Thirteenth Meeting of Focal Points for Specially Protected Areas

Alexandria, Egypt, 9-12 May 2017

Agenda item 6: Updating of the Reference List of Marine Habitat Types for the Selection of Sites to be included in the National Inventories of Natural Sites of Conservation Interest in the Mediterranean

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

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(UN Environment /MAP)
Specially Protected Areas Regional Activity Centre (SPA/RAC)
Boulevard du Leader Yasser Arafat
B.P. 337 - 1080 Tunis Cedex - Tunisia
E-mail: car-asp@spa-rac.org

The original version of this document was prepared for the Specially Protected Areas Regional Activity Centre (SPA/RAC) by Enrique Ballesteros, SPA/RAC Consultant with contribution from, Ricardo AGUILAR (OCEANA), Hocein BAZAIRI, Doug EVANS (ETC/BD), Vasilis, GEROVASILEIOU, Alain Jeudi DE GRISSAC (GFCM consultant), Pilar MARIN (OCEANA), Maria del Mar OTERO (IUCN-Med), Atef OUERGHI (SPA/RAC), Gérard PERGENT, Alfonso RAMOS, Yassine Ramz SGHAIER (RAC/SPA), Leonardo TUNESI.
Introduction

The Protocol concerning Specially Protected Areas and Biological Diversity in the Mediterranean and the Action plan for the Protection of the Marine Environment and the Sustainable Development of the Coastal Areas of the Mediterranean (MAP Phase II), adopted by the Contracting Parties to the Barcelona Convention in 1995, contains provisions for the preparation of inventories of habitats at national as well as regional level.

In this context, and following a specific provision of MAP Phase II to prepare inventories according to common criteria, the Contracting Parties adopted at their 10th Ordinary Meeting (Tunis, 18-21 November 1997) criteria for the establishment of national inventories of natural sites of conservation interest. The criteria require that "Information concerning each inventoried site will be compiled according to a standard format, which will have to be agreed by the Parties upon a proposal from the Centre. Such information will include, but will not necessarily be limited to, the fields detailed in Appendix I to these criteria " (Art. 7)". To this end, a Standard Data-Entry Form (SDF) was conceived as an operational inventory tool made available to the relevant national authorities. It is designed to cover the fields of information detailed in the Appendix to the Criteria, and the specific criteria for the assessment of the importance of the site for habitats and species (Art. 4, 5 and 6 of the Criteria). The criteria provided also for the establishment of a reference list of marine and coastal natural habitat types, on the basis of a model classification. A model classification of marine habitat types for the Mediterranean region, as well as a reference list of habitat types were adopted in 1999.

During the last symposiums on the marine key habitats held in Portoroz from 27 to 31 October 2014, it was recommended to amend, discuss and propose new facies for integration within the Barcelona Convention’s Habitats List.

The 19th Meeting of the Contracting Parties to the Convention for the Protection of the Marine Environment and the Coastal Region of the Mediterranean (Barcelona Convention) requested SPA/RAC to revise the Reference List of Marine and Coastal Habitat Types in the Mediterranean for consideration by COP 20, taking in full account the biodiversity-related MAP Ecological Objectives, IMAP, and GES targets (Decision IG.22/12).

The Draft Reference List of Marine Habitat Types proposed hereinafter will be used for the Selection of Sites to be included in the National Inventories of Natural Sites of Conservation Interest in the Mediterranean. It will be also used to define the reference list of habitats types to be monitored within the framework of the Integrated Monitoring and Assessment Program (IMAP) in relation to the common indicator EO1.
Draft Updated Reference List of Marine Habitat Types for the Selection of Sites to be included in the National Inventories of Natural Sites of Conservation Interest in the Mediterranean

In order to draw up the updated Reference List of Marine Habitat Types, an updated and more comprehensive draft classification of benthic marine habitat types for the Mediterranean region (UNEP(DEPI)/MED WG.431/Inf.17) was elaborated based on:

- Classification of benthic marine habitat types for the Mediterranean region of the Barcelona Convention (1998),
- the schemes of the new EUNIS classification system\(^1\) (Table 1),
- the List of French Mediterranean habitats (Michez et al., 2014),
- the Spanish inventory of marine habitats (Templado et al., 2012),
- the Croatian List of Marine Habitats (Bakran-Petricioli, 2011) and,
- new habitats based on the experts inputs.

