

EUNIS habitat classification – a guide for users

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Introduction

The EUNIS habitat classification is a comprehensive system covering the terrestrial and marine habitat types of the European land mass and its surrounding seas. It is hierarchical in structure and includes a key with criteria for identification of habitats at the first three levels. The underlying database and interface via the EUNIS website include text descriptions and environmental parameters, and relationships to several other classifications and to legislative systems. The EUNIS habitat classification is distinct from Annex I of the EU Habitats Directive (a selective list of habitats). The classification is freely available through the website portal <http://eunis.eea.europa.eu/habitats.jsp>. This guide includes information to help users of that website. A hard copy version of the classification (2004 version) was published by Davies *et al* (2004) and is available for download from the website (http://eunis.eea.europa.eu/upload/EUNIS_2004_report.pdf).

Background

The taxonomy for classification of species has been under development for over 200 years since the pioneering work of Linnaeus. The distinction between species is clearly understood by taxonomists, although they are not without disagreements and there are frequent revisions of some groups, for example following the recent development of phylogenetic systematics. Many identification guides include keys so that criteria for the differences between species can be recognised. By contrast, although botanists have been classifying vegetation for the past century, habitat classification which builds on classical phytosociology so as to include abiotic features of the habitat is a relatively new development.

The need for a classification has several driving forces: establishment of habitat protection legislation; inventory of habitats in a biogeographic region, country or site; biodiversity monitoring and reporting; description of a species' habitat requirements. A habitat classification system should be comprehensive, scientific, unambiguous and easily understood without requiring detailed technical knowledge. In the past few decades a number of national classifications have been developed, and as a result, there are several habitat type classification systems in use for monitoring and description of habitats. These systems have many similarities, but they are not identical and reporting at European level is therefore difficult. Furthermore, different international directives and conventions have used different classifications, making their inter-relationship complex.

To meet the need for a habitat classification which is applicable at a pan-European level, the first European initiatives began in the early 1980s. Since the inception of the European Environment Agency in the mid-1990s there has been a continuous work programme on

habitat classification undertaken through the European Topic Centre on Biological Diversity (and its predecessors), as a component of the European Nature Information System (EUNIS). It builds upon the previous initiatives of the habitat classification developed for the European Commission (DG XI) CORINE Biotopes Project (Devillers *et al*, 1991) and its successor the Palaearctic habitat classification (Devillers & Devillers, 1996), developed for the Council of Europe, but re-structures and re-defines that classification. In the marine sector it is based on the JNCC Marine Habitat Classification for Britain and Ireland (Connor *et al*, 2004) and habitat types developed by the Barcelona and Helcom marine conventions (Barcelona Convention (1998), Helsinki Commission (1998)).

Habitat types are characterised using a system of parameters, for example substrate type, dominant lifeform, humidity, typical depth zone, human usage and impact. A novel feature of the classification, which is strictly hierarchical, is the development of criteria based on these parameters, forming a key for identification of habitats, analogous to keys for identification of species. The criteria have been developed at the first three hierarchical levels. However, habitats are very difficult to define analytically and the boundaries between them cannot be determined genetically as for species, so that any classification is bound to be a compromise between different opinions. The transition zones between two habitats can be extensive. The notes which are provided together with the criteria serve to guide the user's interpretation, especially at the boundaries, and are the result of the authors' search for guidance amongst many expert contributors to the classification. They should be read carefully, since many apparent exceptions to the dividing rules are mentioned explicitly.

Relationships between EUNIS habitats and other habitat classifications are an important component of the classification. These enable users of national classifications to relate their data to the international level, and provide linkages to habitat systems in use in legislation. In the context of the European Environment Agency the most important of these is Annex I of the EU Habitats Directive, and all habitats in that Annex are cross-referenced to EUNIS habitats. It is vital that the user understands the distinction between Annex I, a selective list of habitats of conservation interest adopted for legislative purposes, and the EUNIS habitat classification, a comprehensive system designed to cover all habitat types occurring in Europe.

Objectives

The aim during development of the EUNIS habitat classification has been to create a European reference set of habitat types including a description of all types and a hierarchical classification. This enables referencing and reporting habitat data in a comparable manner for use in inventories, monitoring, assessment and biodiversity indicators. It does not aim to supplant existing national or sectoral systems, unless member countries or institutions so wish. The specific requirements are that the classification should:

- be objective and scientifically based, with clear definitions and principles;
- provide a common and easily understood language for the description of all marine, freshwater and terrestrial habitats throughout Europe;
- seek as far as possible to achieve a consensus amongst those concerned with habitat classification as developers or users;
- be comprehensive, but applicable at a number of hierarchical levels of complexity in recognition of the variety of its applications;

- be flexible so as to evolve and allow the admission of new information, but also sufficiently stable to support users of its predecessors and other systems;
- hold information in a relational database allowing interrogation based on a number of parameters;
- be publicly available through an internet portal including searching and download tools.

Definitions

The geographical scope is the European mainland, extending east to the Ural Mountains, including offshore islands (British Isles, Cyprus; Iceland but not Greenland), and the archipelagos of the European Union Member States (Canary Islands, Madeira and the Azores). Anatolian Turkey and the Caucasus are included in the classification in principle, although knowledge from these areas is more limited and their habitats are therefore not developed in detail. Marine areas whose habitats are included in the classification are the north-east Atlantic (including the North Sea), Baltic, Mediterranean and Black Seas.

A habitat is defined as: “plant and animal communities as the characterising elements of the biotic environment, together with abiotic factors (soil, climate, water availability and quality, and others), operating together at a particular scale”.

The scale of organisms and of the environmental units in which they occur is intrinsic to the definition of habitat: it is that occupied by small vertebrates, large invertebrates and vascular plants. Samples of between 1 m² and 100 m² will generally be adequate to categorise habitats. At the larger scale, habitats can be grouped as “habitat complexes”, which are frequently-occurring combinations or mosaics of individual habitat types, usually occupying at least 10 ha, which may be inter-dependent. Estuaries, combining tidal water, mud flats, saltmarshes and other littoral habitats, are a good example. Approximately 30 habitat complexes are included in the EUNIS habitat classification at a nominal level only. At the smaller scale, “microhabitats” (features generally occupying less than 1 m² which are characteristic of certain habitat types and important for some smaller invertebrates and lower plants) might be described. Examples are decaying wood, found in mature forests and required by invertebrates whose function is decomposition, or animal dung in grassland environments. Such microhabitats are not currently part of the EUNIS habitat classification. Users are recommended to list and characterise microhabitats as appropriate to their requirements, for example, bryophyte surveyors have used soil, natural rock, bark of living shrubs and trees, dead wood, masonry, dry stone, tarmac, thatch, wood, free-floating aquatic plants.

