A thematic contribution to the

National Biodiversity Strategy

Italian interpretation Manual of the habitats (92/43/EEC Directive)

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Ministry of the Environment, Land and Sea Protection
Nature Protection Directorate
General Director Aldo COSENTINO

Italian Society of Botany onlus
President Francesco Maria RAIMONDO

Authors of the Manual: E. Biondi, C. Blasi, S. Burrascano, S. Casavecchia, R. Copiz, E. Del Vico, D. Galdenzi, D. Gigante, C. Lasen, G. Spampinato, R. Venanzoni, L. Zivkovic.

Other authors: N. Abdelahad, M. Aleffi, M. Allegrezza, G. Alongi, C. Andreis, S. Assini, G. Bacchetta, S. Brullo, M. Caccianiga, M. Casti, G. Ciaschetti, R. Di Pietro, P. Digiovinazzo, E. Farris, S. Fascetti, G. Filibeck, R. Filigheddu, A.R. Frattaroli, B. Foggi, B. Gallino, D. Gargano, G. Giaccone, L. Gianguzzi, R. Guarino, M. G. Mariotti, F. Mascia, S. Pesaresi, M. Pellizzari, F. Piccoli, G. Pirone, L. Poldini, M. Puglisi, G. Relini, F. Sartori, G. Sburlino, A. Selvaggi, D. Viciani.

Thematic and regional experts: N. Abdelahad (Algae), M. Allegrezza (Marche), C. Andreis (Lombardia), P.V. Arrigoni (Toscana & Sardegna), G. Bacchetta (Sardegna), S. Bagella (Sardegna), L. Bernardo (Calabria), E. Brugiapaglia (Molise), S. Brullo (Sicilia), M. Caccianiga (Lombardia), G. Ciaschetti (Abruzzo), A. Crisafulli (Sicilia), P. Di Marzio (Molise), R. Di Pietro (Lazio), S. Fascetti (Basilicata), B. Foggi (Toscana), L. Forte (Puglia), A. R. Frattaroli (Abruzzo), B. Gallino (Piemonte), C. Gangale (Calabria), D. Gargano (Calabria), C. Giancola (Molise), L. Gianguzzi (Sicilia), R. Guarino (Sicilia), L. Gubellini (Marche), L. Lastrucci (Toscana), M.G. Mariotti (Liguria), P. Medagli (Puglia), E. Orsomando (Umbria), M. Pellizzari (Emilia-Romagna), E.V. Perrino (Puglia), F. Piccoli (Emilia-Romagna), B. Paura (Molise), M. Pinzi (Marche), G. Pirone (Abruzzo), L. Poldini (Alpi, Friuli Venezia Giulia), G. Sburlino (Alpi, Veneto), A. Selvaggi (Piemonte), F. Selvi (Toscana), M. Speranza (Emilia-Romagna), A. Stanisci (Molise), S. Strumia (Campania), F.M. Tardella (Umbria), D. Uzunov (Calabria), S. Verde (Lombardia), D. Viciani (Toscana).

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Design by:
Progetto Artiser - Roma
www.artiser.it
info@artiser.it

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Editors: C. Blasi, E. Biondi, R. Copiz, D. Galdenzi, S. Pesaresi.

Assistant to the editors: I. Anzellotti, S. Bonacquisti, R. Frondoni, B. Mollo.

Photos by: C. Andreis, E. Biondi, R. Copiz, C. Lasen, M. Luth, G. Spampinato.

Front cover: Cala del Cefalo (Cilento and Vallo di Diano National Park). Photo by R. Copiz.

PREMISE

Italy did not play a particularly active role in the early drafting phases of Directive 92/43/EEC (better known as the Habitats Directive), particularly as regards the definition of the Annexes concerning species and habitats. This resulted in the omission of some species and habitats that deserve protection, an oversight that has yet to be fully redressed. Moreover, the definition of many habitats included in the European Manual for the interpretation of habitats of community interest did not, despite repeated updates, fully reflect the complex characteristics of the plant communities present in Italy, if not in fairly general physiognomic and ecological terms.

This somewhat elaborate situation warranted an Italian Manual for the interpretation of the habitats found in Italy designed to provide an analysis and description of a considerable part of the extraordinary natural heritage in Italy and to serve as a source of information and for decision-taking purposes. Indeed, a precise, homogeneous interpretation of habitats plays a fundamental role in the definition of Sites of Community Interest and in the promotion of initiatives aimed at enhancing the conservation of habitats, at assessing the occurrence of species within the habitats and at planning the monitoring programmes foreseen in the Directive itself.

The Ministry commissioned the Italian Society of Botany to prepare this Manual. This Society, which is one of the oldest scientific societies in Italy and boasts among its members innumerable researchers from the various botanic disciplines, had previously collaborated very effectively with the Nature Protection Directorate of the Ministry on numerous projects related to the Natura 2000 Network. It is only by adopting a serious scientific approach that we can lay the foundations required to effectively solve the problems regarding our overall quality of life. The loss of biodiversity plays a fundamental role in this regard if we consider that diversity of life in all its forms, levels and planning processes strongly influences, whether it be directly or indirectly, man and the development of society.

Fiumara Amendolea (Southern Calabria). Foto di *G. Spampinato*.

THE HABITATS DIRECTIVE

The Habitats Directive is one of the most important legislative means of protecting biodiversity in Europe. In order to fulfil the goals laid down in the Directive, Europe set up a dedicated network of sites (Natura 2000 Network) designed to protect the habitats and animal and plant species that best characterise the biodiversity in our continent. This approach ensures, both directly and indirectly, the protection of species populations insofar as the *in situ* conservation of such populations is achieved by protecting their habitats.

This is the first directive in which the link between species and communities is clearly recognised, and in which Phytosociology (Plant Science) is adopted as a basis for the definition and identification of habitats, and in which even the biodiversity within semi-natural habitats is considered to be important. As a consequence, the biodiversity resulting from man's activities over the millennia, both as an animal-breeder and crop-grower, is no longer considered to be less important than that found in fully natural habitats. Certain features of landscapes that have been modified by man are also recognised as contributing to biodiversity and have consequently been included among conservation targets. Conservation thus requires careful planning strategies aimed at striking a balance between an acceptable degree of naturalness and the socio-economic needs of given habitats.

NATURA 2000 NETWORK IN ITALY

The Natura 2000 Network is currently made up of 2,288 Sites of Community Interest (SCI), which cover 4,542,986 hectares, and 597 Special Protection Areas (SPA), defined according to the preceding Birds Directive (79/409/EEC), which cover 4,389,722 hectares.

The SCIs and SPAs currently account for respectively 15.04% and 14.53% of the Italian territory. If these two types of area are combined (i.e. by counting overlapping areas only once), the Natura 2000 Network overall cover is approximately 20%, which may be sufficient to ensure the conservation of biodiversity in Italy as long as suitable management strategies are adopted and an adequate level of connectivity is maintained between the areas.

THE MANUAL

GOALS

Although texts and manuals on habitats of community interest have been published in recent years by a number of Italian administrative regions, certain inconsistencies in the interpretations adopted prevent direct comparisons. There was thus the need for a homogeneous approach to the identification of the habitats and to the assessment of their state of conservation.

The Italian Manual for the interpretation of the Habitats Directive 92/43/EEC, which not only represents a technical and scientific reference tool for Italy itself, but also serves as a basis for relations between Italy and EU technical-administrative bodies and other Member States, has been conceived to:

- draw up an interpretation that is shared by the leading experts in different habitats, taking into consideration any work that has previously been conducted by the individual regions;
- act as a fundamental tool for the assessment of the state of conservation of the habitats and for the definition of management strategies aimed at maintaining or achieving a "satisfactory" state of conservation as defined by the Habitats Directive itself.

METHODS

This Manual is founded on the collection and analysis of all the material and official documents published to date, such as the Natura 2000 databank, the assessments recently conducted to satisfy Article 17 of the Habitats Directive, the Reference Lists of the three Biogeographical Regions identified in Italy (Alpine, Continental and Mediterranean) and, above all, the EUR27 version of the European manual. The results achieved under other agreements and in the Life Natura projects were also analysed. The Italian Society of Marine Biology made a significant contribution to the section regarding the marine habitats. Moreover, previous research on the flora and vegetation of Italy, any regional manuals written and the "Italian Habitats" (Friuli Museum of Natural History and Ministry of Environment) were all thoroughly reviewed. The papers presented at the 43rd Congress of the Italian Society of Vegetation Science, which was held in Ancona in 2007 and was focused on the application of the Habitats Directive itself, also proved to be very useful.

