

This is an extract from the following report:

Vegetation analysis and distribution maps for EUNIS habitats

Report EEA/NSV/14/006

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2 Description and classification of EUNIS heathland, scrub and tundra habitats on the basis of in situ vegetation measurements throughout Europe – Task 1

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 forest habitat revision (Schaminée et al. 2013) and, after further revision, was submitted 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/14/006*), 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 m² to a few hundreds m² (Chytrý & Otýpková 2003), such samples are 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 (08-11-2014; <http://www.givd.info/>), 206 databases with 3,015,737 vegetation plots have been registered, a large part of them with 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; announced at the Annual meeting of the European Vegetation Survey in Vienna in 2012) – 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), approved in 2012, guarantee that data property rights of the original contributors are respected. By November 2014, 41 databases from all European regions, including the largest ones, joined EVA. These databases contained in total 646 439 vegetation plots from most European regions, especially from western, central and southern Europe. However, there is a remarkable lack of data from Scandinavia and eastern European countries, i.e. European regions with less strong or interrupted phytosociological tradition. 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 in turn by 6%, 82% and 12% of the total EVA database.

A prototype of the database management software TURBOVEG 3 was developed for joint management of multiple databases, that uses 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 taxonomies used in national and regional databases. This is managed using the SynBioSys Taxon Database, which was initially established for the purposes of the *SynBioSys Europe* project and is now further developed and extended within the framework of EVA. Each relevé in this Archive has a unique Global Unified identifier (GUID) and version control 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 the large datasets of vegetation-plot data (http://www.sci.muni.cz/botany/vegsci/braun_blanquet.php?lang=en) in Europe.

The vegetation-plot data used in the Braun-Blanquet Project form the basis for determining and providing the floristic composition of heathland, scrub and tundra vegetation data, in a similar fashion as in the EEA 2013 project on forest habitat types (Schaminée et al. 2013). As indicated before, the main input has come from computerized databases set up at many places throughout Europe. This refers to both 'single relevé databases' as well as to 'databases with constancy tables'; the second option is adequate for assessing the species composition of the heathland, scrub and tundra habitat types, but for the actual distribution of forest types (see Chapter 4) single, georeferenced vegetation plot data are needed.

The task to revise the EUNIS heathland, scrub and tundra 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 earlier this year (1-5 September 2014) and submitted to the international journal *Applied Vegetation Science* for publication.

2.3 Update of crosswalks between EUNIS heathland, scrub and tundra 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),

The screenshot displays the EuroVegChecklist browser interface. The left pane shows a list of EUNIS habitat types, including ROS-01, ROS-02, ROS-03, ROS-04, ROS-05, ROS-06, ROS-07, ROS-08, ROS-09, ROS-10, ROS-11, ROS-12, ROS-13, ROS-14, ROS-15, ROS-16, ROS-17, ROS-18, ROS-19, ROS-20, ROS-21, ROS-22, ROS-23, ROS-24, ROS-25, ROS-26, ROS-27, ROS-28, ROS-29, ROS-30, ROS-31, ROS-32, ROS-33, ROS-34, ROS-35, ROS-36, ROS-37, ROS-38, ROS-39, ROS-40, ROS-41, ROS-42, ROS-43, ROS-44, ROS-45, ROS-46, ROS-47, ROS-48, ROS-49, ROS-50, ROS-51, ROS-52, ROS-53, ROS-54, ROS-55, ROS-56, ROS-57, ROS-58, ROS-59, ROS-60, ROS-61, ROS-62, ROS-63, ROS-64, ROS-65, ROS-66, ROS-67, ROS-68, ROS-69, ROS-70, ROS-71, ROS-72, ROS-73, ROS-74, ROS-75, ROS-76, ROS-77, ROS-78, ROS-79, ROS-80, ROS-81, ROS-82, ROS-83, ROS-84, ROS-85, ROS-86, ROS-87, ROS-88, ROS-89, ROS-90, ROS-91, ROS-92, ROS-93, ROS-94, ROS-95, ROS-96, ROS-97, ROS-98, ROS-99, ROS-100. The right pane shows the corresponding EuroVegChecklist alliances, including ROS-01, ROS-02, ROS-03, ROS-04, ROS-05, ROS-06, ROS-07, ROS-08, ROS-09, ROS-10, ROS-11, ROS-12, ROS-13, ROS-14, ROS-15, ROS-16, ROS-17, ROS-18, ROS-19, ROS-20, ROS-21, ROS-22, ROS-23, ROS-24, ROS-25, ROS-26, ROS-27, ROS-28, ROS-29, ROS-30, ROS-31, ROS-32, ROS-33, ROS-34, ROS-35, ROS-36, ROS-37, ROS-38, ROS-39, ROS-40, ROS-41, ROS-42, ROS-43, ROS-44, ROS-45, ROS-46, ROS-47, ROS-48, ROS-49, ROS-50, ROS-51, ROS-52, ROS-53, ROS-54, ROS-55, ROS-56, ROS-57, ROS-58, ROS-59, ROS-60, ROS-61, ROS-62, ROS-63, ROS-64, ROS-65, ROS-66, ROS-67, ROS-68, ROS-69, ROS-70, ROS-71, ROS-72, ROS-73, ROS-74, ROS-75, ROS-76, ROS-77, ROS-78, ROS-79, ROS-80, ROS-81, ROS-82, ROS-83, ROS-84, ROS-85, ROS-86, ROS-87, ROS-88, ROS-89, ROS-90, ROS-91, ROS-92, ROS-93, ROS-94, ROS-95, ROS-96, ROS-97, ROS-98, ROS-99, ROS-100. The bottom pane shows the EuroVegChecklist for vegetation (Nomenclature) and the EuroVegChecklist for vegetation (Syntaxa).

Figure 2.1. EuroVegChecklist browser with tab "Syntaxa -> EUNIS" open, based on the submitted version (2013) of the EuroVegChecklist.

was based on a version of the European Vegetation Checklist (EuroVegChecklist) from July 2012. However, the EuroVegChecklist was subjected to further modifications after July 2012 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 diagnostic 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 offer the connection with vegetation types published in the past (Mucina et al. 2014).

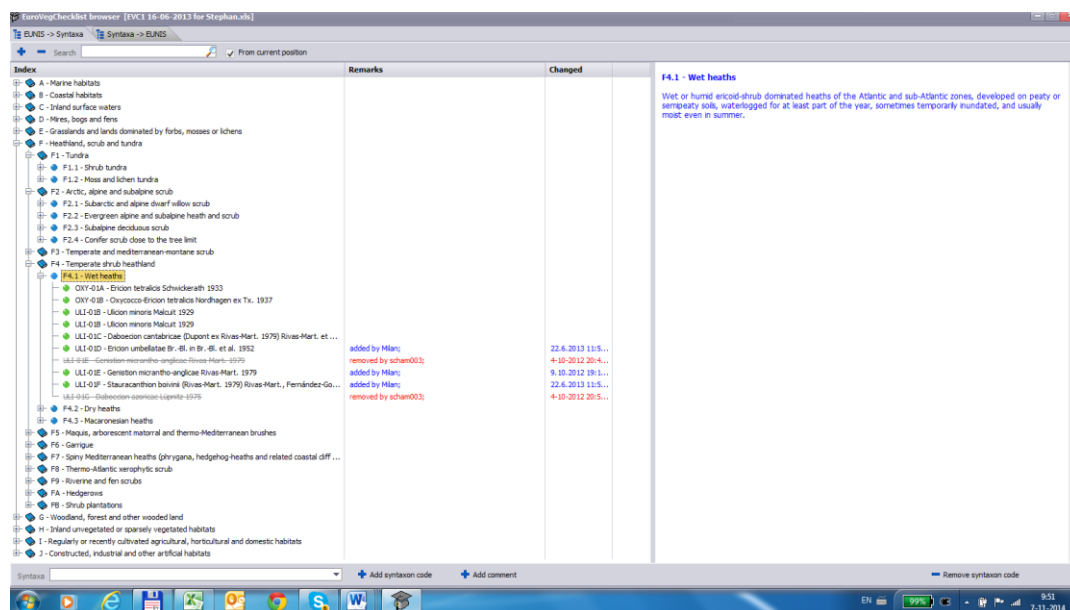


Figure 2.2. Screen shot of SynBioSys Europe, showing the crosswalks from EUNIS to syntaxa (left panel) and syntaxa to EUNIS (right panel).

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.

To ease the workflow, a tool, called the EuroVegChecklist browser (see Figure 2.1 and Figure 2.2), has been developed for linking EUNIS habitats to alliances.

In relation to the definition of heathland, scrub and tundra, the following EUNIS types have been taken into account for the current task: B1.5 (Coastal dune heaths), B1.6 (Coastal dune scrub), B2.5 (Shingle and gravel beaches with scrub) and F (Heathland, scrub and tundra). The syntaxa of the EuroVegChecklist that have been considered were selected on the basis of the crosswalks. The EUNIS categories FA (Hedgerows) and FB (Shrub plantations) were not dealt with, as these types are based on a mixture of concepts. Some of these units correspond to physiognomic types that are unrelated to phytosociological types, whereas other units are complexes of different vegetation types.

2.4 The floristic composition of EUNIS heathland, scrub and tundra habitats at the level of alliances of the EuroVegChecklist

The floristic composition of the EUNIS heathland, scrub and tundra 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 930,000 relevés has been compiled, in TURBOVEG format (see Paragraph 2.2), of which 34,000 relevés could be assigned to heathland, scrub or tundra. This database contains datasets from a wide range of data providers throughout Europe (Appendix E).

The procedure consists of two steps. In a first step, the relevés of these – regional and national – datasets have been classified at the level of alliances of the 2013 EuroVegChecklist (submitted version). This was done by matching regional and national classification systems to which the relevés in the datasets of the data providers were assigned, with the European overview. At present, about 60% of the 930,000 relevés could be assigned to one of the alliances accepted in the 2013 EuroVegChecklist (565,000), 6% of which belong to heathlands, scrubs or tundra habitat. In a second step, the assignment to the EUNIS heathland, scrub and tundra habitat types was performed by merging the datasets 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 simple 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, 215 heathland, scrub and tundra alliances of the EuroVegChecklist have been assigned to one of the 35 EUNIS heathland, scrub and tundra habitat types. At present, for 164 of these alliances in-situ vegetation data (relevés), i.e. 76%, were available. With regard to the EUNIS heathland, scrub and tundra habitat types, 32 out of 35 have been covered by real data (91%). As mentioned before (Paragraph 2.3), the categories FA and FB are not dealt with, as these EUNIS types are based on a mixture of concepts. The reasons for having no in-situ vegetation data for certain alliances are the following:

(1) Narrow alliance concepts in the EuroVegChecklist. For some heathland, scrub and tundra types, the EuroVegChecklist uses a narrow concept of alliances, which has not been used before. Relevés in the original databases are not classified to these alliances and correct assignment is difficult.

(2) Alliances described from Asia, occurrence in Europe not documented. They may occur in eastern or south-eastern Europe, but European data are scarce or non-existing.

(3) 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.

(4) Macaronesian and Iberian alliances not recognized in the Spanish SIVIM database. In a few cases there are discrepancies between the concepts used in EuroVegChecklist and those recognized in SIVIM, making difficult to split original relevés into different EVC concepts.

3 Reviewing the EUNIS heathland, scrub and tundra habitats – Task 2

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, 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 Paragraph 2.1. In Paragraph 2.3, information has been provided on the update of the EuroVegChecklist and the crosswalks between the EUNIS classification and this checklist.

3.2 Review of the EUNIS heathland, scrub and tundra habitat classification

As mentioned above (Par. 2.3) the following EUNIS heathland, scrub and tundra habitat types were considered: F1-6 from the main category F, and three habitat types from category B: B1.5 (Coastal dune heaths), B1.6 (Coastal dune scrub) and B2.5 (Shingle and gravel beaches with scrub).

In line with the recommendations for improving the EUNIS forest habitat classification, similar conclusions can be drawn for the heath and scrub habitats. They will involve two types of recommendations, one concerning the classification itself, with recommendations for new units, splitting and merging

existing units and removing units considered unnecessary, and one dealing with their naming (see the EEA 2013 report for further details; Schaminée et al. 2013).

Classification By comparing the existing EUNIS classification with the phytosociological content of the assigned syntaxa, we found strong grounds for revising the EUNIS types B1.5, B1.6, F2.2, F3.1, F3.2, F5.1, F5.2 and F1.7. We further propose to delete B2.5 (Shingle and gravel beaches with scrub) as a distinct habitat type, as the particular species composition of such habitats is similar to that of other shingle and gravel beaches (B1, B2, B3). The same applies to F6.5 Macaronesian garrigues, which can be deleted too as these low and open shrub communities of the Canary Islands, Azores and Madeira are coastal and covered by habitat types B1-3.

Proposal for improvement of the EUNIS types:

EUNIS B1.5 Coastal dune heaths. These stable dunes with a leached surface and vegetation dominated by various dwarf shrubs should be split into two types, according to the dominant species. The proposed separation in B1.5a *Atlantic and Baltic coastal Empetrum heaths* (with 1 alliance) and B1.5b *Atlantic coastal Calluna and Ulex heaths* (with 3 alliances) goes along well with the division in the equivalent Natura 2000 habitat types H2140 (Decalcified fixed dunes with *Empetrum nigrum*) and H2150 (Atlantic decalcified fixed dunes of the *Calluno-Ulicetea*), which is an extra advantage.

EUNIS B1.6 Coastal dune scrub. These stable dunes with scrub should be split in two geographically defined types, resulting in B1.6a *Atlantic and Baltic coastal dune scrub* (with 6 alliances), with *Hippophae rhamnoides* and *Salix repens* as dominant shrub species, and B1.6b *Mediterranean and Black Sea coastal dune scrub* (with 13 alliances), with *Juniperus* and other sclerophyllous shrubs as dominant species. A separate status could be given to the Macaronesian coastal dune scrub, but such communities are poorly developed. The proposed division reflects the classification scheme of most of the other coastal habitat types

EUNIS F2.2 Evergreen alpine and subalpine heath and scrub. These small, dwarf or prostrate shrub formations of the alpine and subalpine zones of mountains should be split into three types, on the basis of dominant growth form, resulting in F2.2a *Alpine and subalpine ericoid heaths* (11 alliances), F2.2b *Alpine and subalpine Juniperus scrub* (7 alliances) and F2.2c *Alpine and subalpine genistoid scrub* (2 alliances). The naming of the habitat types after dominant growth forms makes the indication 'evergreen' in the name superfluous.

We recommend combining the mostly deciduous *EUNIS F3.1 Temperate thickets and scrub* and *EUNIS F3.2 Submediterranean deciduous thickets and scrub* and then splitting this combined group into six types on the basis of

dominant growth forms (with a separate habitat type for forest clearings): F3.1a Lowland to montane temperate and submediterranean *Juniperus* scrub (3 alliances), F3.1b Temperate bramble scrub (2 alliances), F3.1c Lowland to montane temperate and submediterranean genistoid scrub (11 alliances), F3.1d Temperate forest clearing scrub (2 alliances), F3.1e Temperate and submediterranean thorn scrub (17 alliances), and F3.1f Low steppic scrub (2 alliances).

We recommend combining the evergreen sclerophyllous and/or lauriphyllous mediterranean vegetation *EUNIS F5.1 Arborescent matorral* and *EUNIS F5.2 Maquis* into one habitat type, as these types are floristically difficult to distinguish. The resulting F5.1-2 Arborescent matorral and maquis (17 alliances) houses tall shrub communities that are dominated by phanerophytes.

EUNIS F6.1 Western garrigues. These mediterranean shrub formations should be split into two types on the basis of soil characteristics (basophilous versus acidic) in this part of the Mediterranean region, resulting in F6.1a Western basophilous garrigues (13 alliances) and F6.1b Western acidic garrigues (7 alliances). In the eastern part of the Mediterranean region this variation is less prominent, and a split here in the two habitat types of the Eastern garrigues (F6.2) is not recommended.

EUNIS F6.8 Xero-halophile scrub. These salt-tolerant shrub formations of the Mediterranean zone and Caspian Sea should be split into two types on the basis of geographic variation, resulting in F6.8a Mediterranean halo-nitrophilous scrub (12 alliances) and F6.8b Caspian Sea halo-nitrophilous scrub (3 alliances). Moreover, as these scrubs in these parts of Europe are more or less by definition xerophytic, it seems to be better to name them after their tolerance for salt and high amounts of nitrogen.

We recommend combining *EUNIS F7.1 West Mediterranean spiny heaths* and *EUNIS F7.2 Central Mediterranean spiny heaths* into one habitat type, as these types are floristically difficult to distinguish. Moreover, we propose renaming the resulting habitat type and restricting it to coastal areas, as these shrub formations tend to overlap with F6.1, resulting in F7.1 Western Mediterranean spiny scrubs on coastal cliffs.

EUNIS F7.4 Hedgehog-heaths. These, often spiny, cushion heaths of the Mediterranean mountains should be split into four types on the basis of geographic variation. Moreover, it seems to be appropriate to reflect their mountainous occurrence in the name, resulting in F7.4a West-Mediterranean mountain hedgehog heaths (9 alliances), F7.4b Central Mediterranean mountain hedgehog heaths (8 alliances), and F7.4c East-Mediterranean hedgehog heaths (7 alliances) and F7.4d Macaronesian mountain hedgehog heaths (3 alliances).

Naming: With regard to the names of the EUNIS forest 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: F6.1 Western garrigues (to be split in acidic and basophilous), F6.2 Eastern, non-Illyrian garrigues, F6.3 Illyrian garrigues, F6.4 Black Sea garrigues. The addition 'non-Illyrian' is attached to the name of habitat type F6.3, because the Adriatic coast is part of the East Mediterranean region.

General recommendation 3: Do not use square brackets to indicate scientific names. If included, scientific taxon names should be in italics.

General recommendation 4: Use a standardized naming. Example: use only the name heaths instead of alternatively heaths or heath, like in F2.2 Evergreen alpine and subalpine heath and scrub. Another example is the use of the name 'fields' in F5.4 Spanish-broom (*Spartium junceum*) fields, which easily can be changed into F5.4 *Spartium junceum* scrub.