Furthermore, the following lists were taken into account:

- the European Red list of marine Habitats in the Mediterranean
- the list compiled by OCEANA, with the contribution of experts on Mediterranean deep-sea habitats, in order to implement the UNGA Resolutions for the protection of Vulnerable Marine Ecosystems (VMEs)\(^2\) in the GFCM context.

Given that the habitats that deserve specific attention are those displaying certain features that make them important for conservation and are vulnerable to disturbances, the criteria used for inclusion in the Reference List take into account a series of eight traits that define more accurately this “importance” and “vulnerability”. While they are sometimes correlated, these traits account for different features of the habitats that make them worthy (or not) for protection.

They are partially based on those used in the last edition of the Mediterranean Reference List of marine habitat types (1999 and take into consideration the FAO’s criteria\(^3\) for identification of VMEs which were used by OCEANA in order to develop the list of VMEs in the GFCM context.

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\(^1\) EUNIS is the EUropean Nature Information System and brings together European data on habitat and species among others. It provides the reference information system to assist in the designation of Natura 2000 sites. It was submitted for EIONET consultation in 2015 and could be adopted in 2017.

\(^2\) United Nations General Assembly (UNGA) Resolutions 59/25, 61/105 and 64/72.

The eight traits are the following:

1) Fragility: Degree of susceptibility to degradation (i.e. maintaining its structure and functions) when faced to natural and anthropogenic disturbances.
2) Inability to recover quickly from a disturbance (resilience). Usually related to life-history traits of component species that make recovery difficult (i.e. slow growth rates, late age of maturity, low or unpredictable recruitment, long-lived).
3) Uniqueness or rarity: Degree of rarity, i.e. unusual, very unfrequent, at the Mediterranean level.
4) Importance of the habitat for hosting rare, threatened, endangered or endemic species that occur only in discrete areas.
5) Species diversity: The number of species sheltered in the habitat.
6) Structural complexity: Degree of complexity of physical structures created by biotic and abiotic features.
7) Capacity of modifying the physical environment and the ecosystem processes (i.e. geomorphological traits, fluxes of matter and energy).
8) Significance of the habitat for the survival, spawning/reproduction of species not necessarily typical for the habitat during all their life cycle and other (ecosystem) services provided by the habitat.

Each habitat type has been rated from 1 (very low) to 5 (very high) in relation to each trait in relation to other habitats situated in the same bathymetric zone. Its inclusion in the list depends on the final rating adding the values of the eight traits altogether. The threshold used here for the inclusion of a habitat in the Reference List is of 22.

All habitats type having a rating of 5 in “Uniqueness” (i.e. those that are extremely rare) have been selected for the Reference List regardless of the final rating.

No water column habitats or habitats of anthropogenic origin have been considered for the inclusion in the Reference List.

When the main habitat-forming species is an alien, it has not been selected for the Reference List whatever it is the final rating.

The proposed Reference List of Mediterranean habitat types has been elaborated based on the discussions, comments and suggestions of the adhoc group meeting held in Blanes, Spain, on 22-23 February 2017 in presence of a number of Mediterranean experts and regional partner organizations (GFCM, IUCN-Med, OCEANA and ETC/BD). The Focal Points for SPA will be invited to consider and review the proposed Reference List that should remain dynamic to ensure adequate harmonisation with other classifications defined in relevant frameworks, such as EUNIS, and according to the implementation inputs of the IMAP.
PROPOSED DRAFT UPDATED REFERENCE LIST OF MARINE HABITAT TYPES

MA1.5 Mediterranean littoral rock
   MA1.51 Supralittoral rock
      Wracks of dead seagrass