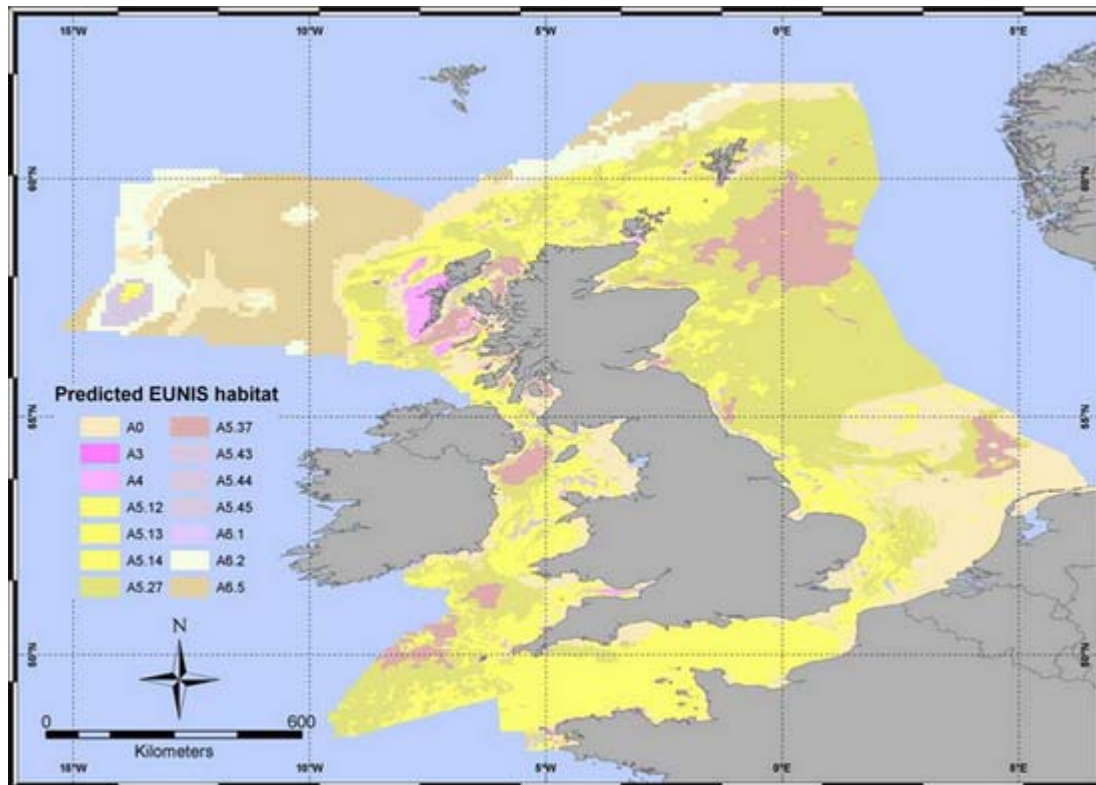
Applications

- to provide broad categories for the assessment of the state and trends of nature for use in the European Environment Agency's reporting process
- to evaluate habitat diversity values in biodiversity assessments
- to support the development of the EU NATURA2000 network for extension to new countries as they join the EU, and also for the development of the Council of Europe EMERALD network (Bern Convention)

- to obtain an overview of habitat distribution at European level and to map habitats at a level appropriate to the scale, whether or not in cross-reference to CORINE Land Cover maps
- to enable national nature conservation authorities to place and assess their habitats in a European context
- to provide a practical system for the description and monitoring of habitat types for national, regional and local nature inventory, evaluation and management relevant to both site and species information
- to identify and document the character and distribution of the most threatened habitat types in Europe e.g. in national or regional red lists.
- A tool for harmonising habitat data, for example explicit cross-references are included in Czech, Slovak and Romanian habitat/biotope catalogues.

Examples of projects using the EUNIS habitat classification include:

MESH (Mapping European Seabed Habitats) (<http://www.searchmesh.net/>);

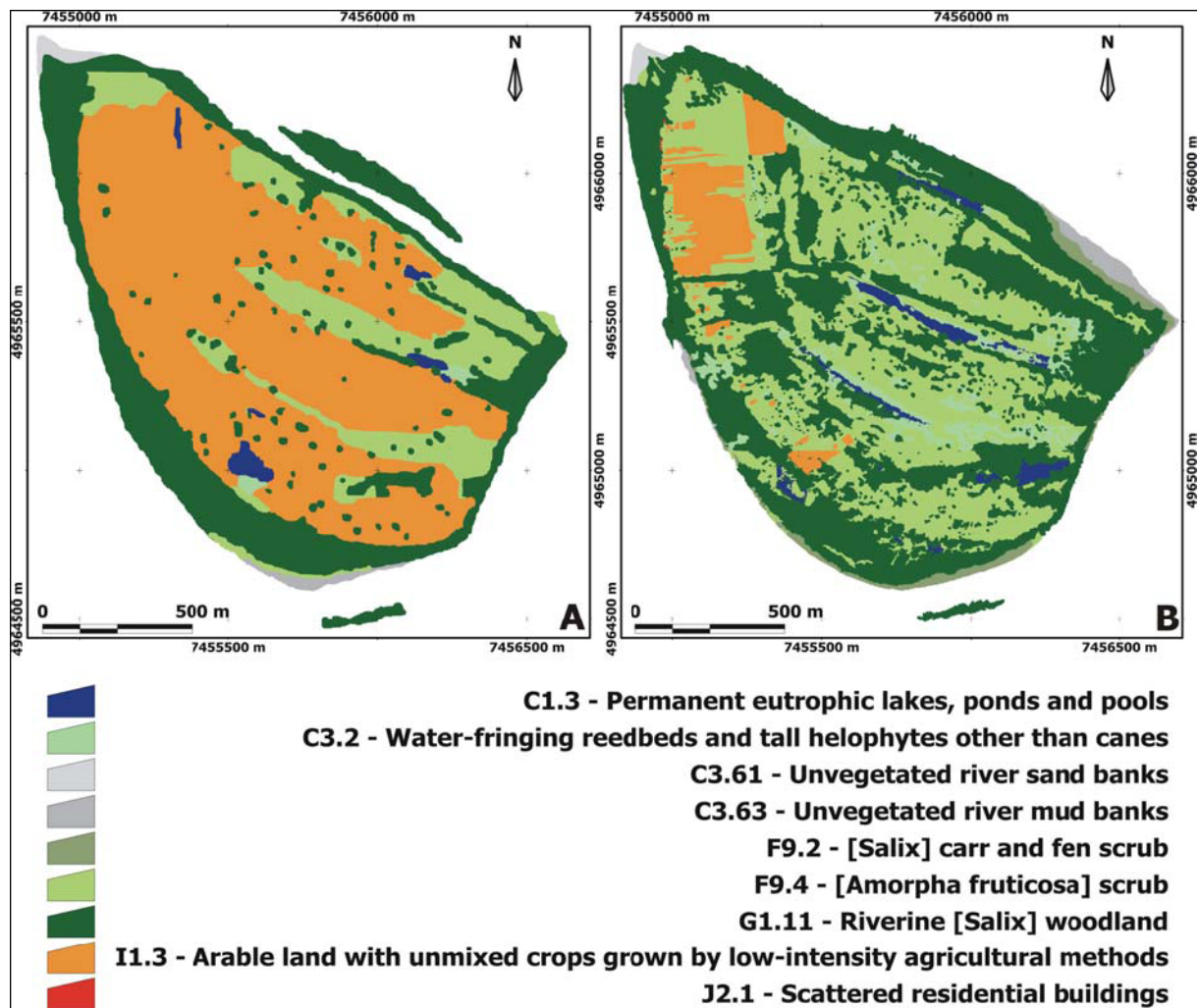


EUNIS Model © Mesh 2007 (source: <http://www.searchmesh.net/Default.aspx?page=1910>)

European Critical Loads mapping (de Bakker *et al*, 2007).

MIRABEL: Models for Integrated Review and Assessment of Biodiversity in European Landscapes (Petit *et al* 2001).

Changes of habitat types through several decades in the Danube region in Serbia - The case of Veliko ratno ostrvo island near Belgrade (Šinžar-Sekulić *et al*)



Habitat maps of the island Veliko ratno ostrvo for the year 1984 (A) and the year 2000 (B) using EUNIS habitats

How to use the EUNIS habitat classification

NB This section is based on the website as it appears in June 2008. It should be updated when there is any update to the website's appearance or function. In particular, areas of the website where I have asked for revisions are shown in italics here.

