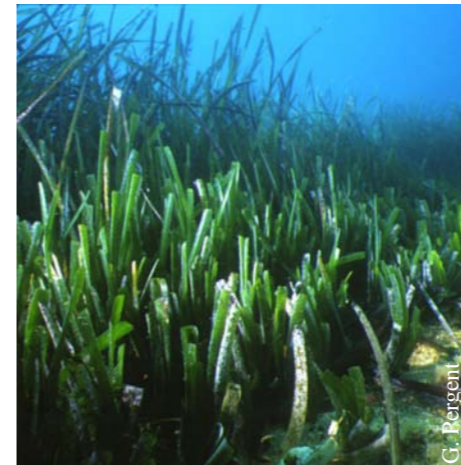


REFERENCE LIST OF MARINE HABITAT TYPES

for the Selection of Sites to be included in the National Inventories of Natural Sites of Conservation Interest



Forward

The various lists of threatened or endangered species (Barcelona Protocol - Annex II, Berne Convention, Habitat Directive - Annex II) were established using selection criteria determined by various Organisations and which are referenced in various documents (Wells et al., 1983, IUCN 1994, UNEP 1995, Boudouresque et al, 1996). Criteria were also defined for the evaluation of sites (Barcelona Protocol - Annex I, Habitat Directive - Annex III, Bardat et al. 1997, MAP/UNEP, 1997).

As to the habitats, a few attempts were made in the terrestrial domain to evaluate them and to establish their hierarchy (in Bardat et al., 1997) but almost never in the marine domain.

Certain habitats clearly deserve specific attention due to their vulnerability but also because other criteria make them important: presence of species either protected or considered as having a high heritage value, but also intrinsic value of the habitat from an aesthetic, economic, heritage view point, or due to its rarity.

Bardat et al. (1997) have established a natural space evaluation method. For this they present site selection criteria among which only one is specific to the habitats:

vulnerability which they define as the inability of the habitat to maintain its structure and its functions when faced with unfavorable influences either potential or existing. Its evaluation considered as subjective is sometimes questioned. They evaluate it as per three levels:

- 1: high vulnerability,
- 2: medium vulnerability,
- 3: low vulnerability.

The other criteria that we will take into consideration characterise the intrinsic value of a habitat (biocenosis, association, facies) hence the interest to maintain its condition even if it does not face a potentially direct threat. Their scale can also be assessed as per three levels.

Heritage value: appraisal of the value of a given habitat for the national or regional natural heritage due to its unique character, which may be endemic, structurally exceptional (cliff, cave, "platier"...) or have a unique ecological situation (meeting of two masses of water, concentration zone) or be of symbolic and cultural value:

- 1: high heritage value,
- 2: medium value value,
- 3: low heritage value.

Rarity: habitat encountered more or less frequently:

- 1: habitat known in only one or in a very limited number of sites,
- 2: habitat rare in most countries for it is endemic to a zone or very scattered,
- 3: habitat not rare.

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Aesthetic: evaluation of the aesthetic and landscape value of a given habitat:

- 1: habitat of high aesthetic value,
- 2: habitat of medium aesthetic value,
- 3: habitat of low aesthetic value.

Economic: evaluation of the economic significance of a given habitat either direct due to its richness in species exploited by fishing activities or indirect due to its significance in the trophic network or of its possible touristic exploitation:

- 1: high economic value,
- 2: medium economic value,
- 3: low economic value.

On the basis of these criteria, habitats can be classified into three main categories:

- Priority habitats (P): habitats the conservation of which is mandatory. There are several class 1 criteria.
- Remarkable habitats (R): habitats that deserve specific attention or management. There is one class 1 criterion.
- Other habitats (OH): habitats that have no rarity or vulnerability character and the heritage, aesthetic and economic importance of which is limited. These habitats do not require special conservation or management measures. There is no class 1 criterion.

A table with several topics enables habitats to be classified either by criteria or according to a set of two criteria or more to determine, depending on the needs, the protection or management levels sought.

It is clear that the assessment of the level for each criterion is carried out for the Mediterranean as a whole, but can also be applied locally, nationally and subregionally.

The estimation of the level for each criteria can be made using three data sources:

- exploitation of the literature,
- information collected from amateurs and professionals,
- on site prospection within the framework of local, national or international programmes

It is worth noting that the evaluation of the habitats at the level of association and facies is not necessarily the same as that of the biocenosis which those associations and facies belong to. Some of them could be considered as priority, i.e. requiring, due to their vulnerability, their heritage quality, their rarity or their high aesthetic value, a specific protection whereas the biocenosis itself or the other facies are of no specific interest. Moreover, the evaluation levels of each criterion can vary as a function of the local conditions.

Reference List of Marine Habitat Types for the Selection of Sites to be included in the National Inventories of Natural Sites of Conservation Interest

REFERENCE LIST OF MARINE HABITAT TYPES

I. SUPRALITTORAL

I.2. SANDS

I.2.1. Biocenosis of supralittoral sands

- *I.2.1.5. Facies of phanerogams which have been washed ashore (upper part)

II. MEDIOLITTORAL

II.1. MUDS, SANDY MUDS AND SANDS

II.1.1. Biocenosis of muddy sands and muds

- *II.1.1.1. Association with halophytes
- *II.1.1.2. Facies of saltworks

II.3. STONES AND PEBBLES

II.3.1. Biocenosis of mediolittoral coarse detritic bottoms

- *II.3.1.1. Facies of banks of dead leaves of *P. oceanica* and other phanerogams

II.4. HARD BEDS AND ROCKS

II.4.1. Biocenosis of the upper mediolittoral rock

- *II.4.1.3. Association with *Nemalion helminthoides* and *Rissoella verruculosa*
- *II.4.1.4. Association with *Lithophyllum papillosum* and *Polysiphonia* spp.

