic-alpine grasslands belong to the orders *Carici-Kobresietea* and *Seslerietalia caerulea*, the alpine-subalpine grasslands of the Balkan and Apennines to the orders *Seslerietalia tenuifoliae* and *Onobrychido-Seslerietalia*: E4.4a Arctic-alpine calcareous grassland, and E4.4b Alpine and subalpine calcareous grasslands of the Balkan and Apennines.

*EUNIS E5.2 Thermophile woodland fringes* could be split into three types, according to floristic composition, going along with geographical distribution (Macaronesia) and soil characteristics (base-rich versus acidic): E5.2a Thermophile woodland fringe of base-rich soils, E5.2b Thermophilous woodland fringe of acidic soils, and E5.2c Macaronesian thermophile woodland fringe.

*EUNIS E5.4 Moist or wet tall-herb and fern fringes and meadows.* We propose to restrict this habitat type to the lowlands and to exclude anthropogenic stands. Therefore, a change of name is proposed: E5.4a Moist or wet tall-herb and fern fringe of the lowlands. The mountain forms of such stands are assigned to E5.5.

Naming: With regard to the names of the EUNIS grassland habitat types we could derive a set of general recommendations, which we have applied to the existing classification. Where relevant, we have clarified our suggestions by one or more examples.

General recommendation 1: Adopt brief and clear names for the habitat types.

General recommendation 2: Names within a group of related habitat types should be mutually exclusive with regard to, for example, biogeographic zone. Example: Atlantic and Baltic coastal dune grassland (B1.4a) versus Mediterranean and Macaronesian coastal dune grasslands (B1.4b) and Black Sea coastal dune grassland (B1.4c).

General recommendation 3: Do not use square brackets to indicate scientific names. If included, scientific taxon names should be in italics. This only concerns one habitat type within group E: E5.3 [*Pteridium aquilinum*] fields, a

habitat type that we will not consider as these bracken fields are no grassland. In the web version of the EUNIS classification this change has already been made.

General recommendation 4: Use a standardized naming. Example: use only the name grassland instead of alternatively grasslands or grassland, like in E2 Mesic grasslands and E2.8 Trampled mesophyllous grasslands versus E2.7 Unmanaged mesic grassland. We propose to use singular instead of the plural for terms like steppe, meadow and stand.

### **3.3 Proposed changes in the EUNIS grassland habitat types**

Applying these recommendation with regard to content and naming would result in the following updated list of EUNIS grassland habitat types (habitat types with just changes in names – without splitting and/or change of content – are indicated with an \*; in such case, the existing name is put within brackets behind the proposed new name):

- ▶ B1.4 Coastal dune grassland could be divided into three types, according to geographical distribution:
  - ▶▶ B1.4a Atlantic and Baltic coastal dune grassland
  - ▶▶ B1.4b Mediterranean and Macaronesian coastal dune grassland
  - ▶▶ B1.4c Black Sea coastal dune grassland
- ▶ B1.9 Machair should be restricted to the grassland part of the habitats and accordingly renamed:
  - ▶▶ B1.9a Machair grasslands\*
- ▶ E1.1 Inland sand and rock with open vegetation is much too general and could be divided into ten types, mainly based on different regions and floristic composition
  - ▶▶ E1.1a Pannonian and Pontic sandy steppe
  - ▶▶ E1.1b Temperate and boreal pioneer grassland on shallow soils on siliceous rocky outcrops
  - ▶▶ E1.1c Boreal open, sub-thermophilous grassland on shallow soils on siliceous rocky outcrops

- ▶▶ E1.1d Submediterranean and temperate pioneer grassland on calcareous and ultramafic rocky outcrops
- ▶▶ E1.1e Submediterranean xeric open grasslands of skeletal calcareous and ultramafic soils
- ▶▶ E1.1f Continental dry rocky steppic grassland and dwarf scrub on chalk outcrops
- ▶▶ E1.1g Perennial grassland on rocky outcrops at low altitudes in Central and Southeastern Europe
- ▶▶ E1.1h Submontane to supramontane ultramafic rocky grassland of the Balkans
- ▶▶ E1.1i Subatlantic and submediterranean perennial grassland on calcareous shallow soils
- ▶▶ E1.1j Dry steppic, submediterranean pasture of South-Eastern Europe
- ▶ E1.2 Perennial calcareous grassland and basic steppes could be split into three types, according to floristic composition and geographical distribution:
  - ▶▶ E1.2a Semi-dry perennial calcareous grassland
  - ▶▶ E1.2b Continental dry steppe
- ▶ E1.3 Mediterranean xeric grassland could be split into three types, according to floristic composition and geographical distribution:
  - ▶▶ E1.3a Mediterranean closely grazed dry grassland
  - ▶▶ E1.3b Mediterranean tall perennial dry grassland
  - ▶▶ E1.3c Mediterranean annual-rich dry grassland
- ▶ E1.5 Mediterranean-montane grassland could be split into five types, according to floristic composition and representing different regions:
  - ▶▶ E1.5a Iberian oromediterranean siliceous dry grassland
  - ▶▶ E1.5b Iberian oromediterranean basiphilous dry grassland
  - ▶▶ E1.5c Corsican and Sardinian oromediterranean siliceous dry grassland
  - ▶▶ E1.5d Greek and Anatolian oromediterranean siliceous dry grassland



- ▶▶ E1.5e Madeiran oromediterranean siliceous dry grassland
- ▶ E1.7 Closed non-Mediterranean dry acid and neutral grassland. Change of content and consequently change of name:
  - ▶▶ E1.7a Lowland to submontane, dry to mesic *Nardus* grassland
- ▶ E1.8 Mediterranean dry acid and neutral closed grassland. Change of content and consequently change of name:
  - ▶▶ E1.8a Open Iberian supra-mediterranean dry acid and neutral grassland
- ▶ E1.9 Non-Mediterranean dry acid and neutral open grassland, including inland dune grasslands, has to be more restricted to these dune systems and could be divided over two types according to floristic composition and geomorphology:
  - ▶▶ E1.9a Oceanic to subcontinental inland sand grassland on dry acid and neutral soils
  - ▶▶ E1.9b Inland mobile sand and dune with siliceous grassland
- ▶ E1.A Mediterranean to Atlantic open, dry, acid and neutral grassland\* [Mediterranean dry acid and neutral open grassland]
- ▶ E1.B Heavy metal grassland
- ▶ E1.F Azorean open, dry, acid to neutral grassland
- ▶ E2.1 Permanent mesotrophic pastures and aftermath-grazed meadows. Change of content and consequently change of name:
  - ▶▶ E2.1a Mesic permanent pasture of lowlands and mountains
- ▶ E2.2 Low and medium altitude hay meadow\* [Low and medium altitude hay meadows]
- ▶ E2.3 Mountain hay meadow\* [Mountain hay meadows]
- ▶ E2.4 Iberian summer pasture (vallicar)\* [Iberian summer pastures (vallicar)]
- ▶ E3.1 Mediterranean tall humid grassland. Change of content and consequently change of name:
  - ▶▶ E3.1a Mediterranean tall humid inland grassland

- ▶ E3.2 Mediterranean short humid grassland could be split into two types, according to altitude:
  - ▶▶ E3.2a Mediterranean short moist grassland of lowlands
  - ▶▶ E3.2b Mediterranean short moist grassland of mountains
- ▶ E3.3 Sub-mediterranean moist meadows
- ▶ E3.4 Moist or wet mesotrophic to eutrophic grassland could be split into two types, according to management:
  - ▶▶ E3.4a Moist or wet mesotrophic to eutrophic hay meadow
  - ▶▶ E3.4b Moist or wet mesotrophic to eutrophic pasture
- ▶ E3.5 Moist or wet oligotrophic grassland has to be renamed as we propose to restrict this grassland to the non-Mediterranean regions:
  - ▶▶ E3.5a Non-Mediterranean moist or wet oligotrophic grassland
- ▶ E4.1 Vegetated snow-patch
- ▶ E4.3 Acid alpine and subalpine grassland could be split into two types, according to their geographical distribution:
  - ▶▶ E4.3a Boreal and arctic acidophilous alpine grassland
  - ▶▶ E4.3b Temperate acidophilous alpine grassland
- ▶ E4.4 Calcareous alpine and subalpine grassland could be split into two types, according to floristic composition and geographical distribution:
  - ▶▶ E4.4a Arctic-alpine calcareous grassland
  - ▶▶ E4.4b Alpine and subalpine calcareous grassland of the Balkan and Apennines
- ▶ E5.2 Thermophile woodland fringes could be split into three types, according to geographical distribution and soil characteristics:
  - ▶▶ E5.2a Thermophile woodland fringe of baserich soils
  - ▶▶ E5.2b Thermophilous woodland fringe of acidic soils
  - ▶▶ E5.2c Macaronesian thermophile woodland fringe

- ▶ E5.4 Moist or wet tall-herb and fern fringes and meadows. Change of content and consequently change of name:
- ▶▶ E5.4a Moist or wet tall-herb and fern fringe of the lowlands
- ▶ E5.5 Subalpine moist or wet tall-herb and fern stand\* [Subalpine moist or wet tall-herb and fern stands]
- ▶ E6.1 Mediterranean inland salt steppe\* [Mediterranean inland salt steppes]
- ▶ E6.2 Continental inland salt steppe\* [Continental inland salt steppes]
- ▶ E6.3 Temperate inland salt marsh
- ▶ E7.1 Temperate and hemiboreal wooded pasture and meadow\* [Atlantic parkland]
- ▶ E7.2 Hemiboreal and boreal wooded pasture and meadow\* [Sub-continental parkland]
- ▶ E7.3 Mediterranean wooded pasture and meadow\* [Dehesa]

*Table 3.1. Overview of old and revised EUNIS habitat types.*

EUNIS code new	EUNIS-3 habitat name new	EUNIS code old	EUNIS-3 habitat name old
B1.4a	Atlantic and Baltic coastal dune grassland (grey dunes)	B1.4	Coastal stable dune grassland
B1.4b	Mediterranean and Macaronesian coastal dune grassland (grey dunes)		
B1.4c	Black Sea coastal dune grassland (grey dunes)		
B1.9	Machair grassland	B1.9	Machair
E1.1a	Pannonian and Pontic sandy steppe	E1.1	Inland sand and rock with open vegetation
E1.1b	Temperate and boreal pioneer grassland on shallow soils on siliceous rock outcrops		
E1.1c	Boreal open, sub-thermophilous grassland on shallow soils on siliceous rock outcrops		
E1.1d	Submediterranean and temperate pioneer grassland on calcareous and ultramafic rock outcrops		
E1.1e	Submediterranean open dry grassland of skeletal calcareous and ultramafic soils		
E1.1f	Continental dry rocky steppic grasslands and dwarf scrub on chalk outcrops		
E1.1g	Perennial grassland on rocky outcrops at low altitudes in Central and Southeastern Europe		
E1.1h	Submontane to supramontane ultramafic rocky grassland of the Balkans		
E1.1i	Subatlantic and submediterranean perennial grassland on calcareous shallow soils		

E1.1j	Dry steppic, submediterranean pasture of Southeastern Europe		
E1.2a	Semi-dry perennial calcareous grassland	E1.2	Perennial calcareous grassland and basic steppes
E1.2b	Continental dry steppe		
E1.3a	Mediterranean closely grazed dry grassland	E1.3	Mediterranean xeric grassland
E1.3b	Mediterranean tall perennial dry grassland		
E1.3c	Mediterranean annual-rich dry grassland		
E1.4	Merged with other habitats in EUNIS revision, partly with E1.3b and partly with F6.8a and F6.8b	E1.4	Mediterranean tallgrass and Artemisia steppes
E1.5a	Iberian oromediterranean siliceous dry grassland	E1.5	Mediterranean montane grassland
E1.5b	Iberian oromediterranean basiphilous dry grassland		
E1.5c	Corsican and Sardinian oromediterranean siliceous dry grassland		
E1.5d	Greek and Anatolian oromediterranean siliceous dry grassland		
E1.5e	Madeiran oromediterranean siliceous dry grassland		
E1.6	Subnitrophilous annual grasslands	E1.6	Subnitrophilous annual grasslands (excluded)
E1.7a	Lowland to submontane, dry to mesic Nardus grassland	E1.7	Non-Mediterranean dry acid and neutral closed grassland
E1.8	Open Iberian supramediterranean dry acid and neutral grassland	E1.8	Mediterranean dry acid and neutral closed grassland
E1.9a	Oceanic to subcontinental inland sand grassland on dry acid and neutral soils	E1.9	Non-Mediterranean dry acid and neutral open grassland, including inland dune grassland
E1.9b	Inland mobile sand and dunes with siliceous grassland		
E1.A	Mediterranean to Atlantic open, dry, acid and neutral grassland	E1.A	Mediterranean dry acid and neutral open grassland
E1.B	Heavy-metal grassland	E1.B	Heavy-metal grassland
E1.C	Dry Mediterranean lands with unpalatable non-vernal herbaceous vegetation	E1.C	Dry mediterranean lands with unpalatable non-vernal herbaceous vegetation (excluded)
E1.D	Unmanaged dry grassland	E1.D	Unmanaged xeric grassland (excluded)
E1.E	Trampled dry grassland with annuals	E1.E	Trampled xeric grasslands with annuals (excluded)
E1.F	Azorean open, dry, acid to neutral grassland		
E2.1a	Mesic permanent pasture of lowlands and mountains	E2.1	Permenant mesotrophic pastures and aftermath-grazed meadows
E2.2	Low and medium altitude hay meadows	E2.2	Low and medium altitude hay meadows
E2.3	Mountain hay meadow	E2.3	Mountain hay meadows
E2.4	Iberian summer pasture (vallicar)	E2.4	Iberian summer pastures (vallicares)
E2.5	Now included within E1.2a	E2.5	Meadows of the steppe zone
E3.1a	Mediterranean tall humid inland grassland	E3.1	Mediterranean tall humid grassland
E3.2a	Mediterranean short moist grassland of lowlands	E3.2	Mediterranean short humid grassland
E3.2b	Mediterranean short moist grassland of mountains		
E3.3	Submediterranean moist meadow	E3.3	Sub-mediterranean humid meadows
E3.4a	Moist or wet mesotrophic to eutrophic hay meadow	E3.4	Moist or wet mesotrophic to eutrophic grassland
E3.4b	Moist or wet mesotrophic to eutrophic pasture		
E3.5	Non-Mediterranean moist or wet oligotrophic grassland	E3.5	Moist or wet oligotrophic grassland

E4.1	Vegetated snow-patch	E4.1	Vegetated snow-patch
E4.2	Moved in EUNIS revision to H	E4.2	Moss and lichen dominated mountain summits, ridges and exposed slopes
E4.3a	Boreal and arctic acidophilous alpine grassland	E4.3	Acid alpine and subalpine grassland
E4.3b	Temperate acidophilous alpine grassland		
E4.4a	Arctic-alpine calcareous grassland	E4.4	Calcareous alpine and subalpine grassland
E4.4b	Alpine and subalpine calcareous grassland of the Balkan and Apennines		
E4.5	Alpine and subalpine enriched grassland	E4.5	Alpine and subalpine enriched grassland
E5.1	Anthropogenic herb stands	E5.1	Anthropogenic herb stands (excluded)
E5.2a	Thermophilous woodland fringe of base-rich soils	E5.2	Thermophile woodland fringes
E5.2b	Thermophilous woodland fringe of acidic soils		
E5.2c	Macaronesian thermophilous woodland fringe		
E5.3	Pteridium aquilinum stand	E5.3	Pteridium aquilinum fields
E5.4	Moist or wet tall-herb and fern fringe of the lowlands	E5.4	Moist or wet tall-herb and fern fringes and meadows
E5.5	Subalpine moist or wet tall-herb and fern stand	E5.5	Subalpine moist or wet tall-herb and fern stands
E6.1	Mediterranean inland salt steppe	E6.1	Mediterranean inland salt steppes
E6.2	Continental inland salt steppe	E6.2	Continental inland salt steppes
E6.3	Temperate inland salt marsh		
E7.1	Temperate and hemiboreal wooded pasture and meadow	E7.1	Atlantic parkland
E7.2	Hemiboreal and boreal wooded pasture and meadow	E7.2	Sub-continental parkland
E7.3	Mediterranean wooded pasture and meadow	E7.3	Dehesa

## Appendix A: An updated crosswalk EUNIS grassland habitat types (B1.4, B1.9, E1-E6) to the 2013 EuroVegChecklist syntaxa

### B - Coastal habitats

#### B1 - Coastal dunes and sandy shores

##### B1.4 - Coastal stable dune grassland

- \* TUB-02B - Alkanno-Maresion nanae Rivas Goday ex 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-02A - Crucianellion maritimae Rivas Goday et Rivas-Mart. 1958
- \* TUB-02D - Cutandio maritimae-Vulpion membranaceae de Foucault et Géhu in de Foucault 1999
- \* CRU-03B - Cynodonto-Teucrium polii Korzhenevsky et Klyukin 1990
- \* COR-02D - Diantho catalaunici-Scrophularion humifusae Baudiere et Simonneau 1974
- \* MOQ-01C - Euphorbia paraliae-Lotion glauci Jardim et al. 2003
- \* CRU-01A - Euphorbia portlandicae-Helichrysion stoechadis Géhu et Tx. ex Sissingh 1974
- \* CRU-02B - Helichrysion picardii (Rivas-Mart., Costa et Izco in Rivas-Mart. et al. 1990) Rivas-Mart. et al. 1999
- \* CRU-01B - Koelerion arenariae Tx. 1937 corr. Gutermann et Mucina 1993
- \* TUB-02C - Laguro ovati-Vulpion fasciculatae Géhu et Biondi 1994
- \* TUB-02A - Linarion pedunculatae Díez Garretas et al. in Díez Garretas 1984
- \* TUB-02G - Maresion nanae Géhu et al. 1987
- \* TUB-02H - Medicagini-Triplachnion nitentis Mayer 1995
- \* CRU-03E - Melico chrysolepidis-Ephedron distachyae Umanets et Solomakha 1999
- \* TUB-02I - Ononidion tournefortii Géhu et al. 1996
- \* CRU-01C - Psammo-Koelerion Pignatti 1953
- \* TUB-02E - Psammo-Vulpion Pignatti 1953
- \* CRU-03D - Scabiosion ucranicae Sanda et al. 1980
- \* CRU-03A - Sileno thymifoliae-Jurineion kilaeae Géhu et Uslu ex Mucina et Jakushenko ined.
- \* CRU-03C - Verbascion pinnatifidi Korzhenevsky et Klyukin 1990
- \* TUB-02F - Vulpio-Lotion Horvatic 1963

##### B1.9 - Machair

- \* AMM-01A - Ammophilion Br.-Bl. 1921
- \* COR-02B - Armerion elongatae Pötsch 1962
- \* MOL-01C - Cynosurion cristati Tx. 1947
- \* CRU-01B - Koelerion arenariae Tx. 1937 corr. Gutermann et Mucina 1993
- \* COR-04A - Thero-Airion Tx. ex Oberd. 1957
- \* NAR-01C - Violion caninae Schwickerath 1944

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

#### E1 - Dry grasslands

##### E1.1 - Inland sand and rock with open vegetation

- \* COR-07E - *Aethionemion saxatilis* Bergmeier et al. 2009
- \* FES-11A - *Alyssion bertolonii* E. Pignatti et Pignatti 1977
- \* FES-07C - *Alyssion heldreichii* Bergmeier et al. 2009
- \* FES-06A - *Alyso-Festucion pallentis* Moravec in Holub et al. 1967
- \* COR-07A - *Alyso-Sedion* Oberd. et T. Müller in T. Müller 1961
- \* COR-02B - *Armerion elongatae* Pötsch 1962
- \* COR-02E - *Armerion junceae* Br.-Bl. ex Br.-Bl. et al. 1952
- \* COR-02F - *Armerio-Potentillion* Micevski 1978
- \* FES-08A - *Artemisio hololeucae-Hyssopion cretaei* Romashchenko et al. 1996
- \* FES-06B - *Asplenio septentrionalis-Festucion pallentis* Zólyomi 1936 corr. 1966
- \* FES-06C - *Avenulo adsurgentis-Festucion pallentis* Mucina in Mucina et Kolbek 1993
- \* COR-03C - *Bassio laniflorae-Bromion tectorum* Borhidi 1996 nom. conserv. propos.
- \* FES-06D - *Bromo pannonici-Festucion csikhegyensis* Zólyomi 1966 corr. Mucina hoc loco
- \* FES-08C - *Centaureo carbonatae-Koelerion talievii* Romashchenko et al. 1996
- \* FES-07B - *Centaureo-Bromion fibrosi* Blečić et al. 1969
- \* COR-01A - *Corynephorion canescentis* Klika 1931
- \* FES-11B - *Cytiso spinescentis-Bromion erecti* Bonin 1978
- \* FES-06H - *Diantho lumnitzeri-Seslerion* (Soó 1971) Chytrý et Mucina in Mucina et Kolbek 1993
- \* COR-05F - *Diantho pinifolii-Jasionion heldreichii* Bergmeier et al. 2009
- \* FES-08B - *Euphorbio cretophilae-Thymion cretaei* Didukh 1989
- \* COR-03E - *Festucion beckeri* Vicherek 1972
- \* COR-03D - *Festucion vaginatae* Soó 1929
- \* FES-12B - *Festuco-Bromion* Barbero et Loisel 1971
- \* FES-06E - *Galio campanulatae-Poion versicoloris* Kukovitsa et al. ex Didukh et Mucina in Mucina et al. 2013
- \* FES-11C - *Hippocrepido glaucae-Stipion austroitalicae* Forte et Terzi in Forte et al. 2005
- \* COR-02A - *Hyperico perforati-Scleranthion perennis* Moravec 1967
- \* FES-06F - *Chrysopogono-Festucion dalmatica* Borhidi 1996
- \* FES-13A - *Chrysopogono-Saturejion subspicatae* Horvat et Horvatic 1934
- \* COR-03A - *Koelerion glaucae* Volk 1931
- \* FES-07A - *Polygonion albanicae* Ritter-Studnicka 1970
- \* FES-06G - *Saturejion montanae* Horvat in Horvat et al. 1974
- \* FES-14A - *Saturejo-Thymion* Micevski 1971
- \* COR-05E - *Scabioso-Trifolion dalmatici* Horvatic et N. Randelovic in N. Randelovic 1977
- \* FES-13B - *Scorzonerion villosae* Horvatic 1963
- \* COR-05B - *Sedion anglici* Br.-Bl. in Br.-Bl. et Tx. 1952
- \* COR-07C - *Sedion micrantho-sediformis* Rivas-Mart., P. Sánchez et Alcaraz ex P. Sánchez et Alcaraz 1993
- \* COR-05C - *Sedion pyrenaici* Tx. in Rivas-Mart. et al. 2011
- \* COR-05D - *Sedo albi-Veronicion dillenii* Korneck 1974
- \* COR-02C - *Sedo-Cerastion arvensis* Sissingh et Tideman 1960
- \* COR-05A - *Sedo-Scleranthion* Br.-Bl. 1950
- \* COR-06B - *Sedo-Thymion* De Molenaar 1976

- \* FES-11D - *Seslerio nitidae*-*Caricion macrolepidis* Ubaldi 1997
  - \* FES-06I - *Seslerion rigidae* Zólyomi 1936
  - \* COR-03B - *Sileno conicae*-*Cerastion semidecandri* Korneck 1974
  - \* COR-04A - *Thero-Airion* Tx. ex Oberd. 1957
  - \* COR-07B - *Tortello tortuosae*-*Sedion albi* Hallberg ex Dengler et Löbel 2006
  - \* COR-07D - *Valerianion tuberosae* Guinochet 1975
  - \* COR-06A - *Veronico-Poion glaucae* Nordhagen 1943
  - \* FES-12A - *Xero-Bromion erecti* Zoller 1954
- E1.2 - Perennial calcareous grassland and basic steppes
- \* FES-09A - *Adonido vernalis*-*Stipion tirsae* Didukh 1983 nom. inval.
  - \* FES-03G - *Agropyron pectinati* Golub et Uzhametskaya 1991
  - \* FES-10B - *Artemisio albae*-*Dichanthion ischaemi* X. Font ex Rivas-Mart. et M.L. López in Rivas-Mart. et al. 2002
  - \* ART-04A - *Artemisio marschalliani*-*Elytrigion intermedii* Korotchenko et Didukh 1997
  - \* FES-03F - *Artemisio tauricae*-*Festucion Korzhenevsky* et Klyukin 1991
  - \* FES-03B - *Artemisio-Kochion* Soó 1964
  - \* ART-04B - *Bassio-Artemisio austriacae* Solomeshch in Mirkin et al. 1986
  - \* FES-10A - *Brachypodion phoenicoidis* Br.-Bl. ex Molinier 1934
  - \* FES-01A - *Bromion erecti* Koch 1926
  - \* FES-09B - *Carici humilis*-*Androsacion tauricae* Didukh 1983 nom. inval.
  - \* FES-05C - *Caricion stenophyllae* Golub et Saveleva 1991
  - \* FES-04B - *Centaurion sumensis* Golub et Uzhametskaya 1992
  - \* FES-01B - *Cirsio-Brachypodion pinnati* Hadac et Klika in Klika et Hadac ex Klika 1951
  - \* FES-10C - *Diplachnion serotinae* Br.-Bl. 1961
  - \* FES-03A - *Festucion sulcatae* Soó 1930
  - \* 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-04A - *Helictotricho desertori*-*Stipion rubentis* Toman 1969
  - \* FES-01G - *Chrysopogono-Danthonion* Kojic 1957
  - \* FES-03E - *Pimpinello-Thymion zygoidi* Dihoru et Donita 1970
  - \* FES-01F - *Polygalo mediterraneae*-*Bromion erecti* (Biondi et al. 2005) Di Pietro et al. 2013
  - \* FES-01E - *Potentillo splendentis*-*Brachypodion pinnati* Br.-Bl. 1967
  - \* FES-05B - *Stipion korshinskyi* Toman 1969
  - \* FES-03D - *Stipion lessingianae* Soó 1947
  - \* FES-03C - *Stipo-Poion xerophilae* Br.-Bl. et Tx. ex Br.-Bl. 1949
  - \* FES-05A - *Tanaceto achilleifolii*-*Stipion lessingianae* Royer ex Lysenko et Mucina 2013
  - \* FES-09C - *Veronico multifidae*-*Stipion ponticae* Didukh 1983 nom. inval.
- E1.3 - Mediterranean xeric grassland
- \* LYG-03A - *Agropyro pectinati*-*Lygeion sparti* Br.-Bl. et O. de Bolòs 1958 corr. Rivas-Mart. et al. 1999
  - \* SAC-01A - *Agrostion castellanae* Rivas Goday ex Rivas-Mart. et al. 1980
  - \* TRA-02A - *Asterisco-Velezion rigidae* (Rivas Goday 1964) S. Brullo 1985
  - \* TRA-01A - *Brachypodion distachyi* Rivas-Mart. 1978