3.3 Proposed changes in the EUNIS heathland, scrub and tundra habitats

Applying these recommendation with regard to content and naming would result in the following updated list of EUNIS heathland, scrub and tundra habitat types (habitat types with changes in names are indicated with an *; in such case, the existing name is put within brackets behind the proposed new name):

► B1.5 Coastal dune heaths could be divided into two types, according to dominant species:

►► B1.5a Atlantic and Baltic coastal *Empetrum* heaths

►► B1.5b Atlantic coastal *Calluna* and *Ulex* heaths

► B1.6 Coastal dune scrub should be split into two types on the basis of geographical variation:

►► B1.6a Atlantic and Baltic coastal dune scrub

►► B1.6b Mediterranean and Black Sea coastal dune scrub

► B2.5 Shingle and gravel beaches with scrub should be merged with other habitat types on shingle and gravel beaches

► F1.1 Shrub tundra

► F1.2 Moss and lichen tundra

► F2.1 Subarctic and alpine dwarf willow scrub

► F2.2 Evergreen alpine and subalpine heath and scrub should be split into three types, on the basis of dominant growth form:

►► F2.2a Alpine and subalpine ericoid heaths

►► F2.2b Alpine and subalpine *Juniperus* scrub

►► F2.2c Alpine and subalpine genistoid scrub

► F2.3 Subalpine and subarctic deciduous scrub

► F2.4 Subalpine *Pinus mugo* scrub* [Conifer scrub close to the tree limit]

► F3.1 Temperate thickets and scrub and ► F3.2 Submediterranean deciduous thickets and scrub should be merged and then split into six types on the basis of dominant growth form:

►► F3.1-2a Lowland to montane temperate and submediterranean *Juniperus* scrub

►► F3.1-2b Temperate bramble scrub

►► F3.1-2c Lowland to montane temperate and submediterranean genistoid scrub

►► F3.1-2d Temperate forest clearing scrub

►► F3.1-2e Temperate and submediterranean thorn scrub

►► F3.1-2f Low steppic scrub

► F4.1 Wet heaths* [Wet heath]

► F4.2 Dry heaths* [Dry heath]

► F4.3 Macaronesian heaths* [Macaronesian heath]

► F5.1 Arborescent matorral and ► F5.2 Maquis should be merged into one type as these types are difficult to distinguish:

►► F5.1-2 Arborescent matorral and maquis

► F5.3 Submediterranean pseudomaquis

► F5.4 *Spartium junceum* scrub* [Spanish-broom ([*Spartium junceum*]) fields]

► F5.5 Thermo-Mediterranean scrub

► F6.1 Western garrigues should be split into two types on the basis of soil characteristics:

►► F6.1a Western basophilous garrigues

►► F6.2b Western acidic garrigues

► F6.2 Eastern, non-Illyrian garrigues

► F6.3 Illyrian garrigues

► F6.4 Black Sea garrigues

► F6.5 Macaronesian garrigues should be merged with other habitat types on shingle and gravel beaches (B1-3).

► F6.6 Supra-Mediterranean garrigues

► F6.7 Mediterranean gypsum scrubs

► F6.8 Xero-halophile scrub should be split into two types on the basis of geographical variation:

►► F6.8a Mediterranean halo-nitrophilous scrub

►► F6.8b Caspian Sea halo-nitrophilous scrub

► F7.1 West Mediterranean spiny heaths and ► F7.2 Central Mediterranean spiny heaths should be merged and renamed:

► F7.1-2 Western Mediterranean spiny scrubs on coastal cliffs

► F7.3 Phrygana* [East Mediterranean phrygana]

► F7.4 Hedgehog-heaths should be renamed and split into two types on the basis of geographical variation:

- ▶ F7.4a West Mediterranean mountain hedgehog heaths
- ▶ F7.4b Central Mediterranean mountain hedgehog heaths
- ▶ F7.4c East Mediterranean hedgehog heaths
- ▶ F7.4d Macaronesian mountain hedgehog heaths
- ▶ F8.1 Canary Island xerophytic scrub
- ▶ F8.2 Madeiran xerophytic scrub
- ▶ F9.1 Temperate and boreal riparian scrub
- ▶ F9.2 Salix fen scrub
- ▶ F9.3 Mediterranean riparian scrub

Appendix A: An updated crosswalk EUNIS heathland, scrub and tundra habitat types (B1.5, B1.6, B2.5, F) to the 2013 EuroVegChecklist syntaxa

B - Coastal habitats

B1 - Coastal dunes and sandy shores

B1.5 - Coastal dune heaths

- * ULI-01A - *Ericion cinereae* Böcher 1940
- * ULI-01B - *Ulicion minoris* Malcuit 1929
- * ULI-01D - *Ericion umbellatae* Br.-Bl. in Br.-Bl. et al. 1952
- * ULI-02B - *Genistion pilosae* Bøcher 1943
- * ULI-02C - *Empetrion nigri* Schubert ex Westhoff et Den Held 1969

B1.6 - Coastal dune scrub

- * LAV-01D - *Quercion fruticosae* Rothmaler 1954
- * MOQ-01A - *Traganion moquinii* Sunding 1972
- * QUI-01A - *Oleo-Ceratonion siliquae* Br.-Bl. ex Guinochet et Drouineau 1944
- * QUI-01C - *Juniperion turbinatae* Rivas-Mart. 1975 corr. 1987
- * QUI-01H - *Rubo longifoliae*-*Coremation albi* Rivas-Mart. in Rivas-Mart. et al. 1980
- * QUI-01J - *Rhamno graeci*-*Juniperion lyciae* Costa et al. 1984
- * RHA-02A - *Berberidion vulgaris* Br.-Bl. ex Tx. 1952 nom. conserv.
- * RHA-02C - *Carpino-Prunion spinosae* Weber 1974
- * RHA-02D - *Pruno spinosae*-*Rubion radulae* Weber 1974
- * RHA-03A - *Salicion arenariae* Tx. ex Passarge in Scamoni 1963
- * RHA-03B - *Ligustro-Hippophaeion* Géhu et Géhu-Franck 1983
- * RHA-03C - *Holoschoeno australis*-*Salicion arenariae* Neto et al. 2004

B2 - Coastal shingle

B2.5 - Shingle and gravel beaches with scrub

F - Heathland, scrub and tundra

F1 - Tundra

F1.1 - Shrub tundra

- * LOI-01A - *Loiseleurio-Arctostaphylion* Kalliola ex Nordhagen 1943
- * LOI-01B - *Phyllodoco-Vaccinion myrtilli* Nordhagen 1943

F1.2 - Moss and lichen tundra

- * KOB-01B - *Dryadion integrifoliae* Ohba ex Daniëls 1982
- * LOI-01A - *Loiseleurio-Arctostaphylion* Kalliola ex Nordhagen 1943

F2 - Arctic, alpine and subalpine scrub

F2.1 - Subarctic and alpine dwarf willow scrub

- * HER-01A - *Salicion herbaceae* Br.-Bl. in Br.-Bl. et Jenny 1926
- * HER-01B - *Salici herbaceae*-*Caricion lachenalii* Béguin et Theurillat 1982
- * HER-01G - *Cassiopo-Salicion herbaceae* Nordhagen 1943

F2.2 - Evergreen alpine and subalpine heath and scrub

- * KOB-01A - Kobresio-Dryadion Nordhagen 1943
- * KOB-01B - Dryadion integrifoliae Ohba ex Daniëls 1982
- * LOI-01A - Loiseleurio-Arctostaphylion Kalliola ex Nordhagen 1943
- * LOI-01B - Phyllodoco-Vaccinion myrtilli Nordhagen 1943
- * LOI-01C - Loiseleurio-Vaccinion Br.-Bl. in Br.-Bl. et Jenny 1926
- * LOI-01D - Rhododendro ferruginei-Vaccinion Br.-Bl. ex Schnyder 1930
- * LOI-01E - Juniperion nanae Br.-Bl. in Br.-Bl. et al. 1939
- * LOI-01F - Bruckenthalion spiculifoliae Horvat 1949
- * LOI-01G - Rhododendron caucasici Onipchenko 2002
- * LOI-01H - Salici kazbekensis-Empetrion nigrae Onipchenko 2002
- * LOI-01I - Aconito nasuti-Juniperion Onipchenko 2002
- * RHO-01A - Ericion carneaе Rübel ex Grabherr et al. 1993
- * RHO-01B - Daphno oleoidis-Juniperion alpinae Stanisci 1997
- * RHO-01C - Daphno-Genistion radiatae N. Randelovic et Rexhepi 1980
- * SAB-03A - Cytision oromediterranei Tx. in Tx. et Oberd. 1958 corr. Rivas-Mart. 1987
- * SAB-03B - Genisto versicoloris-Juniperion hemisphaericae Rivas-Mart. et J.A. Molina in Rivas-Mart., Fernández-González et Loidi 1999
- * SAB-03C - Pruno prostratae-Juniperion sabinae Rivas-Mart. et J.A. Molina in Rivas-Mart., Fernández-González et Loidi 1999
- * ULI-02A - Genisto-Vaccinion Br.-Bl. 1926

F2.3 - Subalpine deciduous scrub

- * SAB-05A - Lonicero-Rhamnion falacis P. Fukarek 1969
- * VIR-01A - Alnion viridis Schnyder 1930
- * VIR-01B - Salicion pentandrae Br.-Bl. 1967
- * VIR-01C - Salicion helveticae Rübel ex Theurillat in Theurillat et al. 1995
- * VIR-01D - Salicion silesiacaе Rejmánek et al. 1971

F2.4 - Conifer scrub close to the tree limit

- * MUG-01A - Pinion mugo Pawlowski et al. 1928
- * MUG-01B - Erico-Pinion mugo Leibundgut 1948 nom. invers. propos.
- * MUG-01C - Epipactido atropurpureae-Pinion mugo Stanisci 1997
- * MUG-01D - Lonicero borbasianaе-Pinion mugo Carni et Mucina 2013

F3 - Temperate and mediterranean-montane scrub

F3.1 - Temperate thickets and scrub

- * CYT-01A - Cytision oromediterraneo-scoparii Rivas-Mart. et al. 2002
- * CYT-03A - Sarothamnion scoparii Oberd. 1957
- * CYT-03B - Erico scopariae-Cytision scoparii Mucina in Mucina et al. 2013
- * LON-01A - Lonicero-Rubion silvatici Tx. et Neumann ex Wittig 1977
- * LON-02A - Frangulo-Rubion Rivas Goday 1964
- * LON-03A - Vaccinio-Juniperion communis Passarge in Passarge et G. Hofmann 1968
- * RHA-01A - Aegopodio podagrariae-Sambucion nigrae Chytrý in Mucina et al. 2013

- * RHA-01E - Chelidonio-Acerion negundi L. Ishbirdin et A. Ishbirdin 1989
 - * RHA-02A - Berberidion vulgaris Br.-Bl. ex Tx. 1952 nom. conserv.
 - * RHA-02C - Carpino-Prunion spinosae Weber 1974
 - * RHA-02D - Pruno spinosae-Rubion radulae Weber 1974
 - * RHA-02E - Frangulo alni-Pyrion cordatae Herrera et al. 1991
 - * RHA-02F - Tamo communis-Viburnion lantanae (Géhu et al. 1983) Mucina in Mucina et al. 2013
 - * RHA-02G - Brachypodio pinnati-Juniperion communis Mucina in Mucina et al. 2013
 - * RHA-02Q - Prunion fruticosae Tx. 1952
 - * RHA-02R - Lamio purpureae-Acerion tatarici Fitsailo 2007
 - * RHA-03A - Salicion arenariae Tx. ex Passarge in Scamoni 1963
 - * RHA-03B - Ligustro-Hippophaeion Géhu et Géhu-Franck 1983
 - * RHA-03C - Holoschoeno australis-Salicion arenariae Neto et al. 2004
 - * RHA-04A - Sambuco racemosae-Salicion capreae Tx. et Neumann ex Oberd. 1957
 - * RHA-04C - Astringio-Corylion avellanae Passarge 1978
- F3.2 - Submediterranean deciduous thickets and brushes
- * CYT-01B - Ulici europaei-Cytision striati Rivas-Mart. et al. 1991
 - * CYT-01C - Genistion floridae Rivas-Mart. 1974
 - * CYT-01D - Cytision multiflori Rivas-Mart. 1974
 - * CYT-01E - Retamion monospermae Rivas-Mart et al. 2002
 - * CYT-01F - Retamion sphaerocarphae Rivas-Mart. 1981
 - * CYT-01G - Adenocarpion decorticantis (Rivas-Mart. et F. Valle ex F. Valle 1985) Rivas-Mart. et al. 1999
 - * CYT-01H - Violo messanensis-Adenocarpion intermedii Mucina in Mucina et al. 2013
 - * CYT-02A - Telinion monspessulano-linifoliae Rivas-Mart. et al. 2002
 - * CYT-02B - Genisto spartioidis-Phlomidion almeriensis Rivas Goday et Rivas-Mart. 1969
 - * CYT-02C - Genisto scorpii-Retamion sphaerocarphae Rivas-Mart. et Costa in Rivas-Mart. et al. 2011
 - * CYT-02D - Genistion specioso-equisetiformis Rivas-Mart. et F. Valle in Rivas-Mart. et al. 2011
 - * PUB-01A - Paliuro-Petterion P. Fukarek 1962
 - * PUB-01B - Eryngio campestris-Paliurion spinae-christi (Jovanovic 1985) Matevski et al. 2008
 - * PUB-01C - Junipero excelsae-Quercion pubescentis Jakucs 1960
 - * PUB-01D - Fraxino orni-Cotinion Soó 1960
 - * PUB-01E - Pruno tenellae-Syringion (B. Jovanovic 1979) Carni et al. 2009
 - * PUB-01F - Syringo-Carpinion orientalis Jakucs 1959
 - * RHA-02A - Berberidion vulgaris Br.-Bl. ex Tx. 1952 nom. conserv.
 - * RHA-02B - Amelanchiero-Buxion O. de Bolòs et Romo in Romo 1989
 - * RHA-02H - Rubio periclymeni-Rubion ulmifolii Oberd. ex Rivas-Mart. et al. 1993
 - * RHA-02I - Scrophulario glabratae-Rubion ulmifolii Vicente Orellana et al. 2012

- * RHA-02J - *Pruno spinosae*-*Rubion ulmifolii* O. de Bolòs 1954
- * RHA-02K - *Lonicero arboreae*-*Berberidion hispanicae* O. de Bolòs 1954
- * RHA-02L - *Cytision sessilifolii* Biondi in Biondi et al. 1989
- * RHA-02M - *Berberido aetnensis*-*Crataegion laciniatae* Gianguzzi et al. 2011
- * RHA-02N - *Pruno tenellae*-*Syringion Jovanovic* ex Carni et Mucina 2013
- * RHA-02O - *Berberido creticae*-*Prunion cocomiliae* Bergmeier 1990
- * RHA-02P - *Asparago verticillati*-*Crataegion tauricae* Korzhenevsky et Klyukin 1990

F4 - Temperate shrub heathland

F4.1 - Wet heaths

- * OXY-01A - *Ericion tetralicis* Schwickerath 1933
- * OXY-01B - *Oxycocco-Ericion tetralicis* Nordhagen ex Tx. 1937
- * ULI-01B - *Ulicion minoris* Malcuit 1929
- * ULI-01C - *Daboecion cantabricae* (Dupont ex Rivas-Mart. 1979) Rivas-Mart. et al. in Loidi et al. 1997
- * ULI-01D - *Ericion umbellatae* Br.-Bl. in Br.-Bl. et al. 1952
- * ULI-01E - *Genistion micrantho-anglica* Rivas-Mart. 1979
- * ULI-01F - *Stauracanthion boivinii* (Rivas-Mart. 1979) Rivas-Mart., Fernández-González et Loidi 1999

F4.2 - Dry heaths

- * QUI-01B - *Ericion arboreae* (Rivas-Mart. ex Rivas-Mart. et al. 1986) Rivas-Mart. 1987
- * ULI-01A - *Ericion cinereae* Böcher 1940
- * ULI-01B - *Ulicion minoris* Malcuit 1929
- * ULI-01C - *Daboecion cantabricae* (Dupont ex Rivas-Mart. 1979) Rivas-Mart. et al. in Loidi et al. 1997
- * ULI-01D - *Ericion umbellatae* Br.-Bl. in Br.-Bl. et al. 1952
- * ULI-02A - *Genisto-Vaccinion* Br.-Bl. 1926
- * ULI-02B - *Genistion pilosae* Bøcher 1943
- * ULI-02C - *Empetrion nigri* Schubert ex Westhoff et Den Held 1969

F4.3 - Macaronesian heaths

- * LAU-01A - *Myrico fayae-Ericion arboreae* Oberd. 1965
- * ULI-01G - *Daboecion azoricae* Lüpnitz 1975

F5 - Maquis, arborescent matorral and thermo-Mediterranean brushes

F5.1 - Arborescent matorral

F5.2 - Maquis

- * LAV-01D - *Quercion fruticosae* Rothmaler 1954
- * QUI-01A - *Oleo-Ceratonion siliquae* Br.-Bl. ex Guinochet et Drouineau 1944
- * QUI-01B - *Ericion arboreae* (Rivas-Mart. ex Rivas-Mart. et al. 1986) Rivas-Mart. 1987
- * QUI-01D - *Asparago albi-Rhamnion oleoidis* Rivas Goday ex Rivas-Mart. 1975
- * QUI-01E - *Rhamno lycioidis-Quercion cocciferae* Rivas Goday ex Rivas-Mart. 1975
- * QUI-01F - *Periplocion angustifoliae* Rivas-Mart. 1975

- * QUI-01H - *Rubo longifoliae*-*Coremation albi* Rivas-Mart. in Rivas-Mart. et al. 1980
- * QUI-01I - *Asparago orientalis*-*Juniperion macrocarpae* (Díez-Garretas et Asensi 2013) *Mucina* stat. nov. hoc loco
- * QUI-01J - *Rhamno graeci*-*Juniperion lyciae* Costa et al. 1984
- * QUI-01K - *Pistacio terebinthi*-*Rhamnion alaterni* Barbero et Quézel ex Quézel et al. 1992
- * QUI-02B - *Ceratonio*-*Pistacion lentisci* Zohary ex Zohary et Orshan 1959

F5.3 – *Pseudomaquis*

- * PUB-01A - *Paliuro*-*Petterion* P. Fukarek 1962
- * PUB-01B - *Eryngio campestris*-*Paliurion spinae-christi* (Jovanovic 1985) Matevski et al. 2008
- * PUB-01C - *Junipero excelsae*-*Quercion pubescentis* Jakucs 1960
- * PUB-01D - *Fraxino orni*-*Cotinion* Soó 1960
- * PUB-01E - *Pruno tenellae*-*Syringion* (B. Jovanovic 1979) Carni et al. 2009
- * PUB-01F - *Syringo*-*Carpinion orientalis* Jakucs 1959

F5.4 - [*Spartium junceum*] fields

- * QUI-01A - *Oleo*-*Ceratonion siliquae* Br.-Bl. ex Guinochet et Drouineau 1944
- * RHA-02L - *Cytision sessilifolii* Biondi in Biondi et al. 1989

F5.5 - Thermo-Mediterranean scrub

- * CRI-02D - *Euphorbion pithyusae* Biondi et Géhu in Géhu et Biondi 1994
- * CRI-02E - *Anthyllidion barbae-jovis* S. Brullo et De Marco 1989
- * CYT-01E - *Retamion monospermae* Rivas-Mart et al. 2002
- * CYT-01F - *Retamion sphaerocarphae* Rivas-Mart. 1981
- * CYT-02A - *Telinion monspessulano-linifoliae* Rivas-Mart. et al. 2002
- * CYT-02B - *Genisto spartioidis*-*Phlomidion almeriensis* Rivas Goday et Rivas-Mart. 1969
- * CYT-02C - *Genisto scorpii*-*Retamion sphaerocarphae* Rivas-Mart. et Costa in Rivas-Mart. et al. 2011
- * CYT-02D - *Genistion specioso-equisetiformis* Rivas-Mart. et F. Valle in Rivas-Mart. et al. 2011
- * LAV-01B - *Staezelino-Ulicion baetici* Rivas Goday et Rivas-Mart. 1969
- * LAV-01C - *Ulici argentei*-*Cistion ladaniferi* Br.-Bl. et al. 1965
- * LAV-01D - *Quercion fruticosae* Rothmaler 1954
- * LAV-01E - *Cistion ladaniferi* Br.-Bl. ex A. Bolós et O. Bolós in A. Bolós 1950
- * LAV-01F - *Calicotomo villosae*-*Genistion tyrrhenae* Biondi 2000
- * LAV-01G - *Teucrium mari* (Gamisans et Muracciole 1984) Biondi et Mossa 1992
- * LAV-02A - *Coremation albi* Rothmaler 1943
- * MIC-01A - *Cisto cretici*-*Ericion manipuliflorae* Horvatic 1958
- * MIC-01B - *Cisto eriocephali*-*Ericion multiflorae* Biondi 2000
- * MIC-02A - *Hyperico olympici*-*Cistion cretici* (Oberd. 1954) R. Jahn et Bergmeier in *Mucina* et al. 2009