Clay hills of Montalbano Jonico - Matera. Photo by *R. Copiz*.

SAMPLE FACTSHEET

The "sample factsheet", which was designed specifically for this manual, was used as a template to describe each habitat. The "habitat's diagnostic name" first briefly illustrates the habitat's characteristics in Italy and mentions any subtypes or variants. The factsheet then goes on to present any other features that shed light on the habitat, such as the combination of prevailing species and the syntaxonomic details of the plant species found within the habitat.
A specific section places the habitat within the context of its plant landscape by providing details on its synphytosociological and geosynphytosociological analyses so as allow comparisons with other habitats by highlighting the most complex mosaic features.
Particular attention was placed on the distribution of the habitat on a regional scale, with inconsistencies being highlighted between each region and the data reported in the Natura 2000 databank or the European interpretation manual. The following scenarios were thus considered: data already present in Natura 2000 databank and confirmed; data already present in Natura 2000 databank though doubtful; data already present in Natura 2000 databank though wrong; new data; probable data. Each of these scenarios is highlighted using a specific colour on a small map of Italy.
The "Notes" section contains any further details, missing information, inconsistencies or potentially misleading information. The bibliography is exhaustive and includes all the references available, which comprise both publications and maps on a national, regional and local scale. The factsheet for each habitat was compiled by an expert, or a team of experts, at the national or regional levels. The factsheets were subsequently reviewed and validated on a website set up specifically for this purpose. Approximately 130 botanists contributed to this crucial phase by making over 800 comments, suggestions and additions, thereby definitively transforming the manual into a document that enjoys widespread support and approval within the scientific community.

31: Acque stagnanti

3160: Laghi e stagni distrofici naturali

Natural dystrophic lakes and ponds

Codice CORINE Biotopes
22.14 - Dystrophic waters

Codice EUNIS
C1.4 - Permanent dystrophic lakes, ponds and pools

Regione biogeografica di appartenenza
Alpina (Alp), Mediterranea

Descrizione generale dell'habitat
Natural lakes and ponds with brown tinted water due to peat and humic acids, generally on peaty soils in bogs or in heaths with natural evolution toward bogs. pH is often low, 3 to 6. Plant communities belong to the order *Utricularietalia*.

Frase diagnostica dell'habitat in Italia
Laghi e stagni distrofici naturali con acque acide spesso brune per la presenza di torba o acidi umici, generalmente su substrati torbosi, prevalentemente dei Piani bioclimatici Supra e Oro-Temperato, con vegetazione idrofitica sommersa pauci-specifica riferibile all'ordine *Utricularietalia intermedio-minoris*.

Sottotipi e varianti (compilare se necessario)

Combinazione fisionomica di riferimento
Sono specie guida dell'Habitat per l'Italia: ***Utricularia* spp.**, ***Rhynchospora alba***, ***R. fusca***, ***Sparganium minimum*** (= *S. natans*), ***Sphagnum* spp.** Inoltre si possono ricordare: *Utricularia minor*, *U. bremii*, *U. stygia*, *Alisma lanceolatum*, *Carex lasiocarpa*, *C. rostrata*, *Equisetum fluviatile*, *Potamogeton alpinus*, *P. filiformis*, *P. gramineus*, *Scorpidium scorpioides*, *Sparganium angustifolium*, *S. hyperboreum*, *Veronica scutellata*.

Broad-leaved woodland with Turkey oak, Italian oak and Pedunculate oak (Macchia di Anagni – Frosinone). Photo by *R. Copiz*.

Wetlands in the Circeo National Park, Sabaudia – Latina. Photo by *R. Copiz*.

Riferimento sintassonomico

Il riferimento sintassonomico è alle alleanze *Sphagno Utricularion* Muller & Görs 1960 e *Scorpidio Utricularion* Pietsch 1965, incluse nell'ordine *Utricularietalia intermedio-minoris* Pietsch 1965 e nella classe *Utricularietea intermedio-minoris* Pietsch 1965.

Dinamiche e contatti

Le tipologie di Habitat riferibili al codice 3160 si sviluppano prevalentemente nei paesaggi di torbiera, all'interno di pozze più o meno ampie ma generalmente poco profonde, in mosaico con le fitocenosi riferibili agli Habitat del gruppo 71 (complesso delle "Torbiere acide di sfagni") per le tipologie presenti in Italia, con le quali instaurano contatti di tipo catenale. In condizioni di interrimento possono essere invase da comunità delle alleanze *Rhynchosporion* (Habitat 7150) e *Caricion fuscae* (Habitat 7140).

Specie alleate/con

Distribuzione dell'habitat in Italia

Piemonte, Valle d'Aosta, Lombardia, Trentino Alto Adige, Veneto, Friuli Venezia Giulia, Toscana, Calabria

- Dato già presente in SD Natura 2000 e confermato
- Dato già presente in SD Natura 2000 ma dubbio
- Dato già presente in SD Natura 2000 ma errato
- Dato nuovo
- Dato probabile

Note

Data la precisa caratterizzazione ecologica dell'Habitat, si ritiene che l'ordine a cui si fa riferimento nel Manuale EUR/27 sia *Utricularietalia intermedio-minoris* Pietsch 1965 (classe *Utricularietea intermedio-minoris* Pietsch 1965) e non *Utricularietalia* Den Hartog & Segal 1964 (classe *Potametea* Klika in Klika & Novák 1941).

Riferimenti Bibliografici

BRACCO F., BUFFA G., GHIRELLI L., SBURLINO G., VILLANI M., 2000. Dati vegetazionali per la gestione di un ambiente fluviale degradato: il fiume Dese (Pianura veneta). In: Biondi E., Celantonio R. (Eds.): La pianificazione del paesaggio tra ri naturazione ed iper antropizzazione. Acc. Marchighiana Sci. Lett. Arti: 309-325.

DIERSSEN K., 1996. Vegetation Nordeuropas. Eugen Ulmer Verlag, Stuttgart.

DÍTĚ D., NAVRÁTILOVÁ J., HÁJEK M., VALACHOVIC M., PUKAJOVÁ D., 2006. Habitat variability and classification of Utricularia communities: comparison of peat depressions in Slovakia and the Trebon basin. Preslia, 78: 331-343.

GERDOL R., TOMASELLI M., 1997. Vegetation of wetlands in the Dolomites. Dissertationes Bot., 281. Cramer. 197 pag.

LASEN C., 2008. Natura e paesaggi del territorio bellunese. In: LASEN C. (a cura), Tesori naturalistici. Viaggio alla scoperta dei paesaggi e della biodiversità, dalla montagna al mare, nelle province di Belluno, Vicenza, Verona, Mantova, Ancona: 25-139. Fondazione Cariverona.

LASEN C., SCARIOT A., 2007. Le macrofite. In: AA.VV. (a cura di ARPAV), Studio della qualità delle acque dei piccoli laghi alpini: 155-186. Interreg IIIA Italia-Austria. Ed. ARPAV Belluno.

PADOAN S., CANIGLIA G., 2004. L'Oasi di Valle Averto (Venezia): flora e lineamenti della vegetazione. Lav. Soc. Ven. Sc. Nat., 29: 79-88.

PIETSCH W., 2000. Vegetation structure and indicator values of various stages of European *Utricularietea intermedio-minoris* communities. Coll. Phytosoc., 27: 921-952.

PIETSCH W., 2008. Beitrag zur Soziologie und Ökologie der europäischen *Littorelletea-* und *Utricularietea*-Gesellschaften. Feddes Repertorium, 88 (3): 141-245.

RAFFAELLI M., MORI SECCI M., MARIOTTI LIPPI M., FIORINI G., 1997. Indagini floristico vegetazionali e archeopalinologiche sul Lago Baccio e sul Lago del Greppo (Appennino Tosco-Emiliano). Webbia, 51(2): 201-235.

SARZO A., PROSSER F., FRISINGHELLI M., 1998. Flora e vegetazione della zona umida di Bolzonella (Provincia di Padova - Italia settentrionale). Archivio Geobot., 3 (2) 1997: 179-200.