- \* LYG-02A - *Cymbopogono hirti-Brachypodion ramosi* Horvatic 1963
  - \* TRA-02C - *Dauco-Catananchion luteae* S. Brullo 1985
  - \* SAC-02A - *Deschampsio maderensis-Parafestucion albidae* Capelo et al. 2000
  - \* TRA-01I - *Diantho humilis-Velezion rigidae* Korzhenevsky et Klyukin ex Mucina in Mucina et al. 2013
  - \* 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
  - \* LYG-01C - *Festucion scariosae* Martínez-Parras et al. 1984
  - \* LYG-02B - *Hyparrhenion hirtae* Br.-Bl. et al. 1956
  - \* TRA-01F - *Hypochoeridion achyrophori* Biondi et Guerra 2008
  - \* LYG-01E - *Leontodono tuberosi-Bellion sylvestris* Biondi et al. 2001
  - \* LYG-03C - *Moricandio-Lygeion sparti* S. Brullo et al. 1990
  - \* TRA-01D - *Omphalodion commutatae* Rivas-Mart. et al. ex Izco 1976 corr. Pérez Raya et al. 1991
  - \* TRA-02D - *Onobrychido-Ptilostemion stellati* S. Brullo et al. 2001
  - \* TRA-02B - *Plantagini-Catapodion marini* S. Brullo 1985
  - \* BUL-01D - *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
  - \* LYG-01F - *Reichardio maritimae-Dactylidion hispanicae* Biondi et al. 2001
  - \* BUL-01E - *Romulion* Oberd. 1954
  - \* LYG-03D - *Scorzonero creticae-Lygeion sparti* S. Brullo et al. 2002
  - \* TRA-01C - *Sedo-Ctenopsion gypsophilae* Rivas Goday et Rivas-Mart. ex Izco 1974
  - \* LYG-01D - *Stipion parviflorae* De la Torre et al. 1996
  - \* TRA-01B - *Stipion retortae* Br.-Bl. et O. de Bolòs ex O. de Bolòs 1957
  - \* LYG-03B - *Stipion tenacissimae* Rivas-Mart. 1984
  - \* LYG-01A - *Thero-Brachypodion retusi* Br.-Bl. 1925
  - \* BUL-01A - *Trifolio subterranei-Periballion minutae* Rivas Goday 1964
  - \* LYG-01B - *Trisetum velutini-Brachypodion boissieri* Rivas-Mart. et al. 2002
  - \* TRA-01E - *Vulpio ciliatae-Crepidion neglectae* Poldini 1989
  - \* TRA-01G - *Vulpion ligusticae* Aubert et Loisel 1971
  - \* TRA-01H - *Xeranthemion annui* Oberd. 1954
- E1.4 - Mediterranean tallgrass and *Artemisia* steppes
- \* LYG-03A - *Agropyro pectinati-Lygeion sparti* Br.-Bl. et O. de Bolòs 1958 corr. Rivas-Mart. et al. 1999
  - \* LYG-02A - *Cymbopogono hirti-Brachypodion ramosi* Horvatic 1963
  - \* LYG-01C - *Festucion scariosae* Martínez-Parras et al. 1984
  - \* LYG-02B - *Hyparrhenion hirtae* Br.-Bl. et al. 1956
  - \* LYG-01E - *Leontodono tuberosi-Bellion sylvestris* Biondi et al. 2001
  - \* LYG-03C - *Moricandio-Lygeion sparti* S. Brullo et al. 1990
  - \* LYG-01F - *Reichardio maritimae-Dactylidion hispanicae* Biondi et al. 2001
  - \* LYG-03D - *Scorzonero creticae-Lygeion sparti* S. Brullo et al. 2002
  - \* LYG-01D - *Stipion parviflorae* De la Torre et al. 1996
  - \* LYG-03B - *Stipion tenacissimae* Rivas-Mart. 1984
  - \* LYG-01A - *Thero-Brachypodion retusi* Br.-Bl. 1925
  - \* LYG-01B - *Trisetum velutini-Brachypodion boissieri* Rivas-Mart. et al. 2002
- E1.5 - Mediterranean montane grassland
- \* IND-02B - *Armerion eriophyllae* Pinto da Silva 1970

- \* ONO-01H - Avenion sempervirentis Barbero 1968
- \* ONO-02A - Festucion burnatii Rivas Goday et Rivas-Mart. ex Mayor et al. 1973
- \* ONO-01C - Festucion scopariae Br.-Bl. 1948
- \* ONO-01D - Genistion lobelii Molinier 1934
- \* IND-02A - Hieracio castellani-Plantaginion radicatae Rivas-Mart. et Cantó 1987
- \* IND-01B - Jasionion carpetanae González-Albo 1941
- \* ONO-02B - Minuartio-Poion ligulatae O. de Bolòs 1962
- \* ONO-01B - Ononidion cristatae Royer 1991
- \* ONO-01A - Ononidion striatae Br.-Bl. et Susplugas 1937
- \* ONO-02C - Plantagini discoloris-Thymion mastigophori Molina et Izco 1989
- \* GEN-01B - Plantaginion insularis Klein 1972
- \* IND-01C - Ptilotrichion purpurei Quézel 1953
- \* IND-01A - Teesdaliopsio confertae-Luzulion caespitosae Rivas-Mart. 1987
- \* IND-02C - Thymion serpylloidis Rivas Goday et Rivas-Mart. in Rivas-Mart. 1965
- \* TRI-09A - Trifolion parnassii Quézel ex Quézel et al. 1992

#### E1.6 - Subnitrophilous annual grasslands

- \* STE-06F - Hordeion murini Br.-Bl. in Br.-Bl. et al. 1936
- \* STE-06G - Laguro ovati-Bromion rigidi Géhu et Géhu-Franck 1985
- \* STE-06H - Linario polygalifoliae-Vulpion alopecuri Br.-Bl., Rozeira et Silva in Br.-Bl. et al. 1972
- \* STE-06I - Taeniathero-Aegilopion geniculatae Rivas-Mart. et Izco 1977

#### E1.7 - Non-Mediterranean dry acid and neutral closed grassland

- \* NAR-01G - Achilleo-Arnicion Horvat et Pawlowski in Horvat 1960
- \* COR-02B - Armerion elongatae Pötsch 1962
- \* COR-02E - Armerion juncea Br.-Bl. ex Br.-Bl. et al. 1952
- \* COR-02F - Armerio-Potentillion Micevski 1978
- \* NAR-01E - Nardo-Agrostion tenuis Sillinger 1933
- \* NAR-01A - Potentillo-Polygonion vivipari Nordhagen ex Dierßen 1992
- \* COR-02C - Sedo-Cerastion arvensis Sissingh et Tideman 1960
- \* NAR-01C - Violion caninae Schwickerath 1944

#### E1.8 - Mediterranean dry acid and neutral closed grassland

- \* SAC-01C - Agrostio castellanae-Stipion giganteae Rivas Goday ex Rivas-Mart. et Fernández González 1991
- \* SAC-01A - Agrostion castellanae Rivas Goday ex Rivas-Mart. et al. 1980
- \* NAR-01F - Campanulo herminii-Nardion Rivas-Mart. 1964
- \* TRI-06A - Campanulo herminii-Nardion strictae Rivas-Mart. 1964
- \* SAC-02A - Deschampsio maderensis-Parafestucion albidae Capelo et al. 2000
- \* SAC-01B - Festucion merinói Rivas-Mart. et Sánchez-Mata in Rivas-Mart. et al. 1986 corr. Rivas-Mart. et Sánchez-Mata in Rivas-Mart. et al. 2002
- \* TRI-07A - Sesamoido pygmaeae-Poion violaceae Gamisans 1975

#### E1.9 - Non-Mediterranean dry acid and neutral open grassland, including inland dune grassland

- \* COR-02B - Armerion elongatae Pötsch 1962
- \* COR-02E - Armerion juncea Br.-Bl. ex Br.-Bl. et al. 1952
- \* COR-02F - Armerio-Potentillion Micevski 1978
- \* COR-01A - Corynephorion canescentis Klika 1931
- \* COR-05F - Diantho pinifolii-Jasionion heldreichii Bergmeier et al. 2009
- \* COR-02A - Hyperico perforati-Scleranthion perennis Moravec 1967
- \* COR-03A - Koelerion glaucae Volk 1931

- \* COR-05E - Scabioso-Trifolion dalmatici Horvatic et N. Randelovic in N. Randelovic 1977
  - \* COR-05B - Sedion anglici Br.-Bl. in Br.-Bl. et Tx. 1952
  - \* COR-05C - Sedion pyrenaici Tx. in Rivas-Mart. et al. 2011
  - \* COR-05D - Sedo albi-Veronicion dillenii Korneck 1974
  - \* COR-02C - Sedo-Cerastion arvensis Sissingh et Tideman 1960
  - \* COR-05A - Sedo-Scleranthion Br.-Bl. 1950
  - \* COR-03B - Sileno conicae-Cerastion semidecandri Korneck 1974
  - \* COR-04A - Thero-Airion Tx. ex Oberd. 1957
- E1.A - Mediterranean dry acid and neutral open grassland
- \* TUB-03A - Anthyllido hamosae-Malcolmion lacerae Rivas Goday 1958
  - \* IND-02B - Armerion eriophyllae Pinto da Silva 1970
  - \* TUB-03C - Corynephorion maritimi Costa, Pinto-Gomes, Neto et Rivas-Mart. in Costa et al. 2012
  - \* TUB-03B - Corynephorion articulati-Malcolmion patulae Rivas Goday 1958
  - \* TUB-01B - Crassulo tillaeae-Sedion caespitosi de Foucault 1999
  - \* TUB-03E - Evaco asterisciflorae-Linarion humilis Minissale et Sciandrello 2013 nom. inval.
  - \* TOL-01A - Festucion francoi Lüpnitz 1976 corr. F. Prieto, Aguiar, J.C. Costa, Lousã et Rivas-Mart. in F. Prieto et al. 2012
  - \* TUB-01A - Helianthemion guttati Br.-Bl. in Br.-Bl. et al. 1940
  - \* IND-02A - Hieracio castellani-Plantaginion radicatae Rivas-Mart. et Cantó 1987
  - \* 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 - Ornithopo pinnati-Gaudinion coarctatae F. Prieto et Aguiar, in F. Prieto et al. 2012
  - \* BUL-01E - Romulion Oberd. 1954
  - \* TUB-01F - Sclerantho-Myositidion incrassatae S. Brullo et al. 2001
  - \* TUB-01D - Sedion pedicellato-andegavensis Rivas-Mart. et al. 1986
  - \* TUB-01G - Thymion micans J.C. Costa et al. 2005
  - \* IND-02C - Thymion serpyllidis Rivas Goday et Rivas-Mart. in Rivas-Mart. 1965
  - \* TOL-01B - Tolpido succulentae-Agrostion congestiflorae Aguiar et F. Prieto in F. Prieto et al. 2012
  - \* BUL-01A - Trifolio subterranei-Periballion minutae Rivas Goday 1964
  - \* TUB-01E - Trifolion cherleri Micevski 1972
- E1.B - Heavy-metal grassland
- \* COR-07E - Aethionemion saxatilis Bergmeier et al. 2009
  - \* THL-09B - Armerion halleri Ernst 1965
  - \* DRY-03C - Ptilostemo casabonae-Euphorbion cupanii Angiolini et al. 2005
  - \* THL-09A - Thlaspion calaminarii Ernst 1965
- E1.C - Dry mediterranean lands with unpalatable non-vernal herbaceous vegetation
- E1.D - Unmanaged xeric grassland
- E1.E - Trampled xeric grasslands with annuals
- \* STE-04H - Eragrostio-Polygonion arenastri Couderc et Izco ex Carni et Mucina 1998
  - \* STE-04I - Euphorbion prostratae Rivas-Mart. 1976
  - \* POL-01B - Polycarpion tetraphylli Rivas-Mart. 1975
  - \* STE-04J - Polycarpo-Eleusinion indicae Carni et Mucina 1998

- \* POL-01A - Polygono-Coronopodium Sissingh 1969
- E1.F - Azorean open, dry, acid to neutral grassland
- E2 - Mesic grasslands
  - E2.1 - Permanent mesotrophic pastures and aftermath-grazed meadows
    - \* MOL-01C - Cynosurion cristati Tx. 1947
    - \* MOL-04D - Deschampsion cespitosae Horvatic 1930
    - \* MOL-01G - Lino biennis-Gaudinon fragilis (Br.-Bl. 1967) de Foucault 1989
    - \* MOL-04A - Molinion caeruleae Koch 1926
    - \* MOL-02D - Poion alpinae Gams ex Oberd. 1950
    - \* MOL-02E - Poion supinae Rivas-Mart. et Géhu 1978
    - \* MOL-05A - Potentillion anserinae Tx. 1947
  - E2.2 - Low and medium altitude hay meadows
    - \* MOL-01A - Arrhenatherion elatioris Luquet 1926
    - \* MOL-01E - Brachypodio-Centaureion nemoralis Br.-Bl. 1967
    - \* MOL-04E - Conioselinion tatarici Golub et al. 2003
    - \* MOL-01C - Cynosurion cristati Tx. 1947
    - \* MOL-04D - Deschampsion cespitosae Horvatic 1930
    - \* FEP-06A - Glycyrrhizion echinatae Golub et Saveleva in Golub 1995
    - \* FEP-06C - Glycyrrhizion glabrae Golub et Mirkin in Golub 1995
    - \* FEP-06B - Glycyrrhizion korshinskyi Lysenko 2010
    - \* MOL-04A - Molinion caeruleae Koch 1926
    - \* MOL-01F - Ranunculo neapolitani-Arrhenatherion elatioris Allegrezza et Biondi 2011
    - \* MOL-01H - Rumicion thrysiflori Micevski ex Carni et Mucina 2013
  - E2.3 - Mountain hay meadows
    - \* MOL-02C - Pancicion serbicae Lakušić 1966
    - \* MOL-01B - Phyteumato-Trisetion flavescentis Hundt ex Passarge 1969
    - \* MOL-03A - Polygonion krascheninnikovii Kashapov 1985
    - \* MOL-02A - Trisetio flavescentis-Polygonion bistortae Br.-Bl. et Tx. ex Marschall 1947
    - \* MOL-02B - Violion cornutae Nègre 1972
  - E2.4 - Iberian summer pastures (vallicares)
    - \* SAC-01A - Agrostion castellanae Rivas Goday ex Rivas-Mart. et al. 1980
    - \* 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
  - E2.5 - Meadows of the steppe zone
    - \* FES-02A - Agrostion vinealis Sipailova et al. 1985
    - \* FES-02C - Artemision ponticae Golub et Saveleva in Golub 1995
    - \* FES-02B - Galio veri-Aristolochion clematitidis Shevchyk et Solomakha in Shevchyk et al. 1996
    - \* FES-02D - Seselion libanotis Ageleulov et Golub in Golub 1995
    - \* FES-02E - Trifolion montani Naumova 1986
- E3 - Seasonally wet and wet grasslands
  - E3.1 - Mediterranean tall humid grassland
    - \* MOL-09D - Gaudinio fragilis-Hordeion bulbosi Galán de Mera et al. 1997
    - \* MOL-09A - Molinio-Holoschoenion Br.-Bl. ex Tchou 1948
  - E3.2 - Mediterranean short humid grassland

- \* MOL-09E - *Brachypodio sylvatici-Holoschoenion romani* Gradstein et Schmittenberg 1977
  - \* MOL-09B - *Dactylorhizo-Juncion striati* S. Brullo et Grillo 1978
  - \* MOL-09C - *Deschampsion mediae* Br.-Bl. et al. 1952 nom. conserv. propos.
  - \* TRI-07B - *Sieglingion decumbentis* Gamisans 1976
  - \* MOL-05D - *Trifolion maritimi* Br.-Bl. ex Br.-Bl. et al. 1952
- E3.3 - Sub-mediterranean humid meadows
- \* MOL-08A - *Molinio-Hordeion secalini* Horvatic 1934
  - \* MOL-08E - *Ranunculion velutini* Pedrotti 1978
  - \* MOL-08D - *Trifolion pallidi* Ilijanic 1969
  - \* MOL-08B - *Trifolion resupinati* Micevski 1957
- E3.4 - Moist or wet mesotrophic to eutrophic grassland
- \* MOL-07A - *Althaeion officinalis* Golub et Mirkin in Golub 1995
  - \* MOL-04B - *Calthion palustris* Tx. 1937
  - \* MOL-04E - *Conioselinion tatarici* Golub et al. 2003
  - \* MOL-04D - *Deschampsion cespitosae* Horvatic 1930
  - \* MOL-07B - *Euphorbion palustris* Ageleulov et Golub in Golub 1995
  - \* MOL-04C - *Filipendulo-Petasition* Br.-Bl. ex Duvigneaud 1949
  - \* FEP-06A - *Glycyrrhizion echinatae* Golub et Saveleva in Golub 1995
  - \* FEP-06C - *Glycyrrhizion glabrae* Golub et Mirkin in Golub 1995
  - \* FEP-06B - *Glycyrrhizion korshinskyi* Lysenko 2010
  - \* MOL-05B - *Juncion inflexi* Knapp 1971
  - \* MOL-05C - *Loto tenuis-Trifolion fragiferi* Westhoff et Den Held ex de Foucault 2009
  - \* MOL-07C - *Lythro-Euphorbion* Mirkin et Naumova 1986
  - \* MOL-04A - *Molinion caeruleae* Koch 1926
  - \* MOL-06A - *Oenanthon fistulosae* de Foucault 2009
  - \* MOL-05A - *Potentillion anserinae* Tx. 1947
  - \* MOL-08C - *Trifolio-Ranunculion pedati* Slavnic 1948
- E3.5 - Moist or wet oligotrophic grassland
- \* SCH-02A - *Caricion fuscae* Koch 1926
  - \* MOL-04A - *Molinion caeruleae* Koch 1926
  - \* NAR-01D - *Nardo-Juncion squarrosi* (Oberd. 1957) Passarge 1964
- E4 - Alpine and subalpine grasslands
- E4.1 - Vegetated snow-patch
- \* HER-02A - *Arabidion caeruleae* Br.-Bl. in Br.-Bl. et Jenny 1926
  - \* HER-01G - *Cassiopo-Salicion herbaceae* Nordhagen 1943
  - \* HER-01C - *Festucion picturatae* Krajina 1933 corr. Dúbravcová 2007
  - \* HER-01F - *Hyalopoion ponticae* Rabotnova et Onipchenko in Onipchenko 2002
  - \* HER-01D - *Ranunculion crenati* Lakušić 1968
  - \* HER-01I - *Ranunculo hyperborei-Drepanocladion revolventis* Philippi 1973
  - \* HER-01H - *Ranunculo-Oxyrion didynae* Nordhagen 1943
  - \* HER-01B - *Salici herbaceae-Caricion lachenalii* Béguin et Theurillat 1982
  - \* HER-01A - *Salicion herbaceae* Br.-Bl. in Br.-Bl. et Jenny 1926
  - \* HER-01E - *Sedion candollei* Rivas-Mart., Fernández González et Loidi in Rivas-Mart. et al. 2011
- E4.2 - Moss and lichen dominated mountain summits, ridges and exposed slopes
- \* TRI-01A - *Carici-Juncion trifidi* Nordhagen 1943
  - \* TRI-01C - *Cladonio-Viscarion alpinae* Daniëls 1982

#### E4.3 - Acid alpine and subalpine grassland

- \* KOB-02C - *Agrostion alpinae* Jeník et al. 1980
- \* TRI-04G - *Agrostion schraderanae* Grabherr 1993
- \* TRI-02A - *Anemonastro sibirici-Festucion ovinae* Chytrý et al. 1993
- \* TRI-03D - *Anemonion speciosae* Minaeva ex Onipchenko 2002
- \* MUL-02C - *Calamagrostion arundinaceae* (Luquet 1926) Oberd. 1957
- \* MUL-02A - *Calamagrostion villosae* Pawlowski et al. 1928
- \* SES-03F - *Campanulion albanicae* Lakušić 1966
- \* TRI-06A - *Campanulo herminii-Nardion strictae* Rivas-Mart. 1964
- \* TRI-04A - *Carici macrostyli-Nardion* (Rivas-Mart. et al. 1984) de Foucault 1994
- \* TRI-01A - *Carici-Juncion trifidi* Nordhagen 1943
- \* TRI-03A - *Caricion curvulae* Br.-Bl. 1925
- \* NAR-01B - *Equiseto-Galion borealis* Tx. in Tx. et Böttcher 1969
- \* TRI-04H - *Festucion eskiae* Br.-Bl. 1948
- \* TRI-04I - *Festucion macratherae* Avena et Bruno 1975 corr. Petriccione et Persia 1995
- \* TRI-03C - *Festucion supinae* Br.-Bl. 1948
- \* TRI-04F - *Festucion varia* Br.-Bl. ex Guinochet 1938
- \* KOB-02B - *Festucion versicoloris* Krajina 1934
- \* TRI-05A - *Festucion woronowii* Tsepikova 1987
- \* SES-03D - *Festucion xanthinae* Lakušić et al. 1969
- \* TRI-03B - *Juncion trifidi* Krajina 1934
- \* KOB-01A - *Kobresio-Dryadion* Nordhagen 1943
- \* KOB-02D - *Kobresion capilliformis* Tsepikova 1987
- \* TRI-04B - *Nardion strictae* Br.-Bl. 1926
- \* TRI-01B - *Nardo-Caricion rigidae* Nordhagen 1943
- \* TRI-06B - *Plantaginion thalackeri* Quézel 1953
- \* TRI-08A - *Poion violaceae* Horvat et al. 1937
- \* TRI-04K - *Potentillo montenegrinae-Festucion paniculatae* Redžić ex Carni et Mucina 2013
- \* TRI-04J - *Potentillo rigoanae-Festucion paniculatae* Di Pietro all. nova hoc loco
- \* TRI-04E - *Potentillo ternatae-Nardion* Simon 1958
- \* NAR-01A - *Potentillo-Polygonion vivipari* Nordhagen ex Dierßen 1992
- \* TRI-04C - *Ranunculo pollinensis-Nardion strictae* Bonin 1972
- \* TRI-07A - *Sesamoido pygmaeae-Poion violaceae* Gamisans 1975
- \* TRI-08B - *Seslerion comosae* Horvat et al. 1937
- \* TRI-07B - *Sieglingion decumbentis* Gamisans 1976
- \* MUL-02B - *Trisetion fusci* Krajina 1933

#### E4.4 - Calcareous alpine and subalpine grassland

- \* KOB-02C - *Agrostion alpinae* Jeník et al. 1980
- \* SES-03B - *Anthyllido-Seslerion klasterskyi* Simon 1958
- \* SES-01J - *Armerion cantabricae* Rivas-Mart. et al. 1984
- \* ONO-01H - *Avenion sempervirentis* Barbero 1968
- \* 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-01B - *Dryadion integrifoliae* Ohba ex Daniëls 1982
- \* ONO-02A - *Festucion burnatii* Rivas Goday et Rivas-Mart. ex Mayor et al. 1973

- \* SES-02C - Festucion pungentis Horvat 1930
- \* ONO-01C - Festucion scopariae Br.-Bl. 1948
- \* KOB-02B - Festucion versicoloris Krajina 1934
- \* SES-03D - Festucion xanthinae Lakušić et al. 1969
- \* SES-01G - Festuco saxatilis-Seslerion bielzii (Pawlowski et Walas 1949) Coldea 1984
- \* SES-02D - Festuco-Knaution longifoliae Jovanovic-Dunjic 1955
- \* KOB-01A - Kobresio-Dryadion Nordhagen 1943
- \* KOB-02D - Kobresion capilliformis Tsepkova 1987
- \* SES-01H - Laserpitio nestleri-Ranunculion thorae Vigo ex Molero 1981
- \* ONO-02B - Minuartio-Poion ligulatae O. de Bolòs 1962
- \* ONO-01B - Ononidion cristatae Royer 1991
- \* ONO-01A - Ononidion striatae Br.-Bl. et Susplugas 1937
- \* SES-03A - Oxytropidion dinaricae Lakušić 1966
- \* KOB-02A - Oxytropido-Elynon myosuroidis Br.-Bl. 1950
- \* SES-01I - Primulion intricatae Br.-Bl. ex Vigo 1972
- \* SES-02B - Seslerio juncifoliae-Caricion firmae Trinajstić 2005
- \* SES-01E - Seslerio-Asterion alpini Hadac ex Hadac et al. 1969
- \* SES-03C - Seslerio-Festucion xanthinae Horvat in Horvat et al. 1974
- \* SES-02E - Seslerion apenninae Bruno et Furnari 1966
- \* SES-01A - Seslerion coeruleae Br.-Bl. in Br.-Bl. et Jenny 1926
- \* SES-03E - Seslerion nitidae Horvat 1936
- \* SES-01F - Seslerion tatrae Pawlowski 1935 corr. Klika 1955
- \* SES-02A - Seslerion tenuifoliae Horvat 1930

#### E4.5 - Alpine and subalpine enriched grassland

- \* MOL-02C - Pancicion serbicae Lakušić 1966
- \* MOL-01B - Phyteumato-Trisetion flavescentis Hundt ex Passarge 1969
- \* MOL-02D - Poion alpinae Gams ex Oberd. 1950
- \* MOL-02E - Poion supinae Rivas-Mart. et Géhu 1978
- \* MOL-02A - Trisetio flavescentis-Polygonion bistortae Br.-Bl. et Tx. ex Marschall 1947
- \* MOL-02B - Violion cornutae Nègre 1972

#### E5 - Woodland fringes and clearings and tall forb stands

##### E5.2 - Thermophile woodland fringes

- \* GER-02D - Dictamno albi-Ferulagion galbaniferae (van Gils et al. 1975) de Foucault et al. ex Carni et Dengler in Mucina et al. 2009
- \* GER-02B - Galio litoralis-Geranion sanguinei Géhu et Géhu-Franck in de Foucault et al. 1983
- \* GER-02A - Geranion sanguinei Tx. in T. Müller 1962
- \* GER-01B - Knaution dipsacifoliae Julve ex Dengler et Boch 2008
- \* GER-02E - Lathyro laxiflori-Trifolion velenovskyi (Carni et al. 2000) Carni 2005
- \* GER-03E - Linarion triornithophorae Rivas-Mart. et al. 1984
- \* GER-03A - Melampyrion pratensis Passarge 1979
- \* GER-03F - Origanion virentis Rivas-Mart. et O. de Bolòs in Rivas-Mart. et al. 1984
- \* GER-04B - Pericallion malvifoliae F. Prieto, Dias et Aguiar in F. Prieto et al. 2012
- \* GER-03C - Poion nemoralis Dengler et al. 2006
- \* GER-04A - Ranunculo cortusifolii-Geranion canariensis Rivas-Mart. et al. 1993
- \* GER-02C - Stachyo lusitanicae-Cheirolophion sempervirentis (Capelo 1996) Capelo in Mucina et al. 2013