- * MIC-02B - *Helichryso barrelieri*-*Phagnalion graeci* (Barbéro et Quézel 1989) R. Jahn in Mucina et al. 2009
- * MIC-02C - *Hyperico empetrifolii*-*Micromerion graecae* Barbero et Quézel 1989
- * MIC-02D - *Helichryso sanguinei*-*Origanion syriaci* Barbero et Quézel 1989
- * MIC-02E - *Micromerion* Oberd. 1954
- * MIC-02F - *Sarcopoterio spinosi*-*Genistion fasselatae* Costa et al. 1984
- * QUI-01A - *Oleo-Ceratonion siliquae* Br.-Bl. ex Guinochet et Drouineau 1944
- * QUI-01C - *Juniperion turbinatae* Rivas-Mart. 1975 corr. 1987
- * QUI-01D - *Asparago albi*-*Rhamnion oleoidis* Rivas Goday ex Rivas-Mart. 1975
- * QUI-01F - *Periplocion angustifoliae* Rivas-Mart. 1975
- * QUI-01G - *Juniperon phoeniceae*-*Pinon acutisquamae* A.V. Pérez et Cabezudo in A.V. Pérez et al. 1988 corr. Rivas-Mart. et al. 2002 nom. invers. propos.
- * QUI-01H - *Rubo longifoliae*-*Coremation albi* Rivas-Mart. in Rivas-Mart. et al. 1980
- * QUI-01J - *Rhamno graeci*-*Juniperion lyciae* Costa et al. 1984
- * QUI-02B - *Ceratonio-Pistacion lentisci* Zohary ex Zohary et Orshan 1959
- * ROS-01B - *Eryngio trifidi*-*Ulicion erinacei* Rothmaler 1943
- * ROS-01F - *Rosmarinion officinalis* Molinier 1934
- * ROS-01I - *Cisto cretici*-*Genistion corsicae* Arrigoni et Di Tommaso 1991
- * ROS-04A - *Thymo moroderi*-*Sideritidion leucanthae* O. de Bolòs 1957 corr. Alcaraz et al. 1989
- * ROS-04B - *Anthyllido terniflorae*-*Salsolion papillosae* Rivas Goday et Esteve 1968
- * ROS-04C - *Sideritidion bourgaeanae* Peinado et Martínez-Parras in Peinado et al. 1992
- * ROS-05B - *Lavandulion lanatae* (Martínez-Parras et al. 1984) Rivas-Mart. et al. 2002
- * ULI-01D - *Ericion umbellatae* Br.-Bl. in Br.-Bl. et al. 1952
- * ULI-01F - *Stauracanthion boivinii* (Rivas-Mart. 1979) Rivas-Mart., Fernández-González et Loidi 1999

F6 – Garrigue

F6.1 - Western garrigues

- * CRI-02A - *Dactylido hispanicae*-*Helichrysion stoechadis* Géhu et Biondi in Géhu 1994
- * CRI-02D - *Euphorbion pithyusae* Biondi et Géhu in Géhu et Biondi 1994
- * CRI-02E - *Anthyllidion barbae-jovis* S. Brullo et De Marco 1989
- * CRI-02F - *Crucianellion rupestris* S. Brullo et Furnari 1990
- * LAV-01A - *Cistion laurifolii* Rivas Goday in Rivas Goday et al. 1956
- * LAV-01B - *Staehelino-Ulicion baetici* Rivas Goday et Rivas-Mart. 1969

- * LAV-01C - *Ulici argentei*-*Cistion ladaniferi* Br.-Bl. et al. 1965
 - * LAV-01E - *Cistion ladaniferi* Br.-Bl. ex A. Bolós et O. Bolòs in A. Bolós 1950
 - * LAV-01F - *Calicotomo villosae*-*Genistion tyrrhenae* Biondi 2000
 - * LAV-01G - *Teucrium mari* (Gamisans et Muracciole 1984) Biondi et Mossa 1992
 - * LAV-01H - *Armeria sardoae*-*Genistion salzmannii* Arrigoni 1986
 - * LAV-02A - *Corematum albi* Rothmaler 1943
 - * ROS-01A - *Lavandula latifoliae*-*Genistion boissieri* Rivas Goday et Rivas-Mart. 1969
 - * ROS-01B - *Eryngium trifidum*-*Ulicium erinacei* Rothmaler 1943
 - * ROS-01C - *Ulici densi*-*Thymum sylvestris* (Capelo et al. 1993) Costa et al. 2009
 - * ROS-01D - *Sideritideum incanae*-*Salvia lavandulifoliae* (Rivas Goday et Rivas-Mart. 1969) Izco et Molina 1989
 - * ROS-01E - *Helianthemum italicum*-*Aphyllanthium monspeliensis* Díez Garretas et al. 1998
 - * ROS-01F - *Rosmarinium officinalis* Molinier 1934
 - * ROS-01G - *Hypericum ericoides* Esteve ex Costa et Peris 1985
 - * ROS-01H - *Hypericum balearicum* O. de Bolòs et Molinier 1958
 - * ROS-01I - *Cistus creticus*-*Genistion corsicae* Arrigoni et Di Tommaso 1991
 - * ROS-01J - *Polygala Seslerium insularis* Arrigoni ex Arrigoni et Di Tommaso 1986
 - * ROS-01K - *Artemisia albae*-*Saturegium montanae* Allegrezza et al. 1997
 - * ROS-03A - *Lepidium subulatum* Bellot et Rivas Goday in Rivas Goday et al. 1957
 - * ROS-03B - *Thymum Teucrium verticillatum* Rivas Goday in Rivas Goday et al. 1957
 - * ROS-04A - *Thymum moroderi*-*Sideritideum leucanthae* O. de Bolòs 1957 corr. Alcaraz et al. 1989
 - * ROS-04B - *Anthyllum ternstroemii*-*Salsola papillosa* Rivas Goday et Esteve 1968
 - * ROS-04C - *Sideritideum bourgaeanae* Peinado et Martínez-Parras in Peinado et al. 1992
 - * ROS-05B - *Lavandulum lanatae* (Martínez-Parras et al. 1984) Rivas-Mart. et al. 2002
- F6.2 - Eastern garrigues
- * MIC-02A - *Hypericum olympicum*-*Cistus creticus* (Oberd. 1954) R.Jahn et Bergmeier in Mucina et al. 2009
 - * MIC-02B - *Helichrysum barrelieri*-*Phagnalon graecum* (Barbéro et Quézel 1989) R. Jahn in Mucina et al. 2009
 - * MIC-02C - *Hypericum empetrifolium*-*Micromerion graecum* Barbero et Quézel 1989
 - * MIC-02D - *Helichrysum sanguineum*-*Origanum syriacum* Barbero et Quézel 1989
 - * MIC-02E - *Micromerion* Oberd. 1954
 - * MIC-02F - *Sarcopoterio spinosum*-*Genistion fasselatae* Costa et al. 1984

F6.3 - Illyrian garrigues

- * MIC-01A - Cisto cretici-Ericion manipuliflorae Horvatic 1958
- * MIC-01B - Cisto eriocephali-Ericion multiflorae Biondi 2000

F6.4 - Black Sea garrigues

F6.5 - Macaronesian garrigues

- * CRI-04C - Helichrysion obconico-devium Rivas-Mart. et al. 2002

F6.6 - Supra-Mediterranean garrigues

- * CYP-01A - Hyperico stenobotryos-Alyssion troodi S. Brullo et al. 2005
- * LAV-01A - Cistion laurifolii Rivas Goday in Rivas Goday et al. 1956
- * LAV-01B - Staehelino-Ulicion baetici Rivas Goday et Rivas-Mart. 1969
- * LAV-01H - Armerio sardoae-Genistion salzmannii Arrigoni 1986
- * ONO-01D - Genistion lobelii Molinier 1934
- * ONO-01E - Echinospartion horridi Rivas-Mart. et al. 1991
- * ONO-01F - Genistion occidentalis Rivas-Mart. in Rivas-Mart. et al. 1984
- * ONO-01G - Lavandulo angustifoliae-Genistion cinereae Barbero et al. 1972
- * ONO-02C - Plantagini discoloris-Thymion mastigophori Molina et Izco 1989
- * ONO-02D - Seselio granatensis-Festucion hystricis Rivas-Mart. in Rivas-Mart. et al. 2011
- * ROS-01A - Lavandulo latifoliae-Genistion boissieri Rivas Goday et Rivas-Mart. 1969
- * ROS-01D - Sideritido incanae-Salvion lavandulifoliae (Rivas Goday et Rivas-Mart. 1969) Izco et Molina 1989
- * ROS-01E - Helianthemo italici-Aphyllanthion monspeliensis Díez Garretas et al. 1998
- * ROS-01J - Polygalo-Seslerion insularis Arrigoni ex Arrigoni et Di Tommaso 1986
- * ROS-01K - Artemisio albae-Saturejion montanae Allegrezza et al. 1997
- * ROS-05B - Lavandulion lanatae (Martínez-Parras et al. 1984) Rivas-Mart. et al. 2002

F6.7 - Mediterranean gypsum scrubs

- * ROS-03A - Lepidion subulati Bellot et Rivas Goday in Rivas Goday et al. 1957
- * ROS-03B - Thymo-Teucrium verticillati Rivas Goday in Rivas Goday et al. 1957

F6.8 - Xero-halophile scrubs

- * CRI-02E - Anthyllidion barbae-jovis S. Brullo et De Marco 1989
- * CRI-02F - Crucianellion rupestris S. Brullo et Furnari 1990
- * CRI-04C - Helichrysion obconico-devium Rivas-Mart. et al. 2002
- * LER-01A - Artemision lerchiana Golub 1994
- * LER-02A - Euphorbion seguieranae Golub 1994
- * PEG-01A - Salsolo vermiculatae-Peganion harmalae Br.-Bl. et O. de Bolòs 1954

- * PEG-01B - *Haloxylon tamariscifolium*-*Atriplicion glaucae* Rivas Goday et Rivas-Mart. ex Rigual 1972
 - * PEG-01C - *Salsola oppositifolia*-*Suaedion fruticosae* Rigual 1972
 - * PEG-01D - *Lycium europaeum*-*Ipomoeion purpureae* O. de Bolòs ex Mucina all. nov. hoc loco
 - * PEG-01E - *Artemisia arborescens* Géhu et Biondi 1986
 - * PEG-01F - *Atriplex halimifolia*-*Suaedion verae* Géhu et al. ex Bergmeier et Dimopoulos 2003
 - * PEG-01G - *Medicago citrinae*-*Lavaterion arborea* O. de Bolòs et Vigo in O. de Bolòs et al. 1984
 - * PEG-02A - *Artemisia glutinosa*-*Santolinion rosmarinifoliae* Costa 1975
 - * PEG-02B - *Santolinion pectinato-canescens* Peinado et Martínez-Parras 1984
 - * PEG-03A - *Chenopodium tomentosum* Sunding 1972
 - * PEG-04A - *Artemisia thuscula*-*Rumicion lunariae* Rivas-Mart. et al. 1993
 - * PEG-04B - *Launaea arborescens*-*Schizogynion sericeae* Rivas-Mart. et al. 1993
 - * PEG-04C - *Argyranthemum succulentum*-*Calendulion maderensis* Capelo et al. 2000
 - * PEG-04D - *Nicotiana glauca*-*Ricinion communis* Rivas-Mart., Fernández-González et Loidi 1999
- F7 - Spiny Mediterranean heaths (phrygana, hedgehog-heaths and related coastal cliff vegetation)
- F7.1 - West Mediterranean spiny heaths
- * CRI-02B - *Astragalion tragacanthae* (Folch ex Rivas-Mart., Fernández-González et Loidi 1999) Rivas-Mart. et al. 2002
 - * CRI-02C - *Launaeion cervicornis* (O. de Bolòs et Vigo ex Gil et Llorens 1995) Rivas-Mart., Fernández-González et Loidi 1999
- F7.2 - Central Mediterranean spiny heaths
- F7.3 - East Mediterranean phrygana
- * MIC-02E - *Micromerion Oberd.* 1954
 - * MIC-02F - *Sarcopoterio spinosi*-*Genistion fasselatae* Costa et al. 1984
- F7.4 - Hedgehog-heaths
- * CYP-01A - *Hyperico stenobotrys*-*Alyssion troodi* S. Brullo et al. 2005
 - * DAP-01A - *Astragalo angustifolii*-*Seslerion coerulantis* Quézel 1964
 - * DAP-01B - *Eryngio multifidi*-*Bromion fibrosi* Quézel 1964
 - * DAP-01C - *Stipa pulcherrimae*-*Morinion persicae* Quézel 1964
 - * DAP-02A - *Astragalion cretici* Bergmeier 2002
 - * DAP-02B - *Verbascion spinosi* Zaffran ex Bergmeier 2002
 - * DAP-02C - *Colchico cretensis*-*Cirsion morinifolii* Bergmeier 2002
 - * GEN-01A - *Anthyllidion hermanniae* Klein 1972
 - * ONO-01E - *Echinospartion horridi* Rivas-Mart. et al. 1991
 - * ROS-02A - *Xeroacantho*-*Erinaceion* (Quézel 1953) O. de Bolòs 1967

- * ROS-05A - *Andryalium agardhii* Rivas-Mart. ex Rivas Goday et Mayor 1966
- * RUM-01A - *Rumici-Astragalium siculi* Poli 1965
- * RUM-02A - *Cerastio-Astragalium nebrodensis* Pignatti et Nimis ex S. Brullo 1984
- * RUM-02B - *Armerion nebrodensis* S. Brullo 1984
- * RUM-03A - *Armerion aspomontanae* S. Brullo et al. 2001
- * RUM-03B - *Koelerio brutiae-Astragalium calabrici* Giacomini et Gentile ex S. Brullo in S. Brullo et al. 2005

F8 - Thermo-Atlantic xerophytic scrub

F8.1 - Canary Island xerophytic scrub

- * AEO-01A - *Soncho acaulis-Sempervivum* Sunding 1972
- * AEO-01B - *Greenovum aureae* Rivas-Mart. et al. 1993
- * AEO-02A - *Aichryso laxi-Monanthium laxiflorae* Santos et Reyes Betancort 2009
- * KLE-01A - *Aeonio-Euphorbium canariensis* Sunding 1972
- * KLE-01B - *Euphorbium regijsjuboi-lamarckii* Rivas-Mart., Wildpret, O. Rodríguez et Del Arco in Rivas-Mart. et al. 2011
- * OLE-01A - *Mayteno canariensis-Juniperium canariensis* Santos et F. Galván ex Santos 1983 corr. Rivas-Mart. et al. 1993
- * OLE-01B - *Retamum rhodorhizoides* Del Arco et al. 2009
- * OLE-02A - *Cisto canariensis-Micromerium hyssopifoliae* Pérez de Paz et al. 1990 corr. Rivas-Mart. in Rivas-Mart. 2011
- * PEG-03A - *Chenopodium tomentosae* Sunding 1972
- * PEG-04A - *Artemisia thusculae-Rumicium lunariae* Rivas-Mart. et al. 1993
- * PEG-04B - *Launaea arborescens-Schizogynium sericeae* Rivas-Mart. et al. 1993
- * PEG-04D - *Nicotiana glauca-Ricinium communis* Rivas-Mart., Fernández-González et Loidi 1999
- * SUP-01A - *Spartocytisium nubigeni* Oberd. ex Esteve 1973
- * SUP-01B - *Plantaginum webbii* Martín Osorio, Wildpret et Rivas-Mart. In Martín Osorio et al. 2007
- * VIO-01A - *Violium cheiranthifoliae* Voggenreiter ex Martín Osorio, Wildpret et Rivas-Mart. in Martín Osorio et al. 2007

F8.2 - Madeiran xerophytic scrub

- * AEO-01C - *Sinapidendro angustifolii-Aeonium glutinosi* Capelo et al. 2000
- * KLE-01A - *Aeonio-Euphorbium canariensis* Sunding 1972
- * OLE-01D - *Oleo maderensis-Maytenium umbellatae* Capelo et al. 2000
- * OLE-02B - *Soncho ustulati-Artemisia argenteae* Capelo et al. 2000
- * PEG-04C - *Argyranthemum succulentum-Calendulum maderensis* Capelo et al. 2000

F9 - Riverine and fen scrubs

F9.1 - Riverine scrub

- * PUR-01A - *Salicium phylicifoliae* Dierßen 1992
- * PUR-01B - *Salicium eleagno-daphnoides* (Moor 1958) Grass 1993
- * PUR-01D - *Salicium triandrae* T. Müller et Görs 1958

- * PUR-01E - *Rubo caesii*-*Amorphion fruticosae* Shevchyk et Solomakha in Shevchyk et al. 1996
 - * PUR-01F - *Artemisio dniproicae*-*Salicion acutifoliae* Shevchyk et Solomakha in Shevchyk et al. 1996
 - * PUR-01G - *Salicion salvifoliae* Rivas-Mart. et al. 1984
 - * PUR-01H - *Salicion discolori-neotrichae* Br.-Bl. et O. de Bolòs 1958 corr. Rivas-Mart. et al. 2002
 - * PUR-01I - *Salicion pedicellatae* Rivas-Mart. et al. 1984
 - * PUR-01J - *Salicion cantabricae* Rivas-Mart., T.E. Díaz et Penas in Rivas-Mart. et al. 2011
- F9.2 - [Salix] carr and fen scrub
- * CIN-01A - *Salicion cinereae* T. Müller et Görs ex Passarge 1961
- F9.3 - Southern riparian galleries and thickets
- * NER-01A - *Tamaricion africanae* Br.-Bl. et O. de Bolòs 1958
 - * NER-01B - *Tamaricion boveano-canariensis* Izco et al. 1984
 - * NER-01C - *Rubo ulmifolii*-*Nerion oleandri* O. de Bolòs 1958
 - * NER-01D - *Securinegion buxifoliae* Rivas Goday ex Lopez Saenz et Velasco 1995
 - * NER-01E - *Tamaricion dalmaticae* Jasprica in Mucina et al. 2013
 - * NER-01F - *Rubo sancti-Nerion oleandri* Brullo et al. 2004
 - * POP-03A - *Salicion canariensis* Rivas-Mart. et al. ex Rivas-Mart., Fernández González et Lodi 1999
 - * PUR-02A - *Tamaricion parviflorae* I. Kárpáti et V. Kárpáti 1961
 - * PUR-02B - *Artemisio scopariae*-*Tamaricion ramosissimae* Simon et Dihoru 1963
 - * TAM-01A - *Agropyro fragilis*-*Tamaricion ramosissimae* Golub in Barmin 2001