It is assumed in these notes that the user will approach the classification through the website portal <http://eunis.eea.europa.eu/habitats.jsp>. The most effective routes through the website will depend on the user's starting point and requirements.

There are four tutorials (<http://eunis.eea.europa.eu/tutorials.jsp>) devoted to habitat searches. Although these illustrate a previous version of the website (2005), the basic principles remain valid and the new user is recommended to spend a few minutes viewing these tutorials.

HABITAT TYPES SEARCH

Find information about habitat types of interest for biodiversity and nature protection





Search habitat types with names starting with:

Easy search | [Advanced Search](#) | [Links & Downloads](#) | [Help](#)

A set of predefined functions to search the database





Links to easy searches	Description
Names and Descriptions	Search habitat types by name or description
Legal Instruments	Search EUNIS habitat types under legal designation at European level
Country/Biogeographic region	Find habitat types located within a country and/or biogeographic region
Code/Classifications	Find habitat types by their relations with one of the linked classifications
Pick habitat types, show species	Find species characterising a specific habitat type
Pick habitat types, show sites	Find sites containing a particular habitat type
Pick habitat types, show references	Find books, articles which refer to a habitat type
Pick references, show habitat types	Find habitat types referred by books, articles etc.
Key navigation	Identify a habitat type following questions and graphical schemas
EUNIS habitat types hierarchical view	Hierarchical visualisation of EUNIS habitat types classification
ANNEX I habitat types hierarchical view	Hierarchical visualisation of ANNEX I habitat types classification

To gain an overview of the classification

Select “Key navigation” to view the criteria distinguishing habitats at level 1 of the classification: these can be shown diagrammatically by clicking **Diagram** : . Each “page” of the key will take you from a ‘parent’ habitat to one of its ‘children’ at the next level down. You can then either follow the key on through the next level or view a factsheet for that ‘child’. The key extends to level 3 of the hierarchy. The first page (shown below) provides the route to one of the ten level 1 habitats, and then subsequent pages subdivide a level 1 habitat to level 2, and then from each level 2 habitat to level 3. The key can either be followed through further criteria using routes such as 002 (leading to question 002), or G (leading to habitat type G), or  leading to a factsheet.


Habitat types key navigation

You may use 'key navigation' function to identify a specific habitat by answering a set of questions. Starting from first question to next questions you select one of the possible answers. Here are samples of possible answers:

- no ( 002) - Leading to question named '002'
- Yes [ G] - Leading to another questions subset of level G
- no  [ E6] - Links directly to factsheet for E6

Additionally the diagram may be used for reference.

category : (All)All habitats


Diagram : 

Question 001 : **Constructed or extremely artificial or regularly tilled habitat?**

Is the habitat highly artificial, i.e. either constructed or with a man-made substrate; industrial; maintained solely by frequent tilling; or if recently abandoned, then either bare or with pioneer and ruderal vegetation with cover < 30%, (path = Yes)? All other habitats follow path = No. Note that habitats which originated through extractive industries (quarries, mines, peat diggings etc) or disused constructed surfaces, which have been colonised by natural or semi-natural plant and/or animal communities, including pioneer or ruderal communities with vegetation cover > 30%, follow path = No.

Answers:

No ( 002)

Yes ( 011)

Question 011 : **Regularly tilled?**

Habitats maintained solely by frequent tilling or arising from recent abandonment of previously tilled ground such as arable land and gardens (path = Yes) are distinguished from completely artificial habitats (path = No), which are primarily human settlements, industrial developments, transport or waste dump sites or highly artificial waters with wholly constructed beds or heavily contaminated water.

Answers:

Yes ( 012)

No ( 013)

Alternatively an overview can be obtained by clicking “EUNIS habitat types hierarchical view” and then either clicking on a level 1 habitat type or a + sign to open the hierarchy to the next level. At this point either click on a level 2 habitat type to see the factsheet, or again click the + sign to expand one branch to level 3. This process can be repeated to the end of each branch of the hierarchy.

EUNIS habitat type hierarchical view

- ⊕ [A : Marine habitats](#)
- ⊕ [B : Coastal habitats](#)
- ⊖ [C : Inland surface waters](#)
 - ⊕ [C1 : Surface standing waters](#)
 - ⊕ [C2 : Surface running waters](#)
 - ⊕ [C3 : Littoral zone of inland surface waterbodies](#)
- ⊕ [D : Mires, bogs and fens](#)
- ⊕ [E : Grasslands and lands dominated by forbs, mosses or lichens](#)
- ⊕ [F : Heathland, scrub and tundra](#)
- ⊕ [G : Woodland, forest and other wooded land](#)
- ⊕ [H : Inland unvegetated or sparsely vegetated habitats](#)
- ⊕ [I : Regularly or recently cultivated agricultural, horticultural and domestic habitats](#)
- ⊕ [J : Constructed, industrial and other artificial habitats](#)
- ⊕ [X : Habitat complexes](#)

If your primary interest is in Annex I of the Habitats Directive, the website includes a database containing all these habitat types. They can be viewed hierarchically by clicking “Annex I habitat types hierarchical view”, and then expanding from the first two hierarchical levels to the Annex I habitat of interest.

Habitat Annex I Directive hierarchical view: (higher levels are for grouping only)

- ⊕ [1 : COASTAL AND HALOPHYTIC HABITATS](#)
- ⊕ [2 : COASTAL SAND DUNES AND INLAND DUNES](#)
- ⊕ [3 : FRESHWATER HABITATS](#)
- ⊕ [4 : TEMPERATE HEATH AND SCRUB](#)
- ⊕ [5 : SCLEROPHYLLOUS SCRUB \(MATORRAL\)](#)
- ⊕ [6 : NATURAL AND SEMI-NATURAL GRASSLAND FORMATIONS](#)
 - ⊖ [6100 : Natural grasslands](#)
 - [6110 : Rupicolous calcareous or basophilic grasslands of the Alysso-Sedion albi](#)
 - [6120 : Xeric sand calcareous grasslands](#)
 - [6130 : Calaminarian grasslands of the Violetalia calaminariae](#)
 - [6140 : Siliceous Pyrenean Festuca eskia grasslands](#)
 - [6150 : Siliceous alpine and boreal grasslands](#)
 - [6160 : Oro-Iberian Festuca indigesta grasslands](#)
 - [6170 : Alpine and subalpine calcareous grasslands](#)
 - [6180 : Macaronesian mesophile grasslands](#)
 - [6190 : Rupicolous pannonic grasslands \(Stipo-Festucetalia pallentis\)](#)
 - ⊕ [6200 : Semi-natural dry grasslands and scrubland facies](#)
 - ⊕ [6300 : Sclerophyllous grazed forests \(dehesas\)](#)
 - ⊕ [6400 : Semi-natural tall-herb humid meadows](#)
 - ⊕ [6500 : Mesophile grasslands](#)
- ⊕ [7 : RAISED BOGS AND MIRES AND FENS](#)
- ⊕ [8 : ROCKY HABITATS AND CAVES](#)
- ⊕ [9 : FORESTS](#)

The factsheet then shows the habitat description, names in several other languages and relationships to the EUNIS habitat classification and other classifications (where available).