- \* GER-03D - *Teucrium scorodoniae* de Foucault et al. 1983
- \* GER-01A - *Trifolium medii* T. Müller 1962
- \* GER-03B - *Viola riviniana*-*Stellaria holostea* Passarge 1994

#### E5.3 - *Pteridium aquilinum* fields

- \* EPI-01A - *Epilobium angustifolium* Oberd. 1957
- \* LON-01A - *Lonicera-Rubus silvatici* Tx. et Neumann ex Wittig 1977

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

- \* EPI-02C - *Aegopodium podagrariae* Tx. 1967 nom. conserv. propos.
- \* MOL-07A - *Althaeion officinalis* Golub et Mirkin in Golub 1995
- \* EPI-04B - *Archangelicum litoralis* Scamoni et Passarge 1963
- \* MUL-03B - *Arunco-Petasition albae* Br.-Bl. et Sutter 1977
- \* MOL-04E - *Conioselinion tatarici* Golub et al. 2003
- \* EPI-04D - *Cynanchum-Convolvulion sepium* Rivas Goday et Rivas-Mart. ex Rivas-Mart. 1977
- \* MOL-04D - *Deschampsion cespitosae* Horvatic 1930
- \* EPI-04E - *Dorycnion recti-Rumicion conglomerati* Gradstein et Schmittenberg 1977
- \* MOL-07B - *Euphorbion palustris* Ageleulov et Golub in Golub 1995
- \* MOL-04C - *Filipendulo-Petasition* Br.-Bl. ex Duvigneaud 1949
- \* EPI-02B - *Impatiens noli-tangere-Stachyion sylvaticae* Görs ex Mucina 1993
- \* EPI-04F - *Ipomoeo acuminatae-Ageratinion adenophorae* Espírito-Santo et al. 2004
- \* MOL-07C - *Lythro-Euphorbion* Mirkin et Naumova 1986
- \* EPI-04C - *Nardosmion laevigatae* Klotz et Köck 1986
- \* MUL-03A - *Petasition officinalis* Sillinger 1933
- \* EPI-04A - *Senecionion fluviatilis* Tx. ex Moor 1958
- \* MUL-03C - *Senecionion samniti* Bonin 1978

#### E5.5 - Subalpine moist or wet tall-herb and fern stands

- \* MUL-01A - *Adenostylion alliariae* Br.-Bl. 1926 nom. conserv. propos.
- \* MUL-01F - *Cirsium appendiculatum* Horvat et al. 1937
- \* MUL-01D - *Cirsium flavispinae* Quézel 1953
- \* MUL-01C - *Delphinion elati* Hadac ex Hadac et al. 1969
- \* MUL-01E - *Doronicion corsici* Gamisans 1975
- \* MUL-01B - *Dryopterido-Athyrium distentifolium* (Holub ex Šýkora et Štursa 1973) Jeník et al. 1980
- \* MUL-05A - *Mulgedion alpini* Nordhagen 1943
- \* MUL-06A - *Polemonio acutiflori-Veratrum lobeliani* Telyatnikov 2012
- \* MUL-04A - *Rumicion alpini* Rübel ex Scharfetter 1938
- \* MUL-07A - *Trisetum sibiricae-Aconitum septentrionalis* Ermakov et al. 2000

#### E6 - Inland salt steppes

##### E6.1 - Mediterranean inland salt steppes

- \* FEP-02C - *Atraphaxo-Capparidion* Korzhenevsky 1992
- \* 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
- \* CRY-01B - *Heleochoion schoenoidis* Br.-Bl. ex Rivas Goday 1956
- \* SAL-03A - *Limoniasion monopetali* Pignatti 1952
- \* SAL-02D - *Limonion algarvensi-lanceolati* Costa et al. 2012
- \* SAL-02C - *Limonion catalaunico-viciosi* Rivas-Mart. et Costa 1984



- \* SAL-02E - Limonion confusi (Br.-Bl. 1933) Rivas-Mart. et Costa 1984
  - \* SAL-02B - Lygeo sparti-Limonion furfuracei Rigual 1972
  - \* SAL-02A - Lygeo-Lepidion cardaminis Rivas Goday et Rivas-Mart. ex Rivas-Mart. et Costa 1984
  - \* SAG-02E - Mesembryanthemion nodiflori Géhu et al. 1990
  - \* SAG-02D - Pholiuro-Spergularion Pignatti 1952
  - \* SAG-02B - Polypogonion subspathacei Gamisans 1990
  - \* FEP-01D - Puccinellion convolutae Micevski 1965
  - \* FEP-01E - Puccinellion lagascae Rivas-Mart. in Rivas-Mart. et Costa 1976 corr. Alonso et De la Torre 2004
  - \* SAL-02F - Triglochino barrelieri-Limonion glomerati Biondi et al. 2001
- E6.2 - Continental inland salt steppes
- \* FEP-03G - Alhagion pseudalhagi Golub et Czorbádze in Golub 1994
  - \* FEP-04A - Artemisio pauciflorae-Camphorosmion monspeliaceae Karpov 2001
  - \* KAL-02A - Artemisio santonicae-Puccinellion fominii Shelyag-Sosonko et al. 1989
  - \* FEP-02B - Artemision maritimae Micevski 1970
  - \* KAL-02B - Camphorosmo-Agropyrion desertori Korzhenevsky et Klyukin 1991
  - \* KAL-01B - Climacoptero crassae-Suaedion acuminatae Golub et Corbadze 1989 corr. Lysenko ex Mucina in Mucina et al. 2013
  - \* CRY-01A - Cypero-Spergularion salinae Slavnic 1948
  - \* FEP-03F - Diantho guttati-Million vernalis Umanets et Solomakha 1998
  - \* FEP-01A - Festucion pseudovinae Soó 1933
  - \* FEP-03E - Festuco valesiaca-Limonion gmelinii Mirkin in Golub et Solomakha 1988
  - \* KAL-01A - Kalidion caspici Golub, Rukhlenko et Sokolof 2001
  - \* CRY-01C - Lepidion latifolii Golub et Mirkin 1986
  - \* 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
- E6.3 - Temperate inland salt marsh
- E7 - Sparsely wooded grasslands
- E7.1 - Atlantic parkland
- E7.2 - Sub-continental parkland
- E7.3 - Dehesa

## Appendix B: An updated crosswalk Syntaxa to EUNIS grassland habitat types (B1.4, B1.9, E1-E6)

MUL-01A -	<i>Adenostylion alliariae</i> Br.-Bl. 1926 nom. conserv. propos. * E5.5 - Subalpine moist or wet tall-herb and fern stands
FES-09A -	<i>Adonido vernalis-Stipion tirsae</i> Didukh 1983 nom. inval. * E1.2 - Perennial calcareous grassland and basic steppes
EPI-02C -	<i>Aegopodion podagrariae</i> Tx. 1967 nom. conserv. propos. * E5.4 - Moist or wet tall-herb and fern fringes and meadows
COR-07E -	<i>Aethionemion saxatilis</i> Bergmeier et al. 2009 * E1.1 - Inland sand and rock with open vegetation * E1.B - Heavy-metal grassland
FES-03G -	<i>Agropyron pectinati</i> Golub et Uzhametskaya 1991 * E1.2 - Perennial calcareous grassland and basic steppes
LYG-03A -	<i>Agropyro pectinati-Lygeion sparti</i> Br.-Bl. et O. de Bolòs 1958 corr. Rivas-Mart. et al. 1999 * E1.4 - Mediterranean tall-grass and [ <i>Artemisia</i> ] steppes * E1.3 - Mediterranean xeric grassland
SAC-01C -	<i>Agrostio castellanae-Stipion giganteae</i> Rivas Goday ex Rivas-Mart. et Fernández González 1991 * E1.8 - Closed Mediterranean dry acid and neutral grassland
KOB-02C -	<i>Agrostion alpinae</i> Jeník et al. 1980 * E4.3 - Acid alpine and subalpine grassland * E4.4 - Calcareous alpine and subalpine grassland
SAC-01A -	<i>Agrostion castellanae</i> Rivas Goday ex Rivas-Mart. et al. 1980 * E2.4 - Iberian summer pastures (vallicares) * E1.8 - Closed Mediterranean dry acid and neutral grassland * E1.3 - Mediterranean xeric grassland
TRI-04G -	<i>Agrostion schraderanae</i> Grabherr 1993 * E4.3 - Acid alpine and subalpine grassland
FES-02A -	<i>Agrostion vinealis</i> Sipailova et al. 1985 * E2.5 - Meadows of the steppe zone
NAR-01G -	<i>Achilleo-Arnicion</i> Horvat et Pawlowski in Horvat 1960 * E1.7 - Closed non-Mediterranean dry acid and neutral grassland
FEP-03G -	<i>Alhagion pseudalhagi</i> Golub et Czorbade in Golub 1994 * E6.2 - Continental inland salt steppes
TUB-02B -	<i>Alkanno-Maresion nanae</i> Rivas Goday ex Rivas Goday et Rivas-Mart. 1963 corr. Díez Garretas et al. 2001 * B1.4 - Coastal stable dune grassland (grey dunes)
MOL-07A -	<i>Althaeion officinalis</i> Golub et Mirkin in Golub 1995 * E3.4 - Moist or wet eutrophic and mesotrophic grassland * E5.4 - Moist or wet tall-herb and fern fringes and meadows
FES-11A -	<i>Alyssion bertolonii</i> E. Pignatti et Pignatti 1977 * E1.1 - Inland sand and rock with open vegetation
FES-07C -	<i>Alyssion heldreichii</i> Bergmeier et al. 2009 * E1.1 - Inland sand and rock with open vegetation
FES-06A -	<i>Alyso-Festucion pallentis</i> Moravec in Holub et al. 1967

- \* E1.1 - Inland sand and rock with open vegetation
- COR-07A - Alysso-Sedion Oberd. et T. Müller in T. Müller 1961
- \* E1.1 - Inland sand and rock with open vegetation
- AMM-01A - Ammophilion Br.-Bl. 1921
- \* B1.9 - Machair
- TRI-02A - Anemonastro sibirici-Festucion ovinae Chytrý et al. 1993
- \* E4.3 - Acid alpine and subalpine grassland
- TRI-03D - Anemonion speciosae Minaeva ex Onipchenko 2002
- \* E4.3 - Acid alpine and subalpine grassland
- TUB-03A - Anthyllido hamosae-Malcolmion lacerae Rivas Goday 1958
- \* B1.4 - Coastal stable dune grassland (grey dunes)
- \* E1.A - Open Mediterranean dry acid and neutral grassland
- SES-03B - Anthyllido-Seslerion klasterskyi Simon 1958
- \* E4.4 - Calcareous alpine and subalpine grassland
- HER-02A - Arabidion caeruleae Br.-Bl. in Br.-Bl. et Jenny 1926
- \* E4.1 - Vegetated snow-patch
- EPI-04B - Archangelicion litoralis Scamoni et Passarge 1963
- \* E5.4 - Moist or wet tall-herb and fern fringes and meadows
- SES-01J - Armerion cantabricae Rivas-Mart. et al. 1984
- \* E4.4 - Calcareous alpine and subalpine grassland
- COR-02B - Armerion elongatae Pötsch 1962
- \* E1.7 - Closed non-Mediterranean dry acid and neutral grassland
- \* E1.9 - Open non-Mediterranean dry acid and neutral grassland, including inland dune grassland
- \* E1.1 - Inland sand and rock with open vegetation
- \* B1.9 - Machair
- IND-02B - Armerion eriophyllae Pinto da Silva 1970
- \* E1.A - Open Mediterranean dry acid and neutral grassland
- \* E1.5 - Mediterranean-montane grassland
- THL-09B - Armerion halleri Ernst 1965
- \* E1.B - Heavy-metal grassland
- COR-02E - Armerion juncea Br.-Bl. ex Br.-Bl. et al. 1952
- \* E1.7 - Closed non-Mediterranean dry acid and neutral grassland
- \* E1.9 - Open non-Mediterranean dry acid and neutral grassland, including inland dune grassland
- \* E1.1 - Inland sand and rock with open vegetation
- COR-02F - Armerio-Potentillion Micevski 1978
- \* E1.9 - Open non-Mediterranean dry acid and neutral grassland, including inland dune grassland
- \* E1.1 - Inland sand and rock with open vegetation
- \* E1.7 - Closed non-Mediterranean dry acid and neutral grassland
- MOL-01A - Arrhenatherion elatioris Luquet 1926
- \* E2.2 - Low and medium altitude hay meadows
- FES-10B - Artemisio albae-Dichanthion ischaemi X. Font ex Rivas-Mart. et M.L. López in Rivas-Mart. et al. 2002
- \* E1.2 - Perennial calcareous grassland and basic steppes
- FES-08A - Artemisio hololeucae-Hyssopion cretacei Romashchenko et al. 1996
- \* E1.1 - Inland sand and rock with open vegetation
- ART-04A - Artemisio marschalliani-Elytrigion intermedii Korotchenko et Didukh 1997

- \* E1.2 - Perennial calcareous grassland and basic steppes
- FEP-04A - *Artemisio pauciflorae*-*Camphorosmion monspeliacae* Karpov 2001
- \* E6.2 - Continental inland salt steppes
- KAL-02A - *Artemisio santonicae*-*Puccinellion fominii* Shelyag-Sosonko et al. 1989
- \* E6.2 - Continental inland salt steppes
- FES-03F - *Artemisio tauricae*-*Festucion Korzhenevsky* et Klyukin 1991
- \* E1.2 - Perennial calcareous grassland and basic steppes
- FES-03B - *Artemisio-Kochion* Soó 1964
- \* E1.2 - Perennial calcareous grassland and basic steppes
- FEP-02B - *Artemision maritimae* Micevski 1970
- \* E6.2 - Continental inland salt steppes
- FES-02C - *Artemision ponticae* Golub et Saveleva in Golub 1995
- \* E2.5 - Meadows of the steppe zone
- MUL-03B - *Arunco-Petasion albae* Br.-Bl. et Sutter 1977
- \* E5.4 - Moist or wet tall-herb and fern fringes and meadows
- FES-06B - *Asplenio septentrionalis*-*Festucion pallentis* Zólyomi 1936 corr. 1966
- \* E1.1 - Inland sand and rock with open vegetation
- TRA-02A - *Asterisco-Velezion rigidae* (Rivas Goday 1964) S. Brullo 1985
- \* E1.3 - Mediterranean xeric grassland
- FEP-02C - *Atraphaxo-Capparidion* Korzhenevsky 1992
- \* E6.1 - Mediterranean inland salt steppes
- ONO-01H - *Avenion sempervirentis* Barbero 1968
- \* E4.4 - Calcareous alpine and subalpine grassland
- \* E1.5 - Mediterranean-montane grassland
- FES-06C - *Avenulo adsurgentis*-*Festucion pallentis* Mucina in Mucina et Kolbek 1993
- \* E1.1 - Inland sand and rock with open vegetation
- COR-03C - *Bassio laniflorae*-*Bromion tectorum* Borhidi 1996 nom. conserv. propos.
- \* E1.1 - Inland sand and rock with open vegetation
- ART-04B - *Bassio-Artemision austriacae* Solomeshch in Mirkin et al. 1986
- \* E1.2 - Perennial calcareous grassland and basic steppes
- MOL-09E - *Brachypodio sylvatici*-*Holoschoenion romani* Gradstein et Schmittenberg 1977
- \* E3.2 - Mediterranean short humid grassland
- MOL-01E - *Brachypodio-Centaureion nemoralis* Br.-Bl. 1967
- \* E2.2 - Low and medium altitude hay meadows
- TRA-01A - *Brachypodion distachyi* Rivas-Mart. 1978
- \* E1.3 - Mediterranean xeric grassland
- FES-10A - *Brachypodion phoenicoidis* Br.-Bl. ex Molinier 1934
- \* E1.2 - Perennial calcareous grassland and basic steppes
- FES-01A - *Bromion erecti* Koch 1926
- \* E1.2 - Perennial calcareous grassland and basic steppes
- FES-06D - *Bromo pannonici*-*Festucion csikhegyensis* Zólyomi 1966 corr. Mucina hoc loco
- \* E1.1 - Inland sand and rock with open vegetation
- MUL-02C - *Calamagrostion arundinaceae* (Luquet 1926) Oberd. 1957
- \* E4.3 - Acid alpine and subalpine grassland
- MUL-02A - *Calamagrostion villosae* Pawlowski et al. 1928
- \* E4.3 - Acid alpine and subalpine grassland
- MOL-04B - *Calthion palustris* Tx. 1937
- \* E3.4 - Moist or wet eutrophic and mesotrophic grassland

- SES-03F - *Campanulion albanicae* Lakušić 1966  
 \* E4.3 - Acid alpine and subalpine grassland
- NAR-01F - *Campanulo herminii-Nardion* Rivas-Mart. 1964  
 \* E1.8 - Closed Mediterranean dry acid and neutral grassland
- TRI-06A - *Campanulo herminii-Nardion strictae* Rivas-Mart. 1964  
 \* E1.8 - Closed Mediterranean dry acid and neutral grassland  
 \* E4.3 - Acid alpine and subalpine grassland
- KAL-02B - *Camphorosmo-Agropyrion desertori* Korzhenevsky et Klyukin 1991  
 \* E6.2 - Continental inland salt steppes
- FES-09B - *Carici humilis-Androsacion tauricae* Didukh 1983 nom. inval.  
 \* E1.2 - Perennial calcareous grassland and basic steppes
- TRI-04A - *Carici macrostyli-Nardion* (Rivas-Mart. et al. 1984) de Foucault 1994  
 \* E4.3 - Acid alpine and subalpine grassland
- TRI-01A - *Carici-Juncion trifidi* Nordhagen 1943  
 \* E4.2 - Moss and lichen dominated mountain summits, ridges and exposed slopes  
 \* E4.3 - Acid alpine and subalpine grassland
- SES-01B - *Caricion austroalpinae* Sutter 1962  
 \* E4.4 - Calcareous alpine and subalpine grassland
- TRI-03A - *Caricion curvulae* Br.-Bl. 1925  
 \* E4.3 - Acid alpine and subalpine grassland
- SES-01C - *Caricion ferrugineae* G. Br.-Bl. et Br.-Bl. in G. Br.-Bl. 1931  
 \* E4.4 - Calcareous alpine and subalpine grassland
- SES-01D - *Caricion firmae* Gams 1936  
 \* E4.4 - Calcareous alpine and subalpine grassland
- SCH-02A - *Caricion fuscae* Koch 1926  
 \* E3.5 - Moist or wet oligotrophic grassland
- FES-05C - *Caricion stenophyllae* Golub et Saveleva 1991  
 \* E1.2 - Perennial calcareous grassland and basic steppes
- HER-01G - *Cassiopo-Salicion herbaceae* Nordhagen 1943  
 \* E4.1 - Vegetated snow-patch
- FES-08C - *Centaureo carbonatae-Koelerion talievii* Romashchenko et al. 1996  
 \* E1.1 - Inland sand and rock with open vegetation
- FES-07B - *Centaureo-Bromion fibrosi* Blečić et al. 1969  
 \* E1.1 - Inland sand and rock with open vegetation
- FES-04B - *Centaurion sumensis* Golub et Uzhmetskaya 1992  
 \* E1.2 - Perennial calcareous grassland and basic steppes
- FES-01B - *Cirsio-Brachypodium pinnati* Hadac et Klika in Klika et Hadac ex Klika 1951  
 \* E1.2 - Perennial calcareous grassland and basic steppes
- MUL-01F - *Cirsion appendiculati* Horvat et al. 1937  
 \* E5.5 - Subalpine moist or wet tall-herb and fern stands
- MUL-01D - *Cirsion flavispinae* Quézel 1953  
 \* E5.5 - Subalpine moist or wet tall-herb and fern stands
- TRI-01C - *Cladonio-Viscarion alpinae* Daniëls 1982  
 \* E4.2 - Moss and lichen dominated mountain summits, ridges and exposed slopes
- KAL-01B - *Climacoptero crassae-Suaedion acuminatae* Golub et Corbadze 1989 corr. Lysenko ex Mucina in Mucina et al. 2013  
 \* E6.2 - Continental inland salt steppes
- MOL-04E - *Conioselinion tatarici* Golub et al. 2003

- \* E2.2 - Low and medium altitude hay meadows
- \* E3.4 - Moist or wet eutrophic and mesotrophic grassland
- \* E5.4 - Moist or wet tall-herb and fern fringes and meadows
- COR-01A - *Corynephorion canescentis* Klika 1931
  - \* B1.4 - Coastal stable dune grassland (grey dunes)
  - \* E1.9 - Open non-Mediterranean dry acid and neutral grassland, including inland dune grassland
  - \* E1.1 - Inland sand and rock with open vegetation
- TUB-03C - *Corynephorion maritimi* Costa, Pinto-Gomes, Neto et Rivas-Mart. in Costa et al. 2012
  - \* E1.A - Open Mediterranean dry acid and neutral grassland
- TUB-03B - *Corynephorion articulati-Malcolmion patulae* Rivas Goday 1958
  - \* E1.A - Open Mediterranean dry acid and neutral grassland
- TUB-01B - *Crassulo tillaeae-Sedion caespitosi* de Foucault 1999
  - \* E1.A - Open Mediterranean dry acid and neutral grassland
- CRU-02A - *Crucianellion maritimae* Rivas Goday et Rivas-Mart. 1958
  - \* B1.4 - Coastal stable dune grassland (grey dunes)
- TUB-02D - *Cutandion maritimae-Vulpion membranaceae* de Foucault et Géhu in de Foucault 1999
  - \* B1.4 - Coastal stable dune grassland (grey dunes)
- LYG-02A - *Cymbopogono hirti-Brachypodion ramosi* Horvatic 1963
  - \* E1.4 - Mediterranean tall-grass and [*Artemisia*] steppes
  - \* E1.3 - Mediterranean xeric grassland
- EPI-04D - *Cynancho-Convolvulion sepium* Rivas Goday et Rivas-Mart. ex Rivas-Mart. 1977
  - \* E5.4 - Moist or wet tall-herb and fern fringes and meadows
- CRU-03B - *Cynodonto-Teucrium polii* Korzhenevsky et Klyukin 1990
  - \* B1.4 - Coastal stable dune grassland (grey dunes)
- MOL-01C - *Cynosurion cristati* Tx. 1947
  - \* E2.1 - Permanent mesotrophic pastures and aftermath-grazed meadows
  - \* E2.2 - Low and medium altitude hay meadows
  - \* B1.9 - Machair
- CRY-01A - *Cypero-Spergularion salinae* Slavnic 1948
  - \* E6.2 - Continental inland salt steppes
- FES-11B - *Cytiso spinescentis-Bromion erecti* Bonin 1978
  - \* E1.1 - Inland sand and rock with open vegetation
- MOL-09B - *Dactylorhizo-Juncion striati* S. Brullo et Grillo 1978
  - \* E3.2 - Mediterranean short humid grassland
- TRA-02C - *Dauco-Catananchion luteae* S. Brullo 1985
  - \* E1.3 - Mediterranean xeric grassland
- MUL-01C - *Delphinion elati* Hadac ex Hadac et al. 1969
  - \* E5.5 - Subalpine moist or wet tall-herb and fern stands
- SAC-02A - *Deschampsio maderensis-Parafestucion albidae* Capelo et al. 2000
  - \* E1.8 - Closed Mediterranean dry acid and neutral grassland
  - \* E1.3 - Mediterranean xeric grassland
- MOL-04D - *Deschampsion cespitosae* Horvatic 1930
  - \* E2.1 - Permanent mesotrophic pastures and aftermath-grazed meadows
  - \* E2.2 - Low and medium altitude hay meadows
  - \* E3.4 - Moist or wet eutrophic and mesotrophic grassland
  - \* E5.4 - Moist or wet tall-herb and fern fringes and meadows
- MOL-09C - *Deschampsion mediae* Br.-Bl. et al. 1952 nom. conserv. propos.