Appendix B: An updated crosswalk Syntaxa to EUNIS heathland, scrub and tundra habitat types (B1.5, B1.6, B2.5, F)

- CRI-02A - *Dactylido hispanicae*-*Helichrysion stoechadis* Géhu et Biondi in Géhu 1994
 - * F6.1 - Western garrigues
- CRI-02D - *Euphorbion pithyusae* Biondi et Géhu in Géhu et Biondi 1994
 - * F5.5 - Thermo-Mediterranean scrub
 - * F6.1 - Western garrigues
- HER-01B - *Salici herbaceae*-*Caricion lachenalii* Béguin et Theurillat 1982
 - * F2.1 - Subarctic and alpine dwarf willow scrub
- KOB-01B - *Dryadion integrifoliae* Ohba ex Daniëls 1982
 - * F1.2 - Moss and lichen tundra
 - * F2.2 - Evergreen alpine and subalpine heath and scrub
- LOI-01A - *Loiseleurio-Arctostaphylion Kalliola* ex Nordhagen 1943
 - * F1.1 - Shrub tundra
 - * F1.2 - Moss and lichen tundra
 - * F2.2 - Evergreen alpine and subalpine heath and scrub
- LOI-01B - *Phyllodoco-Vaccinon myrtilli* Nordhagen 1943
 - * F1.1 - Shrub tundra
 - * F2.2 - Evergreen alpine and subalpine heath and scrub
- LOI-01C - *Loiseleurio-Vaccinon Br.-Bl.* in Br.-Bl. et Jenny 1926
 - * F2.2 - Evergreen alpine and subalpine heath and scrub
- LOI-01D - *Rhododendro ferruginei-Vaccinon Br.-Bl.* ex Schnyder 1930
 - * F2.2 - Evergreen alpine and subalpine heath and scrub
- LOI-01E - *Juniperion nanae Br.-Bl.* in Br.-Bl. et al. 1939
 - * F2.2 - Evergreen alpine and subalpine heath and scrub
- LOI-01F - *Bruckenthalion spiculifoliae* Horvat 1949
 - * F2.2 - Evergreen alpine and subalpine heath and scrub
- LOI-01G - *Rhododendron caucasici* Onipchenko 2002
 - * F2.2 - Evergreen alpine and subalpine heath and scrub
- LOI-01H - *Salici kazbekensis-Empetrion nigrae* Onipchenko 2002
 - * F2.2 - Evergreen alpine and subalpine heath and scrub
- LOI-01I - *Aconito nasuti-Juniperion* Onipchenko 2002
 - * F2.2 - Evergreen alpine and subalpine heath and scrub
- RHO-01A - *Ericion carnea* Rübel ex Grabherr et al. 1993
 - * F2.2 - Evergreen alpine and subalpine heath and scrub
- RHO-01B - *Daphno oleoidis-Juniperion alpinae* Stanisci 1997
 - * F2.2 - Evergreen alpine and subalpine heath and scrub
- RHO-01C - *Daphno-Genistion radiatae* N. Randelovic et Rexhepi 1980
 - * F2.2 - Evergreen alpine and subalpine heath and scrub
- SAB-03A - *Cytision oromediterranei* Tx. in Tx. et Oberd. 1958 corr. Rivas-Mart. 1987
 - * F2.2 - Evergreen alpine and subalpine heath and scrub

- SAB-03B - *Genisto versicoloris-Juniperion hemisphaericae* Rivas-Mart. et J.A. Molina in Rivas-Mart., Fernández-González et Loidi 1999
* F2.2 - Evergreen alpine and subalpine heath and scrub
- SAB-03C - *Pruno prostratae-Juniperion sabiniae* Rivas-Mart. et J.A. Molina in Rivas-Mart., Fernández-González et Loidi 1999
* F2.2 - Evergreen alpine and subalpine heath and scrub
- SAB-05A - *Lonicero-Rhamnion falacis* P. Fukarek 1969
* F2.3 - Subalpine deciduous scrub
- MUG-01A - *Pinion mugo* Pawlowski et al. 1928
* F2.4 - Conifer scrub close to the tree limit
- MUG-01B - *Erico-Pinion mugo* Leibundgut 1948 nom. invers. propos.
* F2.4 - Conifer scrub close to the tree limit
- MUG-01C - *Epipactido atropurpureae-Pinion mugo* Stanisci 1997
* F2.4 - Conifer scrub close to the tree limit
- MUG-01D - *Lonicero borbasianae-Pinion mugo* Carni et Mucina 2013
* F2.4 - Conifer scrub close to the tree limit
- VIR-01A - *Alnion viridis* Schnyder 1930
* F2.3 - Subalpine deciduous scrub
- VIR-01B - *Salicion pentandrae* Br.-Bl. 1967
* F2.3 - Subalpine deciduous scrub
- VIR-01C - *Salicion helveticae* Rübel ex Theurillat in Theurillat et al. 1995
* F2.3 - Subalpine deciduous scrub
- VIR-01D - *Salicion silesiaca* Rejmánek et al. 1971
* F2.3 - Subalpine deciduous scrub
- ULI-01A - *Ericion cinerea* Böcher 1940
* B1.5 - Coastal dune heaths
* F4.2 - Dry heaths
- ULI-01B - *Ulicion minoris* Malcuit 1929
* B1.5 - Coastal dune heaths
* F4.1 - Wet heaths
* F4.2 - Dry heaths
- ULI-01C - *Daboecion cantabricae* (Dupont ex Rivas-Mart. 1979) Rivas-Mart. et al. in Loidi et al. 1997
* F4.1 - Wet heaths
* F4.2 - Dry heaths
- ULI-01D - *Ericion umbellatae* Br.-Bl. in Br.-Bl. et al. 1952
* B1.5 - Coastal dune heaths
* F4.1 - Wet heaths
* F4.2 - Dry heaths
* F5.5 - Thermo-Mediterranean scrub
- ULI-01E - *Genistion micrantho-anglica* Rivas-Mart. 1979
* F4.1 - Wet heaths
- ULI-01F - *Stauracanthion boivinii* (Rivas-Mart. 1979) Rivas-Mart., Fernández-González et Loidi 1999
* F4.1 - Wet heaths
* F5.5 - Thermo-Mediterranean scrub
- ULI-01G - *Daboecion azoricae* Lüpnitz 1975
* F4.3 - Macaronesian heaths

- ULI-02A - Genisto-Vaccinion Br.-Bl. 1926
 - * F2.2 - Evergreen alpine and subalpine heath and scrub
 - * F4.2 - Dry heaths
- ULI-02B - Genistion pilosae Bøcher 1943
 - * B1.5 - Coastal dune heaths
 - * F4.2 - Dry heaths
- ULI-02C - Empetrion nigri Schubert ex Westhoff et Den Held 1969
 - * B1.5 - Coastal dune heaths
 - * F4.2 - Dry heaths
- RHA-01A - Aegopodio podagrariae-Sambucion nigrae Chytrý in Mucina et al. 2013
 - * F3.1 - Temperate thickets and scrub
- RHA-01E - Chelidonio-Acerion negundi L. Ishbirdin et A. Ishbirdin 1989
 - * F3.1 - Temperate thickets and scrub
- RHA-02A - Berberidion vulgaris Br.-Bl. ex Tx. 1952 nom. conserv.
 - * B1.6 - Coastal dune scrub
 - * F3.1 - Temperate thickets and scrub
 - * F3.2 - Submediterranean deciduous thickets and brushes
- RHA-02B - Amelanchiero-Buxion O. de Bolòs et Romo in Romo 1989
 - * F3.2 - Submediterranean deciduous thickets and brushes
- RHA-02C - Carpino-Prunion spinosae Weber 1974
 - * B1.6 - Coastal dune scrub
 - * F3.1 - Temperate thickets and scrub
- RHA-02D - Pruno spinosae-Rubion radulae Weber 1974
 - * B1.6 - Coastal dune scrub
 - * F3.1 - Temperate thickets and scrub
- RHA-02E - Frangulo alni-Pyrion cordatae Herrera et al. 1991
 - * F3.1 - Temperate thickets and scrub
- RHA-02F - Tamo communis-Viburnion lantanae (Géhu et al. 1983) Mucina in Mucina et al. 2013
 - * F3.1 - Temperate thickets and scrub
- RHA-02G - Brachypodio pinnati-Juniperion communis Mucina in Mucina et al. 2013
 - * F3.1 - Temperate thickets and scrub
- RHA-02H - Rubio periclymeni-Rubion ulmifolii Oberd. ex Rivas-Mart. et al. 1993
 - * F3.2 - Submediterranean deciduous thickets and brushes
- RHA-02I - Scrophulario glabratae-Rubion ulmifolii Vicente Orellana et al. 2012
 - * F3.2 - Submediterranean deciduous thickets and brushes
- RHA-02J - Pruno spinosae-Rubion ulmifolii O. de Bolòs 1954
 - * F3.2 - Submediterranean deciduous thickets and brushes
- RHA-02K - Lonicero arborea-Berberidion hispanicae O. de Bolòs 1954
 - * F3.2 - Submediterranean deciduous thickets and brushes
- RHA-02L - Cytision sessilifolii Biondi in Biondi et al. 1989
 - * F3.2 - Submediterranean deciduous thickets and brushes
 - * F5.4 - [Spartium junceum] fields
- RHA-02M - Berberido aetnensis-Crataegion laciniatae Gianguzzi et al. 2011

- * F3.2 - Submediterranean deciduous thickets and brushes
- RHA-02N - *Pruno tenellae*-*Syringion* Jovanovic ex Carni et Mucina 2013
 - * F3.2 - Submediterranean deciduous thickets and brushes
- RHA-02O - *Berberido creticae*-*Prunion cocomiliae* Bergmeier 1990
 - * F3.2 - Submediterranean deciduous thickets and brushes
- RHA-02P - *Asparago verticillati*-*Crataegion tauricae* Korzhenevsky et Klyukin 1990
 - * F3.2 - Submediterranean deciduous thickets and brushes
- RHA-02Q - *Prunion fruticosae* Tx. 1952
 - * F3.1 - Temperate thickets and scrub
- RHA-02R - *Lamio purpureae*-*Acerion tatarici* Fitsailo 2007
 - * F3.1 - Temperate thickets and scrub
- RHA-03A - *Salicion arenariae* Tx. ex Passarge in Scamoni 1963
 - * B1.6 - Coastal dune scrub
 - * F3.1 - Temperate thickets and scrub
- RHA-03B - *Ligustro-Hippophaeion* Géhu et Géhu-Franck 1983
 - * B1.6 - Coastal dune scrub
 - * F3.1 - Temperate thickets and scrub
- RHA-03C - *Holoschoeno australis*-*Salicion arenariae* Neto et al. 2004
 - * B1.6 - Coastal dune scrub
 - * F3.1 - Temperate thickets and scrub
- RHA-04A - *Sambuco racemosae*-*Salicion capreae* Tx. et Neumann ex Oberd. 1957
 - * F3.1 - Temperate thickets and scrub
- RHA-04C - *Astrantio-Corylion avellanae* Passarge 1978
 - * F3.1 - Temperate thickets and scrub
- LON-02A - *Frangulo-Rubion* Rivas Goday 1964
 - * F3.1 - Temperate thickets and scrub
- LON-03A - *Vaccinio-Juniperion communis* Passarge in Passarge et G. Hofmann 1968
 - * F3.1 - Temperate thickets and scrub
- PUB-01A - *Paliuro-Petterion* P. Fukarek 1962
 - * F3.2 - Submediterranean deciduous thickets and brushes
 - * F5.3 - Pseudomaquis
- PUB-01B - *Eryngio campestris*-*Paliurion spinae-christi* (Jovanovic 1985) Matevski et al. 2008
 - * F3.2 - Submediterranean deciduous thickets and brushes
 - * F5.3 - Pseudomaquis
- PUB-01C - *Junipero excelsae*-*Quercion pubescentis* Jakucs 1960
 - * F3.2 - Submediterranean deciduous thickets and brushes
 - * F5.3 - Pseudomaquis
- PUB-01D - *Fraxino orni*-*Cotinion* Soó 1960
 - * F3.2 - Submediterranean deciduous thickets and brushes
 - * F5.3 - Pseudomaquis
- PUB-01E - *Pruno tenellae*-*Syringion* (B. Jovanovic 1979) Carni et al. 2009
 - * F3.2 - Submediterranean deciduous thickets and brushes
 - * F5.3 - Pseudomaquis
- PUB-01F - *Syringo-Carpinion orientalis* Jakucs 1959

- * F3.2 - Submediterranean deciduous thickets and brushes
- * F5.3 - Pseudomaquis
- ROS-01A - *Lavandulo latifoliae*-*Genistion boissieri* Rivas Goday et Rivas-Mart. 1969
 - * F6.1 - Western garrigues
 - * F6.6 - Supra-Mediterranean garrigues
- ROS-01B - *Eryngio trifidi*-*Ulicion erinacei* Rothmaler 1943
 - * F5.5 - Thermo-Mediterranean scrub
 - * F6.1 - Western garrigues
- ROS-01C - *Ulici densi*-*Thymion sylvestris* (Capelo et al. 1993) Costa et al. 2009
 - * F6.1 - Western garrigues
- ROS-01D - *Sideritido incanae*-*Salvion lavandulifoliae* (Rivas Goday et Rivas-Mart. 1969) Izco et Molina 1989
 - * F6.1 - Western garrigues
 - * F6.6 - Supra-Mediterranean garrigues
- ROS-01E - *Helianthemo italici*-*Aphyllanthion monspeliensis* Díez Garretas et al. 1998
 - * F6.1 - Western garrigues
 - * F6.6 - Supra-Mediterranean garrigues
- ROS-01F - *Rosmarinion officinalis* Molinier 1934
 - * F5.5 - Thermo-Mediterranean scrub
 - * F6.1 - Western garrigues
- ROS-01G - *Hypericion ericoidis* Esteve ex Costa et Peris 1985
 - * F6.1 - Western garrigues
- ROS-01H - *Hypericion balearici* O. de Bolòs et Molinier 1958
 - * F6.1 - Western garrigues
- ROS-01I - *Cisto cretici*-*Genistion corsicae* Arrigoni et Di Tommaso 1991
 - * F5.5 - Thermo-Mediterranean scrub
 - * F6.1 - Western garrigues
- ROS-01J - *Polygalo*-*Seslerion insularis* Arrigoni ex Arrigoni et Di Tommaso 1986
 - * F6.1 - Western garrigues
 - * F6.6 - Supra-Mediterranean garrigues
- ROS-01K - *Artemisio albae*-*Saturejion montanae* Allegrezza et al. 1997
 - * F6.1 - Western garrigues
 - * F6.6 - Supra-Mediterranean garrigues
- ROS-02A - *Xeroacantho*-*Erinaceion* (Quézel 1953) O. de Bolòs 1967
 - * F7.4 - Hedgehog-heaths
- ROS-03A - *Lepidion subulati* Bellot et Rivas Goday in Rivas Goday et al. 1957
 - * F6.1 - Western garrigues
 - * F6.7 - Mediterranean gypsum scrubs
- ROS-03B - *Thymo*-*Teucrium verticillati* Rivas Goday in Rivas Goday et al. 1957
 - * F6.1 - Western garrigues
 - * F6.7 - Mediterranean gypsum scrubs
- ROS-04A - *Thymo moroderi*-*Sideritidion leucanthae* O. de Bolòs 1957 corr. Alcaraz et al. 1989

- * F5.5 - Thermo-Mediterranean scrub
- * F6.1 - Western garrigues
- ROS-04B - Anthyllido terniflorae-Salsolion papillosae Rivas Goday et Esteve 1968
 - * F5.5 - Thermo-Mediterranean scrub
 - * F6.1 - Western garrigues
- ROS-04C - Sideritidion bourgaeanae Peinado et Martínez-Parras in Peinado et al. 1992
 - * F5.5 - Thermo-Mediterranean scrub
 - * F6.1 - Western garrigues
- ROS-05A - Andryalion agardhii Rivas-Mart. ex Rivas Goday et Mayor 1966
 - * F7.4 - Hedgehog-heaths
- ROS-05B - Lavandulion lanatae (Martínez-Parras et al. 1984) Rivas-Mart. et al. 2002
 - * F5.5 - Thermo-Mediterranean scrub
 - * F6.1 - Western garrigues
 - * F6.6 - Supra-Mediterranean garrigues
- CYT-01A - Cytision oromediterraneo-scoparii Rivas-Mart. et al. 2002
 - * F3.1 - Temperate thickets and scrub
- CYT-01B - Ulici europaei-Cytision striati Rivas-Mart. et al. 1991
 - * F3.2 - Submediterranean deciduous thickets and brushes
- CYT-01C - Genistion floridae Rivas-Mart. 1974
 - * F3.2 - Submediterranean deciduous thickets and brushes
- CYT-01D - Cytision multiflori Rivas-Mart. 1974
 - * F3.2 - Submediterranean deciduous thickets and brushes
- CYT-01E - Retamion monospermae Rivas-Mart et al. 2002
 - * F3.2 - Submediterranean deciduous thickets and brushes
 - * F5.5 - Thermo-Mediterranean scrub
- CYT-01F - Retamion sphaerocarpae Rivas-Mart. 1981
 - * F3.2 - Submediterranean deciduous thickets and brushes
 - * F5.5 - Thermo-Mediterranean scrub
- CYT-01G - Adenocarpion decorticantis (Rivas-Mart. et F. Valle ex F. Valle 1985) Rivas-Mart. et al. 1999
 - * F3.2 - Submediterranean deciduous thickets and brushes
- CYT-01H - Violo messanensis-Adenocarpion intermedii Mucina in Mucina et al. 2013
 - * F3.2 - Submediterranean deciduous thickets and brushes
- CYT-02A - Telinion monspessulano-linifoliae Rivas-Mart. et al. 2002
 - * F3.2 - Submediterranean deciduous thickets and brushes
 - * F5.5 - Thermo-Mediterranean scrub
- CYT-02B - Genisto spartioidis-Phlomidion almeriensis Rivas Goday et Rivas-Mart. 1969
 - * F3.2 - Submediterranean deciduous thickets and brushes
 - * F5.5 - Thermo-Mediterranean scrub
- CYT-02C - Genisto scorpii-Retamion sphaerocarpae Rivas-Mart. et Costa in Rivas-Mart. et al. 2011
 - * F3.2 - Submediterranean deciduous thickets and brushes
 - * F5.5 - Thermo-Mediterranean scrub