MA1.54 Lower mediolittoral rock
   MA1.541 Facies with Pollicipes pollicipes
   MA1.542 Belt of Lithophyllum byssoides
   MA1.546 Belt of Neogoniolithon brassica-florida/Dendropoma spp.
   MA1.549 Belt of Fucus virsoides
      Belt of Palisada spp.
      Belt of Titanoderma ramosissimum
   Anchialine environments
   MA1.54A Mediolittoral rockpools
      Deep mediolittoral rockpools with Fucales

MA2.55 Biogenic reef assemblages of the lower mediolittoral rock
   MA2.551 Vermetid reefs (Dendropoma spp.)
   MA2.552 Platforms with coralline algae (Lithophyllum concretions)
   MA2.561 Banks of dead leaves of Posidonia oceanica and other macrophytes
   Reefs of Sabellaria alveolata

MA3.5 Mediterranean littoral coarse sediment
   MA3.51 Slowly drying wracks in supralittoral coarse sediment

MA4.5 Mediterranean littoral mixed sediment
   MA4.51 Slowly drying wracks in supralittoral mixed sediment

MA5.5 Mediterranean littoral sand
   MA5.51 Supralittoral sands
      Supralittoral compacted terrigenous clays
   MA5.52 Mediolittoral sands
      Mediolittoral compacted terrigenous clays
      Littoral sediments dominated by marine angiosperms

MB1.5 Mediterranean infralittoral rock
   MB1.51 Infralittoral algae
      Exposed to moderately exposed rocks, well illuminated, with Fucales
      Community of Cystoseira mediterranea
      MB1.513 Community of Cystoseira amentacea var. stricta
      MB1.512 Community of Cystoseira tamariscifolia
         Community of Cystoseira sedoides
         Community of Cystoseira barbatula, C. crinitophylla, C. corniculata

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Final code will be harmonised once the final version of the new EUNIS classification is adopted.
Exposed to moderately exposed rocks, well illuminated, without Fucales
Community of Titanoderma trochanter
MA1.543 Community of Tenarea tortuosa

Exposed to moderately exposed rocks, shaded
MB.1.51O Exposed to moderately exposed and shaded upper infralittoral rock with Astroides calycularis

Sheltered upper infralittoral rock, well illuminated with Fucales
MB1.51G with Cystoseira crinita
MB1.51F with Cystoseira brachycarpa var. balearica
   with Cystoseira spinosa var. tenuior
   with Cystoseira algeriensis
   with Cystoseira caespitosa
   with Cystoseira foeniculacea
MB1.51I with Cystoseira sauvageaiana
MB1.51U with Cystoseira compressa
   with Cystoseira elegans
   with Cystoseira compressa var. pustulata
MB1.51H with Cystoseira crinitophylla
MB1.51K with Sargassum vulgare
   with Cystoseira barbatula
   with Cystoseira spp.
   with Cystoseira barbata/C. foeniculacea f. tenuiramosa

Sheltered upper infralittoral rock, well illuminated without Fucales
   with Rhodomelaceae (Halopithys incurva/Digenea simplex/Rytiphlaea tinctoria/Alsidium spp.)
   MB1.51E with Cladocora caespitosa

Sheltered, shaded, upper infralittoral rock
MB1.51Y Coralligenous (in enclave)

Lower infralittoral rock, moderately illuminated with Fucales
MB1.51J with Cystoseira spinosa
   with Cystoseira funkii
   with Cystoseira dubia
   with Cystoseira corniculata
   with Cystoseira usneoides
   with Cystoseira squarrosa
   with Cystoseira foeniculacea f. latiramosa
   with Sargassum acinarium/S. trichocarpum

Lower infralittoral rock, moderately illuminated, without Fucales
   Kelp beds of Laminaria ochroleuca
   Kelp beds of Saccorhiza polyschides/Phyllariopsis spp.
   with Eunicella singularis
   with Cladocora caespitosa

Sheltered and shaded, invertebrate dominated infralittoral rock
with *Cladocora caespitosa*
with *Pourtalosmilia anthophyllites*
with *Corallium rubrum*
with *Astroides calycularis*

Infralittoral rock affected by sediments
with *Eunicella singularis*
with *Axinella* spp.
with *Eunicella gazella, E. labiata, E. singularis, Leptogorgia* spp.