- \* E3.2 - Mediterranean short humid grassland
- COR-02D - *Diantho catalaunici-Scrophularion humifusae* Baudiere et Simonneau 1974
- \* B1.4 - Coastal stable dune grassland (grey dunes)
- FEP-03F - *Diantho guttati-Million vernalis* Umanets et Solomakha 1998
- \* E6.2 - Continental inland salt steppes
- TRA-01I - *Diantho humilis-Velezion rigidae* Korzhenevsky et Klyukin ex Mucina in Mucina et al. 2013
- \* E1.3 - Mediterranean xeric grassland
- FES-06H - *Diantho lumnitzeri-Seslerion* (Soó 1971) Chytrý et Mucina in Mucina et Kolbek 1993
- \* E1.1 - Inland sand and rock with open vegetation
- COR-05F - *Diantho pinifolii-Jasionion heldreichii* Bergmeier et al. 2009
- \* E1.9 - Open non-Mediterranean dry acid and neutral grassland, including inland dune grassland
- \* E1.1 - Inland sand and rock with open vegetation
- GER-02D - *Dictamno albi-Ferulagion galbaniferae* (van Gils et al. 1975) de Foucault et al. ex Carni et Dengler in Mucina et al. 2009
- \* E5.2 - Thermophile woodland fringes
- FES-10C - *Diplachnion serotinae* Br.-Bl. 1961
- \* E1.2 - Perennial calcareous grassland and basic steppes
- MUL-01E - *Doronicion corsici* Gamisans 1975
- \* E5.5 - Subalpine moist or wet tall-herb and fern stands
- EPI-04E - *Dorycnio recti-Rumicion conglomerati* Gradstein et Schmittenberg 1977
- \* E5.4 - Moist or wet tall-herb and fern fringes and meadows
- KOB-01B - *Dryadion integrifoliae* Ohba ex Daniëls 1982
- \* E4.4 - Calcareous alpine and subalpine grassland
- MUL-01B - *Dryopterido-Athyron distentifolii* (Holub ex Sýkora et Štursa 1973) Jeník et al. 1980
- \* E5.5 - Subalpine moist or wet tall-herb and fern stands
- EPI-01A - *Epilobion angustifolii* Oberd. 1957
- \* E5.3 - [*Pteridium aquilinum*] fields
- NAR-01B - *Equiseto-Galion borealis* Tx. in Tx. et Böttcher 1969
- \* E4.3 - Acid alpine and subalpine grassland
- STE-04H - *Eragrostio-Polygonion arenastri* Couderc et Izco ex Carni et Mucina 1998
- \* E1.E - Trampled xeric grasslands with annuals
- MOQ-01C - *Euphorbio paraliae-Lotion glauci* Jardim et al. 2003
- \* B1.4 - Coastal stable dune grassland (grey dunes)
- FES-08B - *Euphorbio cretophilae-Thymion cretacei* Didukh 1989
- \* E1.1 - Inland sand and rock with open vegetation
- CRU-01A - *Euphorbio portlandicae-Helichrysion stoechadis* Géhu et Tx. ex Sissingh 1974
- \* B1.4 - Coastal stable dune grassland (grey dunes)
- MOL-07B - *Euphorbion palustris* Ageleulov et Golub in Golub 1995
- \* E3.4 - Moist or wet eutrophic and mesotrophic grassland
- \* E5.4 - Moist or wet tall-herb and fern fringes and meadows
- STE-04I - *Euphorbion prostratae* Rivas-Mart. 1976
- \* E1.E - Trampled xeric grasslands with annuals
- TUB-03E - *Evaco asterisciflorae-Linarion humilis* Minissale et Sciandrello 2013 nom. inval.
- \* E1.A - Open Mediterranean dry acid and neutral grassland
- COR-03E - *Festucion beckeri* Vicherek 1972
- \* E1.1 - Inland sand and rock with open vegetation
- ONO-02A - *Festucion burnatii* Rivas Goday et Rivas-Mart. ex Mayor et al. 1973

- \* E1.5 - Mediterranean-montane grassland
- \* E4.4 - Calcareous alpine and subalpine grassland
- TRI-04H - *Festucion eskiae* Br.-Bl. 1948
  - \* E4.3 - Acid alpine and subalpine grassland
- TOL-01A - *Festucion francoi* Lüpnitz 1976 corr. F. Prieto, Aguiar, J.C. Costa, Lousã et Rivas-Mart. in F. Prieto et al. 2012
  - \* E1.A - Open Mediterranean dry acid and neutral grassland
- TRI-04I - *Festucion macratherae* Avena et Bruno 1975 corr. Petriccione et Persia 1995
  - \* E4.3 - Acid alpine and subalpine grassland
- 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
  - \* E1.8 - Closed Mediterranean dry acid and neutral grassland
  - \* E2.4 - Iberian summer pastures (vallicares)
  - \* E1.3 - Mediterranean xeric grassland
- HER-01C - *Festucion picturatae* Krajina 1933 corr. Dúbravcová 2007
  - \* E4.1 - Vegetated snow-patch
- FEP-01A - *Festucion pseudovinae* Soó 1933
  - \* E6.2 - Continental inland salt steppes
- SES-02C - *Festucion pungentis* Horvat 1930
  - \* E4.4 - Calcareous alpine and subalpine grassland
- LYG-01C - *Festucion scariosae* Martínez-Parras et al. 1984
  - \* E1.4 - Mediterranean tall-grass and [*Artemisia*] steppes
  - \* E1.3 - Mediterranean xeric grassland
- ONO-01C - *Festucion scopariae* Br.-Bl. 1948
  - \* E4.4 - Calcareous alpine and subalpine grassland
  - \* E1.5 - Mediterranean-montane grassland
- FES-03A - *Festucion sulcatae* Soó 1930
  - \* E1.2 - Perennial calcareous grassland and basic steppes
- TRI-03C - *Festucion supinae* Br.-Bl. 1948
  - \* E4.3 - Acid alpine and subalpine grassland
- COR-03D - *Festucion vaginatae* Soó 1929
  - \* E1.1 - Inland sand and rock with open vegetation
- TRI-04F - *Festucion variae* Br.-Bl. ex Guinocet 1938
  - \* E4.3 - Acid alpine and subalpine grassland
- KOB-02B - *Festucion versicoloris* Krajina 1934
  - \* E4.3 - Acid alpine and subalpine grassland
  - \* E4.4 - Calcareous alpine and subalpine grassland
- TRI-05A - *Festucion woronowii* Tsepikova 1987
  - \* E4.3 - Acid alpine and subalpine grassland
- SES-03D - *Festucion xanthinae* Lakušić et al. 1969
  - \* E4.3 - Acid alpine and subalpine grassland
  - \* E4.4 - Calcareous alpine and subalpine grassland
- SES-01G - *Festuco saxatilis*-*Seslerion bielzii* (Pawłowski et Walas 1949) Coldea 1984
  - \* E4.4 - Calcareous alpine and subalpine grassland
- FEP-03E - *Festuco valesiacae*-*Limonion gmelinii* Mirkin in Golub et Solomakha 1988
  - \* E6.2 - Continental inland salt steppes
- FES-12B - *Festuco*-*Bromion* Barbero et Loisel 1971
  - \* E1.1 - Inland sand and rock with open vegetation



- SES-02D - Festuco-Knaution longifoliae Jovanovic-Dunjic 1955  
 \* E4.4 - Calcareous alpine and subalpine grassland
- FES-01C - Filipendulo vulgaris-Helictotrichion pratensis Dengler et Löbel in Dengler et al. 2003  
 \* E1.2 - Perennial calcareous grassland and basic steppes
- MOL-04C - Filipendulo-Petasition Br.-Bl. ex Duvigneaud 1949  
 \* E3.4 - Moist or wet eutrophic and mesotrophic grassland  
 \* E5.4 - Moist or wet tall-herb and fern fringes and meadows
- SAG-02A - Frankenion pulverulentae Rivas-Mart. ex Castroviejo et Porta 1976  
 \* E6.1 - Mediterranean inland salt steppes
- FES-06E - Galio campanulatae-Poion versicoloris Kukovitsa et al. ex Didukh et Mucina in Mucina et al. 2013  
 \* E1.1 - Inland sand and rock with open vegetation
- GER-02B - Galio litoralis-Geranion sanguinei Géhu et Géhu-Franck in de Foucault et al. 1983  
 \* E5.2 - Thermophile woodland fringes
- FES-02B - Galio veri-Aristolochion clematitidis Shevchyk et Solomakha in Shevchyk et al. 1996  
 \* E2.5 - Meadows of the steppe zone
- MOL-09D - Gaudinio fragilis-Hordeion bulbosi Galán de Mera et al. 1997  
 \* E3.1 - Mediterranean tall humid grassland
- SAG-02C - Gaudinio-Podospermion cani S. Brullo et Siracusa 2000  
 \* E6.1 - Mediterranean inland salt steppes
- ONO-01D - Genistion lobelii Molinier 1934  
 \* E1.5 - Mediterranean-montane grassland
- FES-01D - Gentianello amarellae-Helictotrichion pratensis Royer ex Dengler in Mucina et al. 2009  
 \* E1.2 - Perennial calcareous grassland and basic steppes
- GER-02A - Geranion sanguinei Tx. in T. Müller 1962  
 \* E5.2 - Thermophile woodland fringes
- FEP-06A - Glycyrrhizion echinatae Golub et Saveleva in Golub 1995  
 \* E2.2 - Low and medium altitude hay meadows  
 \* E3.4 - Moist or wet eutrophic and mesotrophic grassland
- FEP-06C - Glycyrrhizion glabrae Golub et Mirkin in Golub 1995  
 \* E2.2 - Low and medium altitude hay meadows  
 \* E3.4 - Moist or wet eutrophic and mesotrophic grassland
- FEP-06B - Glycyrrhizion korshinskyi Lysenko 2010  
 \* E2.2 - Low and medium altitude hay meadows  
 \* E3.4 - Moist or wet eutrophic and mesotrophic grassland
- FEP-02A - Halo-Artemision Pignatti 1953  
 \* E6.1 - Mediterranean inland salt steppes
- CRY-01B - Heleochloion schoenioidis Br.-Bl. ex Rivas Goday 1956  
 \* E6.1 - Mediterranean inland salt steppes
- TUB-01A - Helianthemion guttati Br.-Bl. in Br.-Bl. et al. 1940  
 \* E1.A - Open Mediterranean dry acid and neutral grassland
- FES-04A - Helictotricho desertori-Stipion rubentis Toman 1969  
 \* E1.2 - Perennial calcareous grassland and basic steppes
- CRU-02B - Helichrysion picardii (Rivas-Mart., Costa et Izco in Rivas-Mart. et al. 1990) Rivas-Mart. et al. 1999  
 \* B1.4 - Coastal stable dune grassland (grey dunes)
- IND-02A - Hieracio castellani-Plantaginion radicatae Rivas-Mart. et Cantó 1987  
 \* E1.A - Open Mediterranean dry acid and neutral grassland

- \* E1.5 - Mediterranean-montane grassland
- FES-11C - Hippocrepido glaucae-Stipion austroitalicae Forte et Terzi in Forte et al. 2005
- \* E1.1 - Inland sand and rock with open vegetation
- STE-06F - Hordeion murini Br.-Bl. in Br.-Bl. et al. 1936
- \* E1.6 - Subnitrophilous annual grassland
- HER-01F - Hyalopoion ponticae Rabotnova et Onipchenko in Onipchenko 2002
- \* E4.1 - Vegetated snow-patch
- LYG-02B - Hyparrhenion hirtae Br.-Bl. et al. 1956
- \* E1.4 - Mediterranean tall-grass and [Artemisia] steppes
- \* E1.3 - Mediterranean xeric grassland
- COR-02A - Hyperico perforati-Scleranthion perennis Moravec 1967
- \* E1.1 - Inland sand and rock with open vegetation
- \* E1.9 - Open non-Mediterranean dry acid and neutral grassland, including inland dune grassland
- TRA-01F - Hypochoeridion achyrophori Biondi et Guerra 2008
- \* E1.3 - Mediterranean xeric grassland
- FES-01G - Chrysopogono-Danthonion Kojic 1957
- \* E1.2 - Perennial calcareous grassland and basic steppes
- FES-06F - Chrysopogono-Festucion dalmatica Borhidi 1996
- \* E1.1 - Inland sand and rock with open vegetation
- FES-13A - Chrysopogono-Saturejion subspicatae Horvat et Horvatic 1934
- \* E1.1 - Inland sand and rock with open vegetation
- EPI-02B - Impatienti noli-tangere-Stachyion sylvaticae Görs ex Mucina 1993
- \* E5.4 - Moist or wet tall-herb and fern fringes and meadows
- EPI-04F - Ipomoeo acuminatae-Ageratinion adenophorae Espírito-Santo et al. 2004
- \* E5.4 - Moist or wet tall-herb and fern fringes and meadows
- IND-01B - Jasionion carpetanae González-Albo 1941
- \* E1.5 - Mediterranean-montane grassland
- MOL-05B - Juncion inflexi Knapp 1971
- \* E3.4 - Moist or wet eutrophic and mesotrophic grassland
- TRI-03B - Juncion trifidi Krajina 1934
- \* E4.3 - Acid alpine and subalpine grassland
- KAL-01A - Kalidion caspici Golub, Rukhlenko et Sokolof 2001
- \* E6.2 - Continental inland salt steppes
- GER-01B - Knaution dipsacifoliae Julve ex Dengler et Boch 2008
- \* E5.2 - Thermophile woodland fringes
- KOB-01A - Kobresio-Dryadion Nordhagen 1943
- \* E4.4 - Calcareous alpine and subalpine grassland
- \* E4.3 - Acid alpine and subalpine grassland
- KOB-02D - Kobresion capilliformis Tsepikova 1987
- \* E4.4 - Calcareous alpine and subalpine grassland
- \* E4.3 - Acid alpine and subalpine grassland
- CRU-01B - Koelerion arenariae Tx. 1937 corr. Gutermann et Mucina 1993
- \* B1.4 - Coastal stable dune grassland (grey dunes)
- \* B1.9 - Machair
- COR-03A - Koelerion glaucae Volk 1931
- \* E1.1 - Inland sand and rock with open vegetation

- \* E1.9 - Open non-Mediterranean dry acid and neutral grassland, including inland dune grassland
- STE-06G - *Laguro ovati-Bromion rigidi* Géhu et Géhu-Franck 1985
  - \* E1.6 - Subnitrophilous annual grassland
- TUB-02C - *Laguro ovati-Vulpion fasciculatae* Géhu et Biondi 1994
  - \* B1.4 - Coastal stable dune grassland (grey dunes)
- SES-01H - *Laserpitio nestleri-Ranunculion thorae* Vigo ex Molero 1981
  - \* E4.4 - Calcareous alpine and subalpine grassland
- GER-02E - *Lathyro laxiflori-Trifolion velenovskyi* (Carni et al. 2000) Carni 2005
  - \* E5.2 - Thermophile woodland fringes
- LYG-01E - *Leontodono tuberosi-Bellion sylvestris* Biondi et al. 2001
  - \* E1.3 - Mediterranean xeric grassland
  - \* E1.4 - Mediterranean tall-grass and [*Artemisia*] steppes
- CRY-01C - *Lepidion latifolii* Golub et Mirkin 1986
  - \* E6.2 - Continental inland salt steppes
- SAL-03A - *Limoniastrion monopetali* Pignatti 1952
  - \* E6.1 - Mediterranean inland salt steppes
- SAL-02D - *Limonion algarvensi-lanceolati* Costa et al. 2012
  - \* E6.1 - Mediterranean inland salt steppes
- SAL-02C - *Limonion catalaunico-viciosoi* Rivas-Mart. et Costa 1984
  - \* E6.1 - Mediterranean inland salt steppes
- SAL-02E - *Limonion confusi* (Br.-Bl. 1933) Rivas-Mart. et Costa 1984
  - \* E6.1 - Mediterranean inland salt steppes
- FEP-03B - *Limonion sareptani* Golub 1994
  - \* E6.2 - Continental inland salt steppes
- FEP-03C - *Limonion tomentelli* Agafonov et Golub in Golub 1994
  - \* E6.2 - Continental inland salt steppes
- STE-06H - *Linario polygalifoliae-Vulpion alopecuri* Br.-Bl., Rozeira et Silva in Br.-Bl. et al. 1972
  - \* E1.6 - Subnitrophilous annual grassland
- TUB-02A - *Linarion pedunculatae* Díez Garretas et al. in Díez Garretas 1984
  - \* B1.4 - Coastal stable dune grassland (grey dunes)
- GER-03E - *Linarion triornithophorae* Rivas-Mart. et al. 1984
  - \* E5.2 - Thermophile woodland fringes
- MOL-01G - *Lino biennis-Gaudinion fragilis* (Br.-Bl. 1967) de Foucault 1989
  - \* E2.1 - Permanent mesotrophic pastures and aftermath-grazed meadows
- LON-01A - *Lonicro-Rubion silvatici* Tx. et Neumann ex Wittig 1977
  - \* E5.3 - [*Pteridium aquilinum*] fields
- MOL-05C - *Loto tenuis-Trifolion fragiferi* Westhoff et Den Held ex de Foucault 2009
  - \* E3.4 - Moist or wet eutrophic and mesotrophic grassland
- SAL-02B - *Lygeo sparti-Limonion furfuracei* Rigual 1972
  - \* E6.1 - Mediterranean inland salt steppes
- SAL-02A - *Lygeo-Lepidion cardaminis* Rivas Goday et Rivas-Mart. ex Rivas-Mart. et Costa 1984
  - \* E6.1 - Mediterranean inland salt steppes
- MOL-07C - *Lythro-Euphorbion* Mirkin et Naumova 1986
  - \* E3.4 - Moist or wet eutrophic and mesotrophic grassland
  - \* E5.4 - Moist or wet tall-herb and fern fringes and meadows
- TUB-02G - *Maresion nanae* Géhu et al. 1987
  - \* B1.4 - Coastal stable dune grassland (grey dunes)

- TUB-02H - *Medicagini-Triplachnion nitentis* Mayer 1995  
 \* B1.4 - Coastal stable dune grassland (grey dunes)
- GER-03A - *Melampyrion pratensis* Passarge 1979  
 \* E5.2 - Thermophile woodland fringes
- CRU-03E - *Melico chrysolepidis-Ephedrion distachyae* Umanets et Solomakha 1999  
 \* B1.4 - Coastal stable dune grassland (grey dunes)
- SAG-02E - *Mesembryanthemion nodiflori* Géhu et al. 1990  
 \* E6.1 - Mediterranean inland salt steppes
- ONO-02B - *Minuartio-Poion ligulatae* O. de Bolòs 1962  
 \* E1.5 - Mediterranean-montane grassland  
 \* E4.4 - Calcareous alpine and subalpine grassland
- TUB-01C - *Molinerion laevis* Br.-Bl. et al. 1952  
 \* E1.A - Open Mediterranean dry acid and neutral grassland
- MOL-09A - *Molinio-Holoschoenion* Br.-Bl. ex Tchou 1948  
 \* E3.1 - Mediterranean tall humid grassland
- MOL-08A - *Molinio-Hordeion secalini* Horvatic 1934  
 \* E3.3 - Sub-mediterranean humid meadows
- MOL-04A - *Molinion caeruleae* Koch 1926  
 \* E3.4 - Moist or wet eutrophic and mesotrophic grassland  
 \* E2.2 - Low and medium altitude hay meadows  
 \* E2.1 - Permanent mesotrophic pastures and aftermath-grazed meadows  
 \* E3.5 - Moist or wet oligotrophic grassland
- LYG-03C - *Moricandio-Lygeion sparti* S. Brullo et al. 1990  
 \* E1.3 - Mediterranean xeric grassland  
 \* E1.4 - Mediterranean tall-grass and [*Artemisia*] steppes
- MUL-05A - *Mulgedion alpini* Nordhagen 1943  
 \* E5.5 - Subalpine moist or wet tall-herb and fern stands
- TRI-04B - *Nardion strictae* Br.-Bl. 1926  
 \* E4.3 - Acid alpine and subalpine grassland
- NAR-01E - *Nardo-Agrostion tenuis* Sillinger 1933  
 \* E1.7 - Closed non-Mediterranean dry acid and neutral grassland
- TRI-01B - *Nardo-Caricion rigidae* Nordhagen 1943  
 \* E4.3 - Acid alpine and subalpine grassland
- NAR-01D - *Nardo-Juncion squarrosi* (Oberd. 1957) Passarge 1964  
 \* E3.5 - Moist or wet oligotrophic grassland
- EPI-04C - *Nardosmion laevigatae* Klotz et Köck 1986  
 \* E5.4 - Moist or wet tall-herb and fern fringes and meadows
- MOL-06A - *Oenanthion fistulosae* de Foucault 2009  
 \* E3.4 - Moist or wet eutrophic and mesotrophic grassland
- TRA-01D - *Omphalodion commutatae* Rivas-Mart. et al. ex Izco 1976 corr. Pérez Raya et al. 1991  
 \* E1.3 - Mediterranean xeric grassland
- TRA-02D - *Onobrychido-Ptilostemion stellati* S. Brullo et al. 2001  
 \* E1.3 - Mediterranean xeric grassland
- ONO-01B - *Ononidion cristatae* Royer 1991  
 \* E1.5 - Mediterranean-montane grassland  
 \* E4.4 - Calcareous alpine and subalpine grassland
- ONO-01A - *Ononidion striatae* Br.-Bl. et Susplugas 1937  
 \* E1.5 - Mediterranean-montane grassland

- \* E4.4 - Calcareous alpine and subalpine grassland
- TUB-02I - *Ononidion tournefortii* Géhu et al. 1996
- \* B1.4 - Coastal stable dune grassland (grey dunes)
- GER-03F - *Origanion virentis* Rivas-Mart. et O. de Bolòs in Rivas-Mart. et al. 1984
- \* E5.2 - Thermophile woodland fringes
- TUB-03D - *Ormenido multicaulis-Malcolmion broussonetii* Br.-Bl. in Br.-Bl. et al. 1940
- \* E1.A - Open Mediterranean dry acid and neutral grassland
- TUB-01H - *Ornithopo pinnati-Gaudinion coarctatae* F. Prieto et Aguiar, in F. Prieto et al. 2012
- \* E1.A - Open Mediterranean dry acid and neutral grassland
- SES-03A - *Oxytropidion dinaricae* Lakušić 1966
- \* E4.4 - Calcareous alpine and subalpine grassland
- KOB-02A - *Oxytropido-Elynion myosuroidis* Br.-Bl. 1950
- \* E4.4 - Calcareous alpine and subalpine grassland
- MOL-02C - *Pancicion serbicae* Lakušić 1966
- \* E2.3 - Mountain hay meadows
- \* E4.5 - Alpine and subalpine enriched grassland
- GER-04B - *Pericallion malvifoliae* F. Prieto, Dias et Aguiar in F. Prieto et al. 2012
- \* E5.2 - Thermophile woodland fringes
- MUL-03A - *Petasion officinalis* Sillinger 1933
- \* E5.4 - Moist or wet tall-herb and fern fringes and meadows
- FEP-01B - *Peucedano officinalis-Asterion sedifolii* Borhidi 1996
- \* E6.2 - Continental inland salt steppes
- SAG-02D - *Pholiuro-Spergularion Pignatti* 1952
- \* E6.1 - Mediterranean inland salt steppes
- MOL-01B - *Phyteumato-Trisetion flavescens* Hundt ex Passarge 1969
- \* E2.3 - Mountain hay meadows
- \* E4.5 - Alpine and subalpine enriched grassland
- FES-03E - *Pimpinello-Thymion zygoidi* Dihoru et Donita 1970
- \* E1.2 - Perennial calcareous grassland and basic steppes
- ONO-02C - *Plantagini discoloris-Thymion mastigophori* Molina et Izco 1989
- \* E1.5 - Mediterranean-montane grassland
- FEP-03A - *Plantagini salsae-Artemision santonici* Lysenko et Mucina in Lysenko et al. 2011
- \* E6.2 - Continental inland salt steppes
- TRA-02B - *Plantagini-Catapodion marini* S. Brullo 1985
- \* E1.3 - Mediterranean xeric grassland
- BUL-01D - *Plantaginion cupanii* S. Brullo et Grillo 1978
- \* E1.3 - Mediterranean xeric grassland
- GEN-01B - *Plantaginion insularis* Klein 1972
- \* E1.5 - Mediterranean-montane grassland
- BUL-01B - *Plantaginion serrariae* Galán de Mera et al. 2000
- \* E1.3 - Mediterranean xeric grassland
- TRI-06B - *Plantaginion thalackeri* Quézel 1953
- \* E4.3 - Acid alpine and subalpine grassland
- MOL-02D - *Poion alpinae* Gams ex Oberd. 1950
- \* E4.5 - Alpine and subalpine enriched grassland
- \* E2.1 - Permanent mesotrophic pastures and aftermath-grazed meadows
- GER-03C - *Poion nemoralis* Dengler et al. 2006
- \* E5.2 - Thermophile woodland fringes

MOL-02E - Poion supinae Rivas-Mart. et Géhu 1978  
\* E4.5 - Alpine and subalpine enriched grassland  
\* E2.1 - Permanent mesotrophic pastures and aftermath-grazed meadows

TRI-08A - Poion violaceae Horvat et al. 1937  
\* E4.3 - Acid alpine and subalpine grassland

MUL-06A - Polemonio acutiflori-Veratrimon lobeliani Telyatnikov 2012  
\* E5.5 - Subalpine moist or wet tall-herb and fern stands

POL-01B - Polycarpion tetraphylli Rivas-Mart. 1975  
\* E1.E - Trampled xeric grasslands with annuals

STE-04J - Polycarpo-Eleusinion indicae Carni et Mucina 1998  
\* E1.E - Trampled xeric grasslands with annuals

FES-01F - Polygalo mediterraneae-Bromion erecti (Biondi et al. 2005) Di Pietro et al. 2013  
\* E1.2 - Perennial calcareous grassland and basic steppes

FES-07A - Polygonion albanicae Ritter-Studnicka 1970  
\* E1.1 - Inland sand and rock with open vegetation

MOL-03A - Polygonion krascheninnikovii Kashapov 1985  
\* E2.3 - Mountain hay meadows

POL-01A - Polygono-Coronopodion Sissingh 1969  
\* E1.E - Trampled xeric grasslands with annuals

SAG-02B - Polypogonion subspatheae Gamisans 1990  
\* E6.1 - Mediterranean inland salt steppes

BUL-01C - Poo bulbosae-Astragalion sesamei Rivas Goday et Ladero 1970  
\* E1.3 - Mediterranean xeric grassland

MOL-05A - Potentillion anserinae Tx. 1947  
\* E2.1 - Permanent mesotrophic pastures and aftermath-grazed meadows  
\* E3.4 - Moist or wet eutrophic and mesotrophic grassland

TRI-04K - Potentillo montenegrinae-Festucion paniculatae Redžić ex Carni et Mucina 2013  
\* E4.3 - Acid alpine and subalpine grassland

TRI-04J - Potentillo rigoanae-Festucion paniculatae Di Pietro all. nova hoc loco  
\* E4.3 - Acid alpine and subalpine grassland

FES-01E - Potentillo splendentis-Brachypodion pinnati Br.-Bl. 1967  
\* E1.2 - Perennial calcareous grassland and basic steppes

TRI-04E - Potentillo ternatae-Nardion Simon 1958  
\* E4.3 - Acid alpine and subalpine grassland

NAR-01A - Potentillo-Polygonion vivipari Nordhagen ex Dierßen 1992  
\* E4.3 - Acid alpine and subalpine grassland  
\* E1.7 - Closed non-Mediterranean dry acid and neutral grassland

SES-01I - Primulion intricatae Br.-Bl. ex Vigo 1972  
\* E4.4 - Calcareous alpine and subalpine grassland

CRU-01C - Psammo-Koelerion Pignatti 1953  
\* B1.4 - Coastal stable dune grassland (grey dunes)

TUB-02E - Psammo-Vulpion Pignatti 1953  
\* B1.4 - Coastal stable dune grassland (grey dunes)

DRY-03C - Ptilostemo casabonae-Euphorbion cupanii Angiolini et al. 2005  
\* E1.B - Heavy-metal grassland

IND-01C - Ptilotrichion purpurei Quézel 1953  
\* E1.5 - Mediterranean-montane grassland