- CYT-02D - *Genistion specioso-equisetiformis* Rivas-Mart. et F. Valle in Rivas-Mart. et al. 2011
 * F3.2 - Submediterranean deciduous thickets and brushes
 * F5.5 - Thermo-Mediterranean scrub
- CYT-03A - *Sarothamnion scoparii* Oberd. 1957
 * F3.1 - Temperate thickets and scrub
- CYT-03B - *Erico scopariae-Cytision scoparii* Mucina in Mucina et al. 2013
 * F3.1 - Temperate thickets and scrub
- LAV-01A - *Cistion laurifolii* Rivas Goday in Rivas Goday et al. 1956
 * F6.1 - Western garrigues
 * F6.6 - Supra-Mediterranean garrigues
- LAV-01B - *Staehelino-Ulicion baetici* Rivas Goday et Rivas-Mart. 1969
 * F5.5 - Thermo-Mediterranean scrub
 * F6.1 - Western garrigues
 * F6.6 - Supra-Mediterranean garrigues
- LAV-01C - *Ulici argentei-Cistion ladaniferi* Br.-Bl. et al. 1965
 * F5.5 - Thermo-Mediterranean scrub
 * F6.1 - Western garrigues
- LAV-01D - *Quercion fruticosae* Rothmaler 1954
 * B1.6 - Coastal dune scrub
 * F5.2 - Maquis
 * F5.5 - Thermo-Mediterranean scrub
- LAV-01E - *Cistion ladaniferi* Br.-Bl. ex A. Bolós et O. Bolós in A. Bolós 1950
 * F5.5 - Thermo-Mediterranean scrub
 * F6.1 - Western garrigues
- LAV-01F - *Calicotomo villosae-Genistion tyrrhenae* Biondi 2000
 * F5.5 - Thermo-Mediterranean scrub
 * F6.1 - Western garrigues
- LAV-01G - *Teucrium mari* (Gamisans et Muracciole 1984) Biondi et Mossa 1992
 * F5.5 - Thermo-Mediterranean scrub
 * F6.1 - Western garrigues
- LAV-01H - *Armerio sardoae-Genistion salzmännii* Arrigoni 1986
 * F6.1 - Western garrigues
 * F6.6 - Supra-Mediterranean garrigues
- LAV-02A - *Coremation albi* Rothmaler 1943
 * F5.5 - Thermo-Mediterranean scrub
 * F6.1 - Western garrigues
- MIC-01A - *Cisto cretici-Ericion manipuliflorae* Horvatic 1958
 * F5.5 - Thermo-Mediterranean scrub
 * F6.3 - Illyrian garrigues
- MIC-01B - *Cisto eriocephali-Ericion multiflorae* Biondi 2000
 * F5.5 - Thermo-Mediterranean scrub
 * F6.3 - Illyrian garrigues
- MIC-02A - *Hyperico olympici-Cistion cretici* (Oberd. 1954) R.Jahn et Bergmeier in Mucina et al. 2009
 * F5.5 - Thermo-Mediterranean scrub
 * F6.2 - Eastern garrigues

- MIC-02B - *Helichryso barrelieri*-*Phagnalion graeci* (Barbéro et Quézel 1989)
R. Jahn in Mucina et al. 2009
* F5.5 - Thermo-Mediterranean scrub
* F6.2 - Eastern garrigues
- MIC-02C - *Hyperico empetrifolii*-*Micromerion graecae* Barbero et Quézel 1989
* F5.5 - Thermo-Mediterranean scrub
* F6.2 - Eastern garrigues
- MIC-02D - *Helichryso sanguinei*-*Origanion syriaci* Barbero et Quézel 1989
* F5.5 - Thermo-Mediterranean scrub
* F6.2 - Eastern garrigues
- MIC-02E - *Micromerion* Oberd. 1954
* F5.5 - Thermo-Mediterranean scrub
* F6.2 - Eastern garrigues
* F7.3 - East Mediterranean phrygana
- MIC-02F - *Sarcopoterio spinosi*-*Genistion fasselatae* Costa et al. 1984
* F5.5 - Thermo-Mediterranean scrub
* F6.2 - Eastern garrigues
* F7.3 - East Mediterranean phrygana
- QUI-01A - *Oleo-Ceratonion siliquae* Br.-Bl. ex Guinochet et Drouineau 1944
* B1.6 - Coastal dune scrub
* F5.2 - Maquis
* F5.4 - [*Spartium junceum*] fields
* F5.5 - Thermo-Mediterranean scrub
- QUI-01B - *Ericion arboreae* (Rivas-Mart. ex Rivas-Mart. et al. 1986) Rivas-Mart. 1987
* F4.2 - Dry heaths
* F5.2 - Maquis
- QUI-01C - *Juniperion turbinatae* Rivas-Mart. 1975 corr. 1987
* B1.6 - Coastal dune scrub
* F5.5 - Thermo-Mediterranean scrub
- QUI-01D - *Asparago albi*-*Rhamnion oleoidis* Rivas Goday ex Rivas-Mart. 1975
* F5.2 - Maquis
* F5.5 - Thermo-Mediterranean scrub
- QUI-01E - *Rhamno lycioidis*-*Quercion cocciferae* Rivas Goday ex Rivas-Mart. 1975
* F5.2 - Maquis
- QUI-01F - *Periplocion angustifoliae* Rivas-Mart. 1975
* F5.2 - Maquis
* F5.5 - Thermo-Mediterranean scrub
- QUI-01G - *Juniperon phoeniceae*-*Pinon acutisquamae* A.V. Pérez et Cabezudo in A.V. Pérez et al. 1988 corr. Rivas-Mart. et al. 2002 nom. invers. propos.
* F5.5 - Thermo-Mediterranean scrub
- QUI-01H - *Rubo longifoliae*-*Coremation albi* Rivas-Mart. in Rivas-Mart. et al. 1980
* B1.6 - Coastal dune scrub

- * F5.2 - Maquis
- * F5.5 - Thermo-Mediterranean scrub
- QUI-01I - *Asparago orientalis*-*Juniperion macrocarpae* (Díez-Garretas et Asensi 2013) *Mucina* stat. nov. hoc loco
 - * F5.2 - Maquis
- QUI-01J - *Rhamno graeci*-*Juniperion lyciae* Costa et al. 1984
 - * B1.6 - Coastal dune scrub
 - * F5.2 - Maquis
 - * F5.5 - Thermo-Mediterranean scrub
- QUI-01K - *Pistacio terebinthi*-*Rhamnion alaterni* Barbero et Quézel ex Quézel et al. 1992
 - * F5.2 - Maquis
- QUI-02B - *Ceratonio*-*Pistacion lentisci* Zohary ex Zohary et Orshan 1959
 - * F5.2 - Maquis
 - * F5.5 - Thermo-Mediterranean scrub
- PEG-01A - *Salsolo vermiculatae*-*Peganion harmalae* Br.-Bl. et O. de Bolòs 1954
 - * F6.8 - Xero-halophile scrubs
- PEG-01B - *Haloxylon tamariscifolii*-*Atriplicion glaucae* Rivas Goday et Rivas-Mart. ex Rigual 1972
 - * F6.8 - Xero-halophile scrubs
- PEG-01C - *Salsolo oppositifoliae*-*Suaedion fruticosae* Rigual 1972
 - * F6.8 - Xero-halophile scrubs
- PEG-01D - *Lycio europaei*-*Ipomoeion purpureae* O. de Bolòs ex *Mucina* all. nov. hoc loco
 - * F6.8 - Xero-halophile scrubs
- PEG-01E - *Artemision arborescentis* Géhu et Biondi 1986
 - * F6.8 - Xero-halophile scrubs
- PEG-01F - *Atriplici halimi*-*Suaedion verae* Géhu et al. ex Bergmeier et Dimopoulos 2003
 - * F6.8 - Xero-halophile scrubs
- PEG-01G - *Medicagini citrinae*-*Lavaterion arboreae* O. de Bolòs et Vigo in O. de Bolòs et al. 1984
 - * F6.8 - Xero-halophile scrubs
- PEG-02A - *Artemisio glutinosae*-*Santolinion rosmarinifoliae* Costa 1975
 - * F6.8 - Xero-halophile scrubs
- PEG-02B - *Santolinion pectinato-canescens* Peinado et Martínez-Parras 1984
 - * F6.8 - Xero-halophile scrubs
- PEG-03A - *Chenoleion tomentosae* Sunding 1972
 - * F6.8 - Xero-halophile scrubs
 - * F8.1 - Canary Island xerophytic scrub
- PEG-04A - *Artemisio thusculae*-*Rumicion lunariae* Rivas-Mart. et al. 1993
 - * F6.8 - Xero-halophile scrubs
 - * F8.1 - Canary Island xerophytic scrub
- PEG-04B - *Launaeo arborescentis*-*Schizogynion sericeae* Rivas-Mart. et al. 1993
 - * F6.8 - Xero-halophile scrubs
 - * F8.1 - Canary Island xerophytic scrub

- PEG-04C - *Argyranthemum succulentum*-*Calendula maderensis* Capelo et al. 2000
 * F6.8 - Xero-halophile scrubs
 * F8.2 - Madeiran xerophytic scrub
- PEG-04D - *Nicotiana glauca*-*Ricinus communis* Rivas-Mart., Fernández-González et Loidi 1999
 * F6.8 - Xero-halophile scrubs
 * F8.1 - Canary Island xerophytic scrub
- ONO-01E - *Echinops partitum* horridi Rivas-Mart. et al. 1991
 * F6.6 - Supra-Mediterranean garrigues
 * F7.4 - Hedgehog-heaths
- ONO-01F - *Genista occidentalis* Rivas-Mart. in Rivas-Mart. et al. 1984
 * F6.6 - Supra-Mediterranean garrigues
- ONO-01G - *Lavandula angustifolia*-*Genista cinerea* Barbero et al. 1972
 * F6.6 - Supra-Mediterranean garrigues
- ONO-02D - *Sesuvium portulacastrum*-*Festuca hyemalis* Rivas-Mart. in Rivas-Mart. et al. 2011
 * F6.6 - Supra-Mediterranean garrigues
- GEN-01A - *Anthyllus hermanniae* Klein 1972
 * F7.4 - Hedgehog-heaths
- RUM-01A - *Rumex crispus*-*Astragalus siculus* Poli 1965
 * F7.4 - Hedgehog-heaths
- RUM-02A - *Cerastium triviale*-*Astragalus nebrodensis* Pignatti et Nimis ex S. Brullo 1984
 * F7.4 - Hedgehog-heaths
- RUM-02B - *Armeria nebrodensis* S. Brullo 1984
 * F7.4 - Hedgehog-heaths
- RUM-03A - *Armeria aspermontana* S. Brullo et al. 2001
 * F7.4 - Hedgehog-heaths
- RUM-03B - *Koeleria cristata*-*Astragalus calabricus* Giacomini et Gentile ex S. Brullo in S. Brullo et al. 2005
 * F7.4 - Hedgehog-heaths
- DAP-01A - *Astragalus angustifolius*-*Sesleria coerulantis* Quézel 1964
 * F7.4 - Hedgehog-heaths
- DAP-01B - *Eryngium multifidum*-*Bromus fibrosus* Quézel 1964
 * F7.4 - Hedgehog-heaths
- DAP-01C - *Stipa pulcherrima*-*Morina persica* Quézel 1964
 * F7.4 - Hedgehog-heaths
- DAP-02A - *Astragalus creticus* Bergmeier 2002
 * F7.4 - Hedgehog-heaths
- DAP-02B - *Verbascum spinosum* Zaffran ex Bergmeier 2002
 * F7.4 - Hedgehog-heaths
- DAP-02C - *Colchicum creticum*-*Cirsium morinifolium* Bergmeier 2002
 * F7.4 - Hedgehog-heaths
- CYP-01A - *Hypericum stenobotrys*-*Alysson troodi* S. Brullo et al. 2005
 * F6.6 - Supra-Mediterranean garrigues
 * F7.4 - Hedgehog-heaths
- LER-01A - *Artemisia lercianae* Golub 1994

- * F6.8 - Xero-halophile scrubs
- LER-02A - Euphorbion seguieranae Golub 1994
- * F6.8 - Xero-halophile scrubs
- PUR-01A - Salicion phylicifoliae Dierßen 1992
- * F9.1 - Riverine scrub
- PUR-01B - Salicion eleagno-daphnoidis (Moor 1958) Grass 1993
- * F9.1 - Riverine scrub
- PUR-01D - Salicion triandrae T. Müller et Görs 1958
- * F9.1 - Riverine scrub
- PUR-01E - Rubo caesii-Amorphion fruticosae Shevchyk et Solomakha in Shevchyk et al. 1996
- * F9.1 - Riverine scrub
- PUR-01F - Artemisio dniproicae-Salicion acutifoliae Shevchyk et Solomakha in Shevchyk et al. 1996
- * F9.1 - Riverine scrub
- PUR-01G - Salicion salvifoliae Rivas-Mart. et al. 1984
- * F9.1 - Riverine scrub
- PUR-01H - Salicion discolori-neotrichae Br.-Bl. et O. de Bolòs 1958 corr. Rivas-Mart. et al. 2002
- * F9.1 - Riverine scrub
- PUR-01I - Salicion pedicellatae Rivas-Mart. et al. 1984
- * F9.1 - Riverine scrub
- PUR-01J - Salicion cantabricae Rivas-Mart., T.E. Díaz et Penas in Rivas-Mart. et al. 2011
- * F9.1 - Riverine scrub
- PUR-02A - Tamaricion parviflorae I. Kárpáti et V. Kárpáti 1961
- * F9.3 - Southern riparian galleries and thickets
- PUR-02B - Artemisio scopariae-Tamaricion ramosissimae Simon et Dihoru 1963
- * F9.3 - Southern riparian galleries and thickets
- CIN-01A - Salicion cinereae T. Müller et Görs ex Passarge 1961
- * F9.2 - [Salix] carr and fen scrub
- NER-01A - Tamaricion africanae Br.-Bl. et O. de Bolòs 1958
- * F9.3 - Southern riparian galleries and thickets
- NER-01B - Tamaricion boveano-canariensis Izco et al. 1984
- * F9.3 - Southern riparian galleries and thickets
- NER-01C - Rubo ulmifolii-Nerion oleandri O. de Bolòs 1958
- * F9.3 - Southern riparian galleries and thickets
- NER-01D - Securinegion buxifoliae Rivas Goday ex Lopez Saenz et Velasco 1995
- * F9.3 - Southern riparian galleries and thickets
- NER-01E - Tamaricion dalmatica Jasprica in Mucina et al. 2013
- * F9.3 - Southern riparian galleries and thickets
- NER-01F - Rubo sancti-Nerion oleandri Brullo et al. 2004
- * F9.3 - Southern riparian galleries and thickets
- TAM-01A - Agropyro fragilis-Tamaricion ramosissimae Golub in Barmin 2001
- * F9.3 - Southern riparian galleries and thickets
- MOQ-01A - Traganion moquinii Sunding 1972

- * B1.6 - Coastal dune scrub
- AEO-01A - *Soncho acaulis*-*Sempervivion* Sunding 1972
 - * F8.1 - Canary Island xerophytic scrub
- AEO-01B - *Greenovion aureae* Rivas-Mart. et al. 1993
 - * F8.1 - Canary Island xerophytic scrub
- AEO-01C - *Sinapidendro angustifolii*-*Aeonion glutinosi* Capelo et al. 2000
 - * F8.2 - Madeiran xerophytic scrub
- AEO-02A - *Aichryso laxi*-*Monanthion laxiflorae* Santos et Reyes Betancort 2009
 - * F8.1 - Canary Island xerophytic scrub
- KLE-01A - *Aeonio-Euphorbion canariensis* Sunding 1972
 - * F8.1 - Canary Island xerophytic scrub
 - * F8.2 - Madeiran xerophytic scrub
- KLE-01B - *Euphorbion regijsjubo-lamarckii* Rivas-Mart., Wildpret, O. Rodríguez et Del Arco in Rivas-Mart. et al. 2011
 - * F8.1 - Canary Island xerophytic scrub
- OLE-01B - *Retamion rhodorrhizoidis* Del Arco et al. 2009
 - * F8.1 - Canary Island xerophytic scrub
- OLE-01D - *Oleo maderensis*-*Maytenion umbellatae* Capelo et al. 2000
 - * F8.2 - Madeiran xerophytic scrub
- OLE-02A - *Cisto canariensis*-*Micromerion hyssopifoliae* Pérez de Paz et al. 1990 corr. Rivas-Mart. in Rivas-Mart. 2011
 - * F8.1 - Canary Island xerophytic scrub
- OLE-02B - *Soncho ustulati*-*Artemision argenteae* Capelo et al. 2000
 - * F8.2 - Madeiran xerophytic scrub
- LAU-01A - *Myrico fayae*-*Ericion arboreae* Oberd. 1965
 - * F4.3 - Macaronesian heaths
- SUP-01A - *Spartocytision nubigeni* Oberd. ex Esteve 1973
 - * F8.1 - Canary Island xerophytic scrub
- SUP-01B - *Plantaginion webbii* Martín Osorio, Wildpret et Rivas-Mart. In Martín Osorio et al. 2007
 - * F8.1 - Canary Island xerophytic scrub
- VIO-01A - *Violion cheiranthifoliae* Voggenreiter ex Martín Osorio, Wildpret et Rivas-Mart. in Martín Osorio et al. 2007
 - * F8.1 - Canary Island xerophytic scrub

Appendix D: Fact sheets EUNIS heathland, scrub and tundra habitat types

- B1.5 Coastal dune heaths
- B1.6 Coastal dune scrub
- B2.5 Shingle and gravel beaches with scrub
- F1.1 Shrub tundra
- F1.2 Moss and lichen tundra
- F2.1 Subarctic and alpine dwarf willow scrub
- F2.2 Evergreen alpine and subalpine heath and scrub
- F2.3 Subalpine deciduous scrub
- F2.4 Conifer scrub close to the tree limit
- F3.1 Temperate thickets and scrub
- F3.2 Submediterranean deciduous thickets and brushes
- F4.1 Wet heaths
- F4.2 Dry heaths
- F4.3 Macaronesian heaths
- F5.1 Arborescent matorral
- F5.2 Maquis
- F5.3 Pseudomaquis
- F5.4 [*Spartium junceum*] fields
- F5.5 Thermo-Mediterranean scrub
- F6.1 Western garrigues
- F6.2 Eastern garrigues
- F6.3 Illyrian garrigues
- F6.4 Black Sea garrigues
- F6.5 Macaronesian garrigues
- F6.6 Supra-Mediterranean garrigues
- F6.7 Mediterranean gypsum scrubs
- F6.8 Xero-halophile scrubs
- F7.1 West Mediterranean spiny heaths
- F7.2 Central Mediterranean spiny heaths
- F7.3 East Mediterranean phrygana
- F7.4 Hedgehog-heaths
- F8.1 Canary Island xerophytic scrub
- F8.2 Madeiran xerophytic scrub
- F9.1 Riverine scrub
- F9.2 [*Salix*] carr and fen scrub
- F9.3 Southern riparian galleries and thickets

Not covered by in situ vegetation data are B2.5 'Shingle and gravel beaches with scrub', F1 'Arborescent matorral', F6.4 Black Sea garrigues, F6.5 'Macaronesian garrigues', and F7.2 'Central Mediterranean spiny heaths'.

In the tables of the floristic composition of the individual EUNIS types, all species with a frequency $\geq 10\%$ are mentioned. The full species lists will be provided electronically.