Infralittoral rocky outcrops ("tègnue")
with *Rhodymenia ardissonei* and encrusting *Peyssonnelia* spp.
with *Cryptonemia lomation* and Ceramiales
with *Ulva laetevirens, U. linza, Radicilingua thysanorhizans*

MB1.52 Euryhaline and/or eurythermal lagoon biocoenosis on rock
MB1.524 with *Cystoseira barbata*

MB2.5 Mediterranean infralittoral biogenic habitat
MB2.51 Biogenic reef assemblages of the infralittoral algae biocoenosis
MB2.511 with *Dendropoma* spp.

MB2.52 Meadows of *Posidonia oceanica*
MB2.521 Superficial meadows
Striped meadows
Barrier reefs/Fringing reefs/Reef platforms
Atolls
MB2.522 Meadows on well developed matte
Meadows on hard substrate
Meadows on soft substrate
MB2.524 Facies of dead "mattes" of *Posidonia oceanica* without much epiflora
MB2.525 Association with of dead “matte” of *Posidonia oceanica* with important epiflora (e.g. *Caulerpa prolifera, Penicillus capitatus* and *Cymodocea nodosa*)

MB2.54 Biogenic reefs on fine sands in very shallow waters
MB2.541 Infralittoral reefs by *Sabellaria alveolata/S. spinulosa*

MB5.5 Mediterranean infralittoral sand
MB5.53 Superficial muddy sands in sheltered waters
MB5.534 with *Cymodocea nodosa*
MB5.535 with *Zostera noltei*
MB5.537 Hydrothermal oozes with *Tritia neritea* and nematodes

MB5.54 Euryhaline and/or eurythermal lagoon biocoenosis on sand
MB5.541 Association with *Ruppia cirrhosa* and/or *Ruppia maritima*
MB5.542 Association with *Stuckenia pectinatus*
MB5.544 with *Zostera noltei*
MB5.545 with *Zostera marina*
with Cymodocea nodosa

**MB6.52** Euryhaline and/or eurythermal lagoon biocoenosis on mud
- MB6.521 Association with *Ruppia cirrhosa* and/or *Ruppia maritima*
- MB6.522 Association with *Stuckenia pectinatus*
- MB6.524 with *Zostera noltei*
- MB6.525 with *Zostera marina*

**MC1.5** Mediterranean circalittoral rock
- Algal dominated circalittoral rock with Fucales
  - MC1.511 with *Cystoseira zostereoides/C. spinosa* var. *compressa*
  - MC1.512 with *Cystoseira usneoides*
  - MC1.513 with *Cystoseira dubia*
  - MC1.514 with *Cystoseira corniculata*
  - MC1.515 with *Sargassum* spp.
- Algal dominated circalittoral rock with kelps
  - MC1.518 with *Laminaria ochroleuca*
    - with *Laminaria rodriguezii*
    - with *Phyllariopsis brevipes/P. purpurascens*
    - with *Saccorhiza polyschides*
- Algal dominated circalittoral rock, without Fucales or kelps
  - with *Osmundaria volubilis/Phyllophora crispa*
- Algal dominated coralligenous
  - with *Halimeda tuna* and *Mesophyllum* spp.
  - MC1.51D with laminar soft red algae
  - MC1.517 with *Lithophyllum* spp.
  - MC1.515 with *Mesophyllum* spp.
    - with *Ptilophora mediterranea*
- Invertebrate-dominated circalittoral rock
  - MC1.51E with *Leptogorgia sarmentosa/Eunicella verrucosa*
  - MC1.51B with *Paramuricea clavata*
  - MC1.51A with *Eunicella singularis*
  - MC1.519 with *Eunicella cavolini*
    - with *Eunicella verrucosa*
    - with big sponges (*Spongia lamella* and others)
    - with *Agelas oroides*, *Bienna* sp. and big Dictyoceratida (*Spongia* spp., *Ircinia* spp., *Sarcotragus* spp.)
    - with big bryozoans (*Pentapora* spp., *Reteporella* spp., *Hornera frondiculata, Adeonella* spp.)
    - with *Corallium rubrum*
    - with *Ellisella paraplexeauides, Eunicella* spp., *Leptogorgia* spp. and *Paramuricea clavata*
    - with *Dendrophyllia ramea*
    - with *Phakellia ventilabrum/Phakellia robusta* and axinellid sponges
    - with *Dendrophyllia cornigera*
    - with *Savalia savaglia* banks
with *Leptogorgia* spp.
Walls and slopes dominated by *Cladocora debilis*
Walls and rims with *Madracis asperula*
Walls and rims with *Leptopsammia pruvoti*
with *Reteporella* spp.
with *Dendrophyllia ramea* banks
with *Ellisella paraplexauroides* banks
with *Dendrophyllia cornigera* and sponge grounds made of *Phakellia ventilabrum*, *P. robusta* and *Poecillastra compressa* and *Pachastrella monilifera*