Xeric sand calcareous grasslands



General information	Geographical distribution	Habitat types	Sites	Species
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English name **Xeric sand calcareous grasslands**

NATURA 2000 habitat type code **6120**
Originally published code **34.12**

Priority **Yes**

Description (English)

Dry, frequently open grasslands on more or less calciferous sand with a subcontinental centre of distribution ([*Koelerion glaucae*, *Silene conicae*-*Cerastion semidecandri*, *Sedo*-*Cerastion*] p.). Plant text: [*Allium schoenoprasum*, *Alyssum montanum* ssp. *gemelinii*, *Astragalus arenarius*, *Cardaminopsis arenosa*, *Carex ligerica*, *Carex praecox*, *Dianthus deltoides*, *Euphorbia seguierana*, *Festuca psammophila*, *Gypsophila fastigiata*, *Helichrysum arenarium*, *Herniaria glabra*, *Koelerion glauca*, *Petrorhagia prolifera*, *Sedum reflexum*, *Silene chlorantha*].

Source:

EC-DGXI.d2 (1996)

Name in other languages


Language ▲	Name
Danish	Tørketålede græsvegetation på kalkrig jordbund
German	Trockene, kalkreiche Sandrasen
Greek	Xerikoi ammwdeiV asbestouci leimwneV
Spanish	Prados calcáreos de arenas xéricas
Finnish	Kuivat kalkkipitoiset niityt
French	Pelouses calcaires de sables xériques
Italian	Formazioni erbose calcicole delle sabbie xerofitiche
Dutch	Kalkminnend grasland op dorre zandbodem
Portuguese	Prados calcários de areias xéricas
Swedish	Sandstäpp

Relationships with other classifications

Classification ▲	Code	Title	Relation Type
EUNIS Habitat Classification 200611	E1.1	Inland sand and rock with open vegetation	wider
EUNIS Habitat Classification 200611	E1.12	Euro-Siberian pioneer calcareous sand swards	same

If you wish to download the complete classification (2004 update) there are two pdf files available under “Related reports”. [EUNIS_2004_report.pdf](#) includes an introduction, the criteria (key), factsheets for all habitat types to level 3, and the glossary. [EUNIS_2004_list.pdf](#) contains a list of all EUNIS habitat types in the 2004 update. The criteria are also available as a separate document.

The habitat search options

Most of the search options allow you to search either the EUNIS habitat classification database, the Annex I habitats database or both. For many searches the item sought, e.g. habitat name, can be completed by clicking the small blue arrow  next to the search box. This then opens a new window showing all values satisfying the partial search criterion already entered. For example, to search for a particular shrub habitat, use the right arrow tool:

Names and Descriptions

Search habitat types by name or description
(ex.: habitat type name contains **marine**)

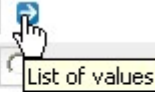
Search will provide the following information (checked fields will be displayed):

Level Code Habitat type name Habitat type english name

◆ Name(Description) starts with

Select database: EUNIS Habitat types Habitats Directive Annex I

Search in: Habitat type names English names Descriptions



Clicking on the right arrow then opens another window, and then the required habitat name, e.g. shrub tundra, can be selected and the search completed:

Press room | About EEA | Contact us

>> Home >> EUNIS >> Habitat types >> Names

Names and Descriptions

Search habitat types by name or description
(ex.: habitat type name contains **marine**)

Search will provide the following information (checked fields will be displayed):

Level Code Habitat type name Habitat type english name

◆ Name(Description) starts with

Select database: EUNIS Habitat types Habitats Directive Annex I

Search in: Habitat type names English names Descriptions

List of values for:

Habitat name or description starts with **shrub**

- [Shrub and low-stem tree orchards](#)
- [Shrub plantations](#)
- [Shrub plantations for leaf or branch harvest](#)
- [Shrub plantations for ornamental purposes or for fruit, other than vineyards](#)
- [Shrub plantations for whole-plant harvesting](#)
- [Shrub tundra](#)
- [Shrubby clearings](#)
- [Shrubby glasswort thickets](#)
- [Shrubby seablite thickets](#)

Close

Searching for EUNIS or Annex I habitats by name

In the example the user wishes to find EUNIS or Annex I habitat types which are dune slacks. Note that if the search is extended to include habitat descriptions, a large number of habitat types may be found.

Names and Descriptions

Search habitat types by name or description
(ex.: habitat type name contains **marine**)

Search will provide the following information (checked fields will be displayed):

Level Code Habitat type name Habitat type english name

◆ Name(Description) Contains

Select database: EUNIS Habitat types Habitats Directive Annex I Both

Search in: Habitat type names English names Descriptions

The result is:

Names and Descriptions

You searched for EUNIS and ANNEX I habitat types for which Scientific name / Vernacular name contains 'dune slack'
Results found: 4

Results displayed per page (max. 300)

Refine your search

Habitat type name

EUNIS Code	ANNEX I Code	Habitat type name
	2190	Humid dune slacks
B1.8		Moist and wet dune slacks
B1.86		Coastal dunes; wet dune slacks; dominated by shrubs or trees
CJ.4132		Dune slack shoreweed swards

The EUNIS habitat factsheet

To see the factsheet for a particular habitat type, click on the habitat type name. The first screen, “General information”, shows the habitat code and name, level in the hierarchy, description and its source, and relationships with other classifications:

Moist and wet dune slacks



General information	Geographical distribution	Legal instruments	Habitat types	Sites	Species	Other info
----------------------------	---------------------------	-------------------	---------------	-------	---------	------------

English name **Moist and wet dune slacks**



EUNIS habitat type code **B1.8**

Level **3**

Description (English)

Moist or wet depressions in coastal dune systems, sometimes with permanent water but more often only seasonally moist or flooded by fresh water. Dune-slacks are extremely rich and specialised habitats, very threatened by the lowering of water tables.

Source:

Hill, M.O., Moss, D. & Davies, C.E. (2004)

Relationships with other classifications

Classification ^	Code	Title	Relation Type
EUNIS Habitat Classification 200410	B1.8	Moist and wet dune slacks	same
EUNIS Habitat Classification 200308	B1.8	Moist and wet dune slacks	same
EUNIS Habitat Classification 200202	B1.8	Moist and wet dune slacks	same
EUNIS Habitat Classification 199910	B1.8	Moist and wet dune slacks	same
EUNIS Habitat Classification 199811	B1.8	Moist and wet dune slacks	same
EUNIS Habitat Classification 199712	B5.4	Moist and wet dune slacks	same
Palaeartic Habitat Classification 200112	16.3	Humid dune-slacks	same

The tabs are used to show further parts of the factsheet under different themes, e.g. Geographical distribution. *NB at present the Geographical distribution maps shade each country with a record in the habitat – geography database table, including those where it is stated that the habitat is believed to be absent. It is therefore essential to read the tabulation below the map. In the example, moist dune slacks are absent from Austria, but mapped as present.*

A more useful distribution map can sometimes be obtained by using the mapping tool to show the sites where the habitat is present. This is particularly true for Annex I habitats

Moist and wet dune slacks

General information	Geographical distribution	Legal instruments	Habitat types	Sites	Species	Other info
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Geographical distribution



Country	Biogeographic Region	Probability	Comment
Austria	Alpine	Absent	Assessment by D. Moss, October 2005
Austria	Continental	Absent	Assessment by D. Moss, October 2005
Belgium	Atlantic	Present	Assessment by D. Moss, October 2005
Belgium	Continental	Absent	Assessment by D. Moss, October 2005
Bulgaria	Alpine	Absent	Assessment by D. Moss, October 2005
Bulgaria	Black Sea	Present	Assessment by D. Moss, October 2005
Bulgaria	Continental	Absent	Assessment by D. Moss, October 2005

The tab “Legal instruments” shows related habitat types designated under either the EU Habitats Directive Annex I or the Council of Europe Bern Convention Resolution No. 4 (1996). The legal name and legal code of the habitat under the instrument are shown.