SINDACO R., MONDINO G.P., SELVAGGI A., EBONE A., DELLA BEFFA G., 2003. Guida al riconoscimento di Ambienti e Specie della Direttiva Habitat in Piemonte. Regione Piemonte, Torino. 220 pp.

SINDACO R., SELVAGGI A., SAVOLDELLI P., 2008. La Rete Natura 2000 in Piemonte - I Siti di Interesse Comunitario. Regione Piemonte.

SBURLINO G., BRACCO F., BUFFA G., GHIRELLI L., 1996. Rapporti dinamici e spaziali nella vegetazione legata alle torbiere basse neutro-alcaline delle risorgive della Pianura padana orientale (Italia settentrionale). Colloques Phytosoc., 24: 285-294.

Riferimenti Bibliografici online

http://www.floradoc.org/habitat/habitat-natura-2000.html

Nomi dei compilatori con e.mail

Daniela Gigante (daniela.gigante@unipg.it)

THE HABITATS OF COMMUNITY INTEREST IN ITALY

The following 9 pages (including this one) briefly describe the 9 types of habitats defined by the European Directive 92/43/EEC that are found in Italy.

1 – MARINE AND COASTAL HABITATS

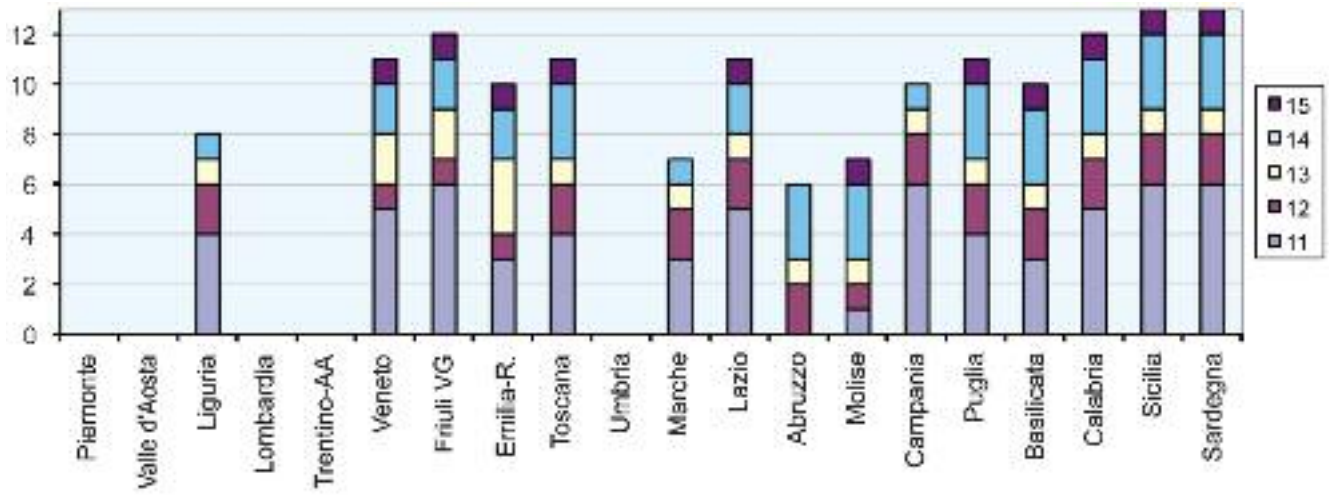
This type includes marine habitats or habitats that are closely related to seawater. It is divided in 6 subgroups, 5 of which are present in Italy: Open sea and tidal areas, Sea cliffs and shingle or stony beaches, Atlantic and continental salt marshes and salt meadows, Mediterranean and thermo-Atlantic salt marshes and salt meadows and Salt and gypsum inland steppes. Sixteen habitats (four of which have priority status) have been recognised in Italy.

List of marine and coastal habitats in Italy.

Code	Name
11	**Open sea and tidal areas**
1110	Sandbanks which are slightly covered by sea water all the time
1120*	Posidonia beds (*Posidonion oceanicae*)
1130	Estuaries
1140	Mudflats and sandflats not covered by seawater at low tide
1150*	Coastal lagoons
1160	Large shallow inlets and bays
1170	Reefs
12	**Sea cliffs and shingle or stony beaches**
1210	Annual vegetation of drift lines
1240	Vegetated sea cliffs of the Mediterranean coasts with endemic *Limonium* spp.
13	**Atlantic and continental salt marshes and salt meadows**
1310	*Salicornia* and other annuals colonizing mud and sand
1320	*Spartina* swards (*Spartinion maritimae*)
1340*	Inland salt meadows
14	**Mediterranean and thermo-Atlantic salt marshes and salt meadows**
1410	Mediterranean salt meadows (*Juncetalia maritimi*)
1420	Mediterranean and thermo-Atlantic halophilous scrubs (*Sarcocornetea fruticosi*)
1430	Halo-nitrophilous scrubs (*Pegano-Salsoletea*)
15	**Salt and gypsum inland steppes**
1510*	Mediterranean salt steppes (*Limonietalia*)

Current distribution of Sites in which marine and coastal habitats have been recorded.

Number of habitats recorded in the Italian regions, divided according to subgroups.



Example of *Crucianellion maritimae* on the sand dunes at the mouth of the river Liscia in northern Sardinia, with *Armeria pungens* and *Helichrysum italicum* subsp. *microphyllum*. Photo by *E. Biondi*.

2 – SAND DUNE HABITATS

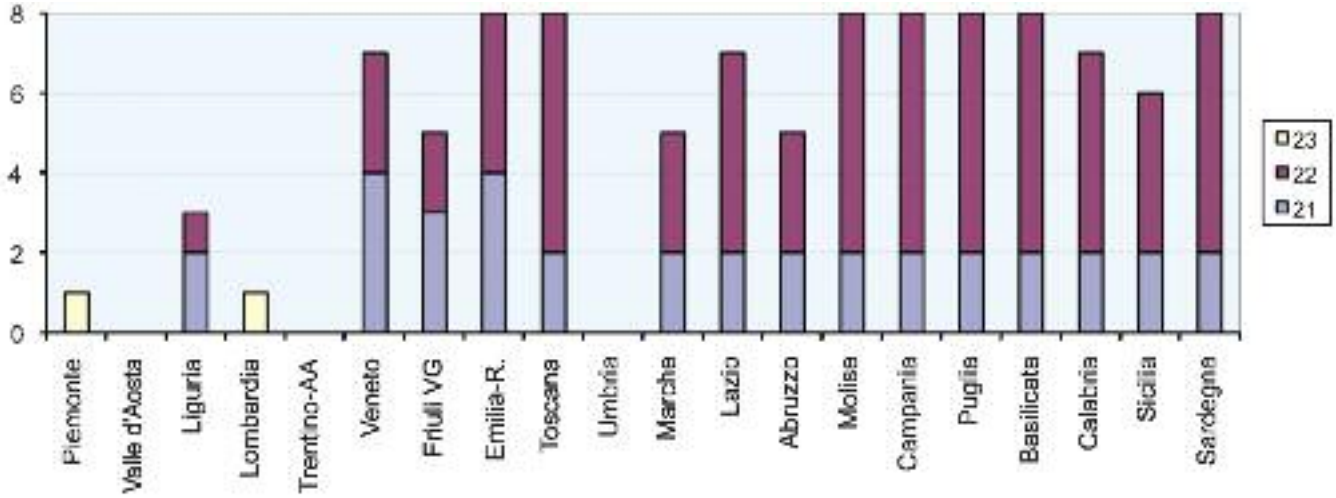
This type includes recent coastal sand dune habitats characterised by strictly psammophilous vegetation, the only exception being the "Inland dunes with open *Corynephorus* and *Agrostis* grasslands", a habitat that is based on ancient, non-coastal sand dunes found in Lombardy and Piedmont.
This type is divided in 3 subgroups: Sea dunes of the Atlantic, North Sea and Baltic coasts, Sea dunes of the Mediterranean coast and Inland dunes, old and decalcified. It contains a total of 21 habitats of community interest, 7 of which have priority status. Eleven of these 21 habitats are found in Italy (3 of which priority), all 3 subgroups being represented.

List of sand dune habitats in Italy.