FEP-01D - Puccinellion convolutae Micevski 1965

- \* E6.1 - Mediterranean inland salt steppes
- FEP-03D - *Puccinellion giganteae* Dubyna et Neuhäuslová 2000
- \* E6.2 - Continental inland salt steppes
- FEP-01E - *Puccinellion lagascae* Rivas-Mart. in Rivas-Mart. et Costa 1976 corr. Alonso et De la Torre 2004
- \* E6.1 - Mediterranean inland salt steppes
- FEP-01C - *Puccinellion limosae* Soó 1933
- \* E6.2 - Continental inland salt steppes
- HER-01D - *Ranunculum crenatum* Lakušić 1968
- \* E4.1 - Vegetated snow-patch
- MOL-08E - *Ranunculum velutinum* Pedrotti 1978
- \* E3.3 - Sub-mediterranean humid meadows
- GER-04A - *Ranunculo cortusifolii*-*Geranium canariensis* Rivas-Mart. et al. 1993
- \* E5.2 - Thermophile woodland fringes
- HER-01I - *Ranunculo hyperborei*-*Drepanocladion revolutum* Philippi 1973
- \* E4.1 - Vegetated snow-patch
- MOL-01F - *Ranunculo neapolitani*-*Arrhenatherion elatioris* Allegrezza et Biondi 2011
- \* E2.2 - Low and medium altitude hay meadows
- TRI-04C - *Ranunculo pollinensis*-*Nardion strictae* Bonin 1972
- \* E4.3 - Acid alpine and subalpine grassland
- HER-01H - *Ranunculo-Oxyria didyma* Nordhagen 1943
- \* E4.1 - Vegetated snow-patch
- LYG-01F - *Reichardia maritima*-*Dactylidium hispanicum* Biondi et al. 2001
- \* E1.3 - Mediterranean xeric grassland
- \* E1.4 - Mediterranean tall-grass and [*Artemisia*] steppes
- BUL-01E - *Rumex* Oberd. 1954
- \* E1.A - Open Mediterranean dry acid and neutral grassland
- \* E1.3 - Mediterranean xeric grassland
- MUL-04A - *Rumex alpinus* Rübel ex Scharfetter 1938
- \* E5.5 - Subalpine moist or wet tall-herb and fern stands
- MOL-01H - *Rumex thyrsoiflorus* Micevski ex Carni et Mucina 2013
- \* E2.2 - Low and medium altitude hay meadows
- HER-01B - *Salix herbacea*-*Caricion lachenalii* Béguin et Theurillat 1982
- \* E4.1 - Vegetated snow-patch
- HER-01A - *Salix herbacea* Br.-Bl. in Br.-Bl. et Jenny 1926
- \* E4.1 - Vegetated snow-patch
- FES-06G - *Satureja montana* Horvat in Horvat et al. 1974
- \* E1.1 - Inland sand and rock with open vegetation
- FES-14A - *Satureja-Thymum* Micevski 1971
- \* E1.1 - Inland sand and rock with open vegetation
- CRU-03D - *Scabiosa ucranica* Sanda et al. 1980
- \* B1.4 - Coastal stable dune grassland (grey dunes)
- COR-05E - *Scabiosa-Trifolium dalmaticum* Horvatic et N. Randelovic in N. Randelovic 1977
- \* E1.1 - Inland sand and rock with open vegetation
- \* E1.9 - Open non-Mediterranean dry acid and neutral grassland, including inland dune grassland
- TUB-01F - *Scleranthus-Myosotidion incrassata* S. Brullo et al. 2001
- \* E1.A - Open Mediterranean dry acid and neutral grassland

- FES-13B - *Scorzonerion villosae* Horvatic 1963  
 \* E1.1 - Inland sand and rock with open vegetation
- LYG-03D - *Scorzonero creticae-Lygeion sparti* S. Brullo et al. 2002  
 \* E1.3 - Mediterranean xeric grassland  
 \* E1.4 - Mediterranean tall-grass and [*Artemisia*] steppes
- COR-05B - *Sedion anglici* Br.-Bl. in Br.-Bl. et Tx. 1952  
 \* E1.1 - Inland sand and rock with open vegetation  
 \* E1.9 - Open non-Mediterranean dry acid and neutral grassland, including inland dune grassland
- HER-01E - *Sedion candollei* Rivas-Mart., Fernández González et Loidi in Rivas-Mart. et al. 2011  
 \* E4.1 - Vegetated snow-patch
- COR-07C - *Sedion micrantho-sediformis* Rivas-Mart., P. Sánchez et Alcaraz ex P. Sánchez et Alcaraz 1993  
 \* E1.1 - Inland sand and rock with open vegetation
- TUB-01D - *Sedion pedicellato-andegavensis* Rivas-Mart. et al. 1986  
 \* E1.A - Open Mediterranean dry acid and neutral grassland
- COR-05C - *Sedion pyrenaici* Tx. in Rivas-Mart. et al. 2011  
 \* E1.1 - Inland sand and rock with open vegetation  
 \* E1.9 - Open non-Mediterranean dry acid and neutral grassland, including inland dune grassland
- COR-05D - *Sedo albi-Veronicion dillenii* Korneck 1974  
 \* E1.1 - Inland sand and rock with open vegetation  
 \* E1.9 - Open non-Mediterranean dry acid and neutral grassland, including inland dune grassland
- COR-02C - *Sedo-Cerastion arvensis* Sissingh et Tideman 1960  
 \* E1.1 - Inland sand and rock with open vegetation  
 \* E1.7 - Closed non-Mediterranean dry acid and neutral grassland  
 \* E1.9 - Open non-Mediterranean dry acid and neutral grassland, including inland dune grassland
- TRA-01C - *Sedo-Ctenopsion gypsophilae* Rivas Goday et Rivas-Mart. ex Izco 1974  
 \* E1.3 - Mediterranean xeric grassland
- COR-05A - *Sedo-Scleranthion* Br.-Bl. 1950  
 \* E1.1 - Inland sand and rock with open vegetation  
 \* E1.9 - Open non-Mediterranean dry acid and neutral grassland, including inland dune grassland
- COR-06B - *Sedo-Thymion* De Molenaar 1976  
 \* E1.1 - Inland sand and rock with open vegetation
- EPI-04A - *Senecionion fluviatilis* Tx. ex Moor 1958  
 \* E5.4 - Moist or wet tall-herb and fern fringes and meadows
- MUL-03C - *Senecionion samniti* Bonin 1978  
 \* E5.4 - Moist or wet tall-herb and fern fringes and meadows
- TRI-07A - *Sesamoido pygmaeae-Poion violaceae* Gamisans 1975  
 \* E4.3 - Acid alpine and subalpine grassland  
 \* E1.8 - Closed Mediterranean dry acid and neutral grassland
- FES-02D - *Seselion libanotis* Ageleulov et Golub in Golub 1995  
 \* E2.5 - Meadows of the steppe zone
- SES-02B - *Seslerio juncifoliae-Caricion firmae* Trinajstić 2005  
 \* E4.4 - Calcareous alpine and subalpine grassland
- FES-11D - *Seslerio nitidae-Caricion macrolepidis* Ubaldi 1997



- \* E1.1 - Inland sand and rock with open vegetation

SES-01E - *Seslerio-Asterion alpini* Hadac ex Hadac et al. 1969

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

SES-03C - *Seslerio-Festucion xanthinae* Horvat in Horvat et al. 1974

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

SES-02E - *Seslerion apenninae* Bruno et Furnari 1966

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

SES-01A - *Seslerion coeruleae* Br.-Bl. in Br.-Bl. et Jenny 1926

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

TRI-08B - *Seslerion comosae* Horvat et al. 1937

  - \* E4.3 - Acid alpine and subalpine grassland

SES-03E - *Seslerion nitidae* Horvat 1936

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

FES-06I - *Seslerion rigidae* Zólyomi 1936

  - \* E1.1 - Inland sand and rock with open vegetation

SES-01F - *Seslerion tatrae* Pawlowski 1935 corr. Klika 1955

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

SES-02A - *Seslerion tenuifoliae* Horvat 1930

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

TRI-07B - *Sieglingion decumbentis* Gamisans 1976

  - \* E3.2 - Mediterranean short humid grassland
  - \* E4.3 - Acid alpine and subalpine grassland

COR-03B - *Sileno conicae-Cerastion semidecandri* Korneck 1974

  - \* E1.1 - Inland sand and rock with open vegetation
  - \* E1.9 - Open non-Mediterranean dry acid and neutral grassland, including inland dune grassland

CRU-03A - *Sileno thymifoliae-Jurineion kilaeae* Géhu et Uslu ex Mucina et Jakushenko ined.

  - \* B1.4 - Coastal stable dune grassland (grey dunes)

GER-02C - *Stachyo lusitanicae-Cheirolophion sempervirentis* (Capelo 1996) Capelo in Mucina et al. 2013

  - \* E5.2 - Thermophile woodland fringes

FES-05B - *Stipion korshinskyi* Toman 1969

  - \* E1.2 - Perennial calcareous grassland and basic steppes

FES-03D - *Stipion lessingiana* Soó 1947

  - \* E1.2 - Perennial calcareous grassland and basic steppes

LYG-01D - *Stipion parviflorae* De la Torre et al. 1996

  - \* E1.3 - Mediterranean xeric grassland
  - \* E1.4 - Mediterranean tall-grass and [*Artemisia*] steppes

TRA-01B - *Stipion retortae* Br.-Bl. et O. de Bolòs ex O. de Bolòs 1957

  - \* E1.3 - Mediterranean xeric grassland

LYG-03B - *Stipion tenacissimae* Rivas-Mart. 1984

  - \* E1.4 - Mediterranean tall-grass and [*Artemisia*] steppes
  - \* E1.3 - Mediterranean xeric grassland

FES-03C - *Stipo-Poion xerophilae* Br.-Bl. et Tx. ex Br.-Bl. 1949

  - \* E1.2 - Perennial calcareous grassland and basic steppes

STE-06I - *Taeniathero-Aegilopion geniculatae* Rivas-Mart. et Izco 1977

  - \* E1.6 - Subnitrophilous annual grassland

FES-05A - *Tanaceto achilleifolii-Stipion lessingiana* Royer ex Lysenko et Mucina 2013

- \* E1.2 - Perennial calcareous grassland and basic steppes
- IND-01A - *Teesdaliopsis confertae*-*Luzulion caespitosae* Rivas-Mart. 1987
- \* E1.5 - Mediterranean-montane grassland
- GER-03D - *Teucrium scorodoniae* de Foucault et al. 1983
- \* E5.2 - Thermophile woodland fringes
- COR-04A - *Thero-Airion* Tx. ex Oberd. 1957
- \* E1.9 - Open non-Mediterranean dry acid and neutral grassland, including inland dune grassland
- \* B1.9 - Machair
- \* E1.1 - Inland sand and rock with open vegetation
- LYG-01A - *Thero-Brachypodium retusi* Br.-Bl. 1925
- \* E1.3 - Mediterranean xeric grassland
- \* E1.4 - Mediterranean tall-grass and [*Artemisia*] steppes
- THL-09A - *Thlaspi calaminarii* Ernst 1965
- \* E1.B - Heavy-metal grassland
- TUB-01G - *Thymion micans* J.C. Costa et al. 2005
- \* E1.A - Open Mediterranean dry acid and neutral grassland
- IND-02C - *Thymion serpylloidis* Rivas Goday et Rivas-Mart. in Rivas-Mart. 1965
- \* E1.A - Open Mediterranean dry acid and neutral grassland
- \* E1.5 - Mediterranean-montane grassland
- TOL-01B - *Tolpido succulentae*-*Agrostion congestiflorae* Aguiar et F. Prieto in F. Prieto et al. 2012
- \* E1.A - Open Mediterranean dry acid and neutral grassland
- COR-07B - *Tortello tortuosae*-*Sedion albi* Hallberg ex Dengler et Löbel 2006
- \* E1.1 - Inland sand and rock with open vegetation
- BUL-01A - *Trifolium subterranei*-*Periballion minutae* Rivas Goday 1964
- \* E1.3 - Mediterranean xeric grassland
- \* E1.A - Open Mediterranean dry acid and neutral grassland
- TUB-01E - *Trifolium cherleri* Micevski 1972
- \* E1.A - Open Mediterranean dry acid and neutral grassland
- MOL-05D - *Trifolium maritimi* Br.-Bl. ex Br.-Bl. et al. 1952
- \* E3.2 - Mediterranean short humid grassland
- GER-01A - *Trifolium medii* T. Müller 1962
- \* E5.2 - Thermophile woodland fringes
- FES-02E - *Trifolium montani* Naumova 1986
- \* E2.5 - Meadows of the steppe zone
- MOL-08D - *Trifolium pallidi* Ilijanic 1969
- \* E3.3 - Sub-mediterranean humid meadows
- TRI-09A - *Trifolium parnassii* Quézel ex Quézel et al. 1992
- \* E1.5 - Mediterranean-montane grassland
- MOL-08B - *Trifolium resupinatum* Micevski 1957
- \* E3.3 - Sub-mediterranean humid meadows
- MOL-08C - *Trifolium-Ranunculum pedati* Slavnic 1948
- \* E3.4 - Moist or wet eutrophic and mesotrophic grassland
- SAL-02F - *Triglochin barrelieri*-*Limonium glomeratum* Biondi et al. 2001
- \* E6.1 - Mediterranean inland salt steppes
- MUL-02B - *Trisetum fuscum* Krajina 1933
- \* E4.3 - Acid alpine and subalpine grassland
- MOL-02A - *Trisetum flavescens*-*Polygonum bistorta* Br.-Bl. et Tx. ex Marschall 1947

- \* E2.3 - Mountain hay meadows
- \* E4.5 - Alpine and subalpine enriched grassland
- MUL-07A - *Trisetum sibiricum*-*Aconitum septentrionale* Ermakov et al. 2000
- \* E5.5 - Subalpine moist or wet tall-herb and fern stands
- LYG-01B - *Trisetum velutinum*-*Brachypodium boissieri* Rivas-Mart. et al. 2002
- \* E1.3 - Mediterranean xeric grassland
- \* E1.4 - Mediterranean tall-grass and [*Artemisia*] steppes
- COR-07D - *Valerianion tuberosae* Guinocet 1975
- \* E1.1 - Inland sand and rock with open vegetation
- CRU-03C - *Verbascum pinnatifidum* Korzhenevsky et Klyukin 1990
- \* B1.4 - Coastal stable dune grassland (grey dunes)
- FES-09C - *Veronica multifida*-*Stipion ponticae* Didukh 1983 nom. inval.
- \* E1.2 - Perennial calcareous grassland and basic steppes
- COR-06A - *Veronica-Poion glaucae* Nordhagen 1943
- \* E1.1 - Inland sand and rock with open vegetation
- NAR-01C - *Violion caninae* Schwickerath 1944
- \* E1.7 - Closed non-Mediterranean dry acid and neutral grassland
- \* B1.9 - Machair
- MOL-02B - *Violion cornutae* Nègre 1972
- \* E2.3 - Mountain hay meadows
- \* E4.5 - Alpine and subalpine enriched grassland
- GER-03B - *Viola riviniana*-*Stellaria holostea* Passarge 1994
- \* E5.2 - Thermophile woodland fringes
- TRA-01E - *Vulpia ciliata*-*Crepidium neglectum* Poldini 1989
- \* E1.3 - Mediterranean xeric grassland
- TUB-02F - *Vulpia-Lolium* Horvatic 1963
- \* B1.4 - Coastal stable dune grassland (grey dunes)
- TRA-01G - *Vulpion ligusticae* Aubert et Loisel 1971
- \* E1.3 - Mediterranean xeric grassland
- TRA-01H - *Xeranthemion annui* Oberd. 1954
- \* E1.3 - Mediterranean xeric grassland
- FES-12A - *Xero-Bromion erecti* Zoller 1954
- \* E1.1 - Inland sand and rock with open vegetation

## Appendix C: Fact sheets EUNIS grassland habitat types

### B1.4 - Coastal stable dune grassland

**Origin of data (countries):** BE, BG, CZ, DE, DK, ES, FR, GR, HR, HU, IT, LT, LV, NL, PL, PT, RO, RS, SK, TR, UA, UK

**List of alliances:** COR-01A - *Corynephorion canescens* Klika 1931, CRU-01A - *Euphorbio portlandicae-Helichrysion stoechadis* Géhu et Tx. ex Sissingh 1974, CRU-01B - *Koelerion arenariae* Tx. 1937 corr. Gutermann et Mucina 1993, CRU-02A - *Crucianellion maritimae* Rivas Goday et Rivas-Mart. 1958, CRU-02B - *Helichrysion picardii* (Rivas-Mart., Costa et Izco in Rivas-Mart. et al. 1990) Rivas-Mart. et al. 1999, CRU-03D - *Scabiosion ucranicae* Sanda et al. 1980, TUB-02A - *Linarion pedunculatae* Díez Garretas et al. in Díez Garretas 1984, TUB-02B - *Alkanno-Maresion nanae* Rivas Goday ex Rivas Goday et Rivas-Mart. 1963 corr. Díez Garretas et al. 2001, TUB-02C - *Laguro ovati-Vulpion fasciculatae* Géhu et Biondi 1994, TUB-02E - *Psammo-Vulpion Pignatti* 1953, TUB-02F - *Vulpio-Lotion* Horvatic 1963, TUB-02G - *Maresion nanae* Géhu et al. 1987, TUB-03A - *Anthyllido hamosae-Malcolmion lacerae* Rivas Goday 1958

**Additional selection rules:** n/a

**Implications for EUNIS classification:** proposed division: B1.4a - Atlantic and Baltic coastal dune grassland (grey dunes), B1.4b - Mediterranean and Macaronesian coastal dune grassland (grey dunes), B1.4c - Black Sea coastal dune grassland (grey dunes)

#### Floristic composition:

<i>Corynephorus canescens</i>	47	<i>Rumex acetosella</i>	17
<i>Carex arenaria</i>	40	<i>Koeleria macrantha</i>	15
<i>Cerastium semidecandrum</i>	28	<i>Hypochaeris radicata</i>	15
<i>Festuca rubra</i> agg.	26	<i>Myosotis ramosissima</i>	14
<i>Hypnum cupressiforme</i>	24	<i>Jasione montana</i>	13
<i>Ammophila arenaria</i>	24	<i>Spergula morisonii</i>	13
<i>Phleum arenarium</i>	22	<i>Cladonia rangiformis</i>	12
<i>Cladonia foliacea</i>	21	<i>Dicranum scoparium</i>	12
<i>Polytrichum piliferum</i>	21	<i>Aira praecox</i>	11
<i>Sedum acre</i>	21	<i>Crucianella maritima</i>	10
<i>Cladonia furcata</i>	20	<i>Erophila verna</i>	10
<i>Cetraria aculeata</i>	18	<i>Senecio jacobaea</i>	10
<i>Galium verum</i>	17	<i>Veronica arvensis</i>	10
<i>Ceratodon purpureus</i>	17	<i>Calamagrostis epigejos</i>	10
<i>Erodium cicutarium</i>	17	<i>Brachythecium albicans</i>	10

## B1.9 - Machair

**Origin of data (countries):** AT, BE, BG, CH, CZ, DE, DK, ES, FR, GR, HR, HU, IE, IT, LT, LU, LV, MK, NL, NO, PL, PT, RS, RU, SE, SI, SK, UA, UK

**List of alliances:** AMM-01A - Ammophilion Br.-Bl. 1921, COR-02B - Armerion elongatae Pötsch 1962, COR-04A - Thero-Airion Tx. ex Oberd. 1957, CRU-01B - Koelerion arenariae Tx. 1937 corr. Gutermann et Mucina 1993, MOL-01C - Cynosurion cristati Tx. 1947, NAR-01C - Violion caninae Schwickerath 1944

**Additional selection rules:** n/a

**Implications for EUNIS classification:** proposed to restrict to grassland part of the habitat and accordingly renamed to: Machair grassland

### Floristic composition:

Agrostis capillaris	38	Hieracium pilosella	17
Plantago lanceolata	38	Bellis perennis	16
Festuca rubra agg.	37	Ranunculus repens	16
Trifolium repens	34	Lotus corniculatus	15
Achillea millefolium agg.	33	Prunella vulgaris	15
Anthoxanthum odoratum	32	Ammophila arenaria	14
Holcus lanatus	29	Danthonia decumbens	13
Poa pratensis	24	Poa trivialis	13
Trifolium pratense	24	Leontodon autumnalis	12
Lolium perenne	23	Cerastium semidecandrum	12
Hypochaeris radicata	22	Galium verum	12
Cerastium fontanum subsp. vulgare	21	Nardus stricta	12
Cynosurus cristatus	21	Festuca pratensis	11
Ranunculus acris	20	Carex arenaria	11
Rumex acetosa	20	Elymus repens	11
Dactylis glomerata	19	Eryngium maritimum	11
Luzula campestris	19	Elymus farctus	11
Potentilla erecta	17	Taraxacum sect. Ruderalia	10
Rumex acetosella	17	Cirsium arvense	10

## E1.1 - Inland sand and rock with open vegetation

**Origin of data (countries):** AD, AT, BA, BE, BG, CH, CZ, DE, DK, EE, ES, FI, FR, GR, HR, HU, IE, IT, LT, LV, MK, NL, NO, PL, PT, RO, RS, SE, SI, SK, UA, UK, XK

**List of alliances:** COR-01A - *Corynephorion canescentis* Klika 1931, COR-02A - *Hyperico perforati-Scleranthion perennis* Moravec 1967, COR-02B - *Armerion elongatae* Pötsch 1962, COR-02C - *Sedo-Cerastion arvensis* Sissingh et Tideman 1960, COR-02E - *Armerion junceae* Br.-Bl. ex Br.-Bl. et al. 1952, COR-02F - *Armerio-Potentillion Micevski* 1978, COR-03A - *Koelerion glaucae* Volk 1931, COR-03B - *Sileno conicae-Cerastion semidecandri* Korneck 1974, COR-03C - *Bassio laniflorae-Bromion tectorum* Borhidi 1996 nom. conserv. propos., COR-03D - *Festucion vaginatae* Soó 1929, COR-03E - *Festucion beckeri* Vicherek 1972, COR-04A - *Thero-Airion* Tx. ex Oberd. 1957, COR-05A - *Sedo-Scleranthion* Br.-Bl. 1950, COR-05B - *Sedion anglici* Br.-Bl. in Br.-Bl. et Tx. 1952, COR-05C - *Sedion pyrenaici* Tx. in Rivas-Mart. et al. 2011, COR-05D - *Sedo albi-Veronicion dillenii* Korneck 1974, COR-05E - *Scabioso-Trifolion dalmatici* Horvatic et N. Randelovic in N. Randelovic 1977, COR-05F - *Diantho pinifolii-Jasionion heldreichii* Bergmeier et al. 2009, COR-07A - *Alyso-Sedion* Oberd. et T. Müller in T. Müller 1961, COR-07B - *Tortello tortuosae-Sedion albi* Hallberg ex Dengler et Löbel 2006, COR-07C - *Sedion micrantho-sediformis* Rivas-Mart., P. Sánchez et Alcaraz ex P. Sánchez et Alcaraz 1993, COR-07E - *Aethionemion saxatilis* Bergmeier et al. 2009, FES-06A - *Alyso-Festucion pallentis* Moravec in Holub et al. 1967, FES-06B - *Asplenio septentrionalis-Festucion pallentis* Zólyomi 1936 corr. 1966, FES-06C - *Avenulo adsurgentis-Festucion pallentis* Mucina in Mucina et Kolbek 1993, FES-06D - *Bromo pannonicum-Festucion csikhegyensis* Zólyomi 1966 corr. Mucina hoc loco, FES-06F - *Chrysopogono-Festucion dalmaticae* Borhidi 1996, FES-06G - *Saturejion montanae* Horvat in Horvat et al. 1974, FES-06H - *Diantho lumnitzeri-Seslerion* (Soó 1971) Chytrý et Mucina in Mucina et Kolbek 1993, FES-06I - *Seslerion rigidae* Zólyomi 1936, FES-07A - *Polygonion albanicae* Ritter-Studnicka 1970, FES-07B - *Centaureo-Bromion fibrosi* Blečić et al. 1969, FES-07C - *Alyssion heldreichii* Bergmeier et al. 2009, FES-11B - *Cytiso spinescentis-Bromion erecti* Bonin 1978, FES-11C - *Hippocrepido glaucae-Stipion austroitalicae* Forte et Terzi in Forte et al. 2005, FES-12A - *Xero-Bromion erecti* Zoller 1954, FES-13A - *Chrysopogono-Saturejion subspicatae* Horvat et Horvatic 1934, FES-13B - *Scorzonerion villosae* Horvatic 1963, FES-14A - *Saturejo-Thymion* Micevski 1971

**Additional selection rules:** n/a

**Implications for EUNIS classification:** proposed division: E1.1a - Pannonian and Pontic sandy steppe, E1.1b - Temperate and boreal pioneer grassland on shallow soils on siliceous rock outcrops, E1.1c - Boreal open, sub-thermophilous grassland on shallow soils on siliceous rock outcrops, E1.1d - Submediterranean and temperate pioneer grassland on calcareous and ultramafic rock outcrops, E1.1e - Submediterranean open dry grassland of skeletal calcareous and ultramafic soils, E1.1f - Continental dry rocky steppic grasslands and dwarf scrub on chalk outcrops, E1.1g - Perennial grassland on rocky outcrops at low altitudes in Central and Southeastern Europe, E1.1h - Submontane to supramontane ultramafic rocky grassland of the Balkans, E1.1i - Subatlantic and submediterranean perennial grassland on calcareous shallow soils, E1.1j - Dry steppic, submediterranean pasture of Southeastern Europe

**Floristic composition:**

Hieracium pilosella	31	Koeleria macrantha	16
Rumex acetosella	30	Festuca ovina	15
Plantago lanceolata	28	Polytrichum piliferum	14
Agrostis capillaris	26	Dicranum scoparium	14
Achillea millefolium agg.	24	Hypericum perforatum	14
Festuca rubra agg.	24	Jasione montana	14
Galium verum	24	Trifolium arvense	14
Carex arenaria	23	Asperula cynanchica	13
Hypochaeris radicata	23	Cladonia furcata	13
Luzula campestris	23	Teucrium chamaedrys	12
Hypnum cupressiforme	22	Aira praecox	12
Corynephorus canescens	20	Potentilla cinerea	12
Lotus corniculatus	19	Thymus pulegioides	12
Euphorbia cyparissias	19	Sanguisorba minor	12
Poa pratensis	17	Pimpinella saxifraga	12
Sedum acre	17	Artemisia campestris	11
Cerastium semidecandrum	17	Calamagrostis epigejos	11
Ceratodon purpureus	16	Carex humilis	10
Anthoxanthum odoratum	16	Cerastium arvense	10

## E1.2 - Perennial calcareous grassland and basic steppes

**Origin of data (countries):** AD, AT, BE, BG, CH, CZ, DE, EE, ES, FR, GR, HR, HU, IE, IT, LT, LU, LV, MD, MK, NL, NO, PL, PT, RO, RS, RU, SE, SI, SK, UA, UK, XK