Moist and wet dune slacks

General information	Geographical distribution	Legal instruments	Habitat types	Sites	Species	Other info
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Code in legal instrument

Legal Instrument	Habitat Type Legal Name	Habitat Type Legal Code
Council of Europe Bern Convention Res. No. 4 1996	Humid dune-slacks	16.3
EU Habitats Directive Annex I	Humid dune slacks	2190

Tab “Habitat types” shows the related syntaxa (vegetation types described using phytosociology) related to moist and wet dune slacks. This information, of interest mainly to botanical specialists, includes the names of related vegetation types and sources of the information. *NB the tab titled “Habitat types” should be titled “Phytosociology” and the “Habitat types” page should be titled “Phytosociological syntaxa” not “Habitat type syntaxa.”*

Moist and wet dune slacks

General information	Geographical distribution	Legal instruments	Habitat types	Sites	Species	Other info
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Habitat type syntaxa

Name ▲	Relation	Source (Abbreviated)	Author	References
Phragmito-Magnocaricetea	n/a	Alterra: Synbiosys project 2002	Klika in Klika et Novak	
Nanocyperetalia	n/a	Alterra: Synbiosys project 2002	Klika	
Caricion davallianae	n/a	The Diversity of European Vegetation 2002	Klika	Rodwell, J. S. & Dring, J.
Potentillion anserinae	n/a	The Diversity of European Vegetation 2002	Тх.	Rodwell, J. S. & Dring, J.
Caricion fuscae	n/a	The Diversity of European Vegetation 2002	Koch	Rodwell, J. S. & Dring, J.
Agrostion salmanticae	not defined	Palaeartic Habitat Classification 2000	Rivas Goday	Eurola, S. & Kaakinen, E.
Hyperico elodis-Sparganion	n/a	The Diversity of European Vegetation 2002	Br.-Bl. et Тх. ex Oberd.	Rodwell, J. S. & Dring, J.
Saginion maritimae	n/a	The Diversity of European Vegetation 2002	Westhoff et al.	Rodwell, J. S. & Dring, J.
Preslion cervinae	n/a	The Diversity of European Vegetation 2002	Br.-Bl. ex Moor	Rodwell, J. S. & Dring, J.

The “Sites” tab cross-references the EUNIS habitat classification with the EUNIS Sites module, and shows all EUNIS sites (CORINE biotopes, Common Database on Designated Areas (CDDA), Natura 2000) for which the current habitat type has been recorded. Note that the relationship may have been established through a related habitat classification used in the Sites database. In the example shown, the CORINE sites where habitat type 16.3 is recorded have been displayed. This is because B1.8 is equivalent to 16.3 in the Palaeartic (formerly CORINE) habitat classification used for CORINE sites (see Relationships with other classifications above).

Moist and wet dune slacks



General information	Geographical distribution	Legal instruments	Habitat types	Sites	Species	Other info
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Map these sites using EUNIS Database map tool

[See sites in Google Earth \(KML file, pre-requires Google Earth installed\)](#)

Sites for which this habitat type is recorded

Site Code ▲	Source Data Set	Country	Site Name
111016105	Corine	Germany, Federal Republic of	HEIDE UND DUENENGEBIETE DER GEESTINSELN SYLT UND AMRUM:
1D1934131	Corine	Germany, Federal Republic of	INSEL LANGENWERDER
1D2034130	Corine	Germany, Federal Republic of	KUESTENLANDSCHAFT WISMAR-BUCHT
1D2034132	Corine	Germany, Federal Republic of	INSEL WALFISCH
200034011	Corine	France	ETANG ET PLAGE DE VENDRES, L'OUSTELET
200050012	Corine	France	LA MARE DE VAUVILLE
200059005	Corine	France	DUNE MARCHAND
412100100	Corine	Netherlands	WADDENZEE EN KUSTZONE VAN DE NOORDZEE
412100101	Corine	Netherlands	TEXELSE DUINEN
412100102	Corine	Netherlands	VLIELAND

If you have Google Earth installed on your computer you can also visualise these sites on a map:



If the current habitat factsheet is for an Annex I habitat type, the Sites listed on this screen are those where the Annex I habitat has been notified by the Member States to the Natura 2000 sites database. For example, for 1110 Sandbanks which are slightly covered by sea water all the time:

Sandbanks which are slightly covered by sea water all the time

General information	Geographical distribution	Habitat types	Sites	Species
---------------------	---------------------------	---------------	--------------	---------

Map these sites using EUNIS Database map tool

[See sites in Google Earth \(KML file, pre-requires Google Earth\)](#)

Sites for which this habitat type is recorded

Site Code ▲	Source Data Set	Country	Site Name
BEMNZ0001	Natura 2000	Belgium	Trapegeer- Stroombank
DE0916303	Natura 2000	Germany, Federal Republic of	NTP S-H Wattenmeer u. angrenzender Küstenstreifen
DE1346301	Natura 2000	Germany, Federal Republic of	Steilküste und Blockgründe Wittow
DE1432301	Natura 2000	Germany, Federal Republic of	Nördliche Seeniederung

The “Species” tab links the habitat type to the EUNIS Species module, showing species which have been recorded as characteristic for the given habitat type. Again the source of the information is shown.

Moist and wet dune slacks

General information	Geographical distribution	Legal instruments	Habitat types	Sites	Species	Other info
---------------------	---------------------------	-------------------	---------------	-------	----------------	------------

Species characteristics for habitat type

Species Scientific Name ▲	Biogeographic Region	Abundance	Frequencies	Faithfulness	Comment
Apium repens	Biogeographic region not detailed in original data set				Annex II species - habitat relation; source Unit of Vegetation Science, Lancaster, 2000
Armeria helodes	Biogeographic region not detailed in original data set				Annex II species - habitat relation; source Unit of Vegetation Science, Lancaster, 2000
Caropsis verticillatunodata	Biogeographic region not detailed in original data set				Annex II species - habitat relation; source Unit of Vegetation Science, Lancaster, 2000
Colchicum corsicum	Biogeographic region not detailed in original data set				Annex II species - habitat relation; source Unit of Vegetation Science, Lancaster, 2000
Coleanthus subtilis	Biogeographic region not detailed in original data set				Annex II species - habitat relation; source Unit of Vegetation Science, Lancaster, 2000

The final tab “Other info” shows records from the database on a range of other parameters. Note that these have only been included when they help to characterise the habitat and distinguish it from similar habitat types. These records can be seen by clicking “Expand all” or the individual parameter for which there are records. As a general rule these additional parameters are only included for habitats at levels 1 to 3.

Moist and wet dune slacks

General information	Geographical distribution	Legal instruments	Habitat types	Sites	Species	Other info
---------------------	---------------------------	-------------------	---------------	-------	---------	-------------------

[Expand All](#) | [Collapse All](#)

Altitude zones (terrestrial and marine) (1 records)
Marine depth zones, more detailed than altitude zones (no records)
Climate zones (no records)
Geomorphology types (1 records)
Substrate types (1 records)
Dominant life forms (no records)
Percentage cover by vegetation (no records)
Characteristics of wetness/dryness (2 records)
Characteristics of water flow, source and quality (no records)
Salinity values, for marine habitats only (no records)
Exposure types (no records)
Acidity, salinity, trophic status (no records)
Characterising temperature (no records)
Light intensity (no records)
Spatial parameters of size and shape (no records)
Temporal parameters (no records)
Human activities and impacts (no records)
Levels of habitat usage (no records)

Searching for species related to particular habitat types

If you wish to know what species are associated with a habitat, but do not wish to restrict your result to a single EUNIS habitat, the search option “Pick habitat types, show species” is useful. In the example, all Annex I habitats whose name or description contains “dune slacks” are selected, and the species recorded for those habitats are then tabulated alongside the habitat name. From this point it is possible to go either to the species factsheet or the habitat factsheet.