Code	Name
21	**Sea dunes of the Atlantic, North Sea and Baltic coasts**
2110	Embryonic shifting dunes
2120	Shifting dunes along the shoreline with *Ammophila arenaria* (white dunes)
2130*	Fixed coastal dunes with herbaceous vegetation (grey dunes)
2160	Dunes with *Hippophaë rhamnoides*
22	**Sea dunes of the Mediterranean coast**
2210	*Crucianellion maritimae* fixed beach dunes
2230	*Malcolmietalia* dune grasslands
2240	*Brachypodietalia* dune grasslands with annuals
2250*	Coastal dunes with *Juniperus* spp.
2260	*Cisto-Lavanduletea* dune sclerophyllous scrubs
2270*	Wooded dunes with *Pinus pinea* and/or *P. pinaster*
23	**Inland dunes, old and decalcified**
2330	Inland dunes with open *Corynephorus* and *Agrostis* grasslands

Current distribution of the Sites in which sand dune habitats have been recorded.

Number of habitats recorded in the Italian regions, divided according to subgroups.



Example of *Sparganium angustifolium* (habitat 3130) on the Nassere Lake (Lagorai - Trento). Photo by *C. Lasen*.

Current distribution of the Sites in which freshwater habitats have been recorded.

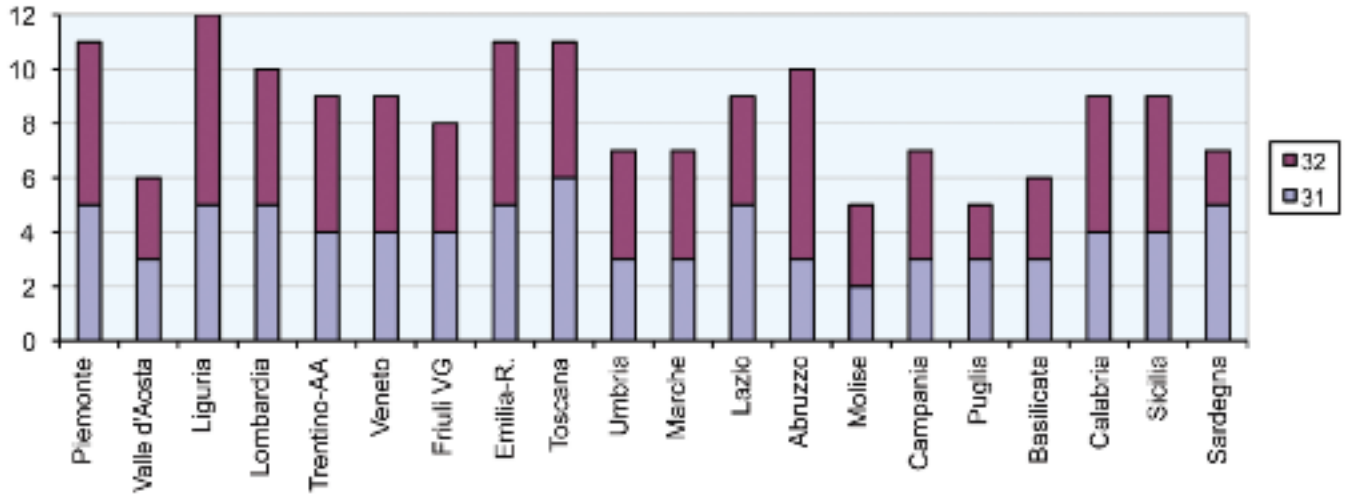
3 – FRESHWATER HABITATS

This type of habitat is found exclusively in two environments: Standing water (lakes and ponds) and Running water (river and torrents). Fifteen such habitats (of which only 1 has priority status) are recognised in Italy. They are found in every region, in both the mountains and plains of the Temperate and Mediterranean areas, with a strong presence not only of typically alpine communities but also of communities that are dependent on a seasonal water supply.

List of freshwater habitats in Italy.

Code	Name
31	**Standing water**
3110	Oligotrophic waters containing very few minerals of sandy plains (*Littorelletalia uniflorae*)
3120	Oligotrophic waters containing very few minerals generally on sandy soils of the West Mediterranean, with *Isoëtes* spp.
3130	Oligotrophic to mesotrophic standing waters with vegetation of the *Littorelletea uniflorae* and/or of the *Isoëto-Nanojuncetea*
3140	Hard oligo-mesotrophic waters with benthic vegetation of *Chara* spp.
3150	Natural eutrophic lakes with *Magnopotamion* or *Hydrocharition*-type vegetation
3160	Natural dystrophic lakes and ponds
3170*	Mediterranean temporary ponds
32	**Running water**
3220	Alpine rivers and the herbaceous vegetation along their banks
3230	Alpine rivers and their ligneous vegetation with *Myricaria germanica*
3240	Alpine rivers and their ligneous vegetation with *Salix elaeagnos*
3250	Constantly flowing Mediterranean rivers with *Glaucium flavum*
3260	Water courses of plain to montane levels with the *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation
3270	Rivers with muddy banks with *Chenopodion rubri* p.p. and *Bidention* p.p. vegetation
3280	Constantly flowing Mediterranean rivers with *Paspalo-Agrostidion* species and hanging curtains of *Salix* and *Populus alba*
3290	Intermittently flowing Mediterranean rivers of the *Paspalo-Agrostidion*

Number of habitats recorded in the Italian regions, subdivided according to subgroups.



4 – TEMPERATE SHRUBLAND HABITATS

This type of habitat, which is the only type that is not subdivided, contains only 5 habitats (of which only 1 has priority status). It is, as would be expected, more common in the alpine and peninsular regions, particularly in mountainous areas, the only exception being habitat 4030 "European dry heaths", which includes the *Calluna vulgaris* communities (the typical moors). They are absent in Campania and Puglia, where the mountains are not high enough for subalpine shrubland communities to grow. This type includes some oro-Mediterranean communities that are commonly found in mountainous areas both on the larger islands and along the coasts.

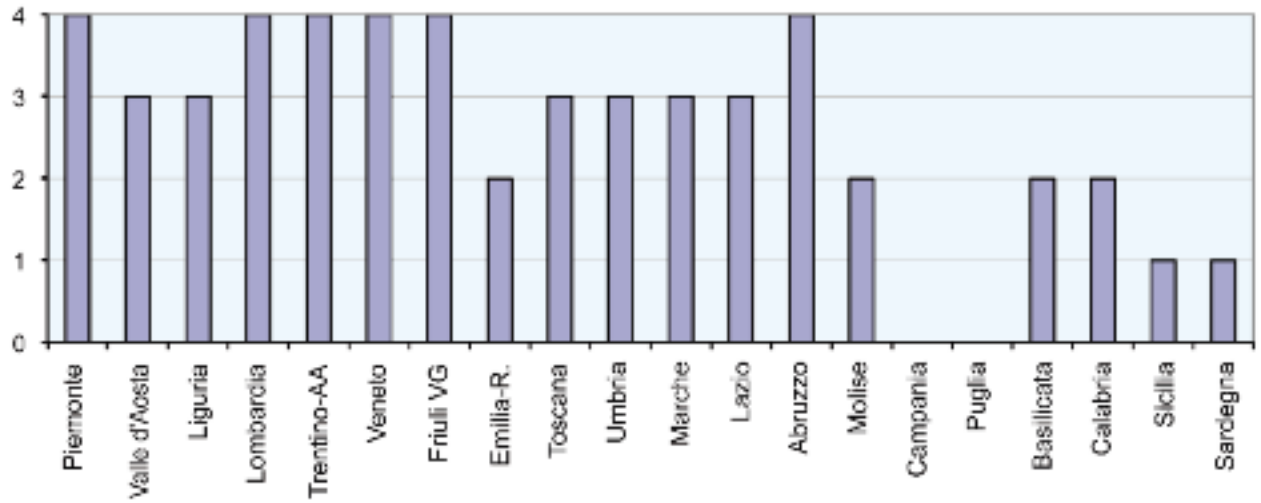
List of temperate shrubland habitats in Italy.

Code	Name
40	**Temperate heath and scrub**
4030	European dry heaths
4060	Alpine and Boreal heaths
4070*	Bushes with *Pinus mugo* and *Rhododendron hirsutum* (*Mugo-Rhododendretum hirsut*
4080	Sub-Arctic *Salix* spp. scrub
4090	Endemic oro-Mediterranean heaths with gorse

Pinus mugo formation (habitat 4070*) on Monte Colombine (Adamello Park). Photo by *C. Andreis*.