**List of alliances:** ART-04B - Bassio-Artemision austriacae Solomeshch in Mirkin et al. 1986, FES-01A - Bromion erecti Koch 1926, FES-01B - Cirsio-Brachypodion pinnati Hadac et Klika in Klika et Hadac ex Klika 1951, 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-01E - Potentillo splendentis-Brachypodion pinnati Br.-Bl. 1967, FES-01F - Polygalo mediterraneae-Bromion erecti (Biondi et al. 2005) Di Pietro et al. 2013, FES-01G - Chrysopogono-Danthonion Kojic 1957, FES-03A - Festucion sulcatae Soó 1930, FES-03B - Artemisio-Kochion Soó 1964, FES-03C - Stipo-Poion xerophilae Br.-Bl. et Tx. ex Br.-Bl. 1949, FES-03D - Stipion lessingianae Soó 1947, FES-03E - Pimpinello-Thymion zygoidi Dihoru et Donita 1970, FES-03G - Agropyron pectinati Golub et Uzhamskaya 1991, FES-04A - Helictotricho desertori-Stipion rubentis Toman 1969, FES-05A - Tanaceto achilleifolii-Stipion lessingianae Royer ex Lysenko et Mucina 2013, FES-10A - Brachypodion phoenicoidis Br.-Bl. ex Molinier 1934, FES-10B - Artemisio albae-Dichanthion ischaemi X. Font ex Rivas-Mart. et M.L. López in Rivas-Mart. et al. 2002, FES-10C - Diplachnion serotinae Br.-Bl. 1961

**Additional selection rules:** n/a

**Implications for EUNIS classification:** proposed division: E1.2a - Semi-dry perennial calcareous grassland, E1.2b - Continental dry steppe

### Floristic composition:

Lotus corniculatus	44	Festuca ovina	18
Plantago lanceolata	42	Trifolium montanum	17
Galium verum	42	Potentilla cinerea	17
Sanguisorba minor	40	Ranunculus bulbosus	17
Plantago media	35	Anthyllis vulneraria	17
Euphorbia cyparissias	34	Scabiosa columbaria	17
Achillea millefolium agg.	34	Festuca rubra agg.	16
Pimpinella saxifraga	33	Arrhenatherum elatius	15
Brachypodium pinnatum	32	Cirsium acaule	15
Briza media	32	Avenula pratensis	15
Linum catharticum	30	Agrostis capillaris	15
Dactylis glomerata	26	Koeleria pyramidata	15
Hieracium pilosella	24	Anthoxanthum odoratum	14
Asperula cynanchica	24	Campanula rotundifolia	14
Leontodon hispidus	24	Coronilla varia	14
Eryngium campestre	24	Prunella vulgaris	14
Koeleria macrantha	23	Viola hirta	14
Hypericum perforatum	23	Carlina vulgaris	14
Helianthemum nummularium	23	Daucus carota	14



Carex flacca	23	Fragaria viridis	14
Carex caryophylla	23	Potentilla tabernaemontani	13
Trifolium pratense	22	Thymus praecox	13
Teucrium chamaedrys	22	Agrimonia eupatoria	13
Salvia pratensis	21	Carex humilis	13
Medicago lupulina	21	Scabiosa ochroleuca	12
Centaurea scabiosa	20	Phleum phleoides	12
Festuca valesiaca	20	Dianthus carthusianorum	12
Thymus pulegioides	20	Centaurea jacea	12
Festuca rupicola	20	Polygala comosa	11
Filipendula vulgaris	20	Stachys recta	11
Bromus erectus	19	Trifolium campestre	11
Leucanthemum vulgare agg.	19	Convolvulus arvensis	11
Medicago sativa subsp. falcata	19	Trifolium repens	10
Poa angustifolia	19	Ononis spinosa	10
Knautia arvensis	18		

## E1.3 - Mediterranean xeric grassland

**Origin of data (countries):** ES, FR, GR, HR, IT, MC, PT

**List of alliances:** BUL-01A - *Trifolium subterranei*-*Periballion minutae* Rivas Goday 1964, BUL-01C - *Poa bulbosae*-*Astragalion sesamei* Rivas Goday et Ladero 1970, BUL-01D - *Plantaginion cupanii* S. Brullo et Grillo 1978, LYG-01A - *Thero-Brachypodion retusi* Br.-Bl. 1925, LYG-01B - *Trisetum velutini*-*Brachypodion boissieri* Rivas-Mart. et al. 2002, LYG-01C - *Festucion scariosae* Martínez-Parras et al. 1984, LYG-01D - *Stipion parviflorae* De la Torre et al. 1996, LYG-01E - *Leontodon tuberosi*-*Bellion sylvestris* Biondi et al. 2001, LYG-02A - *Cymbopogono hirti-Brachypodion ramosi* Horvatic 1963, LYG-02B - *Hyparrhenion hirtae* Br.-Bl. et al. 1956, LYG-03A - *Agropyro pectinati*-*Lygeion sparti* Br.-Bl. et O. de Bolòs 1958 corr. Rivas-Mart. et al. 1999, LYG-03B - *Stipion tenacissimae* Rivas-Mart. 1984, SAC-01A - *Agrostion castellanae* Rivas Goday ex Rivas-Mart. et al. 1980, 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, TRA-01A - *Brachypodion distachyi* Rivas-Mart. 1978, TRA-01C - *Sedo-Ctenopsion gypsophilae* Rivas Goday et Rivas-Mart. ex Izco 1974, TRA-01D - *Omphalodion commutatae* Rivas-Mart. et al. ex Izco 1976 corr. Pérez Raya et al. 1991, TRA-01F - *Hypochoeridion achyrophori* Biondi et Guerra 2008, TRA-01G - *Vulpion ligusticae* Aubert et Loisel 1971, TRA-02B - *Plantagini-Catapodion marini* S. Brullo 1985

**Additional selection rules:** n/a

**Implications for EUNIS classification:** proposed division: E1.3a - Mediterranean closely grazed dry grassland, E1.3b - Mediterranean tall perennial dry grassland, E1.3c - Mediterranean annual-rich dry grassland

### Floristic composition:

<i>Dactylis glomerata</i>	25	<i>Sedum sediforme</i>	14
<i>Brachypodium retusum</i>	22	<i>Erophila verna</i>	13
<i>Poa bulbosa</i>	22	<i>Erodium cicutarium</i>	12
<i>Brachypodium distachyon</i>	21	<i>Eryngium campestre</i>	12
<i>Medicago minima</i>	21	<i>Filago pyramidata</i>	12
<i>Trifolium scabrum</i>	20	<i>Arenaria leptoclados</i>	12
<i>Desmazeria rigida</i>	20	<i>Bombycilaena erecta</i>	12
<i>Sherardia arvensis</i>	18	<i>Anagallis arvensis</i>	12
<i>Asterolinon linum-stellatum</i>	18	<i>Minuartia hybrida</i>	11
<i>Trifolium campestre</i>	18	<i>Stipa tenacissima</i>	11
<i>Euphorbia exigua</i>	16	<i>Sedum album</i>	11
<i>Linum strictum</i>	15	<i>Saxifraga tridactylites</i>	11
<i>Hornungia petraea</i>	15	<i>Hypochaeris achyrophorus</i>	10
<i>Plantago lanceolata</i>	15	<i>Leontodon taraxacoides</i> subsp. <i>longirostris</i>	10
<i>Thymus vulgaris</i>	14	<i>Reichardia picroides</i>	10
<i>Cerastium pumilum</i>	14	<i>Avenula bromoides</i>	10

## E1.4 - Mediterranean tallgrass and Artemisia steppes

**Origin of data (countries):** ES, FR, GR, HR, IT, MC, PT

**List of alliances:** LYG-01A - Thero-Brachypodium retusi Br.-Bl. 1925, LYG-01B - Trisetum velutini-Brachypodium boissieri Rivas-Mart. et al. 2002, LYG-01C - Festucion scariosae Martínez-Parras et al. 1984, LYG-01D - Stipion parviflorae De la Torre et al. 1996, LYG-01E - Leontodono tuberosi-Bellion sylvestris Biondi et al. 2001, LYG-02A - Cymbopogono hirti-Brachypodium ramosi Horvatic 1963, LYG-02B - Hyparrhenion hirtae Br.-Bl. et al. 1956, LYG-03A - Agropyro pectinati-Lygeion sparti Br.-Bl. et O. de Bolòs 1958 corr. Rivas-Mart. et al. 1999, LYG-03B - Stipion tenacissimae Rivas-Mart. 1984

**Additional selection rules:** n/a

**Implications for EUNIS classification:** proposed to merge with other EUNIS types, partly with E1.3b and partly with F6.8a and F6.8b

### Floristic composition:

Brachypodium retusum	51	Helictotrichon filifolium	14
Dactylis glomerata	47	Avena barbata	14
Stipa tenacissima	29	Asphodelus ramosus	14
Avenula bromoides	23	Plantago lanceolata	14
Thymus vulgaris	21	Brachypodium distachyon	13
Reichardia picroides	20	Hypochaeris achyrophorus	13
Eryngium campestre	19	Trifolium campestre	13
Sedum sediforme	19	Fumana thymifolia	12
Medicago minima	19	Convolvulus cantabrica	12
Desmazeria rigida	18	Trifolium scabrum	11
Carlina corymbosa	18	Sherardia arvensis	11
Bituminaria bituminosa	16	Teucrium polium	11
Rosmarinus officinalis	16	Urospermum dalechampii	11
Hyparrhenia hirta	15	Stipa offneri	10
Koeleria vallesiana	15	Ruta angustifolia	10
Linum strictum	15		

## E1.5 - Mediterranean montane grassland

**Origin of data (countries):** AD, AL, BG, ES, FR, GR, IT, PT

**List of alliances:** GEN-01B - Plantaginion insularis Klein 1972, IND-01A - Teesdaliopsio confertae-Luzulion caespitosae Rivas-Mart. 1987, IND-01B - Jasionion carpetanae González-Albo 1941, IND-01C - Ptilotrichion purpurei Quézel 1953, IND-02A - Hieracio castellani-Plantaginion radicatae Rivas-Mart. et Cantó 1987, ONO-01A - Ononidion striatae Br.-Bl. et Susplugas 1937, ONO-01B - Ononidion cristatae Royer 1991, ONO-01C - Festucion scopariae Br.-Bl. 1948, ONO-01D - Genistion lobelii Molinier 1934, ONO-01H - Avenion sempervirentis Barbero 1968, ONO-02A - Festucion burnatii Rivas Goday et Rivas-Mart. ex Mayor et al. 1973, ONO-02B - Minuartio-Poion ligulatae O. de Bolòs 1962, ONO-02C - Plantagini discoloris-Thymion mastigophori Molina et Izco 1989, TRI-09A - Trifolion parnassii Quézel ex Quézel et al. 1992

**Additional selection rules:** n/a

**Implications for EUNIS classification:** proposed division: E1.5a - Iberian oromediterranean siliceous dry grassland, E1.5b - Iberian oromediterranean basiphilous dry grassland, E1.5c - Corsican and Sardinian oromediterranean siliceous dry grassland, E1.5d - Greek and Anatolian oromediterranean siliceous dry grassland, E1.5e - Madeiran oromediterranean siliceous dry grassland

### Floristic composition:

Koeleria vallesiana	57	Avenula pratensis	13
Anthyllis vulneraria	37	Poa ligulata	13
Carex humilis	30	Thymus vulgaris	13
Helianthemum oelandicum	29	Ononis striata	13
Festuca hystrix	27	Thymus nervosus	13
Coronilla minima	23	Sesleria coerulans	13
Potentilla tabernaemontani	22	Asperula cynanchica	12
Anthyllis montana	20	Festuca rubra agg.	12
Festuca gautieri	20	Androsace villosa	12
Helianthemum canum	19	Lotus corniculatus	12
Seseli montanum	17	Eryngium campestre	12
Arenaria grandiflora subsp. grandiflora	17	Galium pyrenaicum	12
Teucrium chamaedrys	16	Arenaria aggregata	11
Sideritis hyssopifolia	15	Poa alpina	11
Helictotrichon sedenense	15	Ononis cristata	11
Helianthemum apenninum	14	Globularia repens	11
Bromus erectus	14	Aphyllanthes monspeliensis	10
Hieracium pilosella	14	Jurinea humilis	10
Fumana procumbens	14	Paronychia kapela	10
Hippocrepis comosa	13		

## **E1.6 - Subnitrophilous annual grasslands**

**Origin of data (countries):** n/a

**List of alliances:** n/a

**Additional selection rules:** n/a

**Implications for EUNIS classification:** exclude from grasslands (anthropogenic)

**Floristic composition:**

No data

## E1.7 - Non-Mediterranean dry acid and neutral closed grassland

**Origin of data (countries):** AT, BE, BG, CZ, DE, DK, ES, FR, HR, HU, IE, IT, LT, LV, MK, NL, NO, PL, RS, SE, SI, SK, UA, UK

**List of alliances:** COR-02B - *Armerion elongatae* Pötsch 1962, COR-02C - *Sedo-Cerastion arvensis* Sissingh et Tideman 1960, COR-02E - *Armerion juncea* Br.-Bl. ex Br.-Bl. et al. 1952, COR-02F - *Armerio-Potentillion Micevski* 1978, NAR-01A - *Potentillo-Polygonion vivipari* Nordhagen ex Dierßen 1992, NAR-01C - *Violion caninae* Schwickerath 1944, NAR-01E - *Nardo-Agrostion tenuis* Sillinger 1933, NAR-01G - *Achilleo-Arnicion* Horvat et Pawlowski in Horvat 1960

**Additional selection rules:** n/a

**Implications for EUNIS classification:** proposed change of content and consequently change of name: Lowland to submontane, dry to mesic *Nardus* grassland

### Floristic composition:

<i>Agrostis capillaris</i>	52	<i>Rubus caesius</i>	16
<i>Festuca rubra</i> agg.	48	<i>Polygala vulgaris</i>	16
<i>Luzula campestris</i>	46	<i>Carex pilulifera</i>	15
<i>Plantago lanceolata</i>	41	<i>Pimpinella saxifraga</i>	15
<i>Anthoxanthum odoratum</i>	39	<i>Lotus corniculatus</i> subsp. <i>corniculatus</i>	15
<i>Achillea millefolium</i> agg.	38	<i>Sedum acre</i>	15
<i>Hieracium pilosella</i>	36	<i>Avenula pubescens</i>	14
<i>Potentilla erecta</i>	34	<i>Artemisia campestris</i>	14
<i>Galium verum</i>	32	<i>Lotus corniculatus</i>	14
<i>Poa pratensis</i>	29	<i>Cerastium arvense</i>	14
<i>Rumex acetosella</i>	28	<i>Ceratodon purpureus</i>	14
<i>Hypochaeris radicata</i>	28	<i>Viola canina</i>	14
<i>Nardus stricta</i>	26	<i>Cladonia furcata</i>	13
<i>Carex arenaria</i>	25	<i>Cerastium fontanum</i> subsp. <i>vulgare</i>	13
<i>Danthonia decumbens</i>	24	<i>Trifolium arvense</i>	13
<i>Festuca ovina</i>	24	<i>Veronica chamaedrys</i>	12
<i>Veronica officinalis</i>	21	<i>Armeria maritima</i> subsp. <i>elongata</i>	12
<i>Holcus lanatus</i>	21	<i>Ranunculus acris</i>	12
<i>Dicranum scoparium</i>	21	<i>Pleurozium schreberi</i>	12
<i>Calamagrostis epigejos</i>	19	<i>Briza media</i>	11
<i>Festuca filiformis</i>	19	<i>Taraxacum laevigatum</i> agg.	11
<i>Calluna vulgaris</i>	19	<i>Senecio jacobaea</i>	11
<i>Pseudoscleropodium purum</i>	19	<i>Brachythecium albicans</i>	11
<i>Rhynchospora squarrosa</i>	19	<i>Festuca brevipila</i>	11
<i>Cerastium semidecandrum</i>	18	<i>Hypericum perforatum</i>	11
<i>Thymus pulegioides</i>	18	<i>Vaccinium myrtillus</i>	11
<i>Hypnum cupressiforme</i>	18	<i>Galium mollugo</i>	10
<i>Trifolium repens</i>	18	<i>Salix repens</i>	10

Deschampsia flexuosa	17	Prunella vulgaris	10
Rumex acetosa	17	Campanula rotundifolia	10
Galium saxatile	17	Hypnum cupressiforme var. lacunosum	10
Koeleria macrantha	16		

## E1.8 - Mediterranean dry acid and neutral closed grassland

**Origin of data (countries):** ES, FR, PT

**List of alliances:** SAC-01A - Agrostion castellanae Rivas Goday ex Rivas-Mart. et al. 1980, 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-01C - Agrostio castellanae-Stipion giganteae Rivas Goday ex Rivas-Mart. et Fernández González 1991, TRI-06A - Campanulo herminii-Nardion strictae Rivas-Mart. 1964, TRI-07A - Sesamoido pygmaeae-Poion violaceae Gamisans 1975

**Additional selection rules:** n/a

**Implications for EUNIS classification:** proposed change of content and consequently change of name to: Open Iberian supramediterranean dry acid and neutral grassland

### Floristic composition:

Nardus stricta	92	Agrostis capillaris	16
Juncus squarrosus	39	Trifolium pratense	16
Potentilla erecta	37	Carex caryophylla	16
Luzula campestris	28	Narcissus bulbocodium	15
Campanula herminii	27	Briza media	15
Festuca iberica	27	Calluna vulgaris	14
Anthoxanthum odoratum	26	Galium verum	14
Ranunculus bulbosus	26	Cynosurus cristatus	14
Festuca rothmaleri	24	Hypochaeris radicata	14
Hieracium pilosella	22	Carex ovalis	13
Agrostis castellana	21	Plantago alpina	12
Danthonia decumbens	21	Carex nigra	11
Lotus corniculatus	21	Genista anglica	11
Galium saxatile	21	Deschampsia flexuosa	11
Jasione laevis	20	Festuca nigrescens	11
Holcus lanatus	20	Luzula multiflora	10
Trifolium repens	18	Polygala vulgaris	10
Pedicularis sylvatica	18	Deschampsia cespitosa	10
Carum verticillatum	17		



## E1.9 - Non-Mediterranean dry acid and neutral open grassland, including inland dune grassland

**Origin of data (countries):** AD, AT, BE, BG, CH, CZ, DE, DK, EE, ES, FI, FR, GR, HR, HU, IE, IT, LT, LV, MK, NL, NO, PL, PT, RO, RS, SE, SI, SK, UA, UK, XK

**List of alliances:** COR-01A - *Corynephorion canescentis* Klika 1931, COR-02A - *Hyperico perforati-Scleranthion perennis* Moravec 1967, COR-02B - *Armerion elongatae* Pötsch 1962, COR-02C - *Sedo-Cerastion arvensis* Sissingh et Tideman 1960, COR-02E - *Armerion juncea* Br.-Bl. ex Br.-Bl. et al. 1952, COR-02F - *Armerio-Potentillion Micevski* 1978, COR-03A - *Koelerion glaucae* Volk 1931, COR-03B - *Sileno conicae-Cerastion semidecandri* Korneck 1974, COR-04A - *Thero-Airion* Tx. ex Oberd. 1957, COR-05A - *Sedo-Scleranthion* Br.-Bl. 1950, COR-05B - *Sedion anglici* Br.-Bl. in Br.-Bl. et Tx. 1952, COR-05C - *Sedion pyrenaici* Tx. in Rivas-Mart. et al. 2011, COR-05D - *Sedo albi-Veronicion dillenii* Korneck 1974, COR-05E - *Scabioso-Trifolion dalmatici* Horvatic et N. Randelovic in N. Randelovic 1977, COR-05F - *Diantho pinifolii-Jasionion heldreichii* Bergmeier et al. 2009

**Additional selection rules:** n/a

**Implications for EUNIS classification:** proposed division: E1.9a - Oceanic to subcontinental inland sand grassland on dry acid and neutral soils, E1.9b - Inland mobile sand and dune with siliceous grassland

### Floristic composition:

Rumex acetosella	43	Sedum acre	17
Agrostis capillaris	37	Artemisia campestris	17
Hieracium pilosella	37	Calamagrostis epigejos	16
Plantago lanceolata	36	Cerastium arvense	15
Carex arenaria	35	Brachythecium albicans	14
Festuca rubra agg.	34	Thymus pulegioides	14
Hypochaeris radicata	34	Holcus lanatus	14
Luzula campestris	33	Hypericum perforatum	14
Achillea millefolium agg.	32	Festuca filiformis	14
Galium verum	32	Bromus hordeaceus	13
Corynephorus canescens	30	Pseudoscleropodium purum	13
Hypnum cupressiforme	29	Cladonia foliacea	12
Poa pratensis	25	Rubus caesius	12
Festuca ovina	25	Pimpinella saxifraga	12
Cerastium semidecandrum	23	Veronica arvensis	12
Ceratodon purpureus	22	Lotus corniculatus subsp. corniculatus	11
Anthoxanthum odoratum	22	Senecio jacobaea	11
Dicranum scoparium	21	Trifolium campestre	11
Jasione montana	21	Avenula pubescens	11
Polytrichum piliferum	20	Hieracium umbellatum	10
Trifolium arvense	19	Veronica officinalis	10
Cladonia furcata	18	Polytrichum juniperinum	10

Aira praecox	18	Trifolium repens	10
Koeleria macrantha	18		

## E1.A - Mediterranean dry acid and neutral open grassland

**Origin of data (countries):** BG, ES, FR, GR, IT, MK, PT

**List of alliances:** BUL-01A - Trifolio subterranei-Periballion minutae Rivas Goday 1964, IND-02A - Hieracio castellani-Plantaginion radicatae Rivas-Mart. et Cantó 1987, TUB-01A - Helianthemion guttati Br.-Bl. in Br.-Bl. et al. 1940, TUB-01B - Crassulo tillaeae-Sedion caespitosi de Foucault 1999, TUB-01C - Molinerion laevis Br.-Bl. et al. 1952, TUB-01D - Sedion pedicellato-andegavensis Rivas-Mart. et al. 1986, TUB-01E - Trifolion cherleri Micevski 1972, TUB-03A - Anthyllido hamosae-Malcolmion lacerae Rivas Goday 1958, TUB-03B - Corynephoru articulati-Malcolmion patulae Rivas Goday 1958, TUB-03C - Corynephorion maritimi Costa, Pinto-Gomes, Neto et Rivas-Mart. in Costa et al. 2012

**Additional selection rules:** n/a

**Implications for EUNIS classification:** proposed new name: Mediterranean to Atlantic open, dry, acid and neutral grassland

### Floristic composition:

Poa bulbosa	48	Anthemis ruthenica	15
Trifolium campestre	39	Trifolium glomeratum	15
Trifolium arvense	37	Chrysopogon gryllus	14
Hypochaeris glabra	34	Taeniatherum caput-medusae	14
Tuberaria guttata	33	Cynodon dactylon	14
Filago minima	31	Trifolium smyrnaeum	13
Erodium cicutarium	29	Medicago rigidula	12
Eryngium campestre	28	Micropyrum tenellum	12
Vulpia ciliate	25	Dasypyrum villosum	12
Psilurus incurvus	25	Potentilla laciniosa	12
Ornithopus compressus	23	Teesdalia coronopifolia	12
Sherardia arvensis	23	Carthamus lanatus	12
Trifolium cherleri	21	Neatostema apulum	12
Galium divaricatum	20	Rumex acetosella	11
Scleranthus annuus	19	Vulpia bromoides	11
Vulpia myuros	19	Chondrilla juncea	11
Plantago lanceolata	19	Filago pyramidata	11
Trifolium scabrum	18	Achillea coarctata	11
Bromus squarrosus	18	Briza maxima	11
Veronica arvensis	18	Ornithogalum comosum	11
Filago gallica	17	Sedum caespitosum	11
Helianthemum salicifolium	17	Crassula tillaea	11
Sanguisorba minor	17	Aphanes arvensis	10
Plantago bellardii	16	Tolpis barbata	10
Petrorhagia prolifera	16	Medicago minima	10
Cerastium pumilum	16	Astragalus onobrychis	10
Trifolium angustifolium	16	Brachypodium distachyon	10

Trifolium subterraneum	16	Rumex bucephalophorus	10
Leontodon taraxacoides subsp. longirostris	15	Xeranthemum annuum	10
Aegilops neglecta	15		

## E1.B - Heavy-metal grassland

**Origin of data (countries):** BE, DE, GR, IT, PL, SI, UK

**List of alliances:** COR-07E - Aethionemion saxatilis Bergmeier et al. 2009, DRY-03C - Ptilostemo casabonae-Euphorbion cupanii Angiolini et al. 2005, THL-09A - Thlaspion calaminarii Ernst 1965, THL-09B - Armerion halleri Ernst 1965

**Additional selection rules:** n/a

**Implications for EUNIS classification:** n/a

### Floristic composition:

Helichrysum italicum subsp. microphyllum	56	Urospermum dalechampii	20
Euphorbia pithyusa subsp. cupanii	48	Rumex acetosa	17
Dittrichia viscosa	42	Piptatherum miliaceum	17
Ptilostemon casabonae	41	Campanula rotundifolia	16
Scrophularia canina subsp. bicolor	36	Cistus monspeliensis	16
Reseda luteola	34	Avena fatua	15
Carlina corymbosa	34	Agrostis capillaris	14
Reichardia picroides	32	Hypochaeris achyrophorus	13
Dactylis glomerata subsp. hispanica	31	Sanguisorba minor subsp. muricata	13
Jasione montana	31	Cladonia pyxidata	12
Daucus carota subsp. carota	30	Santolina chamaecyparissus	12
Rumex bucephalophorus	28	Cistus incanus	12
Cistus salvifolius	28	Limonium merxmuelieri	12
Sixalix atropurpurea subsp. maritima	26	Pimpinella saxifraga	12
Silene vulgaris	25	Carex macrolepis	11
Festuca ovina	24	Plantago lanceolata	11
Bellium bellidioides	21	Teucrium massiliense	11
Centaurium erythraea	20	Lavandula stoechas	10

## **E1.C - Dry mediterranean lands with unpalatable non-vernal herbaceous vegetation**

**Origin of data (countries):** n/a

**List of alliances:** n/a

**Additional selection rules:** n/a

**Implications for EUNIS classification:** exclude from grasslands (anthropogenic)

**Floristic composition:**

No data

## **E1.D - Unmanaged xeric grassland**

**Origin of data (countries):** n/a

**List of alliances:** n/a

**Additional selection rules:** n/a

**Implications for EUNIS classification:** exclude from grasslands (anthropogenic)

**Floristic composition:**

No data

## **E1.E - Trampled xeric grasslands with annuals**

**Origin of data (countries):** n/a

**List of alliances:** n/a

**Additional selection rules:** n/a

**Implications for EUNIS classification:** exclude from grasslands (anthropogenic)

**Floristic composition:**

No data



## **E1.F - Azorean open, dry, acid to neutral grassland**

**Origin of data (countries):** n/a

**List of alliances:** n/a

**Additional selection rules:** n/a

**Implications for EUNIS classification:** proposed as new EUNIS type

**Floristic composition:**  
No data

## E2.1 - Permanent mesotrophic pastures and aftermath-grazed meadows

**Origin of data (countries):** AT, BE, BG, CH, CZ, DE, EE, ES, FR, HR, HU, IE, IT, LU, NL, NO, PL, PT, RO, RS, RU, SE, SI, SK, UA, UK