Pick habitat, show species

 [Download results](#)

You searched for species in habitat types with **Habitat type name or description contains 'dune slack'**

Results found: **49**

Results displayed per page (max. 300) [change](#)

Refine your search

Scientific name [search](#)

Current page: 1 / 5

Go to page: [change page](#)



Group	Order	Family	Species scientific name	Habitat type(s)
Mosses & Liverworts		Amblystegiaceae	Cratoneuron commutatum	Alkaline fens
Flowering Plants		Betulaceae	Betula sp.	Wooded dunes of the Atlantic, Continental and Boreal region
Flowering Plants		Salicaceae	Salix sp.	Dunes with Salix repens ssp. argentea (Salicoid duneside)
Conifers		Pinaceae	Pinus pinaster	Wooded dunes of the Atlantic, Continental and Boreal region
Conifers		Pinaceae	Pinus sylvestris	Wooded dunes of the Atlantic, Continental and Boreal region
Conifers		Cupressaceae	Juniperus oxycedrus	Coastal dunes with Juniperus spp.
Conifers		Cupressaceae	Juniperus communis	Coastal dunes with Juniperus spp.
Flowering Plants		Aceraceae	Acer pseudoplatanus	Wooded dunes of the Atlantic, Continental and Boreal region
Flowering Plants		Compositae	Carlina vulgaris	Dunes with Salix repens ssp. argentea (Salicoid duneside)

Searching for sites related to particular habitat types

If you wish to know at what sites a habitat has been recorded, but do not wish to restrict your result to a single EUNIS habitat, the search option “Pick habitat types, show sites” is useful. In the example, all EUNIS habitats whose name or description contains “dune slacks” are selected, and the sites where those habitats have been recorded are then tabulated alongside the habitat name. From this point it is possible to go either to the sites factsheet or the habitat factsheet.

Pick habitat type, show sites

Find sites containing a particular habitat type
(ex.: EUNIS habitat types **Mires, bogs and fens**)

Search will provide the following information (checked fields will be displayed)

Source data set Designation type Site code Site name Coordinates Habitat types

Name or Description Contains dune slack

Select database: EUNIS habitat types Habitat type Directive Annex I Both

Reset

Pick habitat type, show sites

 [Download results](#)

You searched for sites containing EUNIS habitat types with the following characteristic: **habitat english name or description contains 'dune slack'**.

Results found **139**

Results displayed per page (max. 300) [change](#)

Refine your search

Database source [search](#)

Current page: 1 / 14

Go to page: [change page](#)

Source data set	Designation type	Site code	Site name	Habitat type(s)
Corine	n/a	111016105	HEIDE UND DUENENGEBIETE DER GEESTINSELN SYLT UND AMRUM:	Moist and wet dune slacks
Corine	n/a	112430630	GUDOW-MOELLNER-SEENGEBIET:	Blunt-flowered rush meadows
Corine	n/a	112430633	SEGRAHNER SEE MIT MOOR:	Blunt-flowered rush meadows
Corine	n/a	186616511	HOCKENHEIMER RHEINBOGEN	Blunt-flowered rush meadows
Corine	n/a	1B3345211	TEGELER FLIESS	Blunt-flowered rush meadows

Searching for habitat types in a particular country, biogeographic region or biogeographic region within a country

The search option Country / Biogeographic region allows you to search for all habitats in the EUNIS habitat classification, Annex I or both in a country, a biogeographic region (as defined for the EU Habitats Directive) or a biogeographic region within a country. For example, to find all Annex I habitats in the Atlantic region of Belgium:

Country / Biogeographic region

You searched for ANNEX I Habitat types from biogeoregion Atlantic present in Belgium
Results found: 52

Results displayed per page (max. 300) [change](#)

Refine your search

Habitat type name [search](#)

Current page: 1 / 6

Go to page: [change page](#)

Country	Biogeographic region	Habitat type name
Belgium	Atlantic	Sandbanks which are slightly covered by sea water all the time
Belgium	Atlantic	Estuaries
Belgium	Atlantic	Mudflats and sandflats not covered by seawater at low tide
Belgium	Atlantic	Salicornia and other annuals colonizing mud and sand
Belgium	Atlantic	Spartina swards (Spartinion maritimae)
Belgium	Atlantic	Atlantic salt meadows (Glauco-Puccinellietalia maritimae)
Belgium	Atlantic	Embryonic shifting dunes
Belgium	Atlantic	Shifting dunes along the shoreline with Ammophila arenaria ('white dunes')
Belgium	Atlantic	Fixed coastal dunes with herbaceous vegetation ('grey dunes')
Belgium	Atlantic	Atlantic decalcified fixed dunes (Calluno-Ulicetea)

Country/Biogeographic region

Find habitat types located within a country and/or a biogeographic region
(ex.: habitats from **alpine** biogeographic region of **Austria**)

Search will provide the following information (checked fields will be displayed)

Country Biogeographic region Level Code Habitat type name English name

Country AND/OR Biogeographic region

Select database: EUNIS Habitat types Habitats Directive Annex I Both

Disclaimer: Databases might not contain data for all countries and biogeographic regions

NB at present it is not advised to make this search on EUNIS habitat types, since records in the database showing that a habitat type is absent from a particular country are returned in addition to those where the habitat is present. The example below suggests that the continental region in Belgium (which has no coastline) includes a number of coastal habitats and even sea ice.

Country / Biogeographic region

You searched for **EUNIS and ANNEX I** Habitat types from biogeoregion **Continental present in Belgium**
Results found: **524**

Results displayed per page (max. 300)

Refine your search

Habitat type name

Current page: 1 / 53

Go to page:

Country	Biogeographic region	Habitat type name
Belgium	Continental	Sea ice
Belgium	Continental	Tidal rivers, upstream from the estuary
Belgium	Continental	Coastal saltmarshes and saline reedbeds
Belgium	Continental	Inland saltmarshes
Belgium	Continental	Xero-halophile scrubs
Belgium	Continental	Mediterranean inland salt steppes
Belgium	Continental	Mediterranean gypsum scrubs
Belgium	Continental	Continental inland salt steppes
Belgium	Continental	Sand beaches above the driftline

Code/Classifications search

This is potentially a complex search involving the relationships between habitats in a number of different classifications. It should be used with caution, as the results might be unpredictable and not necessarily those which are required. A null result may also be obtained since all possible relationships between classifications have not been included in the database, and in particular for Annex I habitats only those relationships specified in the 'Interpretation Manual of European Union Habitats' (which describes all Annex I habitats) are included. The search finds EUNIS or Annex I habitats related to particular habitats in another classification, and it is necessary to know the codes in the related classification to use this tool effectively. For example, if you are using the CORINE Land Cover classification in a habitat mapping application, you might wish to know which EUNIS habitat types are included in 3.1.1. Broad-leaved forest. To make this search, select CORINE Land Cover from the classifications drop-down menu and then enter the code 3.1.1. in the search box:

Code/Classifications

Find habitat types by their code in one of the linked classifications
(ex.: Find **Annex 1 habitat types** in relation with habitat types having code starts with **A1** in **EUNIS current classification**)

Search will provide the following information (checked fields will be displayed):

Level Code Scientific name Relationship with other habitat types

CORINE Land Cover

in relation with habitat types from:

in relation with:

The result lists 264 EUNIS habitats which correspond to the definition of broad-leaved forests used in CORINE Land Cover mapping. Note that the result can also be downloaded for further use.