Current distribution of the Sites in which temperate shrubland habitats have been recorded.

Number of habitats recorded in the Italian regions.



5 – MEDITERRANEAN SHRUBLAND HABITATS

This type of habitat is subdivided in 4 subgroups: Sub-mediterranean and temperate scrub, Mediterranean arborescent matorral, Thermo-Mediterranean and pre-steppe brush and Phrygana. A total of 11 habitats of community interest are recognised in Italy, 2 of which have priority status. Worthy of note are habitat 5220* "Arborescent matorral with *Zyziphus*", which is present exclusively in Sicily, and 5410 "West Mediterranean clifftop phryganas (*Astragalo-plantaginetum subulatae*)", which is found in Sardinia alone.

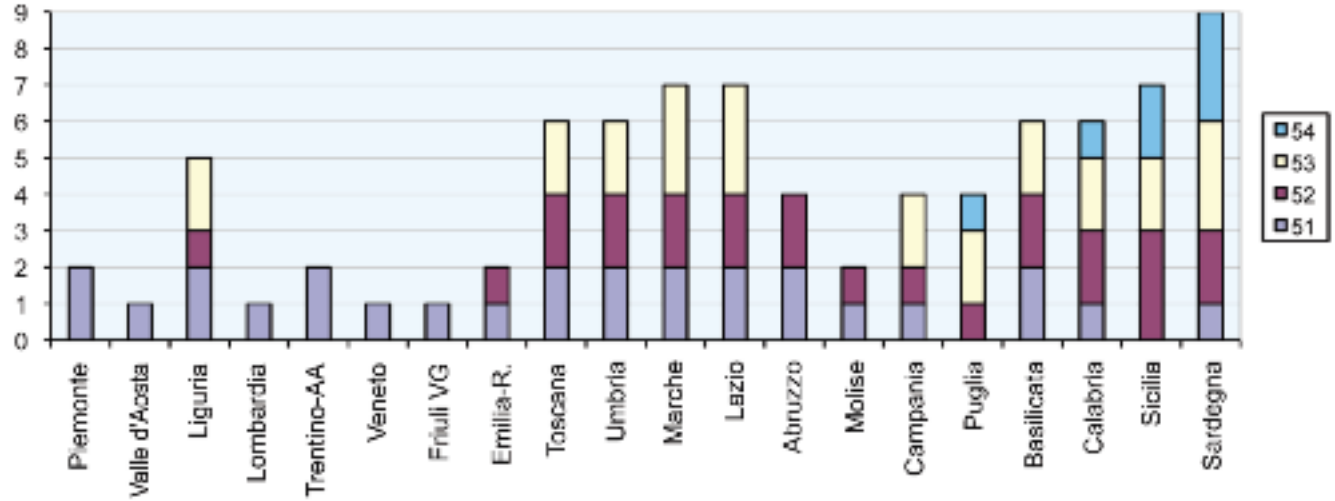
List of the Mediterranean shrubland habitats in Italy.

Code	Name
51	**Sub-mediterranean and temperate scrub**
5110	Stable xerothermophilous formations with *Buxus sempervirens* on rock slopes (*Berberidion* p.p.)
5130	*Juniperus communis* formations on heaths or calcareous grasslands
52	**Mediterranean arborescent matorral**
5210	Arborescent matorral with *Juniperus* spp.
5220*	Arborescent matorral with *Zyziphus*
5230*	Arborescent matorral with *Laurus nobilis*
53	**Thermo-Mediterranean and pre-steppe brush**
5310	*Laurus nobilis* thickets
5320	Low formations of *Euphorbia* close to cliffs
5330	Thermo-Mediterranean and pre-desert scrub
54	**Phrygana**
5410	West Mediterranean clifftop phryganas (*Astragalo-plantaginetum subulatae*)
5420	*Sarcopoterium spinosum* phrygenes
5430	Endemic phryganas of the *Euphorbio-Verbascion*

Centaurea horrida, chamaephytic cushion-forming plant, which is endemic in northern Sardinia (habitat 5410). Photo by *E. Biondi*.

Current distribution of the Sites in which Mediterranean shrubland habitats have been recorded.

Number of habitats recorded in Italy, divided according to subgroups.



List of grassland habitats in Italy.

Code	Name
61	**Natural grasslands**
6110*	Rupicolous calcareous or basophilic grasslands of the *Alysso-Sedion albi*
6130	Calaminarian grasslands of the *Violetalia calaminariae*
6150	Siliceous alpine and boreal grasslands
6170	Alpine and subalpine calcareous grasslands
62	**Semi-natural dry gresslands and scrubland facies**
6210(*)	Semi-natural dry grasslands and scrubland facies on calcareous substrates (*Festuco-Brometalia*) (*important orchid sites)
6220*	Pseudo-steppe with grasses and annuals of the *Thero-Brachypodietea*
6230*	Species-rich Nardus grasslands, on siliceous substrates in mountain areas (and submountain areas in Continental Europe)
6240*	Sub-pannonic steppic grasslands
62A0	Eastern sub-mediterranean dry grasslands (*Scorzoneratalia villosae*)
63	**Sclerophilous grazed forests (dehesas)**
6310	Dehesas with evergreen *Quercus* spp.
64	**Semi-natural tall-herb humid meadows**
6410	*Molinia* meadows on calcareous, peaty or clayey-silt-laden soils (*Molinion caeruleae*)
6420	Mediterranean tall humid grasslands of the *Molinio-Holoschoenion*
6430	Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels
65	**Mesophile grasslands**
6510	Lowland hay meadows (*Alopecurus pratensis, Sanguisorba officinalis*)
6520	Mountain hay meadows

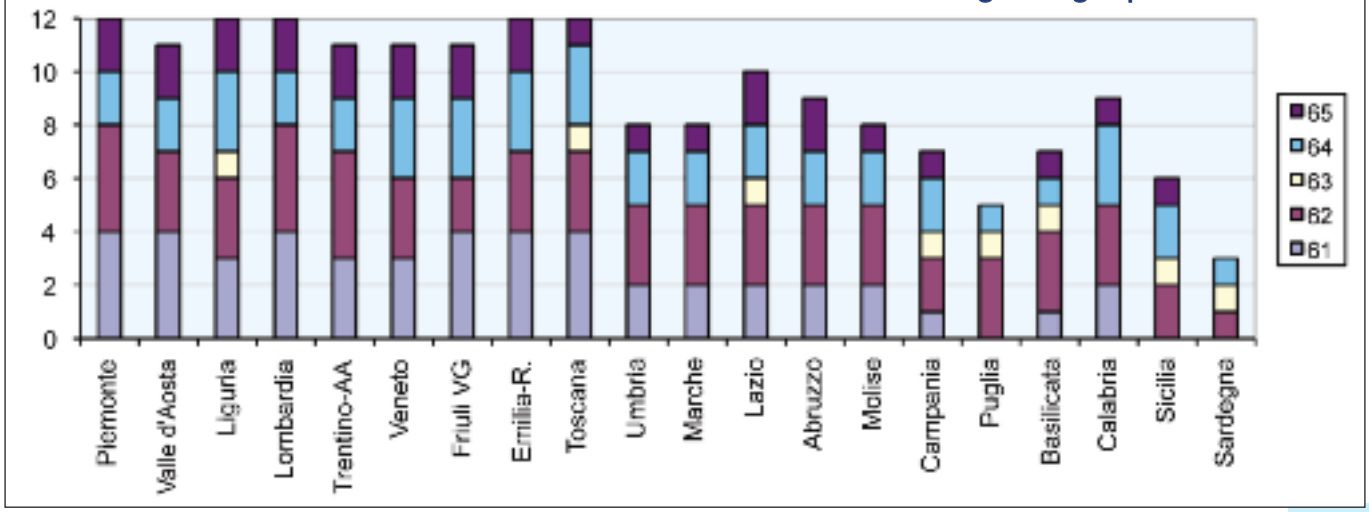
6 – NATURAL AND SEMI-NATURAL GRASSLAND HABITATS

This rich, heterogeneous type contains 5 subgroups: Natural grasslands, Semi-natural dry grasslands and scrubland facies, *Dehesas*, Semi-natural tall-herb humid meadows and Mesophile grasslands. Italy contains 15 habitats, of which 5 have priority status. These habitats are found above all in the Alps and Apennines, where grazing and cutting practices in the mountain and subalpine areas prevent the vegetation from naturally evolving into woodland communities.