B1.5 - Coastal dune heaths

Origin of data (countries): DE, ES, FI, FR, NL, UK

List of alliances: ULI-01A - *Ericion cinereae*, ULI-01B - *Ulicion minoris*, ULI-01D - *Ericion umbellatae*, ULI-02B - *Genistion pilosae*, ULI-02C - *Empetrion nigri*

Additional selection rules: n/a

Implications for EUNIS classification: proposed division: B1.5a Atlantic and Baltic coastal *Empetrum* heaths, B1.5b Atlantic coastal *Calluna* and *Ulex* heaths

Floristic composition:

Calluna vulgaris	64	Potentilla erecta	15
Dicranum scoparium	34	Cladonia portentosa	15
Carex arenaria	31	Calamagrostis epigejos	14
Empetrum nigrum	26	Molinia caerulea	12
Hypnum jutlandicum	24	Hypogymnia physodes	11
Salix repens	22	Agrostis curtisii	11
Erica australis	21	Cistus salvifolius	11
Erica tetralix	20	Festuca ovina	10
Erica cinerea	19	Carex trinervis	10
Erica umbellata	17	Lotus corniculatus	10
Chamaespartium tridentatum	16	Holcus lanatus	10
Pleurozium schreberi	15	Hieracium umbellatum	10
Deschampsia flexuosa	15		

B1.6 - Coastal dune scrub

Origin of data (countries): BE, DE, ES, FR, GR, HR, IT, ME, NL, PL, PT, SI, UK

List of alliances: LAV-01D - Quercion fruticosae, MOQ-01A - Traganion moquinii, QUI-01A - Oleo-Ceratonion siliquae, QUI-01C - Juniperion turbinatae, QUI-01H - Rubo longifoliae-Coremation albi, RHA-02A - Berberidion vulgaris, RHA-02C - Carpino-Prunion spinosae, RHA-02D - Pruno spinosae-Rubion radulae, RHA-03A - Salicion arenariae, RHA-03C - Holoschoeno australis-Salicion arenariae

Additional selection rules: n/a

Implications for EUNIS classification: proposed division: B1.6a Atlantic and Baltic coastal dune scrub, B1.6b Mediterranean and Black Sea coastal dune scrub

Floristic composition:

Crataegus monogyna	43	Moehringia trinervia	16
Urtica dioica	34	Poa pratensis	16
Rubus ulmifolius	30	Galium aparine	16
Rubus caesius	30	Carex arenaria	15
Ligustrum vulgare	28	Smilax aspera	13
Rosa canina	24	Euonymus europaeus	13
Calamagrostis epigejos	22	Senecio jacobaea	13
Prunus spinosa	20	Quercus robur	12
Sambucus nigra	20	Holcus lanatus	11
Brachythecium rutabulum	19	Solanum dulcamara	11
Rubia peregrina	17	Clematis vitalba	11
Pistacia lentiscus	17	Asparagus acutifolius	11
Bryonia cretica subsp. dioica	17	Kindbergia praelonga	10
Lonicera periclymenum	17	Plagiomnium affine	10
Cynoglossum officinale	16	Glechoma hederacea	10
Hippophae rhamnoides	16	Cornus sanguinea	10

B2.5 - Shingle and gravel beaches with scrub

Origin of data (countries): n/a

List of alliances: n/a

Additional selection rules: n/a

Implications for EUNIS classification: should be merged with other habitat types on shingle and gravel beaches

Floristic composition:

No data

F1.1 - Shrub tundra

Origin of data (countries): FI, NO, UK

List of alliances: LOI-01A - Loiseleurio-Arctostaphylion, LOI-01B - Phyllodoco-Vaccinion myrtilli

Additional selection rules: n/a

Implications for EUNIS classification: n/a

Floristic composition:

Vaccinium myrtillus	81	Hypnum jutlandicum	22
Deschampsia flexuosa	77	Cladonia rangiferina	21
Empetrum nigrum	64	Alchemilla alpina	17
Pleurozium schreberi	57	Erica cinerea	17
Cladonia uncialis	53	Agrostis capillaris	17
Vaccinium vitis-idaea	53	Polytrichum commune	16
Dicranum scoparium	52	Arctostaphylos uva-ursi	16
Racomitrium lanuginosum	52	Agrostis canina	15
Cladonia arbuscula	52	Dicranum fuscescens	15
Calluna vulgaris	47	Cladonia coccifera	14
Carex bigelowii	46	Polytrichastrum alpinum	14
Galium saxatile	46	Trichophorum cespitosum	14
Hylocomium splendens	36	Sphaerophorus globosus	13
Cetraria islandica	36	Anthoxanthum odoratum	12
Rhytidiadelphus loreus	36	Blechnum spicant	12
Potentilla erecta	35	Diplophyllum albicans	12
Festuca ovina	34	Rhytidiadelphus squarrosus	11
Nardus stricta	28	Ochrolechia frigida	11
Ptilidium ciliare	28	Juncus squarrosus	11
Hypnum cupressiforme	27	Barbilophozia floerkei	11
Cladonia gracilis	26	Alectoria nigricans	11
Huperzia selago	25	Diphasiastrum alpinum	10
Carex pilulifera	24	Vaccinium uliginosum	10
Festuca vivipara	22	Cladonia pyxidata	10
Cetraria aculeata	22		

F1.2 - Moss and lichen tundra

Origin of data (countries): FI, NO, UK

List of alliances: LOI-01A - Loiseleurio-Arctostaphylion

Additional selection rules: n/a

Implications for EUNIS classification: n/a

Floristic composition:

Deschampsia flexuosa	56	Cetraria aculeata	19
Cladonia uncialis	52	Festuca vivipara	19
Vaccinium myrtillus	51	Ptilidium ciliare	19
Racomitrium lanuginosum	50	Cladonia coccifera	18
Calluna vulgaris	50	Nardus stricta	18
Carex bigelowii	42	Ochrolechia frigida	17
Vaccinium vitis-idaea	42	Cassiope tetragona	17
Pleurozium schreberi	39	Cladonia rangiferina	15
Dicranum scoparium	38	Arctostaphylos alpinus	15
Cladonia arbuscula	37	Polytrichastrum alpinum	14
Empetrum nigrum	37	Agrostis canina	14
Cetraria islandica	34	Antennaria dioica	14
Potentilla erecta	32	Diplophyllum albicans	14
Huperzia selago	31	Salix herbacea	14
Hylocomium splendens	30	Polygonum viviparum	13
Festuca ovina	27	Vaccinium uliginosum	13
Arctostaphylos uva-ursi	26	Solidago virgaurea	12
Erica cinerea	26	Agrostis capillaris	12
Rhytidiadelphus loreus	25	Phyllodoce caerulea	12
Carex pilulifera	24	Alectoria nigricans	11
Cladonia gracilis	24	Hypogymnia physodes	11
Hypnum jutlandicum	23	Cladonia pyxidata	11
Hypnum cupressiforme	22	Diphasiastrum alpinum	11
Galium saxatile	21	Alchemilla alpina	11
Sphaerophorus globosus	20	Cladonia mitis	10
Trichophorum cespitosum	19		

F2.1 - Subarctic and alpine dwarf willow scrub

Origin of data (countries): AD, AT, CH, CZ, ES, FI, FR, IT, NO, PL, SI, SK, UK

List of alliances: HER-01A - Salicion herbaceae

Additional selection rules: Instead of the relevés belonging to the listed alliances, relevés with *Salix herbacea*, *S. polaris*, *S. reticulata* or *S. retusa*, with cover values higher than 25% have been selected

Implications for EUNIS classification: n/a

Floristic composition:

<i>Salix herbacea</i>	60	<i>Carex nigra</i>	14
<i>Polygonum viviparum</i>	54	<i>Carex sempervirens</i>	14
<i>Poa alpina</i>	43	<i>Doronicum clusii</i>	13
<i>Salix retusa</i>	39	<i>Saxifraga androsacea</i>	12
<i>Gnaphalium supinum</i>	32	<i>Euphrasia minima</i>	12
<i>Luzula alpinopilosa</i>	29	<i>Polytrichastrum alpinum</i>	12
<i>Bartsia alpina</i>	25	<i>Campanula scheuchzeri</i>	12
<i>Leucanthemopsis alpina</i>	23	<i>Saxifraga exarata</i>	12
<i>Cetraria islandica</i>	23	<i>Sedum alpestre</i>	12
<i>Salix reticulata</i>	22	<i>Huperzia selago</i>	11
<i>Oreochloa disticha</i>	21	<i>Anthoxanthum odoratum</i>	11
<i>Juncus trifidus</i>	20	<i>Soldanella carpatica</i>	11
<i>Silene acaulis</i>	20	<i>Gentiana verna</i>	11
<i>Sibbaldia procumbens</i>	19	<i>Vaccinium vitis-idaea</i>	11
<i>Ligusticum mutellina</i>	19	<i>Hieracium alpinum</i>	11
<i>Veronica alpina</i>	19	<i>Cerastium cerastoides</i>	10
<i>Agrostis rupestris</i>	19	<i>Pritzelago alpina</i>	10
<i>Primula minima</i>	18	<i>Carex curvula</i>	10
<i>Campanula alpina</i>	18	<i>Dryas octopetala</i>	10
<i>Homogyne alpina</i>	18	<i>Festuca violacea</i>	10
<i>Myosotis alpestris</i>	17	<i>Leontodon pyrenaicus</i>	10
<i>Geum montanum</i>	16	<i>Plantago alpina</i>	10
<i>Minuartia sedoides</i>	15	<i>Pedicularis verticillata</i>	10
<i>Ranunculus alpestris</i>	14	<i>Saxifraga oppositifolia</i>	10
<i>Soldanella alpina</i>	14	<i>Selaginella selaginoides</i>	10
<i>Festuca airoides</i>	14	<i>Avenula versicolor</i>	10

F2.2 - Evergreen alpine and subalpine heath and scrub

Origin of data (countries): AT, CZ, DE, ES, GR, HR, IT, PL, RU, SI, SK, UK

List of alliances: KOB-01A - Kobresio-Dryadion, LOI-01A - Loiseleurio-Arctostaphylion, LOI-01B - Phyllodoco-Vaccinion myrtilli, LOI-01C - Loiseleurio-Vaccinion, LOI-01D - Rhododendro ferrugineae-Vaccinion, LOI-01E - Juniperion nanae, LOI-01G - Rhododendron caucasicum, RHO-01A - Ericion carneae, RHO-01C - Daphno-Genistion radiatae, SAB-03A - Cytision oromediterranei, SAB-03B - Genisto versicoloris-Juniperion hemisphaericae, SAB-03C - Pruno prostratae-Juniperion sabinae, ULI-02A - Genisto-Vaccinion

Additional selection rules: n/a

Implications for EUNIS classification: proposed division: F2.2a Alpine and subalpine ericoid heaths, F2.2b Alpine and subalpine *Juniperus* scrub, F2.2c Alpine and subalpine genistoid scrub

Floristic composition:

Vaccinium myrtillus	62	Juncus trifidus	18
Deschampsia flexuosa	57	Anthoxanthum odoratum	17
Calluna vulgaris	39	Potentilla erecta	16
Vaccinium vitis-idaea	39	Rhododendron ferrugineum	16
Cetraria islandica	32	Loiseleuria procumbens	16
Juniperus communis	27	Cladonia rangiferina	16
Empetrum nigrum	26	Cladonia uncialis	14
Pleurozium schreberi	25	Huperzia selago	14
Homogyne alpina	23	Solidago virgaurea	14
Dicranum scoparium	22	Racomitrium lanuginosum	13
Cladonia arbuscula	20	Avenula versicolor	11
Hylocomium splendens	19	Hieracium alpinum	11
Vaccinium uliginosum	19	Galium saxatile	10
Nardus stricta	19	Arctostaphylos uva-ursi	10

F2.3 - Subalpine deciduous scrub

Origin of data (countries): AT, CH, CZ, ES, FR, PL, SI, SK

List of alliances: VIR-01A - Alnion viridis, VIR-01B - Salicion pentandrae, VIR-01C - Salicion helveticae, VIR-01D - Salicion silesiaca

Additional selection rules: n/a

Implications for EUNIS classification: n/a

Floristic composition:

Alnus viridis	54	Primula elatior subsp. elatior	17
Viola biflora	54	Urtica dioica	17
Geranium sylvaticum	49	Thalictrum aquilegiifolium	17
Senecio nemorensis	47	Aconitum lycoctonum	16
Vaccinium myrtillus	46	Campanula scheuchzeri	16
Adenostyles alliariae	42	Daphne mezereum	15
Hypericum maculatum	41	Ranunculus serpens subsp. nemorosus	15
Saxifraga rotundifolia	40	Heracleum sphondylium	15
Solidago virgaurea	37	Rosa pendulina	15
Sorbus aucuparia	36	Calamagrostis arundinacea	15
Rumex alpestris	35	Gentiana asclepiadea	15
Rubus idaeus	35	Fragaria vesca	15
Luzula sylvatica	34	Rhododendron ferrugineum	14
Calamagrostis villosa	34	Polystichum lonchitis	14
Chaerophyllum hirsutum	33	Rhododendron hirsutum	14
Veratrum album	33	Crepis paludosa	14
Picea abies	32	Lilium martagon	13
Deschampsia cespitosa	32	Phyteuma spicatum	13
Stellaria nemorum subsp. nemorum	29	Carex ferruginea	13
Dryopteris dilatata	29	Tussilago farfara	13
Athyrium distentifolium	29	Soldanella alpina	13
Homogyne alpina	29	Rubus saxatilis	12
Oxalis acetosella	28	Epilobium alpestre	12
Peucedanum ostruthium	26	Veratrum lobelianum	12
Dryopteris filix-mas	25	Doronicum austriacum	12
Salix appendiculata	24	Achillea millefolium	12
Athyrium filix-femina	23	Potentilla erecta	12
Valeriana tripteris	22	Larix decidua	12
Salix silesiaca	22	Aster bellidiastrum	11
Alchemilla vulgaris	21	Aposeris foetida	11
Polygonatum verticillatum	20	Hylocomium splendens	11
Paris quadrifolia	20	Lamiastrum galeobdolon	11
Poa alpina	20	Astrantia major	11
Deschampsia flexuosa	20	Potentilla aurea	11

Geum rivale	20	Vaccinium vitis-idaea	10
Aconitum napellus	19	Cirsium erisithales	10
Epilobium montanum	18	Salix hastata	10
Silene vulgaris	18	Petasites albus	10
Poa nemoralis	18	Rhizomnium punctatum	10
Luzula luzuloides	18	Silene dioica	10
Myosotis sylvatica	18	Polytrichastrum formosum	10
Cicerbita alpina	17	Cardamine amara	10
Knautia maxima	17	Hieracium murorum	10
Acer pseudoplatanus	17		

F2.4 - Conifer scrub close to the tree limit

Origin of data (countries): AT, CZ, DE, HR, IT, PL, SK, UA

List of alliances: n/a

Additional selection rules: Only relevés with *Pinus mugo* cover $\geq 25\%$ have been selected

Implications for EUNIS classification: proposed new name: F2.4 Subalpine *Pinus mugo* scrub

Floristic composition:

<i>Pinus mugo</i>	99	<i>Rubus idaeus</i>	17
<i>Vaccinium myrtillus</i>	88	<i>Athyrium distentifolium</i>	17
<i>Vaccinium vitis-idaea</i>	68	<i>Polygonatum verticillatum</i>	17
<i>Homogyne alpina</i>	61	<i>Tortella tortuosa</i>	16
<i>Dicranum scoparium</i>	56	<i>Lycopodium annotinum</i>	16
<i>Deschampsia flexuosa</i>	49	<i>Daphne mezereum</i>	16
<i>Hylocomium splendens</i>	45	<i>Polytrichastrum formosum</i>	16
<i>Sorbus aucuparia</i>	42	<i>Carduus defloratus</i>	16
<i>Picea abies</i>	42	<i>Potentilla erecta</i>	14
<i>Calamagrostis villosa</i>	41	<i>Phyteuma orbiculare</i>	14
<i>Pleurozium schreberi</i>	37	<i>Huperzia selago</i>	14
<i>Rhododendron hirsutum</i>	34	<i>Rhododendron ferrugineum</i>	13
<i>Erica herbacea</i>	33	<i>Adenostyles alliariae</i>	13
<i>Oxalis acetosella</i>	31	<i>Carex ferruginea</i>	13
<i>Solidago virgaurea</i>	26	<i>Hypericum maculatum</i>	13
<i>Viola biflora</i>	25	<i>Salix appendiculata</i>	13
<i>Sorbus chamaemespilus</i>	25	<i>Soldanella alpina</i>	12
<i>Sesleria albicans</i>	25	<i>Ranunculus montanus</i>	12
<i>Luzula sylvatica</i>	25	<i>Larix decidua</i>	12
<i>Geranium sylvaticum</i>	25	<i>Veratrum album</i>	12
<i>Campanula scheuchzeri</i>	24	<i>Asplenium viride</i>	12
<i>Calamagrostis varia</i>	24	<i>Veratrum lobelianum</i>	12
<i>Rhytiadelphus triquetrus</i>	23	<i>Gentiana asclepiadea</i>	12
<i>Dryopteris dilatata</i>	23	<i>Saxifraga rotundifolia</i>	11
<i>Rubus saxatilis</i>	22	<i>Carex sempervirens</i>	11
<i>Cetraria islandica</i>	22	<i>Dryopteris carthusiana</i>	10
<i>Valeriana tripteris</i>	21	<i>Ctenidium molluscum</i>	10
<i>Valeriana montana</i>	21	<i>Polygala chamaebuxus</i>	10
<i>Hieracium murorum</i>	20	<i>Luzula luzuloides</i>	10
<i>Rosa pendulina</i>	20	<i>Acer pseudoplatanus</i>	10
<i>Juniperus communis</i>	19	<i>Prenanthes purpurea</i>	10
<i>Aster bellidiastrum</i>	18	<i>Calluna vulgaris</i>	10
<i>Galium anisophyllum</i>	18		

F3.1 - Temperate thickets and scrub

Origin of data (countries): AT, BE, CZ, DE, ES, FR, GR, HR, HU, IT, NL, PL, PT, RU, SI, SK, UA, UK

List of alliances: CYT-01A - Cytision oromediterraneo-scoparii, CYT-03A - Sarothamnion scoparii, LON-01A - Lonicero-Rubion silvatici, LON-03A - Vaccinio-Juniperion communis, RHA-01A - Aegopodio podagrariae-Sambucion nigrae, RHA-02A - Berberidion vulgaris, RHA-02C - Carpino-Prunion spinosae, RHA-02D - Pruno spinosae-Rubion radulae, RHA-02E - Frangulo alni-Pyrion cordatae, RHA-02F - Tamo communis-Viburnion lantanae, RHA-02Q - Prunion fruticosae, RHA-02R - Lamio purpureae-Acerion tatarici, RHA-03A - Salicion arenariae, RHA-03C - Holoschoeno australis-Salicion arenariae, RHA-04A - Sambuco racemosae-Salicion capreae, RHA-04C - Astrantio-Corylion avellanae

Additional selection rules: n/a

Implications for EUNIS classification: should be merged with F3.2 (Submediterranean deciduous thickets and brushes) and then divided in: F3.1-2a Lowland to montane temperate and submediterranean *Juniperus* scrub, F3.1-2b Temperate bramble scrub, F3.1-2c Lowland to montane temperate and submediterranean genistoid scrub, F3.1-2d Temperate forest clearing scrub, F3.1-2e Temperate and submediterranean thorn scrub, F3.1-2f Low steppe scrub

Floristic composition:

Crataegus monogyna	46	Corylus avellana	14
Urtica dioica	42	Moehringia trinervia	14
Rosa canina	32	Brachythecium rutabulum	14
Prunus spinosa	31	Clematis vitalba	13
Ligustrum vulgare	29	Lonicera periclymenum	13
Sambucus nigra	28	Bryonia cretica subsp. dioica	12
Rubus caesius	27	Rhamnus catharticus	12
Galium aparine	26	Geranium robertianum	11
Rubus ulmifolius	21	Agrostis capillaris	11
Cornus sanguinea	19	Fraxinus excelsior	11
Euonymus europaeus	17	Elymus repens	11
Calamagrostis epigejos	17	Carex arenaria	10
Quercus robur	16	Fragaria vesca	10
Geum urbanum	16	Hippophae rhamnoides	10
Dactylis glomerata	16	Holcus lanatus	10
Poa pratensis	15	Cynoglossum officinale	10
Glechoma hederacea	15		

F3.2 - Submediterranean deciduous thickets and brushes

Origin of data (countries): BA, ES, FR, GR, HR, IT, MK, RS, SI, SI

List of alliances: CYT-01B - Ulici europaei-Cytision striati, CYT-01C - Genistion floridae, CYT-01D - Cytision multiflori, CYT-01E - Retamion monospermae, CYT-01F - Retamion sphaerocarpace, CYT-01G - Adenocarpion decorticantis, CYT-02A - Telinion monspessulano-linifoliae, CYT-02B - Genisto spartioidis-Phlomidion almeriensis, CYT-02C - Genisto scorpii-Retamion sphaerocarpace, PUB-01A - Paliuro-Petterion, PUB-01B - Eryngio campestris-Paliurion spinae-christi, RHA-02A - Berberidion vulgaris, RHA-02B - Amelanchiero-Buxion, RHA-02H - Rubio periclymeni-Rubion ulmifolii, RHA-02K - Lonicero arboreae-Berberidion hispanicae, RHA-02L - Cytision sessilifolii, RHA-02O - Berberido creticae-Prunion cocomiliae

Additional selection rules: Data from countries PL, NL, BE, DE, UK have been excluded

Implications for EUNIS classification: should be merged with F3.1 (Temperate thickets and scrub) and then divided in: F3.1-2a Lowland to montane temperate and submediterranean *Juniperus* scrub, F3.1-2b Temperate bramble scrub, F3.1-2c Lowland to montane temperate and submediterranean genistoid scrub, F3.1-2d Temperate forest clearing scrub, F3.1-2e Temperate and submediterranean thorn scrub, F3.1-2f Low steppic scrub

Floristic composition:

Pteridium aquilinum	24	Rubus ulmifolius	14
Erica arborea	24	Rosa canina	12
Cytisus scoparius	23	Lavandula stoechas	12
Crataegus monogyna	20	Prunus spinosa	11
Dactylis glomerata	15	Cytisus multiflorus	10

F4.1 - Wet heaths

Origin of data (countries): CZ, DE, ES, FR, IE, NL, PL, UK

List of alliances: OXY-01A - Ericion tetralicis, OXY-01B - Oxycocco-Ericion tetralicis, ULI-01B - Ulicion minoris, ULI-01C - Daboecion cantabrigae, ULI-01D - Ericion umbellatae, ULI-01E - Genistion micrantho-anglicae, ULI-01F - Stauracanthion boivinii

Additional selection rules: n/a

Implications for EUNIS classification: proposed new name: Wet heaths

Floristic composition:

Calluna vulgaris	65	Narthecium ossifragum	13
Erica tetralix	48	Pteridium aquilinum	13
Molinia caerulea	40	Daboecia cantabriga	13
Potentilla erecta	32	Carex panicea	12
Eriophorum angustifolium	26	Juncus squarrosus	12
Erica cinerea	23	Vaccinium myrtillus	12
Drosera rotundifolia	19	Ulex gallii	12
Trichophorum cespitosum	19	Drosera intermedia	11
Agrostis curtisii	15	Rhynchospora alba	10
Erica vagans	15	Sphagnum papillosum	10
Eriophorum vaginatum	13		

F4.2 - Dry heaths

Origin of data (countries): AT, BE, CZ, DE, ES, FI, FR, HU, IT, NL, PL, SK, UK

List of alliances: QUI-01B - *Ericion arboreae*, ULI-01A - *Ericion cinereae*, ULI-01B - *Ulicion minoris*, ULI-01C - *Daboecion cantabricae*, ULI-01D - *Ericion umbellatae*, ULI-02A - *Genisto-Vaccinion*, ULI-02B - *Genistion pilosae*, ULI-02C - *Empetrion nigri*

Additional selection rules: n/a

Implications for EUNIS classification: proposed new name: Dry heaths

Floristic composition:

Calluna vulgaris	74	Empetrum nigrum	13
Dicranum scoparium	35	Pteridium aquilinum	13
Deschampsia flexuosa	33	Agrostis curtisii	12
Hypnum jutlandicum	26	Festuca ovina	12
Erica tetralix	24	Cladonia portentosa	12
Potentilla erecta	23	Pinus sylvestris	12
Molinia caerulea	22	Carex arenaria	12
Erica cinerea	22	Erica vagans	11
Pleurozium schreberi	18	Ulex gallii	11
Vaccinium myrtillus	16	Danthonia decumbens	11
Carex pilulifera	16	Daboecia cantabrica	11
Agrostis capillaris	13	Genista pilosa	10

F4.3 - Macaronesian heaths

Origin of data (countries): ES

List of alliances: LAU-01A - Myrica fayae-Ericion arboreae

Additional selection rules: n/a

Implications for EUNIS classification: proposed new name: Macaronesian heaths

Floristic composition:

Erica arborea	91	Rubus ulmifolius	28
Myrica faya	80	Picconia excelsa	21
Ilex canariensis	71	Davallia canariensis	20
Laurus azorica	63	Cedronella canariensis	18
Asplenium onopteris	52	Myosotis latifolia	18
Brachypodium sylvaticum	39	Phyllis nobla	16
Dryopteris oligodonta	38	Hypericum grandifolium	12
Pteridium aquilinum	38	Teline canariensis	12
Galium scabrum	36	Polystichum setiferum	11
Viburnum tinus	33	Pinus canariensis	10

F5.1 - Arborescent matorral

Origin of data (countries): n/a

List of alliances: n/a

Additional selection rules: n/a

Implications for EUNIS classification: should be merged with F5.2
(Maquis)

Floristic composition:
No data

F5.2 - Maquis

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

List of alliances: LAV-01D - Quercion fruticosae, QUI-01A - Oleo-Ceratonion siliquae, QUI-01B - Ericion arboreae, QUI-01D - Asparago albi-Rhamnion oleoidis, QUI-01E - Rhamno lycioidis-Quercion cocciferae, QUI-01F - Periplocion angustifoliae, QUI-01H - Rubo longifoliae-Coremation albi, QUI-01K - Pistacio terebinthi-Rhamnion alaterni, QUI-02B - Ceratonio-Pistacion lentisci

Additional selection rules: n/a

Implications for EUNIS classification: should be merged with F5.1 (Arborescent matorral)

Floristic composition:

Pistacia lentiscus	58	Phillyrea latifolia	15
Brachypodium retusum	43	Myrtus communis	15
Quercus coccifera	42	Arisarum vulgare	15
Rubia peregrina	37	Chamaerops humilis	14
Smilax aspera	29	Rhamnus lycioides	14
Asparagus acutifolius	29	Daphne mauritanica	14
Olea europaea	26	Erica arborea	14
Rosmarinus officinalis	24	Carex hallerana	12
Phillyrea angustifolia	20	Genista scorpius	12
Arbutus unedo	20	Dactylis glomerata	11
Pinus halepensis	19	Cistus albidus	11
Rhamnus alaternus	19	Urginea maritima	10
Lonicera implexa	19	Clematis flammula	10
Quercus ilex	17	Cistus monspeliensis	10
Cistus salvifolius	17	Thymus vulgaris	10

F5.3 - Pseudomaquis

Origin of data (countries): HR, HU, RO

List of alliances: n/a

Additional selection rules: n/a

Implications for EUNIS classification: n/a

Floristic composition:

Quercus pubescens	62	Campanula sibirica	14
Fraxinus ornus	53	Geranium sanguineum	14
Carpinus orientalis	53	Festuca valesiaca	14
Dactylis glomerata	44	Orchis purpurea	14
Cotinus coggygia	44	Brachypodium pinnatum	14
Crataegus monogyna	41	Erysimum odoratum	14
Cornus mas	37	Berberis vulgaris	13
Euonymus verrucosus	36	Coronilla varia	13
Viburnum lantana	34	Galium glaucum	13
Acer campestre	33	Smilax aspera	13
Teucrium chamaedrys	30	Arabis hirsuta	13
Ligustrum vulgare	28	Melica ciliata	13
Paliurus spina-christi	28	Tamus communis	13
Buglossoides purpureocaerulea	26	Helichrysum italicum	13
Prunus mahaleb	24	Inula ensifolia	13
Juniperus oxycedrus	24	Sanguisorba minor	12
Dictamnus albus	23	Physospermum cornubiense	11
Brachypodium sylvaticum	23	Phillyrea latifolia	11
Asparagus acutifolius	23	Prunus spinosa	11
Polygonatum odoratum	21	Bromus pannonicus	11
Clematis flammula	21	Potentilla cinerea	11
Tanacetum corymbosum	21	Muscari neglectum	11
Rhamnus intermedius	20	Festuca rupicola	11
Euphorbia cyparissias	20	Thalictrum minus	11
Carex hallerana	20	Arum orientale	11
Asparagus verticillatus	18	Epipactis helleborine	11
Paeonia peregrina	18	Mercurialis ovata	11
Polygonatum latifolium	18	Vinca herbacea	10
Geum urbanum	18	Carex michelii	10
Stachys recta	18	Spartium junceum	10
Galanthus elwesii	17	Sedum sexangulare	10
Brachypodium retusum	17	Lembotropis nigricans	10
Galium mollugo	15	Pistacia lentiscus	10
Hypericum perforatum	15	Galium odoratum	10
Pistacia terebinthus	15	Fraxinus excelsior	10

Salvia pratensis	15	Viola hirta	10
Carex humilis	15	Coronilla coronata	10
Vincetoxicum hirundinaria	15	Pyrus pyraister	10
Rosa canina	14		

F5.4 - [*Spartium junceum*] fields

Origin of data (countries): ES, FR, GR, HR, IT, SI, SM

List of alliances: n/a

Additional selection rules: Instead of the relevés belonging to the listed alliances, relevés with *Spartium junceum* cover $\geq 50\%$ have been selected

Implications for EUNIS classification: proposed new name: F5.4 *Spartium junceum* scrub

Floristic composition:

<i>Spartium junceum</i>	100	<i>Quercus ilex</i>	14
<i>Rubus ulmifolius</i>	66	<i>Eryngium campestre</i>	14
<i>Asparagus acutifolius</i>	47	<i>Bromus erectus</i>	14
<i>Rubia peregrina</i>	40	<i>Cistus incanus</i>	13
<i>Crataegus monogyna</i>	35	<i>Cornus sanguinea</i>	13
<i>Brachypodium pinnatum</i>	33	<i>Dittrichia viscosa</i>	12
<i>Dactylis glomerata</i>	32	<i>Foeniculum vulgare</i>	12
<i>Quercus pubescens</i>	28	<i>Lonicera implexa</i>	12
<i>Rosa canina</i>	27	<i>Pyrus amygdaliformis</i>	12
<i>Clematis vitalba</i>	27	<i>Phillyrea angustifolia</i>	12
<i>Rosa sempervirens</i>	24	<i>Psoralea bituminosa</i>	11
<i>Fraxinus ornus</i>	23	<i>Erica arborea</i>	11
<i>Clematis flammula</i>	22	<i>Carlina corymbosa</i>	11
<i>Prunus spinosa</i>	19	<i>Galium album</i>	10
<i>Teucrium chamaedrys</i>	19	<i>Geranium purpureum</i>	10
<i>Hedera helix</i>	17	<i>Phillyrea latifolia</i>	10
<i>Pistacia lentiscus</i>	16	<i>Osyris alba</i>	10
<i>Ulmus minor</i>	15	<i>Juniperus communis</i>	10
<i>Dorycnium hirsutum</i>	14	<i>Carex flacca</i>	10
<i>Smilax aspera</i>	14	<i>Pistacia terebinthus</i>	10
<i>Brachypodium phoenicoides</i>	14	<i>Hypericum perforatum</i>	10

F5.5 - Thermo-Mediterranean scrub

Origin of data (countries): CY, ES, FR, GR, HR, IT, MC, ME, PT, TR

List of alliances: CRI-02D - Euphorbion pithyusae, CRI-02E - Anthyllidion barbae-jovis, CYT-01E - Retamion monospermae, CYT-01F - Retamion sphaerocarpae, CYT-02A - Telinion monspessulano-linifoliae, CYT-02B - Genisto spartioidis-Phlomidion almeriensis, CYT-02C - Genisto scorpii-Retamion sphaerocarpae, LAV-01B - Stachelino-Ulicion baetici, LAV-01C - Ulici argentei-Cistion ladaniferi, LAV-01D - Quercion fruticosae, LAV-01E - Cistion ladaniferi, LAV-01G - Teucrion mari, LAV-02A - Coremation albi, MIC-01A - Cisto cretici-Ericion manipuliflorae, MIC-01B - Cisto eriocephali-Ericion multiflorae, MIC-02A - Hyperico olympici-Cistion cretici, MIC-02D - Helichryso sanguinei-Origanion syriaci, MIC-02E - Micromerion, MIC-02F - Sarcopoterio spinosi-Genistion fasselatae, QUI-01A - Oleo-Ceratonion siliquae, QUI-01C - Juniperion turbinatae, QUI-01D - Asparago albi-Rhamnion oleoidis, QUI-01F - Periplocion angustifoliae, QUI-01G - Juniperion phoeniceae-Pinon acutisquamae, QUI-01H - Rubo longifoliae-Coremation albi, QUI-02B - Ceratonio-Pistacion lentisci, ROS-01B - Eryngio trifidi-Ulicion erinacei, ROS-01F - Rosmarinion officinalis, ROS-04A - Thymo moroderi-Sideritidion leucanthae, ROS-04B - Anthyllido terniflorae-Salsolion papillosae, ROS-04C - Sideritidion bourgaeanae, ROS-05B - Lavandulion lanatae, ULI-01D - Ericion umbellatae, ULI-01F - Stauracanthion boivinii

Additional selection rules: n/a

Implications for EUNIS classification: n/a

Floristic composition:

Pistacia lentiscus	47	Quercus ilex	13
Brachypodium retusum	34	Rhamnus alaternus	13
Rosmarinus officinalis	28	Cistus albidus	13
Rubia peregrina	24	Lonicera implexa	13
Asparagus acutifolius	24	Juniperus phoenicea	13
Smilax aspera	22	Juniperus oxycedrus	12
Olea europaea	21	Erica multiflora	12
Cistus salvifolius	20	Thymus vulgaris	12
Pinus halepensis	16	Chamaerops humilis	12
Quercus coccifera	16	Myrtus communis	11
Dactylis glomerata	15	Ulex parviflorus	11
Arisarum vulgare	14	Sedum sediforme	10
Phillyrea angustifolia	14	Phillyrea latifolia	10
Cistus monspeliensis	14	Rhamnus lycioides	10

F6.1 - Western garrigues

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

List of alliances: CRI-02A - Dactylido hispanicae-Helichryson stoechadis, CRI-02D - Euphorbion pithyusae, CRI-02E - Anthyllidion barbae-jovis, LAV-01A - Cistion laurifolii, LAV-01B - Staehelino-Ulicion baetici, LAV-01C - Ulici argentei-Cistion ladaniferi, LAV-01E - Cistion ladaniferi, LAV-01G - Teucrion mari, LAV-02A - Coremation albi, ROS-01A - Lavandulo latifoliae-Genistion boissieri, ROS-01B - Eryngio trifidi-Ulicion erinacei, ROS-01D - Sideritido incanae-Salvion lavandulifoliae, ROS-01E - Helianthemo italici-Aphyllanthion monspeliensis, ROS-01F - Rosmarinion officinalis, ROS-01G - Hypericion ericoidis, ROS-01H - Hypericion balearici, ROS-03A - Lepidion subulati, ROS-03B - Thymo-Teucrion verticillati, ROS-04A - Thymo moroderi-Sideritidion leucanthae, ROS-04B - Anthyllido terniflorae-Salsolion papillosae, ROS-04C - Sideritidion bourgaeanae, ROS-05B - Lavandulion lanatae

Additional selection rules: n/a

Implications for EUNIS classification: proposed division: F6.1a Western basiphilous garrigues, F6.1b Western acidic garrigues

Floristic composition:

Rosmarinus officinalis	40	Helianthemum syriacum	12
Brachypodium retusum	39	Leuzea conifera	12
Thymus vulgaris	35	Carex hallerana	12
Genista scorpius	29	Lithodora fruticosa	12
Fumana ericoides	21	Stipa offneri	12
Lavandula latifolia	18	Teucrium polium	12
Atractylis humilis	17	Ulex parviflorus	12
Avenula bromoides	17	Cistus albidus	11
Fumana thymifolia	17	Quercus coccifera	11
Dorycnium pentaphyllum	17	Erica multiflora	11
Koeleria vallesiana	16	Coronilla minima	11
Helichrysum stoechas	16	Argyrolobium zanonii	11
Aphyllanthes monspeliensis	16	Helianthemum cinereum	11
Eryngium campestre	15	Linum suffruticosum	11
Sedum sediforme	15	Quercus ilex	11
Bupleurum fruticescens	15	Cistus salvifolius	10
Fumana procumbens	14	Lavandula stoechas	10
Coris monspeliensis	13	Juniperus oxycedrus	10
Dactylis glomerata	12	Cistus clusii	10

F6.2 - Eastern garrigues

Origin of data (countries): CY, GR

List of alliances: MIC-02A - Hyperico olympici-Cistion cretici, MIC-02D - Helichryso sanguinei-Origanion syriaci, MIC-02E - Micromerion, MIC-02F - Sarcopoterio spinosi-Genistion fasselatae

Additional selection rules: n/a

Implications for EUNIS classification: n/a

Floristic composition:

Sarcopoterium spinosum	56	Salvia triloba	18
Calicotome villosa	35	Anthyllis hermanniae	16
Erica manipuliflora	33	Quercus ilex	16
Arbutus unedo	32	Cistus monspeliensis	16
Stipa bromoides	28	Cistus parviflorus	16
Thymus capitatus	28	Fumana arabica	16
Asparagus acutifolius	26	Desmazeria rigida	15
Pinus halepensis	26	Pterocephalus brevis	15
Cistus incanus	26	Ballota acetabulosa	15
Cistus salvifolius	26	Osyris alba	15
Smilax aspera	24	Cynodon dactylon	15
Erica arborea	24	Fumana thymifolia	13
Lithodora hispidula	22	Helichrysum italicum	13
Phillyrea latifolia	22	Trifolium campestre	13
Helichrysum stoechas	20	Fagonia cretica	13
Lonicera implexa	20	Melica minuta	13
Dactylis glomerata	20	Ruscus aculeatus	11
Asphodelus ramosus	20	Capsella bursa-pastoris	11
Quercus coccifera	18	Genista tinctoria	11
Teucrium divaricatum	18	Hordeum murinum	11
Micromeria nervosa	18	Cerastium brachypetalum	11