 [Download results](#)

Code/Classifications

You searched for **EUNIS** habitat types related to habitat types having **code is 3.1.1. in the classification: CORINE Land Cover**
Results found: **264**

Results displayed per page (max. 300) [change](#)

Refine your search

Habitat type name [search](#)

Current page: 1 / 27

Go to page: [change page](#)



Display in results habitat types informations in all classifications

Level	EUNIS Code	ANNEX I Code	Habitat type name	Other codes (Code Classification Relation)
→ → 2	B1		Coastal dunes and sandy shores	J.1.1. CORINE Land Cover Broad-leaved forest
→ → 2	G1		Broadleaved deciduous woodland	J.1.1. CORINE Land Cover Broad-leaved forest
→ → → 3	G1.6		[Fagus] woodland	J.1.1. CORINE Land Cover Broad-leaved forest

Viewing published references to habitat types


To see the full citations for references used in the habitat descriptions, and other references where these have been recorded, the search option “Pick habitat types, show references” should be used. In the example, references for all habitat types whose names include “estuaries” in either EUNIS or Annex I are shown. *NB at present the column headed “source” shows every reference as a Source: these should only be the references which are sources for the descriptions shown in the factsheets.*

Pick habitat type, show references

Find books, articles which refer to a habitat type
(ex.: books, articles on **Alpine acidocline [Rhododendron] heaths** habitat type)

Search will provide the following information (checked fields will be displayed)

Author Date Title Editor Publisher Source type Habitat types

 Habitat type name [→](#)

Search database: EUNIS Habitat types Habitats Directive Annex I Both

Pick habitat type, show references

You searched for references for EUNIS and ANNEX I habitat types with scientific name contains 'estuaries'
Results found: 6


Results displayed per page (max. 300) [change](#)

Refine your search

Title [search](#)

Author	Date	Title	Editor	Publisher	Source type	Habitat type(s)
Brunet, R. et al		Les mots de la géographie-dictionnaire critique	Reclus		Source	Estuaries
Connor, D.W., Allen, J.H., Golding, N., Howell, K.L., Lieberknecht, L.M., Northen, K.O. & Reker, J.B.	2004	The Marine Habitat Classification for Britain and Ireland, Version 04.05		JNCC, Peterborough	Source	Intertidal mobile sand in variable salinity (estuaries) Sublittoral coarse sediment in variable salinity (estuaries) Sublittoral mixed sediment in variable salinity (estuaries) Sublittoral mud in variable salinity (estuaries) Sublittoral sand in variable salinity (estuaries)
European Commission	1999	Interpretation Manual of European Union Habitats, Version EUR 15 / 2		DG Environment, Brussels	Source	Estuaries
Gillner, W.	1960	Vegetations- und Standortsuntersuchungen in den Strandwiesen der schwedischen Westküste.			Source	Estuaries
Hill, M.O., Moss, D. & Davies, C.E.	2004	Revision of habitat descriptions originating from Devillers et al (2001)		European Topic Centre on Nature Protection and Biodiversity, Paris	Source	Estuaries

Searching for habitat types relevant to given published references

To find out which habitat types cite a particular published reference, the search option “Pick references, show habitat types” can be used. In this case there are several ways of searching for the reference, and it is recommended to use the blue arrows  to drill down to a particular reference of interest. Note that in this search the references are either the sources of habitat descriptions, or “other references”, such as those listed in the ‘Interpretation Manual of European Union Habitats’. A search on a source reference is likely to return a very large number of habitat types. In the example references by Heikkinen are sought:

Pick references, show habitat types

Search publications which refer to habitat types
(ex.: Books or articles published by **Helsinki Commission**)

Search will provide the following information (checked fields will be displayed)

Level Code Scientific name English name

◆ Author starts with 

◆ Year is 

◆ Title Contains 

◆ Editor Contains 

◆ Publisher Contains 

Search database: EUNIS Habitat types Habitats Directive Annex I Both

Source reference: Source Other information

List of authors starting with/containing ...

The blue arrow is used to complete the name:

Pick references, show habitat types

Search publications which refer to habitat types
(ex.: Books or articles published by **Helsinki Commission**)

Search will provide the following information (checked fields will be displayed)

Level Code Scientific name English name

◆ Author starts with 

◆ Year is 

◆ Title Contains 

◆ Editor Contains 

◆ Publisher Contains 

Search database: EUNIS Habitat types Habitats Directive

Source reference: Source Other information

List of values - Microsoft Internet Explorer prov...

List of authors References with following characteristics:
- AUTHOR starts with 'he'

List of values

Hedenäs, L. & Löfroth, M.
Heikkinen, R.K.
Helsinki Commission

When Heikkinen is clicked and the search run, the habitat type which cites Heikkinen is given:

Books, articles

You searched for **EUNIS and ANNEX I** habitat types for which the selected references (**Other information**) (with **Author starts with 'Heikkinen, R.K.'**) are recorded in the database
Results found: **1**

Results displayed per page (max. 300)

Refine your search

Habitat type name Criteria Operator

EUNIS Code	ANNEX I Code	Habitat type name
	9060	Coniferous forests on, or connected to, glaciofluvial eskers

Cross-referencing between EUNIS habitat classification and Habitats Directive Annex I

A number of users are interested in the relationships between EUNIS and Annex I. It is important to understand the origin of Annex I, which was drawn from the CORINE habitat classification in use for the European Commission's CORINE Biotopes Project in the late 1980s. The original Annex I list was published when Directive 92/43/EEC was adopted in 1992 by the then 12 EU Member States and habitats were defined by reference to the CORINE classification. In 1996 the 'Interpretation Manual of European Union Habitats-EUR15' (European Commission, 1996) used the Palearctic classification. Subsequently, further habitat types have been added to Annex I at each enlargement of the EU (2004, 2007). These were usually cross-referred to the Palearctic habitat classification (developed from 1993 to 2001), but they have no cross-reference when the habitat proposed by a new Member State was not included in the Palearctic habitat classification. In many cases descriptions of existing habitats were amended and this was done using the Palearctic classification.

There are a number of complexities in establishing relationships between EUNIS habitats and Annex I. In the simplest cases, there is an exact one-to-one equivalence between the two lists. For example, EUNIS G1.61 Medio-European acidophilous [Fagus] forests is equivalent to Annex I 9110 Luzulo-Fagetum beech forests. In this case the source CORINE habitat used in 1989 was 41.11, and this habitat type was unchanged in the Palearctic habitat classification in 1993 from where it was incorporated directly into EUNIS from as G1.61. Another one-to-one relationship exists between E3.121 Peat grasslands of Troodos and 6460 Peat grasslands of Troodos. In this case, a habitat type found only in Cyprus was absent from the Palearctic classification, but was added to EUNIS under E3.1 Mediterranean tall humid grassland so as to ensure that the new Annex I habitat could be included in EUNIS.

A more complex one-to-many example is Annex I 2330 Inland dunes with open *Corynephorus* and *Agrostis* grasslands which overlaps with (or possibly contains) E1.91 Dwarf annual siliceous grassland, E1.92 Perennial open siliceous grassland, E1.93 *Corynephorus* grassland, E1.94 Inland dune pioneer grassland and E1.95 Inland dune siliceous grassland. There are also several examples of many-to-many relationships, particularly amongst marine habitats where some of the Annex I habitats are in effect considered as habitat complexes in EUNIS. For example, Annex I 1130 Estuaries overlaps with a large number of EUNIS habitats including A2.4 Littoral mixed sediments, A5.4

Sublittoral mixed sediments, A1.4 Features of littoral rock amongst others, while conversely EUNIS A2.4 Littoral mixed sediments overlaps with 1130 Estuaries and also 1140 Mudflats and sandflats not covered by seawater at low tide, 1150 Coastal lagoons and 1160 Large shallow inlets and bays.