Circlittoral rock covered by sediments
Serpulid and/or Vermetid reefs, *Filograna implexa* included
with *Neopycnodonte cochlear*
with sponges (mainly *Axinella* spp.)
with *Dendrophyllia ramea*
with *Anomocora profunda* and *Anomocora* sp.
with *Cerianthus* sp.
with *Leptogorgia* spp.
with *Swiftia* spp.

Invertebrate-dominated coralligenous bioconstructions
with *Paramuricea clavata*
with *Eunicella verrucosa*
with *Alcyonium acaule*
with *Leptopsammia pruvoti*
with tube-forming polychaetes (*Filograna implexa*, *Salmacina dysteri*)
with *Astroides calycularis*
with *Corallium rubrum*
with *Agelas oroides*
with *Axinella* spp.
with Erythraean aliens

MC1.52 Shelf edge rock with macroscopic vegetation

Circlittoral rock
with coralligenous outcrops
with coralligenous outcrops affected by sedimentation
with *Paramuricea clavata*
with *Eunicella verrucosa*
with *Paralycoentrum spinulosum*, *Alcyonium palmatum*, *Alcyonium coralloides*
dominated by *Axinellida/Haplosclerida*
dominated by *Dictyoceratida/Hadromerida*
dominated by bryozoans (*Myriapora truncata*, *Pentapora fascialis*, *Reteporella grimaldi*)
with *Antipathella subpinnata*
with alcyonarians
with various suspension feeders (sponges, hydrozoans, bryozoans, ascidians, and others)
with gorgonians (Eunicella spp., Paramuricea clavata)
with Corallium rubrum
with Neopycnodonte cochlear and/or polychaetes and/or brachiopods

Deep circalitlortal banks
of Astroides calycularis
of Dendrophyllia ramea
of Antipathella wollastoni
MC1.521 of Antipathella subpinnata
of Nidalia studeri or Chironephthya mediterranea

MC1.53 Semi-dark caves and overhangs
Walls of infralittoral and circalittoral semi-dark caves and tunnels
  with Phyllangia americana mouchezii
  with Corallium rubrum
  with lithistid sponges (ex-“Lithistida in brackish-water caves or caves subjected to freshwater runoff

Walls of infralittoral and circalittoral semi-dark caves and tunnels affected by high hydrodynamism
  with massive sponges
  with Paramuricea clavata and Eunicella spp.
  with Corallium rubrum
  with Astroides calycularis
  dominated by scleractinian corals (Caryophyllia, Hoplangia, Paracyathus, Polycyathus, Phyllangia)

Ceilings of infralittoral and circalittoral semi-dark caves and tunnels
  with Schizoretepora serratimargo
  with Corallium rubrum

MC2.5 Mediterranean circalitlortal biogenic habitat
MC2.51 Coralligenous platforms