II.4.2. Biocenosis of the lower mediolittoral rock

- *II.4.2.1. Association with *Lithophyllum lichenoides* (= entablature with *L. tortuosum*)
- *II.4.2.5. Facies with *Pollicipes cornucopiae*
- *II.4.2.7. Association with *Fucus virsoides*
- *II.4.2.8. *Neogoniolithon brassica-florida* concretion
- *II.4.2.10. Pools and lagoons sometimes associated with vermetids (infralittoral enclave)

*II.4.3. Mediolittoral caves

- *II.4.3.1. Association with *Phymatolithon lenormandii* and *Hildenbrandia rubra*

III. INFRALITTORAL

III.1. SANDY MUDS, SANDS, GRAVELS AND ROCKS IN EURYHALINE AND EURYTHERMAL ENVIRONMENT

III.1.1. Euryhaline and eurythermal biocenosis

- *III.1.1.1. Association with *Ruppia cirrhosa* and/or *Ruppia maritima*
- *III.1.1.3. Association with *Potamogeton pectinatus*
- *III.1.1.4. Association with *Zostera noltii* in euryhaline and eurythermal environment
- *III.1.1.5. Association with *Zostera marina* in euryhaline and eurythermal environment
- *III.1.1.8. Association with *Halopithys incurva*

III.2. FINE SANDS WITH MORE OR LESS MUD

III.2.2. Biocenosis of well sorted fine sands

- *III.2.2.2. Association with *Halophila stipulacea*

III.2.3. Biocenosis of superficial muddy sands in sheltered waters

- *III.2.3.3. Facies with *Loripes lacteus*, *Tapes* spp.
- *III.2.3.5. Association with *Zostera noltii* on superficial muddy sands in sheltered waters
- *III.2.3.7. Facies of hydrothermal oozes with *Cyclope neritea* and nematodes

III.3. COARSE SANDS WITH MORE OR LESS MUD

III.3.1. Biocenosis of coarse sands and fine gravels mixed by the waves

- *III.3.1.1. Association with rhodolithes

III.3.2. Biocenosis of coarse sands and fine gravels under the influence of bottom currents (also found in the Circalittoral)

- *III.3.2.1. Maërl facies (= Association with *Lithothamnion corallioides* and *Phymatolithon calcareum*) (can also be found as facies of the biocenosis of coastal detritic).
- *III.3.2.2. Association with rhodolithes

III.5. POSIDONIA OCEANICA MEADOWS

*III. 5. 1. Posidonia oceanica meadows (= Association with Posidonia oceanica)

- *III.5.1.1. Ecomorphosis of striped meadows
- *III.5.1.2. Ecomorphosis of "barrier-reef" meadows

III.6. HARD BEDS AND ROCKS

III.6.1. Biocenosis of infralittoral algae

- *III. 6.1.2. Association with *Cystoseira amentacea* (var. *amentacea*, var. *stricta*, var. *spicata*)
- *III.6.1.3. Facies with Vermetids
- *III.6.1.10. Association with *Cystoseira tamariscifolia* and *Saccorhiza polyschides*
- *III.6.1.14. Facies with *Cladocora caespitosa*
- *III.6.1.15. Association with *Cystoseira brachycarpa*
- *III.6.1.16. Association with *Cystoseira crinita*
- *III.6.1.17. Association with *Cystoseira crinitophylla*
- *III.6.1.18. Association with *Cystoseira sauvageauana*
- *III.6.1.19. Association with *Cystoseira spinosa*
- *III.6.1.20. Association with *Sargassum vulgare*
- *III.6.1.25. Association with *Cystoseira compressa*
- *III.6.1.35. Facies and Associations of Coralligenous biocenosis (in enclave)

IV. CIRCALITTORAL

IV. 2. SANDS

IV. 2. 2. Biocenosis of the coastal detritic bottom

- *IV. 2. 2. 7. Association with *Laminaria rodriguezii* on detritic
- *IV. 2. 2. 10. Facies with large Bryozoa

IV. 3. HARD BEDS AND ROCKS

*IV. 3. 1. Coralligenous biocenosis

- *IV. 3. 1. 1. Association with *Cystoseira zosteroides*
- *IV. 3. 1. 2. Association with *Cystoseira usneoides*
- *IV. 3. 1. 3. Association with *Cystoseira dubia*
- *IV. 3. 1. 4. Association with *Cystoseira corniculata*
- *IV. 3. 1. 5. Association with *Sargassum* spp. (indigenous)
- *IV. 3. 1. 8. Association with *Laminaria ochroleuca*
- *IV.3.1.9. Association with *Rodriguezella strafforelli*

- *IV.3.1.10. Facies with *Eunicella cavolinii*
- *IV.3.1.11. Facies with *Eunicella singularis*
- *IV.3.1.12. Facies with *Lophogorgia sarmentosa*
- *IV.3.1.13. Facies with *Paramuricea clavata*
- *IV.3.1.15. Coralligenous platforms

*IV.3. 2. Semi-dark caves (also in enclave in upper stages)

- *IV.3.2.2. Facies with *Corallium rubrum*

V. BATHYAL

V. 1. MUDS

V. 1. 1. Biocenosis of bathyal muds

- *V.1.1.3. Facies of soft muds with *Funiculina quadrangularis* and *Ap porhais seressianus*
- *V.1.1.4. Facies of compact muds with *Isidella elongata*

V. 3. HARD BEDS AND ROCKS

*V.3.1. Biocenosis of deep sea corals

*V.3.2. Caves and ducts in total darkness (in enclave in the upper stages)