Only one Annex I habitat has no EUNIS equivalents: 9060 Coniferous forests on, or connected to, glaciofluvial eskers is defined by a landform feature in addition to a very broad range of forest types, and therefore cannot be related in a meaningful way to EUNIS habitats.

The Annex I / EUNIS relationships can be seen on the factsheets for both EUNIS and Annex I habitats listed under Relationships with other classifications, where the relation type is also shown. *Complete spreadsheets of the relationships between EUNIS and Annex I; and those between Annex I and EUNIS are available for download.* You can also use the search option Legal Instruments in the habitat search menu, which allows a search for EUNIS habitats designated either by Annex I or Bern Convention Resolution No. 4. The search can be restricted to one EUNIS level 1 habitat type so as to focus on the subject of interest.

Legal Instruments

Search for EUNIS habitat types protected by legal instruments at European level
(ex. legal instruments for type **A** - **Marine habitats**)

Search will provide the following information (checked fields will be displayed):

<input checked="" type="checkbox"/> Level	<input checked="" type="checkbox"/> Code	<input checked="" type="checkbox"/> Habitat type name	<input checked="" type="checkbox"/> legal text
<input checked="" type="checkbox"/> Habitat type	H - Inland unvegetated or sparsely vegetated habitats		and
<input checked="" type="checkbox"/> Habitat type name contains	<input type="text"/>		and
<input checked="" type="checkbox"/> legal text	EU Habitats Directive Annex I		

The resulting table uses the underlying relationships between Annex I and EUNIS habitats to list all EUNIS habitats satisfying the search criterion, in this example all Inland unvegetated or sparsely vegetated habitats which have any relationship with an Annex I habitat.

Legal Instruments

You searched for EUNIS habitat types from 'Inland unvegetated or sparsely vegetated habitats', protected by 'EU Habitats Directive Annex I' legal text
Results found: 72

Results displayed per page (max. 300) [change](#)

Refine your search
Habitat type name Search

Current page: 1 / 8

Go to page: [change page](#)



Level	EUNIS Code	Habitat type name	legal text
→ → → 3	H1.1	Cave entrances	Council of Europe Bern Convention Res. No. 4 1996 EU Habitats Directive Annex I
→ → → 3	H1.2	Cave interiors	Council of Europe Bern Convention Res. No. 4 1996 EU Habitats Directive Annex I
→ → → → 4	H1.21	Troglobiont vertebrate caves	Council of Europe Bern Convention Res. No. 4 1996 EU Habitats Directive Annex I
→ → → → 4	H1.22	Subtroglophile vertebrate caves	Council of Europe Bern Convention Res. No. 4 1996 EU Habitats Directive Annex I
→ → → → 4	H1.23	Troglobiont invertebrate caves	Council of Europe Bern Convention Res. No. 4 1996 EU Habitats Directive Annex I
→ → → → 4	H1.24	Troglophile invertebrate caves	Council of Europe Bern Convention Res. No. 4 1996 EU Habitats Directive Annex I
→ → → → 4	H1.25	Subtroglophile invertebrate caves	Council of Europe Bern Convention Res. No. 4 1996 EU Habitats Directive Annex I
→ → → 3	H1.4	Lava tubes	EU Habitats Directive Annex I

EUNIS habitat classification and Corine Land Cover

Each EUNIS habitat class has been assigned to its probable equivalent in the CORINE Land Cover classification (see <http://etc-lusi.eionet.europa.eu/CLC2006/>) and this cross walk can be downloaded as a separate document. Note that in some instances there is not a simple one to one relationship between the two systems

Adding new habitat types to the EUNIS habitat classification

An undertaking such as the development of a pan-European habitat classification will never be complete, since new research, inclusion of new reference material or extension of the geographical area covered will reveal more detailed habitat types which are not included in the current version of the classification. For this reason it is important for users to cite the EUNIS version date when the classification is used in their project. As mentioned above, the classification is designed to allow flexibility in admitting new habitat types, but it is also hoped that there should be stability in the existing classification, at least to level 3.

The developers of the classification at the European Topic Centre on Biological Diversity have set out a number of principles which should be respected when the classification is expanded. These are available on request (email ctecninf@mnhn.fr with 'EUNIS habitats' as the subject). Users are strongly recommended to consult the Topic Centre when they wish to add new habitat types for use in their own particular applications. For example, in the study for the Veliko ratno ostrvo island near Belgrade illustrated above, the authors have included F9.4 [*Amorpha fruticosa*] scrub (this is an alien invasive plant). However a search of the EUNIS website will show only three level three habitats in F9 Riverine and fen scrubs: F9.4 was added by the authors of this study. It would be quite possible for researchers working on different riverine systems in another part of Europe also to add their own new F9.4 – and

confusion would soon result. The preferred action would be to discuss the new habitat type with the Topic Centre's experts who would then advise on how to code the new habitat type, and include it in the next published version.

References

de Bakker, N.V.J., van 't Zelfde, M., & Tamis, W.L.M. (2007). A comparison of EUNIS classes and critical loads of nitrogen between NFC-data and the harmonized land cover map under LRTAP Convention. CML technical report 42, Institute of Environmental Sciences, Leiden University Department Environmental Biology.

Barcelona Convention (1998). Revised Draft Classification of Benthic Marine Habitat Types for the Mediterranean Region. UNEP(OCA)/MED WG.149/5, Annex III.

Connor D.W., Allen J.H., Golding N., Howell K.L., Lieberknecht L.M., Northen K.O. & Reker J.B. (2004) Marine Habitat Classification for Britain and Ireland Version 04.05. JNCC, Peterborough. www.jncc.gov.uk/MarineHabitatClassification

Davies, C.E., Moss, D. & Hill, M.O. (2004). EUNIS Habitat Classification Revised 2004. Report to the European Topic Centre on Nature Protection and Biodiversity. European Environment Agency.

Devillers, P., Devillers-Terschuren, J. & Ledant, J.-P. (1991) *CORINE biotopes manual. Vol. 2. Habitats of the European Community*. Office for Official Publications of the European Communities, Luxembourg.

Devillers, P. & Devillers-Terschuren, J. (1996). A classification of Palaearctic habitats. Council of Europe, Strasbourg: Nature and environment, No 78.

European Commission, 1996. Interpretation Manual of European Union Habitats- EUR15.

Helsinki Commission (1998). Red List of Marine and Coastal Biotopes and Biotopes Complexes of the Baltic Sea, Belt Sea and Kattegat Baltic Sea Environment Proceedings, No. 75 Baltic Marine Environment Protection Commission, Helsinki.

MESH (Mapping European Seabed Habitats) <http://www.searchmesh.net/>

Petit, S., Firbank, L., Wyatt, B., and Howard, D. (2001). MIRABEL: Models for Integrated Review and Assessment of Biodiversity in European Landscapes *Ambio* **30**: 81-88.

Šinžar-Sekulić, J., Komarnicki, A. & Stevanović, V. Changes of habitat types through several decades in the Danube region in Serbia - The case of Veliko ratno ostrvo island near Belgrade.

http://www.oen-iad.org/conference/docs/7_miscellaneous/sinzar-sekulic_et_al.pdf