MC3.5 Mediterranean circalitlortal coarse sediment
MC3.51 Coastal detritic bottoms (without rhodoliths)
  dominated by Leptometra phalangium or Leptometra celtica
MC3.513 with large bryozoans
  with Pennatulaceans (Pennatula, Pteroides, Virgularia)
  with Eunicella filiformis
  with Alcyonium palmatum
  with Laminaria ochroleuca, Saccorhiza polyschides, Phyllariopsis spp.
MC3.515 with Phyllophora crispa/Osmundaria volubilis
MC3.521 with Laminaria rodriguezii

MC3.52 Coastal detritic bottoms with rhodoliths
MC3.523 Maërl beds dominated by Phymatolithon calcareum/Lithothamnion corallioides
  Maërl beds dominated by Lithothamnion corallioides/Lithothamnion crispatum
Maërl beds dominated by *Lithothamnion corallioides* / *L. crispatum* and *Macrorhynchia philippina*
Maërl beds dominated by *Lithothamnion minervae*
Maërl beds dominated by *Neogoniolithon* spp.
Rhodolith beds dominated by *Lithothamnion minervae*
Rhodolith beds dominated by *Lithophyllum racemus*
Rhodolith beds dominated by *Lithothamnion valens*
Rhodolith beds dominated by *Lithophyllum dentatum*
Rhodolith beds mainly composed of cobbles-sized “boxwork” rhodoliths with sessile invertebrates
  Rhodolith beds with mixed nodules and “boxwork” rhodoliths
  MC3.522 Rhodolith beds with *Peyssonnelia* spp.
Rhodolith beds with zoanthids
Rhodolith and cobble beds dominated by invertebrates, with *Alcyonium palmatum*
Rhodolith and cobble beds dominated by anthozoans (*Veretillum, Sarcodictyon catenatum, Epizoanthus arenaceus, Paralcyonium spinulosum*)

MC4.5 Mediterranean circalittoral mixed sediment
  MC4.51 Muddy detritic bottoms
    with *Alcyonium palmatum, Pennatula rubra* and *Spinimuricea* spp.

MC6.5 Mediterranean circalittoral mud
  MC6.51 Coastal terrigenous muds
    MC6.513 Sticky muds with *Virgularia mirabilis* and *Pennatula phosphorea*
    Circalittoral mud with Pennatulaceans and accompanying fauna

MD1.5 Mediterranean offshore circalittoral rock
  MD1.51 Offshore circalittoral rock
    Invertebrate-dominated circalittoral rock with *Leptogorgia sarmentosa/Eunicella verrucosa*
    Invertebrate-dominated circalittoral rock with *Eunicella verrucosa*
    Invertebrate-dominated circalittoral rock with *Paramuricea clavata*
    Invertebrate-dominated circalittoral rock with *Eunicella cavolini*
    Invertebrate-dominated circalittoral rock with *Ellisella paraplexauroides, Eunicella* spp., *Leptogorgia* spp. and *Paramuricea clavata*
    Circalittoral rock covered by sediments, with *Swiftia* spp.
    Circalittoral rock with *Savalia savaglia* banks
    Circalittoral rock dominated by *Leptogorgia* spp.
    Circalittoral rock covered by sediments, with *Leptogorgia* spp.
    Invertebrate-dominated circalittoral rock with *Corallium rubrum*
    Circalittoral rocks with *Paralcyonium spinulosum* and/or *Alcyonium palmatum* and/or *Alcyonium coralloides*
    Deep circalittoral banks of *Nidalia studeri* or *Chironephthya mediterranea*
    Deep circalittoral banks of *Antipathella subpinnata*
    Deep circalittoral banks of *Antipathella wollastoni*
    Invertebrate-dominated circalittoral rock with *Dendrophyllia ramea*
    Circalittoral rock covered by sediments, with *Dendrophyllia ramea*
    Deep circalittoral banks of *Dendrophyllia ramea*
    Circalittoral rock dominated by *Dendrophyllia cornigera*
    Circalittoral walls and slopes dominated by *Cladocora debilis*
Circalittoral rock covered by sediments with *Anomocora profunda* and *Anomocora* sp.

Circalittoral rock covered by sediments, with *Cerianthus* sp.