F6.3 - Illyrian garrigues

Origin of data (countries): HR, IT

List of alliances: MIC-01A - Cisto cretici-Ericion manipuliflorae, MIC-01B - Cisto eriocephali-Ericion multiflorae

Additional selection rules: n/a

Implications for EUNIS classification: n/a

Floristic composition:

Pistacia lentiscus	68	Coronilla emerus	19
Cistus incanus	59	Salvia officinalis	18
Rosmarinus officinalis	45	Dorycnium hirsutum	18
Brachypodium retusum	44	Juniperus phoenicea	17
Teucrium fruticans	41	Euphorbia dendroides	16
Erica multiflora	39	Tanacetum cinerariifolium	16
Cistus monspeliensis	37	Satureja montana	14
Myrtus communis	36	Rhamnus alaternus	14
Juniperus oxycedrus	35	Teucrium flavum	14
Asparagus acutifolius	34	Pistacia terebinthus	13
Smilax aspera	31	Pinus halepensis	13
Quercus ilex	30	Arbutus unedo	13
Arisarum vulgare	29	Asperula aristata	13
Fumana ericoides	27	Frangula rupestris	13
Cistus salvifolius	24	Micromeria juliana	11
Rubia peregrina	24	Daphne gnidium	11
Lonicera implexa	22	Galium corrudifolium	11
Helichrysum italicum	22	Fumana thymifolia	11
Clematis flammula	22	Teucrium polium	11
Dactylis glomerata	20	Helichrysum stoechas	11

F6.4 - Black Sea garrigues

Origin of data (countries): n/a

List of alliances: n/a

Additional selection rules: n/a

Implications for EUNIS classification: n/a

Floristic composition:

No data

F6.5 - Macaronesian garrigues

Origin of data (countries): n/a

List of alliances: n/a

Additional selection rules: n/a

Implications for EUNIS classification: should be merged with other habitat types on shingle and gravel beaches (B1-3)

Floristic composition:

No data

F6.6 - Supra-Mediterranean garrigues

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

List of alliances: LAV-01A - Cistion laurifolii, LAV-01B - Staehelino-Ulicion baetici, ONO-01D - Genistion lobelii, ONO-01E - Echinospartion horridi, ONO-01F - Genistion occidentalis, ONO-01G - Lavandulo angustifoliae-Genistion cinereae, ONO-02C - Plantagini discoloris-Thymion mastigophori, ROS-01A - Lavandulo latifoliae-Genistion boissieri, ROS-01D - Sideritido incanae-Salvion lavandulifoliae, ROS-01E - Helianthemum italici-Aphyllanthion monspeliensis, ROS-05B - Lavandulion lanatae

Additional selection rules: n/a

Implications for EUNIS classification: n/a

Floristic composition:

Genista scorpius	37	Argyrolobium zanonii	13
Thymus vulgaris	30	Asperula cynanchica	12
Koeleria vallesiana	27	Carex hallerana	12
Aphyllanthus monspeliensis	26	Helianthemum apenninum	12
Lavandula latifolia	24	Fumana ericoides	12
Brachypodium retusum	23	Sedum sediforme	12
Carex humilis	22	Avenula pratensis	11
Fumana procumbens	20	Coris monspeliensis	11
Genista hispanica	20	Buxus sempervirens	11
Dorycnium pentaphyllum	19	Helianthemum nummularium	11
Eryngium campestre	19	Festuca hystrix	11
Bromus erectus	17	Teucrium pyrenaicum	11
Rosmarinus officinalis	17	Dactylis glomerata	10
Coronilla minima	17	Arctostaphylos uva-ursi	10
Avenula bromoides	16	Helianthemum cinereum	10
Brachypodium pinnatum	16	Linum narbonense	10
Teucrium chamaedrys	16	Bupleurum fruticescens	10
Erica vagans	15	Carduncellus monspeliensis	10
Potentilla tabernaemontani	15	Lithodora fruticosa	10
Helichrysum stoechas	14	Helianthemum oelandicum subsp. italicum	10
Leuzea conifera	13	Koeleria dasyphylla	10
Globularia bisnagarica	13		

F6.7 - Mediterranean gypsum scrubs

Origin of data (countries): ES

List of alliances: ROS-03A - *Lepidion subulati*, ROS-03B - *Thymo-Teucrium verticillati*

Additional selection rules: n/a

Implications for EUNIS classification: n/a

Floristic composition:

<i>Herniaria fruticosa</i>	62	<i>Gypsophila struthium</i> subsp. <i>struthium</i>	20
<i>Helianthemum squamatum</i>	62	<i>Sedum sediforme</i>	20
<i>Rosmarinus officinalis</i>	46	<i>Lithodora fruticosa</i>	18
<i>Ononis tridentata</i>	45	<i>Stipa parviflora</i>	18
<i>Helianthemum syriacum</i>	45	<i>Lygeum spartum</i>	17
<i>Brachypodium retusum</i>	44	<i>Helichrysum stoechas</i>	16
<i>Thymus vulgaris</i>	41	<i>Centaurea hyssopifolia</i>	14
<i>Plantago albicans</i>	37	<i>Fumana thymifolia</i>	14
<i>Atractylis humilis</i>	33	<i>Koeleria dasyphylla</i>	14
<i>Genista scorpius</i>	32	<i>Coris monspeliensis</i>	13
<i>Koeleria vallesiana</i>	30	<i>Artemisia herba-alba</i>	12
<i>Lepidium subulatum</i>	30	<i>Brachypodium distachyon</i>	11
<i>Teucrium polium</i>	30	<i>Helianthemum salicifolium</i>	11
<i>Gypsophila struthium</i> subsp. <i>hispanica</i>	26	<i>Launaea fragilis</i>	11
<i>Fumana ericoides</i>	26	<i>Astragalus incanus</i>	11
<i>Linum suffruticosum</i>	25	<i>Matthiola fruticulosa</i>	11
<i>Reseda stricta</i>	21	<i>Teucrium libanitis</i>	11
<i>Thymus zygis</i>	21	<i>Thymus aranjuezii</i>	10
<i>Launaea pumila</i>	21	<i>Stipa tenacissima</i>	10

F6.8 - Xero-halophile scrubs

Origin of data (countries): ES, IT, KZ, RU

List of alliances: CRI-02E - Anthyllidion barbae-jovis, CRI-04C - Helichrysion obconico-devium, LER-01A - Artemision lerchianae, LER-02A - Euphorbion seguieranae, PEG-01A - Salsolo vermiculatae-Peganion harmalae, PEG-01B - Haloxylon tamariscifolii-Atriplicion glaucae, PEG-01C - Salsolo oppositifoliae-Suaedion fruticosae, PEG-01D - Lycio europaei-Ipomoeion purpureae, PEG-01E - Artemision arborescentis, PEG-01G - Medicagini citrinae-Lavaterion arboreae, PEG-02A - Artemisio glutinosae-Santolinion rosmarinifoliae, PEG-02B - Santolinion pectinato-canescens, PEG-03A - Chenoleion tomentosae, PEG-04A - Artemisio thusculae-Rumicion lunariae, PEG-04B - Launaeo arborescentis-Schizogynion sericeae, PEG-04C - Argyranthemum succulentum-Calendulion maderensis, PEG-04D - Nicotiano glaucae-Ricinion communis

Additional selection rules: n/a

Implications for EUNIS classification: proposed division: F6.8a Mediterranean halo-nitrophilous scrub, F6.8b Caspian Sea halo-nitrophilous scrub

Floristic composition:

Salsola vermiculata	21	Atriplex halimus	15
Eryngium campestre	20	Dactylis glomerata	14
Artemisia herba-alba	18	Plantago albicans	10
Artemisia campestris	15	Helichrysum italicum	10

F7.1 - West Mediterranean spiny heaths

Origin of data (countries): ES

List of alliances: CRI-02B - Astragalion tragacanthae

Additional selection rules: n/a

Implications for EUNIS classification: should be merged with F7.2 (Central Mediterranean spiny heaths): Western Mediterranean spiny scrubs on coastal cliffs

Floristic composition:

Dactylis glomerata	65	Echinops ritro	15
Astragalus massiliensis	54	Euphorbia canariensis	15
Helichrysum stoechas	50	Aeonium volkerii	15
Cistus salvifolius	47	Senecio bicolor	15
Brachypodium retusum	40	Urginea maritima	15
Sedum sediforme	38	Opuntia maxima	15
Polycarpon polycarpoides subsp. polycarpoides	31	Ononis spinosa	15
Sonchus tenerrimus	29	Crithmum maritimum	15
Festuca ovina	25	Daucus halophilus	13
Reichardia picroides	25	Pallenis maritima	13
Centaurea spinabadia	25	Rubia peregrina	13
Aetheorhiza bulbosa	25	Juniperus oxycedrus	13
Pistacia lentiscus	18	Scilla haemorrhoidalis	13
Plantago subulata	18	Asphodelus gracilis	13
Aeonium lindleyi	18	Armeria pungens	13
Urospermum dalechampii	18	Andryala integrifolia	13
Carlina hispanica	18	Cenchrus ciliaris	13
Festuca arundinacea	18	Carpobrotus edulis	13
Kleinia neriifolia	18	Frankenia laevis	13
Hyparrhenia hirta	15		

F7.2 - Central Mediterranean spiny heaths

Origin of data (countries): n/a

List of alliances: n/a

Additional selection rules: n/a

Implications for EUNIS classification: should be merged with F7.1 (West Mediterranean spiny heaths): Western Mediterranean spiny scrubs on coastal cliffs

Floristic composition:

No data

F7.3 - East Mediterranean phrygana

Origin of data (countries): CY, GR, IT, TR

List of alliances: MIC-02E - Micromerion, MIC-02F - Sarcopoterio spinosi-Genistion fasselatae

Additional selection rules: Instead of the relevés belonging to the listed alliances, relevés with *Sarcopoterium spinosum*, *Thymus capitatus* or *Euphorbia acanthothamnos*, with a cover $\geq 25\%$ have been selected

Implications for EUNIS classification: proposed new name: Phrygana

Floristic composition:

Thymus capitatus	50	Cistus parviflorus	12
Sarcopoterium spinosum	43	Hedypnois cretica	12
Euphorbia acanthothamnos	35	Gagea graeca	12
Pistacia lentiscus	29	Quercus coccifera	12
Asphodelus ramosus	27	Calicotome villosa	12
Lagurus ovatus	22	Cistus salvifolius	11
Olea europaea	20	Thymbra capitata	11
Brachypodium retusum	18	Sherardia arvensis	11
Ballota acetabulosa	18	Bromus intermedius	11
Asparagus acutifolius	16	Salvia triloba	11
Desmazeria rigida	14	Linum strictum	11
Hypochaeris achyrophorus	14	Urginea maritima	11
Fumana thymifolia	14	Phagnalon graecum	11
Trifolium campestre	14	Poa bulbosa	11
Dactylis glomerata	14	Genista acanthoclada	11
Rostraria cristata	12	Convolvulus althaeoides	10
Reichardia picroides	12		

F7.4 - Hedgehog-heaths

Origin of data (countries): ES, GR, IT

List of alliances: DAP-01B - Eryngio multifidi-Bromion fibrosi, DAP-01C - Stipo pulcherrimae-Morinion persicae, ONO-01E - Echinospartion horridi, ROS-02A - Xeroacantho-Erinaceion, ROS-05A - Andryalion agardhii, RUM-01A - Rumici-Astragalion siculi

Additional selection rules: n/a

Implications for EUNIS classification: proposed division: F7.4a West Mediterranean mountain hedgehog heaths, F7.4b Central Mediterranean mountain hedgehog heaths, F7.4c East Mediterranean hedgehog heaths, F7.4d Macaronesian mountain hedgehog heaths

Floristic composition:

Erinacea anthyllis	37	Poa ligulata	15
Koeleria vallesiana	28	Arenaria armerina	15
Echinospartum horridum	26	Pterocephalus spathulatus	14
Carex humilis	24	Echinospartum boissieri	14
Jurinea humilis	21	Alyssum spinosum	14
Thymus vulgaris	21	Thymus granatensis	14
Buxus sempervirens	21	Dianthus subacaulis subsp. brachyanthus	14
Vella spinosa	19	Fumana ericoides	13
Anthyllis vulneraria	19	Helianthemum oelandicum subsp. italicum	13
Convolvulus boissieri	18	Aphyllanthes monspeliensis	13
Fumana procumbens	17	Hippocrepis squamata subsp. eriocarpa	12
Helianthemum cinereum	17	Genista scorpius	12
Centaurea granatensis	16	Brachypodium retusum	12
Sideritis incana	16	Teucrium polium	11
Asperula aristata	16	Carex hallerana	11
Teucrium chamaedrys	15	Festuca hystrix	11
Avenula pratensis	15	Potentilla tabernaemontani	10
Bupleurum spinosum	15		

F8.1 - Canary Island xerophytic scrub

Origin of data (countries): ES

List of alliances: AEO-01A - Soncho acaulis-Sempervivion, AEO-01B - Greenovion aureae, KLE-01A - Aeonio-Euphorbion canariensis, OLE-01A - Mayteno canariensis-Juniperion canariensis, OLE-02A - Cisto canariensis-Micromerion hyssopifoliae, PEG-03A - Chenoleion tomentosae, PEG-04A - Artemisio thusculae-Rumicion lunariae, PEG-04B - Launaeo arborescentis-Schizogynion sericeae, PEG-04D - Nicotiano glaucae-Ricinion communis, SUP-01A - Spartocytisium nubigeni

Additional selection rules: n/a

Implications for EUNIS classification: n/a

Floristic composition:

Kleinia neriifolia	23	Euphorbia canariensis	11
Launaea arborescens	19	Bituminaria bituminosa	10
Euphorbia regis-jubae	17	Periploca laevigata subsp. angustifolia	10
Plocama pendula	15	Euphorbia balsamifera	10
Rubia fruticosa	14	Erysimum scoparium	10
Spartocytisus supranubius	14	Pterocephalus lasiospermus	10
Lycium intricatum	12		

F8.2 - Madeiran xerophytic scrub

Origin of data (countries): ES

List of alliances: AEO-01C - Sinapidendro angustifolii-Aeonion glutinosi, KLE-01A - Aeonio-Euphorbion canariensis, OLE-01D - Oleo maderensis-Maytenion umbellatae, OLE-02B - Soncho ustulati-Artemision argenteae, PEG-04C - Argyranthemum succulentum-Calendulion maderensis

Additional selection rules: n/a

Implications for EUNIS classification: n/a

Floristic composition:

Kleinia neriifolia	43	Scilla haemorrhoidalis	20
Plocama pendula	41	Ceropegia fusca	20
Launaea arborescens	40	Lavandula canariensis	16
Euphorbia canariensis	32	Neochamaelea pulverulenta	14
Euphorbia regis-jubae	31	Opuntia dillenii	13
Rubia fruticosa	30	Aristida adscensionis	12
Lycium intricatum	29	Argyranthemum frutescens	12
Euphorbia balsamifera	26	Helianthemum canariense	11
Schizogyne sericea	26	Suaeda vera	10
Cenchrus ciliaris	24	Campylanthus salsoloides	10
Periploca laevigata subsp. angustifolia	23	Limonium pectinatum	10
Hyparrhenia sinaica	23	Frankenia laevis	10

F9.1 - Riverine scrub

Origin of data (countries): AT, CZ, DE, ES, FR, GL, HR, HU, IT, SI, SK, SM, UA

List of alliances: PUR-01A - Salicion phylicifoliae, PUR-01B - Salicion eleagno-daphnoidis, PUR-01D - Salicion triandrae, PUR-01E - Rubo caesii-Amorphion fruticosae, PUR-01F - Artemisio dniproicae-Salicion acutifoliae, PUR-01G - Salicion salvifoliae, PUR-01H - Salicion discolori-neotrichae, PUR-01I - Salicion pedicellatae, PUR-01J - Salicion cantabricae

Additional selection rules: n/a

Implications for EUNIS classification: n/a

Floristic composition:

Salix purpurea	44	Equisetum arvense	14
Salix elaeagnos	29	Poa trivialis	13
Urtica dioica	28	Salix fragilis	13
Phalaris arundinacea	27	Clematis vitalba	12
Salix triandra	26	Deschampsia cespitosa	12
Rubus caesius	22	Salix atrocinerea	12
Rubus ulmifolius	21	Angelica sylvestris	12
Salix alba	21	Cornus sanguinea	11
Populus nigra	18	Crataegus monogyna	11
Lythrum salicaria	18	Fraxinus angustifolia	11
Solanum dulcamara	18	Lycopus europaeus	11
Ranunculus repens	16	Alnus incana	10
Galium aparine	16	Humulus lupulus	10
Calystegia sepium	15	Rumex obtusifolius	10
Mentha longifolia	15	Eupatorium cannabinum	10
Agrostis stolonifera	15	Aegopodium podagraria	10
Brachypodium sylvaticum	14		

F9.2 - [Salix] carr and fen scrub

Origin of data (countries): AT, BE, CZ, DE, HU, IT, NL, SI, SK, UK

List of alliances: CIN-01A - Salicion cinereae

Additional selection rules: n/a

Implications for EUNIS classification: n/a

Floristic composition:

Salix cinerea	81	Holcus lanatus	17
Lysimachia vulgaris	51	Agrostis stolonifera	16
Phragmites australis	48	Filipendula ulmaria	16
Solanum dulcamara	47	Quercus robur	15
Galium palustre	42	Eupatorium cannabinum	15
Calamagrostis canescens	41	Carex elata	14
Lycopus europaeus	38	Scutellaria galericulata	14
Urtica dioica	34	Cardamine pratensis	13
Iris pseudacorus	33	Hydrocotyle vulgaris	13
Alnus glutinosa	33	Potentilla palustris	13
Juncus effusus	32	Dryopteris dilatata	12
Lythrum salicaria	26	Angelica sylvestris	12
Dryopteris carthusiana	23	Sorbus aucuparia	11
Betula pubescens	22	Agrostis canina	11
Cirsium palustre	21	Ranunculus repens	11
Salix aurita	21	Calamagrostis epigejos	11
Mentha aquatica	21	Calliergonella cuspidata	11
Frangula alnus	21	Glyceria maxima	10
Peucedanum palustre	20	Salix repens	10
Poa trivialis	20	Betula pendula	10
Rubus sect. Rubus	18	Carex pseudocyperus	10
Molinia caerulea	17		

F9.3 - Southern riparian galleries and thickets

Origin of data (countries): ES, GR, IT, RO, RU

List of alliances: NER-01A - Tamaricion africanae, NER-01B - Tamaricion boveano-canariensis, NER-01C - Rubo ulmifolii-Nerion oleandri, NER-01D - Securinegion buxifoliae, NER-01F - Rubo sancti-Nerion oleandri, POP-03A - Salicion canariensis, PUR-02A - Tamaricion parviflorae, PUR-02B - Artemisio scopariae-Tamaricion ramosissimae, TAM-01A - Agropyro fragilis-Tamaricion ramosissimae

Additional selection rules: n/a

Implications for EUNIS classification: n/a

Floristic composition:

Rubus ulmifolius	32	Tamarix africana	16
Nerium oleander	31	Piptatherum miliaceum	15
Tamarix canariensis	27	Dittrichia viscosa	15
Scirpoides holoschoenus	25	Tamarix gallica	14
Phragmites australis	18	Arundo donax	11