**List of alliances:** MOL-01C - Cynosurion cristati Tx. 1947, MOL-01G - Lino biennis-Gaudinion fragilis (Br.-Bl. 1967) de Foucault 1989, MOL-02D - Poion alpinae Gams ex Oberd. 1950, MOL-02E - Poion supinae Rivas-Mart. et Géhu 1978, MOL-04A - Molinion caeruleae Koch 1926, MOL-04D - Deschampsion cespitosae Horvatic 1930, MOL-05A - Potentillion anserinae Tx. 1947

**Additional selection rules:** n/a

**Implications for EUNIS classification:** proposed change of content and consequently change of name: Mesic permanent pasture of lowlands and mountains

### Floristic composition:

Trifolium repens	53	Potentilla anserina	17
Holcus lanatus	50	Phleum pratense	17
Ranunculus repens	49	Juncus articulatus	16
Poa trivialis	44	Cirsium arvense	16
Agrostis stolonifera	39	Leontodon autumnalis	15
Ranunculus acris	36	Carex hirta	15
Lolium perenne	35	Juncus effusus	14
Cerastium fontanum subsp. vulgare	34	Lathyrus pratensis	14
Plantago lanceolata	33	Lotus corniculatus	14
Rumex acetosa	32	Taraxacum sect. Ruderalia	14
Anthoxanthum odoratum	31	Carex panicea	14
Festuca rubra agg.	31	Lotus pedunculatus	14
Trifolium pratense	30	Phalaris arundinacea	14
Poa pratensis	28	Briza media	14
Cardamine pratensis	26	Rumex crispus	13
Achillea millefolium agg.	24	Myosotis scorpioides	13
Alopecurus geniculatus	23	Centaurea jacea	12
Cynosurus cristatus	21	Succisa pratensis	12
Alopecurus pratensis	21	Plantago major	12
Agrostis capillaris	20	Vicia cracca	12
Dactylis glomerata	20	Sanguisorba officinalis	12
Prunella vulgaris	20	Leucanthemum vulgare agg.	12
Deschampsia cespitosa	19	Glechoma hederacea	12
Festuca pratensis	19	Molinia caerulea	12
Bellis perennis	18	Poa annua	12
Elymus repens	18	Bromus hordeaceus	11
Potentilla erecta	18	Veronica chamaedrys	11
Taraxacum sect. Ruderalia	18	Cirsium palustre	11

Glyceria fluitans	18	Lysimachia nummularia	10
Galium palustre	17	Potentilla reptans	10
Lychnis flos-cuculi	17	Carex nigra	10

## E2.2 - Low and medium altitude hay meadows

**Origin of data (countries):** AD, AT, BE, BG, CH, CZ, DE, EE, ES, FR, HR, HU, IE, IT, LT, LU, MK, NL, NO, PL, PT, RO, RS, RU, SE, SI, SK, UA, UK, XK

**List of alliances:** FEP-06B - Glycyrrhizion korshinskyi Lysenko 2010, FEP-06C - Glycyrrhizion glabrae Golub et Mirkin in Golub 1995, MOL-01A - Arrhenatherion elatioris Luquet 1926, MOL-01C - Cynosurion cristati Tx. 1947, MOL-01F - Ranunculo neapolitani-Arrhenatherion elatioris Allegrezza et Biondi 2011, MOL-01H - Rumicion thyrsoflori Micevski ex Carni et Mucina 2013, MOL-04A - Molinion caeruleae Koch 1926, MOL-04B - Calthion palustris Tx. 1937, MOL-04D - Deschampsion cespitosae Horvatic 1930

**Additional selection rules:** n/a

**Implications for EUNIS classification:** n/a

### Floristic composition:

Plantago lanceolata	57	Cirsium arvense	17
Holcus lanatus	51	Cardamine pratensis	16
Ranunculus acris	50	Daucus carota	16
Trifolium pratense	49	Potentilla reptans	16
Achillea millefolium agg.	48	Leontodon hispidus	16
Trifolium repens	46	Luzula campestris	16
Dactylis glomerata	45	Stellaria graminea	16
Rumex acetosa	45	Galium verum	16
Festuca rubra agg.	44	Leontodon autumnalis	16
Anthoxanthum odoratum	43	Heracleum sphondylium	16
Cerastium fontanum subsp. vulgare	38	Agrostis stolonifera	15
Poa pratensis	38	Bromus hordeaceus	15
Festuca pratensis	36	Sanguisorba officinalis	15
Ranunculus repens	34	Medicago lupulina	15
Poa trivialis	34	Trifolium dubium	14
Arrhenatherum elatius	32	Taraxacum sect. Ruderalia	14
Lolium perenne	28	Glechoma hederacea	14
Alopecurus pratensis	27	Knautia arvensis	13
Lathyrus pratensis	27	Crepis biennis	13
Cynosurus cristatus	27	Carex panicea	13
Agrostis capillaris	27	Carex hirta	13
Veronica chamaedrys	26	Lysimachia nummularia	13
Leucanthemum vulgare agg.	26	Equisetum arvense	12
Lotus corniculatus	26	Plantago media	12
Centaurea jacea	26	Rhinanthus minor	12
Prunella vulgaris	25	Succisa pratensis	12
Vicia cracca	23	Taraxacum sect. Ruderalia	12
Trisetum flavescens	23	Avenula pubescens	12
Bellis perennis	21	Pimpinella saxifraga	12

Lychnis flos-cuculi	21	Rumex crispus	12
Taraxacum sect. Ruderalia	21	Hypochaeris radicata	11
Briza media	20	Lotus pedunculatus	11
Deschampsia cespitosa	19	Ajuga reptans	11
Phleum pratense	19	Campanula patula	11
Potentilla erecta	18	Filipendula ulmaria	11
Elymus repens	18	Anthriscus sylvestris	10
Galium mollugo agg.	17	Molinia caerulea	10

## E2.3 - Mountain hay meadows

**Origin of data (countries):** AT, CH, CZ, DE, ES, FR, IT, PL, RU, SK, UA, UK

**List of alliances:** MOL-01B - Phyteumato-Trisetion flavescentis Hundt ex Passarge 1969, MOL-02A - Trisetio flavescentis-Polygonion bistortae Br.-Bl. et Tx. ex Marschall 1947, MOL-03A - Polygonion krascheninnikovii Kashapov 1985, MOL-04B - Calthion palustris Tx. 1937

**Additional selection rules:** n/a

**Implications for EUNIS classification:** proposed new name: Submediterranean moist meadow

### Floristic composition:

Ranunculus acris	58	Vicia sepium	18
Trifolium pratense	57	Heracleum sphondylium	18
Anthoxanthum odoratum	54	Centaurea jacea	18
Rumex acetosa	51	Prunella vulgaris	18
Trifolium repens	49	Luzula campestris	16
Dactylis glomerata	48	Arrhenatherum elatius	16
Plantago lanceolata	48	Ajuga reptans	15
Achillea millefolium agg.	46	Briza media	15
Poa trivialis	45	Sanguisorba officinalis	15
Veronica chamaedrys	42	Campanula patula	15
Agrostis capillaris	41	Bellis perennis	15
Festuca rubra agg.	40	Elymus repens	15
Festuca pratensis	38	Filipendula ulmaria	15
Vicia cracca	37	Knautia arvensis	15
Alopecurus pratensis	37	Potentilla erecta	14
Lathyrus pratensis	36	Rumex crispus	14
Ranunculus repens	35	Alchemilla monticola	14
Holcus lanatus	34	Alchemilla vulgaris agg.	14
Leucanthemum vulgare agg.	33	Leontodon autumnalis	14
Trisetum flavescentis	31	Pimpinella major	14
Cerastium fontanum subsp. vulgare	28	Campanula rotundifolia	14
Cynosurus cristatus	27	Carum carvi	13
Taraxacum sect. Ruderalia	26	Galium verum	13
Poa pratensis	26	Phyteuma spicatum	13
Hypericum maculatum	26	Senecio aquaticus subsp. aquaticus	13
Leontodon hispidus	24	Galium mollugo agg.	13
Geranium sylvaticum	24	Rhytidadelphus squarrosus	12
Lotus corniculatus	23	Plantago media	12
Bistorta officinalis	23	Pimpinella saxifraga	12
Lychnis flos-cuculi	23	Rhinanthus minor	12
Lolium perenne	23	Cardaminopsis halleri	12
Stellaria graminea	22	Myosotis scorpioides	11

Deschampsia cespitosa	21	Bromus racemosus	11
Taraxacum sect. Ruderalia	20	Agrostis stolonifera var. stolonifera	11
Cardamine pratensis	20	Hordeum secalinum	10
Phleum pratense	19	Silene dioica	10

## E2.4 - Iberian summer pastures (vallicares)

**Origin of data (countries):** ES, PT

**List of alliances:** SAC-01A - Agrostion castellanae Rivas Goday ex Rivas-Mart. et al. 1980, 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

**Additional selection rules:** n/a

**Implications for EUNIS classification:** proposed new name: Iberian summer pasture (vallicar)

### Floristic composition:

Agrostis castellana	82	Vulpia bromoides	18
Hypochaeris radicata	82	Vulpia myuros	18
Plantago lanceolata	57	Anthoxanthum odoratum	14
Jasione montana	50	Bromus hordeaceus	14
Holcus lanatus	43	Campanula lusitanica	14
Aira caryophylla	39	Ceratodon purpureus	14
Daucus carota	39	Cytisus multiflorus	14
Festuca elegans subsp. merinoi	39	Dicranum scoparium	14
Galium verum	39	Digitalis purpurea subsp. carpetana	14
Rumex acetosella	39	Erica australis	14
Trifolium striatum	39	Filago minima	14
Trifolium strictum	39	Linum bienne	14
Trifolium dubium	36	Polytrichum piliferum	14
Lotus corniculatus	32	Quercus pyrenaica	14
Arrhenatherum elatius subsp. bulbosum	32	Ranunculus bulbosus	14
Sanguisorba minor	32	Rhinanthus minor	14
Hieracium pilosella	29	Sanguisorba verrucosa	14
Crepis capillaris	25	Sedum amplexicaule subsp. tenuifolium	14
Erica arborea	25	Sesamoides purpurascens	14
Eryngium campestre	25	Anthyllis vulneraria	11
Petrorhagia prolifera	25	Bartramia pomiformis	11
Pteridium aquilinum	25	Carduus carpetanus	11
Trifolium arvense	25	Carex muricata	11
Trifolium pratense	25	Castanea sativa	11
Tuberaria guttata	25	Centaurea jacea	11
Arenaria montana	21	Centaurea paniculata subsp. castellana	11
Dactylis glomerata	21	Cynosurus echinatus	11
Festuca ampla	21	Cytisus grandiflorus	11
Halimium lasianthum subsp. alyssoides	21	Genista florida	11
Senecio sylvaticus	21	Hieracium castellanum	11
Achillea tomentosa	18	Hypericum perforatum	11
Anarrhinum bellidifolium	18	Koeleria caudata	11



Andryala integrifolia	18	Lepidium heterophyllum	11
Campanula rapunculus	18	Micropyrum tenellum	11
Convolvulus arvensis	18	Phalacrocarpum oppositifolium	11
Cynosurus cristatus	18	Rubus	11
Cytisus striatus	18	Senecio erucifolius	11
Hypnum cupressiforme	18	Silene nutans	11
Prunella laciniata	18	Teucrium scorodonia	11
Trifolium angustifolium	18	Trifolium repens	11
Trifolium campestre	18	Vicia sativa subsp. nigra	11

## E2.5 - Meadows of the steppe zone

**Origin of data (countries):** RU, UA

**List of alliances:** FES-02A - *Agrostion vinealis* Sipailova et al. 1985, FES-02E - *Trifolion montani* Naumova 1986

**Additional selection rules:** n/a

**Implications for EUNIS classification:** now included within E1.2a

### Floristic composition:

<i>Achillea millefolium</i> agg.	71	<i>Equisetum arvense</i>	14
<i>Poa angustifolia</i>	56	<i>Hieracium umbellatum</i>	14
<i>Potentilla argentea</i>	47	<i>Sanguisorba officinalis</i>	14
<i>Galium verum</i>	42	<i>Vicia tetrasperma</i>	14
<i>Plantago lanceolata</i>	39	<i>Seseli libanotis</i>	14
<i>Carex praecox</i>	34	<i>Leucanthemum vulgare</i>	14
<i>Elymus repens</i>	34	<i>Linaria vulgaris</i>	14
<i>Agrostis vinealis</i>	32	<i>Phleum pratense</i>	14
<i>Festuca pratensis</i>	28	<i>Bistorta officinalis</i>	14
<i>Stellaria graminea</i>	28	<i>Carex hirta</i>	13
<i>Koeleria delavignei</i>	27	<i>Hypericum perforatum</i>	13
<i>Trifolium pratense</i>	26	<i>Lathyrus pratensis</i>	13
<i>Calamagrostis epigejos</i>	26	<i>Agrostis capillaris</i>	13
<i>Galium boreale</i>	24	<i>Centaurea scabiosa</i>	13
<i>Dactylis glomerata</i>	22	<i>Euphorbia esula</i> subsp. <i>tommasiniana</i>	13
<i>Rumex acetosella</i>	21	<i>Stachys officinalis</i>	13
<i>Ranunculus acris</i>	21	<i>Berteroa incana</i>	13
<i>Rumex thyrsoiflorus</i>	21	<i>Aegopodium podagraria</i>	13
<i>Ranunculus polyanthemus</i>	21	<i>Prunella vulgaris</i>	13
<i>Festuca valesiaca</i>	20	<i>Centaurea jacea</i>	12
<i>Cichorium intybus</i>	20	<i>Dracocephalum ruyschiana</i>	12
<i>Poa pratensis</i>	19	<i>Rumex confertus</i>	12
<i>Taraxacum</i> sect. <i>Ruderalia</i>	19	<i>Trifolium medium</i>	12
<i>Bromus inermis</i>	19	<i>Dianthus borbasii</i>	12
<i>Filipendula vulgaris</i>	18	<i>Heracleum sibiricum</i>	12
<i>Vicia cracca</i>	18	<i>Cerastium fontanum</i> subsp. <i>vulgare</i>	11
<i>Alopecurus pratensis</i>	18	<i>Veronica spicata</i>	11
<i>Festuca rubra</i> agg.	18	<i>Alchemilla</i>	11
<i>Lotus corniculatus</i>	17	<i>Phlomis tuberosa</i>	11
<i>Fragaria viridis</i>	17	<i>Primula macrocalyx</i>	11
<i>Veronica chamaedrys</i>	17	<i>Thalictrum simplex</i>	11
<i>Trifolium montanum</i>	16	<i>Artemisia austriaca</i>	11
<i>Plantago media</i>	16	<i>Veronica austriaca</i> subsp. <i>teucrium</i>	11
<i>Organum vulgare</i>	15	<i>Sedum acre</i>	10

Medicago lupulina	15	Eryngium planum	10
Rumex acetosa	15	Geranium pratense	10
Convolvulus arvensis	15	Glechoma hederacea	10

## **E2.6 – Agriculturally-improved, re-seeded and heavily fertilised grassland, including sport fields and grass lawns**

**Origin of data (countries):** n/a

**List of alliances:** n/a

**Additional selection rules:** n/a

**Implications for EUNIS classification:** exclude from grasslands  
(anthropogenic/agricultural)

**Floristic composition:**

No data

## **E2.7 – Unmanaged mesic grassland**

**Origin of data (countries):** n/a

**List of alliances:** n/a

**Additional selection rules:** n/a

**Implications for EUNIS classification:** exclude from grasslands (no clear definition)

**Floristic composition:**

No data

## **E2.8 – Trampled mesophylous grasslands with annuals**

**Origin of data (countries):** n/a

**List of alliances:** n/a

**Additional selection rules:** n/a

**Implications for EUNIS classification:** exclude from grasslands (no clear definition)

**Floristic composition:**

No data

### E3.1 - Mediterranean tall humid grassland

**Origin of data (countries):** ES, FR, GR, IT, PT

**List of alliances:** MOL-09A - Molinio-Holoschoenion Br.-Bl. ex Tchou 1948

**Additional selection rules:** n/a

**Implications for EUNIS classification:** proposed change of content and consequently change of name: Mediterranean tall humid inland grassland

**Floristic composition:**

Scirpoides holoschoenus	67	Tetragonolobus maritimus	16
Agrostis stolonifera	33	Juncus acutus	15
Schoenus nigricans	32	Equisetum ramosissimum	15
Pulicaria dysenterica	29	Trifolium pratense	14
Molinia caerulea	29	Brachypodium phoenicoides	14
Holcus lanatus	27	Plantago lanceolata	14
Lythrum salicaria	24	Juncus maritimus	13
Daucus carota	23	Juncus articulatus	13
Mentha aquatica	22	Juncus subnodulosus	13
Phragmites australis	21	Lotus tenuis	13
Dittrichia viscosa	19	Succisa pratensis	13
Potentilla reptans	19	Carex distans	12
Carex flacca	19	Ranunculus repens	12
Rubus ulmifolius	18	Calystegia sepium	12
Saccharum ravennae	18	Eupatorium cannabinum	11
Festuca arundinacea	17	Prunella vulgaris	11
Juncus inflexus	16	Cynodon dactylon	11

## E3.2 - Mediterranean short humid grassland

**Origin of data (countries):** BG, ES, FR, IT

**List of alliances:** MOL-05D - Trifolion maritimi Br.-Bl. ex Br.-Bl. et al. 1952, MOL-09C - Deschampsion mediae Br.-Bl. et al. 1952 nom. conserv. propos.

**Additional selection rules:** n/a

**Implications for EUNIS classification:** proposed division: E3.2a - Mediterranean short moist grassland of lowlands, E3.2b - Mediterranean short moist grassland of mountains

### Floristic composition:

Cynodon dactylon	45	Trifolium pratense	17
Plantago lanceolata	30	Lotus tenuis	16
Trifolium fragiferum	30	Hordeum marinum	16
Potentilla reptans	23	Mentha pulegium	16
Plantago coronopus	22	Agrostis stolonifera	15
Lolium perenne	22	Plantago maritima subsp. serpentina	15
Ranunculus sardous	21	Gaudinia fragilis	14
Bromus hordeaceus	21	Deschampsia media	11
Trifolium repens	19	Poa annua	11
Lotus corniculatus	18	Poa trivialis	11
Trifolium resupinatum	17	Agrostis stolonifera var. stolonifera	10
Carex divisa	17	Prunella hyssopifolia	10



### E3.3 - Sub-mediterranean humid meadows

**Origin of data (countries):** BG, FR, HR, IT, MK, RS, XK

**List of alliances:** MOL-08A - Molinio-Hordeion secalini Horvatic 1934, MOL-08B - Trifolion resupinati Micevski 1957, MOL-08D - Trifolion pallidi Ilijanic 1969, MOL-08E - Ranunculion velutini Pedrotti 1978

**Additional selection rules:** n/a

**Implications for EUNIS classification:** proposed new name: Submediterranean moist meadow

#### Floristic composition:

Poa trivialis	63	Lysimachia nummularia	19
Bromus racemosus	57	Cichorium intybus	19
Trifolium pratense	52	Carex divisa	19
Alopecurus pratensis	45	Lotus tenuis	18
Taraxacum sect. Ruderalia	45	Orchis laxiflora	18
Plantago lanceolata	44	Rumex acetosa	18
Lolium perenne	44	Rhinanthus minor	18
Anthoxanthum odoratum	43	Moenchia mantica	17
Trifolium fragiferum	42	Carex otrubae	17
Oenanthe silaifolia	41	Centaurea jacea	17
Cynosurus cristatus	40	Tragopogon pratensis subsp. orientalis	17
Potentilla reptans	39	Trifolium dubium	17
Ranunculus sardous	36	Achillea millefolium agg.	16
Hordeum secalinum	36	Galium verum	16
Festuca pratensis	35	Alopecurus bulbosus	16
Trifolium repens	33	Mentha pulegium	16
Lotus corniculatus	32	Leucanthemum vulgare agg.	15
Trifolium resupinatum	32	Gratiola officinalis	15
Lychnis flos-cuculi	31	Ranunculus polyanthemus	15
Ranunculus acris	30	Convolvulus arvensis	14
Rumex crispus	30	Trifolium squamosum	13
Trifolium patens	30	Crepis setosa	13
Carex hirta	29	Daucus carota	13
Agrostis stolonifera	28	Trifolium pallidum	12
Poa pratensis	27	Inula britannica	11
Galium debile	25	Gaudinia fragilis	11
Holcus lanatus	25	Rorippa sylvestris	11
Elymus repens	24	Cirsium canum	10
Ranunculus repens	23	Tragopogon pratensis	10
Carex distans	23	Bromus hordeaceus	10
Ranunculus velutinus	22	Cynodon dactylon	10
Bellis perennis	22	Oenanthe fistulosa	10

Prunella vulgaris	22	Rhinanthus rumelicus	10
Alopecurus rendlei	21	Cerastium fontanum subsp. vulgare	10
Lathyrus pratensis	20		

## E3.4 - Moist or wet mesotrophic to eutrophic grassland

**Origin of data (countries):** AT, BE, BG, CH, CZ, DE, EE, ES, FR, HR, HU, IE, IT, NL, NO, PL, PT, RO, RS, RU, SE, SI, SK, UA, UK

**List of alliances:** FEP-06B - Glycyrrhizion korshinskyi Lysenko 2010, FEP-06C - Glycyrrhizion glabrae Golub et Mirkin in Golub 1995, MOL-04A - Molinion caeruleae Koch 1926, MOL-04B - Calthion palustris Tx. 1937, MOL-04C - Filipendulo-Petasition Br.-Bl. ex Duvigneaud 1949, MOL-04D - Deschampsion cespitosae Horvatic 1930, MOL-05A - Potentillion anserinae Tx. 1947, MOL-05B - Juncion inflexi Knapp 1971, MOL-05C - Loto tenuis-Trifolion fragiferi Westhoff et Den Held ex de Foucault 2009, MOL-06A - Oenanthion fistulosae de Foucault 2009, MOL-08C - Trifolio-Ranunculion pedati Slavnic 1948

**Additional selection rules:** n/a

**Implications for EUNIS classification:** proposed division: E3.4a - Moist or wet mesotrophic to eutrophic hay meadow, E3.4b - Moist or wet mesotrophic to eutrophic pasture

### Floristic composition:

Ranunculus repens	51	Glyceria fluitans	17
Holcus lanatus	49	Lolium perenne	17
Poa trivialis	47	Lysimachia vulgaris	17
Ranunculus acris	38	Vicia cracca	16
Rumex acetosa	37	Lysimachia nummularia	16
Agrostis stolonifera	35	Sanguisorba officinalis	16
Trifolium repens	33	Festuca pratensis	16
Cardamine pratensis	33	Carex hirta	15
Lychnis flos-cuculi	31	Prunella vulgaris	15
Festuca rubra agg.	30	Phragmites australis	14
Anthoxanthum odoratum	30	Potentilla anserina	14
Filipendula ulmaria	29	Scirpus sylvaticus	14
Galium palustre	28	Succisa pratensis	13
Deschampsia cespitosa	26	Taraxacum sect. Ruderalia	13
Alopecurus pratensis	26	Ranunculus flammula	13
Cerastium fontanum subsp. vulgare	25	Elymus repens	12
Juncus effusus	25	Rumex crispus	12
Cirsium palustre	22	Achillea millefolium agg.	12
Lathyrus pratensis	22	Briza media	12
Lotus pedunculatus	22	Calliargonella cuspidata	12
Plantago lanceolata	22	Glechoma hederacea	12
Poa pratensis	21	Dactylis glomerata	12
Equisetum palustre	20	Juncus conglomeratus	12
Carex panicea	20	Persicaria amphibia	12
Angelica sylvestris	19	Glyceria maxima	12
Trifolium pratense	19	Cirsium arvense	11
Potentilla erecta	18	Molinia caerulea	11

Juncus articulatus	18	Carex acuta	11
Alopecurus geniculatus	18	Agrostis canina	11
Carex nigra	18	Mentha aquatica	11
Lythrum salicaria	18	Agrostis capillaris	11
Galium uliginosum	17	Centaurea jacea	10
Myosotis scorpioides	17	Bistorta officinalis	10
Caltha palustris	17	Cirsium oleraceum	10
Phalaris arundinacea	17	Urtica dioica	10

## E3.5 - Moist or wet oligotrophic grassland

**Origin of data (countries):** AD, AT, BE, BG, CH, CZ, DE, EE, ES, FR, GL, HR, HU, IE, IS, IT, ME, MK, NL, NO, PL, PT, RO, RS, RU, SI, SK, UA, UK, XK

**List of alliances:** MOL-04A - Molinion caeruleae Koch 1926, NAR-01D - Nardo-Juncion squarrosi (Oberd. 1957) Passarge 1964, SCH-02A - Caricion fuscae Koch 1926

**Additional selection rules:** n/a

**Implications for EUNIS classification:** proposed change of content and consequently change of name: Non-Mediterranean moist or wet oligotrophic grassland

### Floristic composition:

Potentilla erecta	46	Lathyrus pratensis	15
Molinia caerulea	45	Lythrum salicaria	15
Carex nigra	36	Nardus stricta	15
Carex panicea	36	Cardamine pratensis	15
Holcus lanatus	33	Ranunculus repens	15
Anthoxanthum odoratum	32	Valeriana dioica	14
Ranunculus acris	29	Caltha palustris	14
Agrostis canina	28	Centaurea jacea	14
Succisa pratensis	28	Juncus conglomeratus	14
Festuca rubra agg.	28	Ranunculus flammula	14
Cirsium palustre	25	Carex rostrata	13
Deschampsia cespitosa	24	Phragmites australis	13
Eriophorum angustifolium	24	Trifolium pratense	13
Lychnis flos-cuculi	22	Potentilla palustris	13
Juncus effusus	22	Aulacomnium palustre	13
Rumex acetosa	22	Poa pratensis	13
Briza media	21	Vicia cracca	12
Galium palustre	21	Achillea millefolium agg.	12
Lotus pedunculatus	21	Luzula multiflora	12
Galium uliginosum	20	Hydrocotyle vulgaris	12
Lysimachia vulgaris	20	Angelica sylvestris	12
Carex echinata	20	Agrostis capillaris	12
Sanguisorba officinalis	19	Juncus subnodulosus	11
Viola palustris	18	Juncus articulatus	11
Plantago lanceolata	17	Galium boreale	11
Filipendula ulmaria	17	Selinum carvifolia	11
Prunella vulgaris	17	Epilobium palustre	10
Equisetum palustre	16	Stachys officinalis	10
Calliergonella cuspidata	15		