Current distribution of the Sites in which grassland habitats have been recorded.

Grazing land on Monte Rogedano (Fabriano) included in the *Phleo ambigui-Bromion erecti* alliance (habitat 6210). Photo by *E. Biondi*.

Number of habitats recorded in Italy, divided according to subgroups.



7 – BOG AND MARSHLAND HABITATS

This type of habitat is divided in 3 subgroups, 2 of which are present in Italy: *Sphagnum* acid bogs and Calcareous fens. Eight habitats are present in our country, of which 4 have priority status. As the map and figure below show, these plant communities are found above all in the Alps and Apennines i.e. in areas where the climate is temperate and there is good soil water availability.

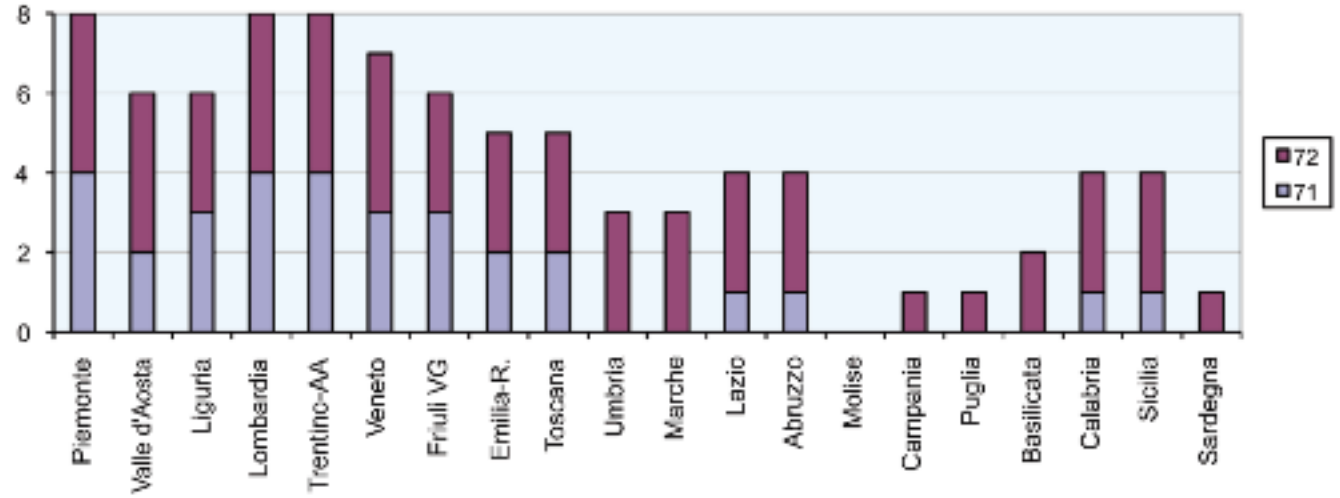
List of the bog and marshland habitats in Italy.

Code	Name
71	***Sphagnum* acid bogs**
7110*	Active raised bogs
7120	Degraded raised bogs still capable of natural regeneration
7140	Transition mires and quaking bogs
7150	Depressions on peat substrates of the *Rhynchosporion*
72	**Calcareous fens**
7210*	Calcareous fens with *Cladium mariscus* and species of the *Caricion davallia*
7220*	Petrifying springs with tufa formation (*Cratoneurion*)
7230	Alkaline fens
7240*	Alpine pioneer formations of *Caricion bicolaris-atrofuscae*

Petrifying spring with travertine formation (habitat 7220*).
Photo by *M. Luth*.

Current distribution of the Sites in which bog and marshland habitats have been recorded.

Number of habitats recorded in Italy, divided according to subgroups.



8 – ROCKY HABITATS

This type of habitat is also divided in 3 subgroups: Scree, Rocky slopes with chasmophytic vegetation and Other rocky habitats, all of which are found in Italy (a total of 11 habitats, of which only 1 has priority status). If we exclude habitat 8330 "Submerged or partially submerged sea caves" and some sea cliffs, these habitats are found above all in mountain zones, where screes and rupicolous areas are more common and wider.

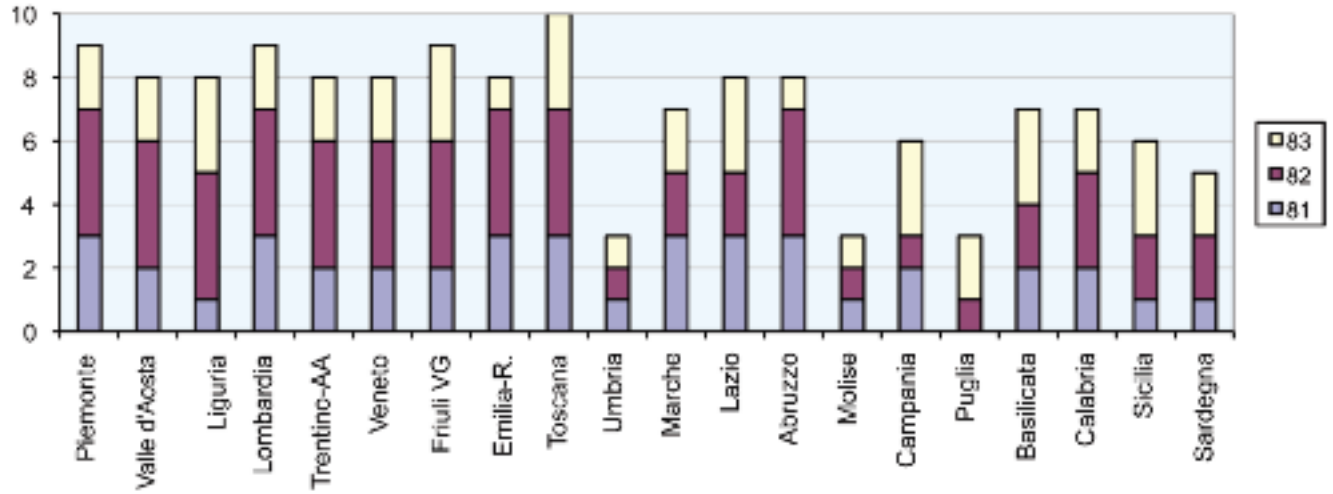
List of rocky habitats in Italy.

Code	Name
81	**Scree**
8110	Siliceous scree of the montane to snow levels (*Androsacetalia alpinae* and *Galeopsietalia ladani*)
8120	Calcareous and calcschist screes of the montane to alpine levels (*Thlaspietea rotundifolii*)
8130	Western Mediterranean and thermophilous screes
82	**Rocky slopes with chasmophytic vegetation**
8210	Calcareous rocky slopes with chasmophytic vegetation
8220	Siliceous rocky slopes with chasmophitic vegetation
8230	Siliceous rock with pioneer vegetation of the *Sedo-Scleranthion* or of the *Sedo albi-Veronicion dillenii*
8240*	Limestone pavements
83	**Other rocky habitats**
8310	Caves not open to the public
8320	Fields of lava and natural excavations
8330	Submerged or partially submerged sea caves
8340	Permanent glaciers

Alyssetum ovirensis in Busa delle Vette, included in habitat 8120 (Belluno Dolomites National Park). Photo by *C. Lasen*.

Current distribution of Sites in which rocky habitats have been recorded.

Number of habitats recorded in Italy, divided according to subgroups.