Invertebrate-dominated circalittoral rock with big sponges (*Spongia lamella* and others)

Deep circalittoral rock dominated by invertebrates with *Phakellia ventilabrum/Phakellia robusta* and axinellid sponges

Circalittoral rock dominated by *Dendrophyllia cornigera* and sponge grounds made of *Phakellia ventilabrum/P. robusta* and *Poecillastra compressa* and *Pachastrella monilifera*

Circalittoral rock covered by sediments, with sponges (mainly *Axinella* spp.)

Circalittoral rocks dominated by *Axinellida /Haplosclerida*

Circalittoral rocks dominated by *Dictyoceratida/Hadromerida*

Invertebrate-dominated circalittoral rock with big bryozoans (*Pentapora* spp., *Hornera frondiculata, Adeonella* spp., *Reteporella* spp.)

Circalittoral rocks dominated by bryozoans (*Myriapora truncata, Pentapora fascialis, Reteporella grimaldii*)

Circalittoral rock with *Neopycnodonte cochlear* and/or polychaetes and/or brachiopods

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**MD2.1 Mediterranean offshore circalittoral biogenic habitat**

Serpulid and Vermetid reefs, *Filograna implexa* included

**MD4.5 Mediterranean offshore circalittoral mixed sediment**

**MD4.51 Open sea detritic bottoms on shelf edge**

**MD4.512 with Leptometra phalangium**

**MD6.5 Mediterranean offshore circalittoral mud**

**MD6.51 Coastal terrigenous muds**

**MD6.511 Sticky muds with Virgularia mirabilis and Pennatula phosphorea**

**ME1.5 Mediterranean upper bathyal rock**

**ME1.51 Upper bathyal rock**

**ME1.511 Lophelia pertusa reefs**

**ME1.521 Madrepora oculata reefs**

**ME1.513 Madrepora oculata and Lophelia pertusa reefs**

Bathyal rocks with Scleractinia and Alcyonacea

with *Madrepora oculata* and/or *Lophelia pertusa* and *Corallium rubrum*

Bathyal rocks with Alcyonacea

Bathyal rocks with *Corallium rubrum*

Bathyal rocks with *Acanthogorgia hirsuta/A. armata*

Bathyal rock with *Paramuricea macrospina* and/or *Bebryce mollis* and/or *Villogorgia bebrycoides*

Bathyal rock with *Viminella flagellum* and/or *V. furcata* and/or

Callogorgia verticillata

Bathyal rock with *Placogorgia massiliensis* and/or *Muriceides lepida*

Bathyal rock with *Nicella granifera*

Bathyal rock with *Swiftia pallida*

Bathyal rock with *Dendrobranchia bonsai*
Bathyal rocks with Antipatharia
   Bathyal rocks with *Leiopathes glaberrima* and/or *Antipathes dichotoma*
   and/or *Parantipathes larix*
   Bathyal rock with Aphanipathidae

Bathyal rocks with Scleractinia
   Bathyal rocks with *Dendrophyllia coringera*
   Bathyal rocks with *Desmophyllum dianthus*
   Bathyal rocks with *Caryophyllia calveri*
   Bathyal rocks with *Madracis pharensis*

Bathyal rocks with Scleractinia and Tetractinellida
   Bathyal rocks with *Madrepora oculata* and/or *Lophelia pertusa* and/or
   *Desmophyllum dianthus* with *Pachastrella monilifera* and/or
   *Poecillastra compressa*

Bathyal rocks with Hexactinellida
   Bathyal rocks with *Asconema setubalense* and/or *Tretodictyum tubulosum*

Bathyal rocks with Demospongiae
   Bathyal rocks with Tetractinellida
   Bathyal rocks with Geodiidae
   Bathyal rocks with desma-bearing demosponges (ex-“Lithistida”)

Bathyal rocks with Crustacea Balanomorpha
   Bathyal rocks with *Pachylasma giganteum*

Bathyal rocks with Echinodermata Antedonoidea
   Bathyal rocks with *Leptometra phalangium* or *Leptometra celtica*
   and/or *Antedon mediterranea*