## E4.1 - Vegetated snow-patch

**Origin of data (countries):** AD, AT, CH, CZ, ES, FR, IT, MK, PL, SI, SK, UK

**List of alliances:** HER-01A - Salicion herbaceae Br.-Bl. in Br.-Bl. et Jenny 1926, HER-01B - Salici herbaceae-Caricion lachenalii Béguin et Theurillat 1982, HER-01C - Festucion picturatae Krajina 1933 corr. Dúbravcová 2007, HER-01E - Sedion candollei Rivas-Mart., Fernández González et Loidi in Rivas-Mart. et al. 2011, HER-02A - Arabidion caeruleae Br.-Bl. in Br.-Bl. et Jenny 1926

**Additional selection rules:** n/a

**Implications for EUNIS classification:** n/a

### Floristic composition:

Luzula alpinopilosa	45	Cerastium cerastoides	16
Gnaphalium supinum	42	Deschampsia flexuosa	16
Poa alpina	39	Nardus stricta	15
Ligusticum mutellina	38	Gentiana punctata	15
Geum montanum	31	Salix retusa	14
Homogyne alpina	29	Deschampsia cespitosa	14
Veronica alpina	28	Polytrichastrum alpinum	13
Polygonum viviparum	27	Ranunculus pseudomontanus	12
Salix herbacea	25	Myosotis alpestris	12
Anthoxanthum odoratum	24	Soldanella pusilla	12
Leucanthemopsis alpina	23	Oreochloa disticha	12
Agrostis rupestris	22	Saxifraga androsacea	11
Sedum alpestre	21	Saxifraga stellaris	11
Potentilla aurea	20	Kiaeria starkei	11
Polytrichastrum sexangulare	19	Pritzelago alpina	11
Festuca picturata	19	Campanula scheuchzeri	11
Silene acaulis	18	Ranunculus alpestris subsp. alpestris	10
Sibbaldia procumbens	17	Cardamine bellidifolia subsp. alpina	10
Soldanella carpatica	17	Carex sempervirens	10

## E4.2 - Moss and lichen dominated mountain summits, ridges and exposed slopes

**Origin of data (countries):** AT, FI, NO, RU, SK, UK

**List of alliances:** n/a

**Additional selection rules:** Selection based on dominance by mosses and liverworts in relevés

**Implications for EUNIS classification:** proposed to move to EUNIS Group H (no grasslands)

### Floristic composition:

Racomitrium lanuginosum	73	Salix herbacea	18
Cetraria islandica	67	Huperzia selago	16
Cladonia uncialis	67	Kiaeria starkei	16
Carex bigelowii	57	Festuca airoides	15
Deschampsia flexuosa	45	Festuca ovina	15
Vaccinium myrtillus	43	Polytrichum juniperinum	15
Cladonia arbuscula	42	Cetraria nivalis	14
Ochrolechia frigida	39	Cladonia pyxidata	14
Cladonia gracilis	35	Flavocetraria nivalis	14
Empetrum nigrum subsp. hermaphroditum	33	Polytrichum piliferum	14
Juncus trifidus	31	Rhytidiadelphus loreus	14
Cladonia coccifera	30	Alectoria ochroleuca	13
Cetraria aculeata	28	Betula nana	13
Polytrichastrum alpinum	28	Cladonia bellidiflora	13
Vaccinium vitis-idaea	28	Cladonia squamosa	13
Alectoria nigricans	23	Dicranum scoparium	13
Pleurozium schreberi	23	Polytrichum strictum	13
Sphaerophorus globosus	23	Alchemilla alpina	12
Thamnolia vermicularis	23	Oreochloa disticha	12
Galium saxatile	22	Agrostis capillaris	11
Ptilidium ciliare	22	Cetraria cucullata	11
Cladonia rangiferina	21	Hylocomium splendens	11
Dicranum fuscescens	21	Luzula spicata	11
Vaccinium uliginosum	19	Nardus stricta	11
Festuca vivipara	18		

## E4.3 - Acid alpine and subalpine grassland

**Origin of data (countries):** AD, AT, BG, BH, CH, CZ, DE, ES, FR, HR, IT, ME, MK, MN, PL, PT, RS, SK, SR, UA, UK, XK

**List of alliances:** KOB-01A - Kobresio-Dryadion Nordhagen 1943, KOB-02B - Festucion versicoloris Krajina 1934, KOB-02C - Agrostion alpinae Jeník et al. 1980, MUL-02A - Calamagrostion villosae Pawlowski et al. 1928, MUL-02B - Trisetion fusci Krajina 1933, MUL-02C - Calamagrostion arundinaceae (Luquet 1926) Oberd. 1957, NAR-01A - Potentillo-Polygonion vivipari Nordhagen ex Dierßen 1992, TRI-01B - Nardo-Caricion rigidae Nordhagen 1943, TRI-03A - Caricion curvulae Br.-Bl. 1925, TRI-03B - Juncion trifidi Krajina 1934, TRI-03C - Festucion supinae Br.-Bl. 1948, TRI-04B - Nardion strictae Br.-Bl. 1926, TRI-04C - Ranunculo pollinensis-Nardion strictae Bonin 1972, TRI-04E - Potentillo ternatae-Nardion Simon 1958, TRI-04F - Festucion varia Br.-Bl. ex Guinocet 1938, TRI-04G - Agrostion schraderanae Grabherr 1993, TRI-04H - Festucion eskiae Br.-Bl. 1948, TRI-06A - Campanulo herminii-Nardion strictae Rivas-Mart. 1964, TRI-06B - Plantaginion thalackeri Quézel 1953, TRI-07A - Sesamoido pygmaeae-Poion violaceae Gamisans 1975, TRI-08A - Poion violaceae Horvat et al. 1937, TRI-08B - Seslerion comosae Horvat et al. 1937

**Additional selection rules:** n/a

**Implications for EUNIS classification:** proposed division: E4.3a - Boreal and arctic acidophilous alpine grassland, E4.3b - Temperate acidophilous alpine grassland

### Floristic composition:

Nardus stricta	51	Trifolium alpinum	14
Anthoxanthum odoratum	37	Solidago virgaurea	14
Deschampsia flexuosa	33	Vaccinium vitis-idaea	14
Vaccinium myrtillus	33	Bistorta officinalis	14
Potentilla erecta	24	Achillea millefolium agg.	13
Homogyne alpina	24	Deschampsia cespitosa	13
Potentilla aurea	21	Hieracium alpinum	13
Carex sempervirens	20	Oreochloa disticha	12
Agrostis capillaris	20	Festuca airoides	12
Agrostis rupestris	19	Trifolium pratense	12
Geum montanum	19	Hieracium pilosella	12
Juncus trifidus	17	Polygonum viviparum	12
Ligusticum mutellina	17	Calamagrostis villosa	12
Festuca rubra agg.	16	Campanula scheuchzeri	11
Avenula versicolor	16	Luzula alpinopilosa	11
Calluna vulgaris	16	Campanula alpina	11
Cetraria islandica	16	Carex caryophyllaea	10
Poa alpina	15	Hypericum maculatum	10
Lotus corniculatus	15	Luzula campestris	10



## E4.4 - Calcareous alpine and subalpine grassland

**Origin of data (countries):** AD, AT, BA, BG, CH, CZ, DE, ES, FR, HR, IT, MK, PL, RS, SI, SK, UK

**List of alliances:** KOB-01A - Kobresio-Dryadion Nordhagen 1943, KOB-02A - Oxytropido-Elynon myosuroidis Br.-Bl. 1950, KOB-02B - Festucion versicoloris Krajina 1934, KOB-02C - Agrostion alpinae Jeník et al. 1980, ONO-01A - Ononidion striatae Br.-Bl. et Susplugas 1937, ONO-01B - Ononidion cristatae Royer 1991, ONO-01C - Festucion scopariae Br.-Bl. 1948, ONO-01H - Avenion sempervirentis Barbero 1968, ONO-02A - Festucion burnatii Rivas Goday et Rivas-Mart. ex Mayor et al. 1973, ONO-02B - Minuartio-Poion ligulatae O. de Bolòs 1962, SES-01A - Seslerion coeruleae Br.-Bl. in Br.-Bl. et Jenny 1926, 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, SES-01E - Seslerio-Asterion alpini Hadac ex Hadac et al. 1969, SES-01F - Seslerion tatarae Pawlowski 1935 corr. Klika 1955, SES-01H - Laserpitio nestleri-Ranunculion thoraе Vigo ex Molero 1981, SES-01I - Primulion intricatae Br.-Bl. ex Vigo 1972, SES-01J - Armerion cantabricae Rivas-Mart. et al. 1984, SES-02A - Seslerion tenuifoliae Horvat 1930, SES-02C - Festucion pungentis Horvat 1930, SES-02D - Festuco-Knaution longifoliae Jovanovic-Dunjic 1955, SES-02E - Seslerion apenninae Bruno et Furnari 1966, SES-03A - Oxytropidion dinaricae Lakušić 1966, SES-03B - Anthyllido-Seslerion klasterskyi Simon 1958, SES-03C - Seslerio-Festucion xanthinae Horvat in Horvat et al. 1974, SES-03E - Seslerion nitidae Horvat 1936

**Additional selection rules:** n/a

**Implications for EUNIS classification:** proposed division: E4.4a - Arctic-alpine calcareous grassland, E4.4b - Alpine and subalpine calcareous grassland of the Balkan and Apennines

### Floristic composition:

Anthyllis vulneraria	38	Carlina acaulis	14
Carex sempervirens	31	Sesleria coerulans	13
Polygonum viviparum	30	Selaginella selaginoides	13
Poa alpina	27	Helictotrichon sedenense	13
Helianthemum oelandicum	27	Leontodon hispidus	12
Phyteuma orbiculare	25	Acinos alpinus	12
Galium anisophyllum	24	Carex humilis	12
Helianthemum nummularium	24	Biscutella laevigata	12
Sesleria albicans	24	Anthoxanthum odoratum	12
Silene acaulis	24	Festuca quadriflora	12
Dryas octopetala	21	Hippocrepis comosa	12
Lotus corniculatus	21	Myosotis alpestris	11
Euphrasia salisburgensis	18	Gentiana clusii	11
Thymus praecox	18	Trifolium pratense	11
Gentiana verna	18	Parnassia palustris	11
Carex firma	18	Linum catharticum	10
Aster bellidiastrum	17	Potentilla crantzii	10

Scabiosa lucida	17	Aster alpinus	10
Bartsia alpina	17	Carduus defloratus	10
Campanula scheuchzeri	16	Thesium alpinum	10
Tortella tortuosa	16	Minuartia sedoides	10
Koeleria vallesiana	16	Festuca gautieri	10
Saxifraga paniculata	15		

## E4.5 - Alpine and subalpine enriched grassland

**Origin of data (countries):** AT, CH, CZ, DE, ES, FR, PL, RU, SI, SK, UA, UK

**List of alliances:** MOL-01B - Phyteumato-Trisetion flavescentis Hundt ex Passarge 1969, MOL-02A - Trisetio flavescentis-Polygonion bistortae Br.-Bl. et Tx. ex Marschall 1947, MOL-02D - Poion alpinae Gams ex Oberd. 1950, MOL-02E - Poion supinae Rivas-Mart. et Géhu 1978

**Additional selection rules:** n/a

**Implications for EUNIS classification:** n/a

### Floristic composition:

Trifolium pratense	56	Luzula campestris	20
Agrostis capillaris	55	Phleum pratense	20
Achillea millefolium agg.	55	Campanula patula	18
Dactylis glomerata	54	Ranunculus repens	18
Veronica chamaedrys	53	Prunella vulgaris	18
Ranunculus acris	51	Potentilla aurea	18
Anthoxanthum odoratum	50	Cynosurus cristatus	18
Rumex acetosa	48	Pimpinella major	18
Festuca rubra agg.	46	Campanula rotundifolia	17
Trifolium repens	46	Poa alpina	17
Plantago lanceolata	42	Arrhenatherum elatius	17
Alchemilla vulgaris agg.	39	Ajuga reptans	17
Trisetum flavescentis	38	Carum carvi	16
Hypericum maculatum	36	Phyteuma spicatum	16
Leontodon hispidus	36	Bellis perennis	16
Cerastium fontanum subsp. vulgare	33	Crepis mollis	16
Deschampsia cespitosa	32	Nardus stricta	15
Leucanthemum vulgare agg.	30	Rhytidadelphus squarrosus	15
Vicia cracca	30	Galium mollugo agg.	15
Geranium sylvaticum	30	Cardaminopsis halleri	15
Lathyrus pratensis	30	Sanguisorba officinalis	14
Taraxacum sect. Ruderalia	29	Knautia arvensis	14
Bistorta officinalis	28	Primula elatior subsp. elatior	14
Poa trivialis	28	Silene dioica	13
Poa pratensis	26	Trollius europaeus	13
Lotus corniculatus	24	Rhinanthus minor	13
Festuca pratensis	24	Festuca nigrescens	12
Alopecurus pratensis	23	Silene vulgaris	12
Stellaria graminea	22	Lychnis flos-cuculi	11
Vicia sepium	22	Anthriscus sylvestris	11
Heracleum sphondylium	21	Aegopodium podagraria	11
Holcus lanatus	21	Avenula pubescens	11

Alchemilla vulgaris agg.	21	Campanula scheuchzeri	11
Briza media	20	Rumex alpestris	10
Potentilla erecta	20	Plantago media	10

## **E5.1 – Anthropogenic herb stands**

**Origin of data (countries):** n/a

**List of alliances:** n/a

**Additional selection rules:** n/a

**Implications for EUNIS classification:** exclude from grasslands (no grasslands)

**Floristic composition:**

No data

## E5.2 - Thermophile woodland fringes

**Origin of data (countries):** AD, AT, BE, CH, CZ, DE, DK, EE, ES, FR, HU, IT, NL, NO, PL, PT, RU, SE, SI, SK, UA, UK

**List of alliances:** GER-01A - Trifolion medii T. Müller 1962, GER-01B - Knaution dipsacifoliae Julve ex Dengler et Boch 2008, GER-02A - Geranion sanguinei Tx. in T. Müller 1962, GER-02B - Galio litoralis-Geranion sanguinei Géhu et Géhu-Franck in de Foucault et al. 1983, GER-03A - Melampyrion pratensis Passarge 1979, GER-03B - Viola riviniana-Stellarion holostea Passarge 1994, GER-03C - Poion nemoralis Dengler et al. 2006, GER-03D - Teucrium scorodoniae de Foucault et al. 1983, GER-03E - Linarion triornithophorae Rivas-Mart. et al. 1984, GER-03F - Origanion virentis Rivas-Mart. et O. de Bolòs in Rivas-Mart. et al. 1984

**Additional selection rules:** n/a

**Implications for EUNIS classification:** proposed division: E5.2a - Thermophilous woodland fringe of base-rich soils, E5.2b - Thermophilous woodland fringe of acidic soils, E5.2c - Macaronesian thermophilous woodland fringe

### Floristic composition:

Dactylis glomerata	46	Trifolium medium	13
Hypericum perforatum	36	Deschampsia flexuosa	13
Achillea millefolium agg.	35	Crataegus monogyna	12
Festuca rubra agg.	33	Brachythecium rutabulum	12
Agrostis capillaris	33	Prunus spinosa	12
Arrhenatherum elatius	29	Galium mollugo agg.	12
Brachypodium pinnatum	28	Hieracium umbellatum	12
Quercus robur	24	Sanguisorba minor	12
Plantago lanceolata	24	Vincetoxicum hirundinaria	12
Origanum vulgare	23	Medicago lupulina	11
Euphorbia cyparissias	23	Sorbus aucuparia	11
Fragaria vesca	22	Vicia cracca	11
Pimpinella saxifraga	21	Rubus caesius	11
Agrimonia eupatoria	21	Solidago virgaurea	11
Veronica chamaedrys	21	Teucrium chamaedrys	11
Knautia arvensis	20	Cornus sanguinea	11
Holcus mollis	19	Trifolium pratense	11
Clinopodium vulgare	19	Daucus carota	11
Lotus corniculatus	18	Pseudoscleropodium purum	11
Poa pratensis	18	Lathyrus pratensis	11
Coronilla varia	17	Polygonatum odoratum	11
Holcus lanatus	17	Rumex acetosella	11
Anthoxanthum odoratum	17	Festuca ovina	11
Poa angustifolia	16	Frangula alnus	10
Rumex acetosa	16	Melampyrum pratense	10

Galium verum	16	Fragaria viridis	10
Centaurea scabiosa	15	Medicago sativa subsp. falcata	10
Geranium sanguineum	14	Hieracium laevigatum	10
Galium mollugo agg.	13	Plagiomnium affine	10
Viola hirta	13	Ranunculus acris	10
Elymus repens	13		

### **E5.3 - Pteridium aquilinum fields**

**Origin of data (countries):** n/a

**List of alliances:** n/a

**Additional selection rules:** n/a

**Implications for EUNIS classification:** exclude from grasslands (no grasslands)

**Floristic composition:**

No data



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

**Origin of data (countries):** AT, BE, BG, CH, CZ, DE, ES, FR, HR, HU, IT, LU, MK, NL, PL, RS, SI, SK, UA, UK

**List of alliances:** EPI-02B - Impatienti noli-tangere-Stachyion sylvaticae Görs ex Mucina 1993, EPI-02C - Aegopodion podagrariae Tx. 1967 nom. conserv. propos., EPI-04A - Senecionion fluviatilis Tx. ex Moor 1958, EPI-04B - Archangelicion litoralis Scamoni et Passarge 1963, EPI-04D - Cynancho-Convolvulion sepium Rivas Goday et Rivas-Mart. ex Rivas-Mart. 1977, EPI-04E - Dorycnio recti-Rumicion conglomerati Gradstein et Schmittenberg 1977, MOL-04C - Filipendulo-Petasition Br.-Bl. ex Duvigneaud 1949, MOL-04D - Deschampsion cespitosae Horvatic 1930, MUL-03A - Petasition officinalis Sillinger 1933, MUL-03B - Arunco-Petasition albae Br.-Bl. et Sutter 1977, MUL-03C - Senecionion samniti Bonin 1978

**Additional selection rules:** n/a

**Implications for EUNIS classification:** proposed change of content and consequently change of name: Moist or wet tall-herb and fern fringe of the lowlands

### Floristic composition:

Urtica dioica	46	Festuca rubra agg.	15
Poa trivialis	37	Lysimachia nummularia	15
Ranunculus repens	36	Iris pseudacorus	15
Filipendula ulmaria	34	Valeriana officinalis	15
Alopecurus pratensis	24	Festuca pratensis	14
Phragmites australis	24	Juncus effusus	14
Holcus lanatus	23	Aegopodium podagraria	14
Phalaris arundinacea	23	Heracleum sphondylium	13
Galium aparine	23	Caltha palustris	13
Rumex acetosa	22	Plantago lanceolata	13
Calystegia sepium	22	Epilobium hirsutum	12
Lythrum salicaria	21	Equisetum palustre	12
Ranunculus acris	20	Cirsium palustre	12
Galium palustre	20	Anthriscus sylvestris	12
Agrostis stolonifera	20	Taraxacum sect. Ruderalia	12
Dactylis glomerata	20	Eupatorium cannabinum	12
Deschampsia cespitosa	20	Carex acuta	12
Cirsium arvense	20	Cirsium oleraceum	11
Elymus repens	19	Carex acutiformis	11
Lychnis flos-cuculi	19	Anthoxanthum odoratum	11
Angelica sylvestris	19	Trifolium repens	11
Glechoma hederacea	18	Cerastium fontanum subsp. vulgare	10
Lysimachia vulgaris	17	Trifolium pratense	10
Symphytum officinale	17	Arrhenatherum elatius	10
Vicia cracca	17	Lycopus europaeus	10

Lathyrus pratensis	16	Rumex crispus	10
Cardamine pratensis	16	Lotus pedunculatus	10
Poa pratensis	15		

## E5.5 - Subalpine moist or wet tall-herb and fern stands

**Origin of data (countries):** AD, AT, CH, CZ, DE, ES, FR, IT, MK, PL, RS, SI, SK, UK

**List of alliances:** MUL-01A - Adenostylion alliariae Br.-Bl. 1926 nom. conserv. propos., MUL-01C - Delphinion elati Hadac ex Hadac et al. 1969, MUL-01D - Cirsion flavispinae Quézel 1953, MUL-01E - Doronicion corsici Gamisans 1975, MUL-01F - Cirsion appendiculati Horvat et al. 1937, MUL-04A - Rumicion alpini Rübel ex Scharfetter 1938

**Additional selection rules:** n/a

**Implications for EUNIS classification:** proposed new name: Subalpine moist or wet tall-herb and fern stand

### Floristic composition:

Rumex alpestris	42	Oxalis acetosella	14
Deschampsia cespitosa	38	Geum rivale	14
Adenostyles alliariae	35	Epilobium alpestre	13
Geranium sylvaticum	32	Saxifraga rotundifolia	13
Chaerophyllum hirsutum	30	Ranunculus acris	13
Urtica dioica	28	Calamagrostis villosa	13
Aconitum napellus	25	Ranunculus platanifolius	13
Hypericum maculatum	22	Luzula sylvatica	13
Viola biflora	22	Vaccinium myrtillus	12
Silene dioica	20	Milium effusum	12
Stellaria nemorum	20	Poa alpina	12
Rubus idaeus	19	Doronicum austriacum	12
Rumex alpinus	19	Homogyne alpina	11
Alchemilla vulgaris agg.	18	Crepis paludosa	11
Veratrum lobelianum	17	Thalictrum aquilegifolium	11
Athyrium filix-femina	16	Veronica chamaedrys	11
Athyrium distentifolium	16	Trollius europaeus	11
Ligusticum mutellina	15	Dryopteris filix-mas	11
Bistorta officinalis	15	Epilobium montanum	11
Cicerbita alpina	15	Heracleum sphondylium	11
Dactylis glomerata	15	Senecio nemorensis subsp. fuchsii	11
Ranunculus repens	15	Myosotis sylvatica	10
Peucedanum ostruthium	14	Agrostis capillaris	10
Veratrum album	14	Geum montanum	10

## E6.1 - Mediterranean inland salt steppes

**Origin of data (countries):** ES, FR, IT, MK, RO, TR, UK

**List of alliances:** CRY-01B - *Heleochloion schoenioidis* Br.-Bl. ex Rivas Goday 1956, FEP-01D - *Puccinellion convolutae* Micevski 1965, FEP-02A - *Halo-Artemision* Pignatti 1953, SAG-02A - *Frankenion pulverulentae* Rivas-Mart. ex Castroviejo et Porta 1976, SAG-02B - *Polypogonion subspathacei* Gamisans 1990, SAG-02C - *Gaudinio-Podospermion cani* S. Brullo et Siracusa 2000, SAL-02A - *Lygeo-Lepidion cardaminis* Rivas Goday et Rivas-Mart. ex Rivas-Mart. et Costa 1984, SAL-02B - *Lygeo sparti-Limonion furfuracei* Rigual 1972, SAL-02C - *Limonion catalaunico-viciosoi* Rivas-Mart. et Costa 1984, SAL-02E - *Limonion confusi* (Br.-Bl. 1933) Rivas-Mart. et Costa 1984, SAL-02F - *Triglochino barrelieri-Limonion glomerati* Biondi et al. 2001

**Additional selection rules:** n/a

**Implications for EUNIS classification:** proposed new name: Mediterranean inland salt steppe

### Floristic composition:

<i>Plantago coronopus</i>	22	<i>Sarcocornia fruticosa</i>	14
<i>Lygeum spartum</i>	21	<i>Hordeum marinum</i>	13
<i>Halimione portulacoides</i>	20	<i>Parapholis incurva</i>	13
<i>Suaeda vera</i>	18	<i>Puccinellia maritima</i>	10
<i>Sarcocornia perennis</i>	18		

## E6.2 - Continental inland salt steppes

**Origin of data (countries):** AT, BG, CZ, DE, HU, KZ, MK, RS, RU, SK, UA

**List of alliances:** CRY-01A - Cypero-Spergularion salinae Slavnic 1948, CRY-01C - Lepidion latifolii Golub et Mirkin 1986, FEP-01A - Festucion pseudovinae Soó 1933, FEP-01C - Puccinellion limosae Soó 1933, FEP-02B - Artemision maritimae Micevski 1970, FEP-03A - Plantagini salsae-Artemision santonici Lysenko et Mucina in Lysenko et al. 2011, FEP-03E - Festuco valesiaca-Limonium gmelinii Mirkin in Golub et Solomakha 1988, FEP-04A - Artemisio pauciflorae-Camphorosmion monspeliaca Karpov 2001, KAL-02A - Artemisio santonicae-Puccinellion fominii Shelyag-Sosonko et al. 1989

**Additional selection rules:** n/a

**Implications for EUNIS classification:** proposed new name: Continental inland salt steppe

### Floristic composition:

Puccinellia distans	42	Plantago maritima	14
Festuca pseudovina	30	Cerastium dubium	12
Scorzonera cana	28	Poa bulbosa	12
Limonium gmelinii	23	Bromus hordeaceus	12
Aster tripolium subsp. pannonicus	19	Plantago lanceolata	12
Artemisia santonicum	18	Chamomilla recutita	11
Camphorosma annua	16	Elymus repens	11
Cynodon dactylon	15		

## **E6.3 - Temperate inland salt marsh**

**Origin of data (countries):** n/a

**List of alliances:** n/a

**Additional selection rules:** n/a

**Implications for EUNIS classification:** proposed as new EUNIS type within grasslands, change of position from Group D (D6.1) to Group E

**Floristic composition:**  
No data

## **E7.1 - Atlantic parkland**

**Origin of data (countries):** n/a

**List of alliances:** n/a

**Additional selection rules:** n/a

**Implications for EUNIS classification:** exclude from grasslands  
(complex)

**Floristic composition:**  
No data

## **E7.2 - Sub-continental parkland**

**Origin of data (countries):** n/a

**List of alliances:** n/a

**Additional selection rules:** n/a

**Implications for EUNIS classification:** exclude from grasslands  
(complex)

**Floristic composition:**  
No data



### **E7.3 - Dehesa**

**Origin of data (countries):** n/a

**List of alliances:** n/a

**Additional selection rules:** n/a

**Implications for EUNIS classification:** exclude from grasslands  
(complex)

**Floristic composition:**  
No data