9 – FOREST HABITATS

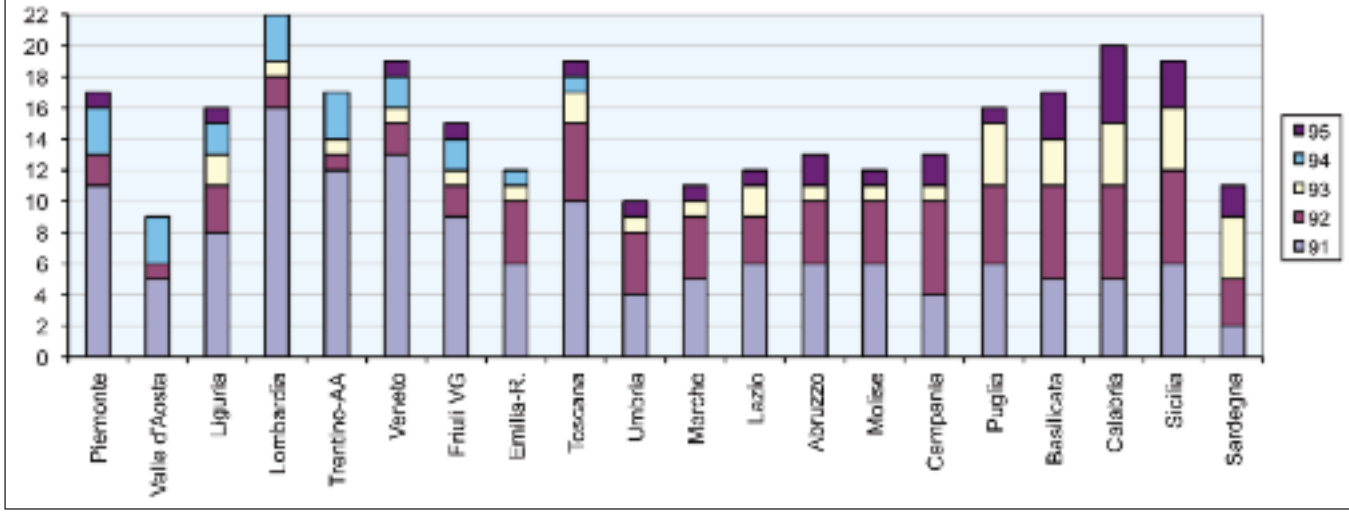
The last type comprises the forest communities, which are divided in 6 subgroups, 5 of which are present in Italy: Forests of Temperate Europe, Mediterranean deciduous forests, Mediterranean sclerophyllous forests, Temperate mountainous coniferous forests and Mediterranean and Macaronesian mountainous coniferous forests. The overall number of habitats of community interest recognised in Italy is 39, 9 of which have priority status. Some are typical of the Apennines e.g. habitat 9210* "Apennine beech forests with *Taxus* and *Ilex*", habitat 9220* "Apennine beech forests with *Abies alba* and beech forests with *Abies nebrodensis*" and habitat 9510* "Southern Apennine *Abies alba* forests".

List of the forest habitats present in Italy.

Code	Name
91	**Forests of Temperate Europe**
9110	*Luzulo-Fagetum* beech forests
9120	Atlantic acidophilous beech forests with *Ilex* and sometimes also *Taxus* in the shrublayer (*Quercenion robori-petraeae* or *Ilici-Fagenion*)
9130	*Asperulo-Fagetum* beech forests
9140	Medio-European subalpine beech woods with *Acer* and *Rumex arifolius*
9150	Medio-European limestone beech forests of the *Cephalanthero-Fagion*
9160	Sub-Atlantic and medio-European oak or oak-hornbeam forests of the *Carpinion betuli*
9170	*Galio-Carpinetum* oak-hornbeam forests
9180*	*Tilio-Acerion* forests of slopes, screes and ravines
9190	Old acidophilous oak woods with *Quercus robur* on sandy plains
91B0	Thermophilous *Fraxinus angustifolia* woods
91D0*	Bog woodland
91E0*	Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion, Alnion incanae, Salicion albae*)
91F0	Riparian mixed forests of *Quercus robur, Ulmus laevis* and *Ulmus minor, Fraxinus excelsior* or *Fraxinus angustifolia*, along the great rivers (*Ulmenion minoris*)
91H0*	Pannonian woods with *Quercus pubescens*
91K0	Illyrian *Fagus sylvatica* forests (*Aremonio-Fagion*)
91L0	Illyrian Oak-hornbeam forests (*Erythronio-Carpinion*)
91M0	Pannonian-Balkanic turkey oak-sessile oak forests
91AA*	Eastern white oak woods
92	**Mediterranean deciduous forests**
9210*	Apennine beech forests with *Taxus* and *Ilex*
9220*	Apennine beech forests with *Abies alba* and beech forests with *Abies nebrodensis*
9250	*Quercus trojana* woods
9260	*Castanea sativa* woods
92A0	*Salix alba* and *Populus alba* galleries
92C0	Platanus orientalis and Liquidambar orientalis woods (Platanion orientalis)
92D0	Southern riparian galleries and thickets (*Nerio-Tamaricetea* and *Securinegion tinctoriae*)
93	**Mediterranean sclerophyllous forests**
9320	*Olea* and *Ceratonia* forests
9330	*Quercus suber* forests
9340	*Quercus ilex* and *Quercus rotundifolia* forests
9350	*Quercus macrolepis* forests
9380	Forests of *Ilex aquifolium*
94	**Temperate mountainous coniferous forests**
9410	Acidophilous *Picea* forests of the montane to alpine levels (*Vaccinio-Piceetea*)
9420	Alpine *Larix decidua* and/or *Pinus cembra* forests
9430(*)	Subalpine and montane *Pinus uncinata* forests (* if on gypsum or limestone)
95	**Mediterranean and Macaronesian mountainous coniferous forests**
9510*	Southern apennine *Abies alba* forests
9530	(Sub-)Mediterranean pine forest with endemic black pines
9540	Mediterranean pine forests with endemic Mesogean pines
9560	Endemic forests with *Juniperus* spp.
9580	Mediterranean *Taxus baccata* woods
95A0	High oro-Mediterranean pine forests

Current distribution of the Sites in which forest habitats have been

Number of habitats recorded in Italy, divided according to subgroups.