Bathyal rocks with Bivalvia
   Bathyal rocks with *Neopycnodonte zibrowii*

ME1.52 Caves and ducts in total darkness (in enclave in upper zones)
   Muddy detritic bottoms
   Walls and ceilings
      with *Dendroxea lenis/Diplastrella bistellata*
      with *Penares euastrum/Rhabderemia minutula/Myrmekioderma spelaeum*
   Walls and ceilings in anchialine environments

ME2.1 Mediterranean upper bathyal biogenic habitat
   Bathyal Anthozoa bioconstructions
      *Madrepora oculata/Lophelia pertusa/Desmophyllum dianthus* reefs
      *Madrepora oculata and Serpula vermicularis* reefs
   Bathyal Bivalvia bioconstructions
      *Neopycnodonte zibrowii* and/or *Neopycnodonte cochlear* reefs
Bathyal sponge bioconstructions
  *Leiodermatium* reefs

**ME3.5 Mediterranean upper bathyal coarse sediment**
- Bathyal coarse sediment with Alcyonacea
  - Bathyal coarse sediments with *Chironephthya mediterranea* and/or *Nidalia studeri* and/or *Paracyonium spinulosum* and/or *Alcyonium palmatum*
  - Bathyal coarse sediments with *Bebryce mollis* and/or *Villogorgia bebricoides* and/or *Paramuricea macrospina* and/or *Muriceides lepida*

**ME5.5 Mediterranean upper bathyal sand**
  **ME5.51 Upper bathyal detritic sands**
  - Bathyal sands with Pennatulacea
    - Bathyal sands with *Pennatula* spp. and/or *Pteroeides spinosum*
  - Bathyal sands with Demospongiae
    - Bathyal sands with *Rhizaxinella* spp.
  - Bathyal sands with Antedonidae
    - Bathyal sands with *Leptometra phalangium* and/or *Antedon mediterranea*

**ME6.5 Mediterranean upper bathyal muds**
  **ME6.514 Bathyal muds with *Pheronema carpenteri***
  - Bathyal muds with *Asconema setubalense*
  **ME6.511 Bathyal muds with *Thenea muricata* and/or *Cladorhiza abyssicola***
  **ME6.513 Bathyal muds with *Funiculina quadrangularis* and/or *Protoptilum carpenteri***
  - Bathyal muds with *Kophobelemnon stelliferum*
  - Bathyal muds with *Pennatula* spp.
  **ME6.515 Bathyal muds with *Isidella elongata***
  **ME6.516 Bathyal muds with *Isidella elongata* with *Aristeus antennatus*, *Aristaeomorpha foliacea* and/or *Nephrops norvegicus***
  **ME6.517 Bathyal muds dominated by *Leptometra phalangium* and/or *Antedon mediterranea***
MF1.5 Mediterranean lower bathyal rock
  MF1.51 Lower bathyal rock
    MF1.511 *Lophelia pertusa* reefs
    MF1.512 *Madrepora oculata* reefs
    MF1.513 *Madrepora oculata* and *Lophelia pertusa* reefs

MF6.5 Mediterranean lower bathyal mud
  MF6.51 Lower bathyal muds
    MF6.511 Sandy muds with *Thenea muricata*
    MF6.513 Compact muds with *Isidella elongata*

MG1.1 Mediterranean abyssal rock

MG6.1 Mediterranean abyssal mud
  Cold seeps and hydrothermal vents
    Methane seeps
    Sulfide vents
Table 1: Combinations are codes for marine EUNIS level 2

Combinations codes for marine EUNIS level 2

<table>
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<th>Zone</th>
<th>Substrate</th>
<th>Hard/firm</th>
<th>Soft</th>
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<td>Rock*</td>
<td>Biogenic habitat*</td>
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<td>Phytal gradient / hydrodynamic gradient</td>
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<td>MA2</td>
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<td></td>
<td>Infralittoral</td>
<td>MA3</td>
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<td>Circalittoral</td>
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<td>Offshore circalittoral</td>
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<td>ME1</td>
<td>ME2</td>
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<td>Abyssal</td>
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Bibliography