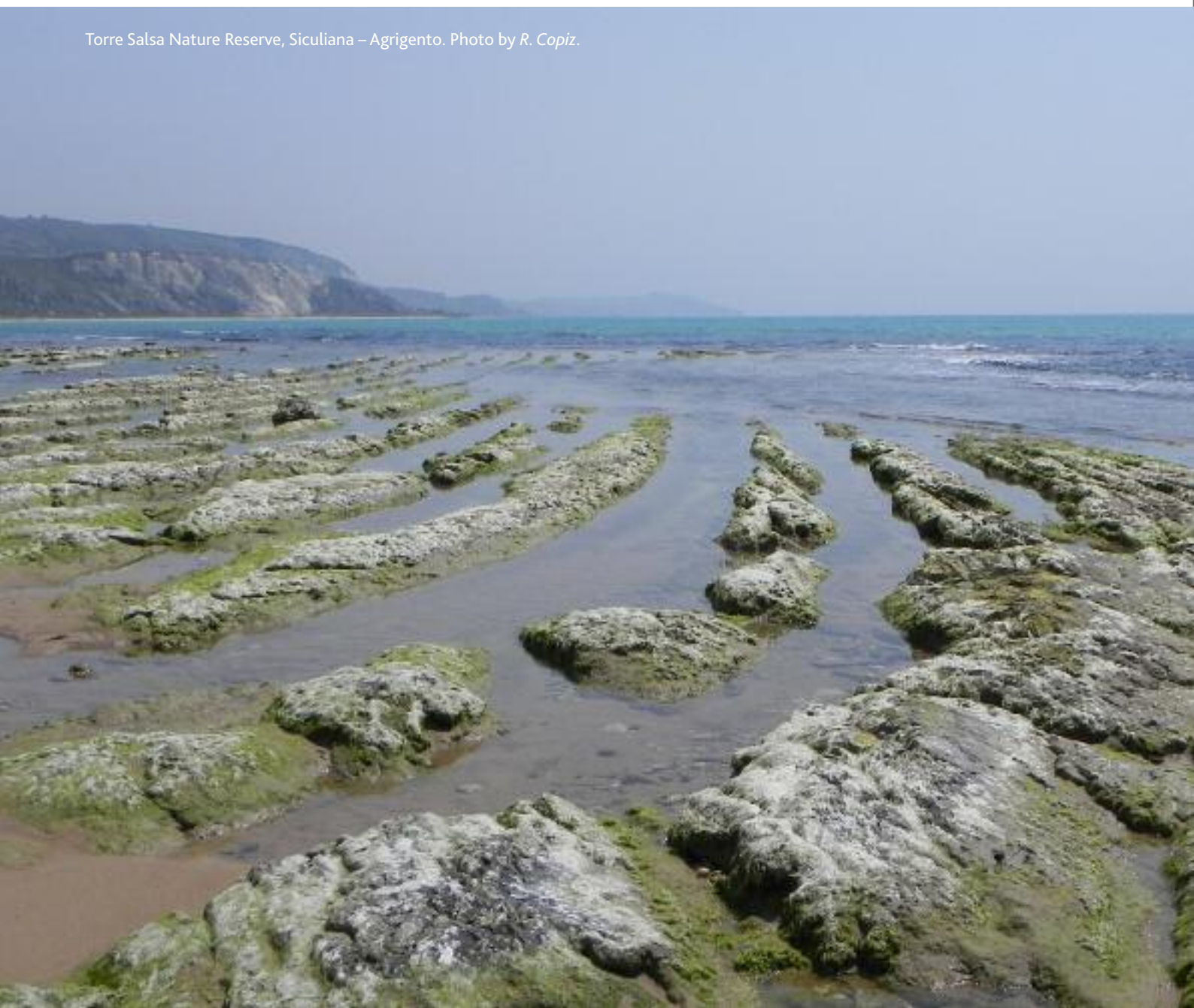
CONCLUSIONS

The Manual identified 131 habitats of community interest in Italy. Three habitats previously included as sites of community interest (2190 "Humid dune slacks", 8160* "Medio-European calcareous scree of hill and montane levels" and 9280 "*Quercus frainetto* woods") should be either excluded or reassigned to other codes. By contrast, two new habitats were recognised in Italy: 2330 "Inland dunes with open *Corynephorus* and *Agrostis* grasslands" and 95A0 "High oro-Mediterranean pine forests".

As regards the distribution at the regional level, 1043 of the habitats included in the official databank were confirmed, 177 were new habitats considered to be certain, 37 were new habitats whose presence needs to be confirmed, while a further 11 were previously included in the databank but are considered to be doubtful. Lastly, 57 habitats previously included in the databank are considered to be wrong, and should thus be removed from the databank and any other sites in which they are included. A number of regions have already modified their data according to the content of the Manual.

This Manual has also shown that the assignment of the "priority" status described in the Annexes of the Habitats Directive may in some cases need to be reviewed. Indeed, the distribution and conservation value of some species and habitats does not justify this status, whereas others that are of great interest deserve to be assigned "priority" status. The Manual also includes factsheets for 15 new habitats that are, despite not being included in the Habitats Directive, of considerable importance at the national level in Italy. These new habitats could either be included in Annex 1 of the Habitats Directive or come under new conservation legislation.

Torre Salsa Nature Reserve, Siculiana – Agrigento. Photo by *R. Copiz*.



NATURA 2000 NETWORK AND NATIONAL BIODIVERSITY STRATEGY

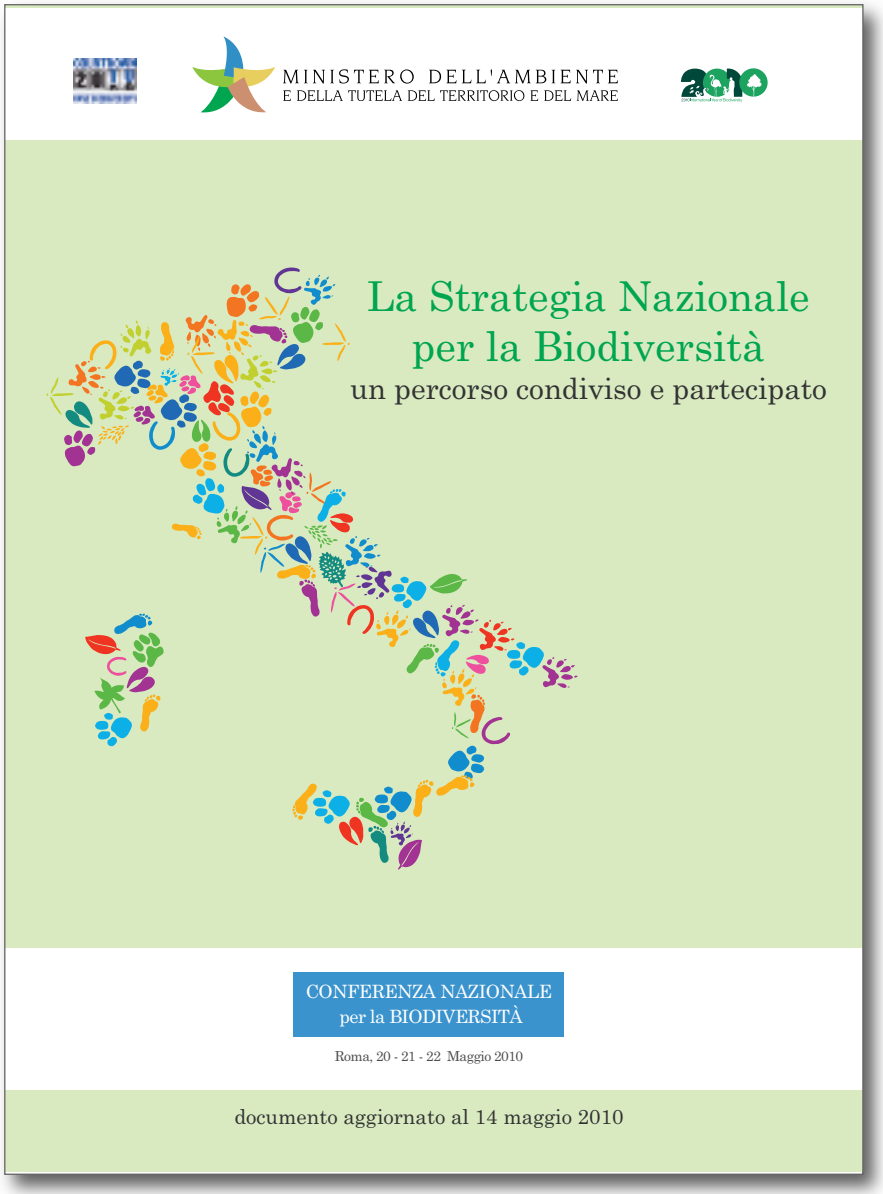
In order to fully satisfy the requirements of the Habitats Directive, a "satisfactory state of conservation" of the habitats (and the whole Natura 2000 Network) will have to be achieved through management strategies and monitoring programmes designed, on the one hand, to verify the efficacy of the initiatives undertaken and, on the other, to prevent any phenomena or transformations that might render the efforts made less effective.

The role of Vegetation Science, and that of Phytosociology in particular, does not end once the habitats have been identified, but is essential in the management phase. Indeed, the synphytosociological and geosynphytosociological analyses are crucial for determining the current state of the habitats and predicting their future according to the management strategies that are proposed and adopted.

Despite certain inherent problems, the Habitats Directive remains a fundamental reference point both in the field of environmental and conservation research and on the professional level insofar as is complementary to the ecosystem approach established by the Convention on Biological Diversity and is a forerunner of the principles expressed in the European Landscape Convention. Indeed, a habitat is, like the landscape, considered to be the result of the natural, cultural, social and economic evolution of the land.

Yet another innovative element is the possibility the Directive offers to place all the Sites of national and European interest within the context of a network. The importance of centres of diversity and elements that can facilitate connectivity (corridors, stepping stones, etc.) as a means of guaranteeing the conservation of a species or community is widely recognised. Recent studies have in fact highlighted the effectiveness of the network of Sites of community interest as an indicator of biodiversity on both a national and European scale, a goal that could no longer be fulfilled solely by the Parks and Nature Reserves network, which was set up in a different era and for different reasons.

The National Strategy for Biodiversity, which is being drafted at this very time, recognises the importance of the Natura 2000 Network in the *in situ* conservation of species and communities, in the active management of natural environments and in the compatible use of the land and its resources.



Melfa River Gorge, Casalvieri – Frosinone. Photo by *R. Copiz*.

Ministry of Environment, Land and Sea Protection
via Cristoforo Colombo, 44
I-00147 Roma
Telephone: +39 06 57221
www.minambiente.it

Italian Society of Botany *onlus*
via Giorgio La Pira, 4
I-50121 Firenze
Telephone: +39 055 2757379
www.societabotanicaitaliana.it
sbi@unifi.it