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GENERAL FISHERIES COMMISSION
FOR THE MEDITERRANEAN
COMMISSION GÉNÉRALE DES
PÊCHES POUR LA MÉDITERRANÉE

GENERAL FISHERIES COMMISSION FOR THE MEDITERRANEAN

SCIENTIFIC ADVISORY COMMITTEE

Tenth Session

Nicosia, Cyprus, 22-26 October 2007

PROPOSAL OF FISHERIES RESTRICTED AREAS (FRA) CONCERNING THE CAP CREUS CANYON

INTRODUCTION

1. The attached document is a revised version of the new proposal of FRA covering the Cap Creus Canyon (GSA 6: Northern Spain) and submitted by WWF on the 9th October 2007.

2. A first version of this proposal was initially reviewed by the Sub-Committee on Marine Environment and Ecosystems (SCMEE), at its eight session (Kavala, September 2007), without reaching consensus on its formal adoption. The proposal was draw up according to a standard format to submit new proposal of FRA, proposed during the Workshop on MPAs (Tunisia, May 2007) and adopted by the Sub-Committee.

3. The Sub-Committee further decided to submit a new version of this proposal to the Tenth session of SAC (Cyprus, October 2007) for consideration, taking into account the comments and views submitted by the SCMEE experts to the Coordinator of the Sub-Committee, before the 2nd October 2007, with the aim to improve this proposal before its submission.

Date of endorsement by the SCMEE

STANDARD FORMAT FOR THE SUBMISSION OF PROPOSALS FOR GFCM FISHERIES RESTRICTED AREAS (FRA) IN THE MEDITERRANEAN

Name of the FRA:

International waters of the Cap de Creus Canyon

Submitted by (Institution, Scientists, GFCM Members…):

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Date of submission:

September 2007

1 EXECUTIVE SUMMARY (maximum 500 words)

Supply a summary of the information contained in sections 2 to 8, including the expected results.

The Cap de Creus Canyon is the western most of the submarine Canyons system in the Gulf of Lions, a bathymetrically complex region with significant sediment input from the Rhone and many other small rivers. The preferential direction of the coastal currents, the narrowing of the shelf and the coastal topographic constrain causes that most of the sediment transport occur through the Cap de Creus Canyon, where observed sediment fluxes are much higher than in the eastern and central submarine Canyons. Additionally, the Cap de Creus Canyon is more frequently affected by periodical arrivals of dense, cold and particle rich shelf water cascades, which makes the Cap de Creus canyon a unique habitat in the northwestern Mediterranean. It presents deep zones very close to the coast with a still much unknown faunistic composition.

The abundant supply of organic matter trough the whole Canyon is thought to be essential for the maintenance of its associated deep sea ecosystems and high biodiversity, including its threatened deep sea coral species. The three-dimensional communities, dominated by *Madrepora oculata*, observed in different locations of the Cap de Creus, constitute the refuge and nursery of numerous benthic mobile species, as well as fish larvae and decapods, in some cases of commercial interest, like hake and red shrimp. The presence of numerous remnants of ropes and fishing gears found in the areas prospected attests the impact of industrial fishing activities in the Canyon. It is known that many of these deep sea coral communities were destroyed probably due to the intense activity of trawlers and bottom long-liners in the areas of the shelf and slope. The living coral communities of the Cap of Creus have survived due to the inaccessibility of some of these deep zones. Current levels of fisheries exploitation (targeting crustaceans and demersal fish) are resulting in an important biodiversity loss, destroying valuable sessile communities and preventing their use as shelter and food by numerous marine organisms.

Benthic communities found until now in the Canyon, show a patchy distribution. Patches present different sizes being some of them quite large (up to several 100 m2). These benthic communities are dominated by the cold water coral *Madrepora oculata* which mixed in several places with *Lophelia pertusa*. The size of the patches should be enough to consider them as a core area that will permit the start of a mid and long term recovery of the vanished populations in the slope and end of the continental shelf.

Nowadays there are more evidences of the interconnection among all the communities of the Canyon, from the continental shelf to the deep-sea waters. The terraces located in the head of the canyon are plenty of organic debris from coastal organisms (like mollusc shells and urchin skeletons) coming from the surrounding shelves. At the same time mobile organisms, like lobsters and fish, have been observed in many places inside the canyon. These organisms temporarily visit or migrate to coastal zones. Due to this interconnection it is necessary an integral conservation plan of the core area together with shallower areas, that will include a strictly enforced fisheries restricted area.

2 AREA IDENTIFICATION

2.1 GFCM GEOGRAPHICAL SUBAREA

Northern Spain (6)

2.2 NAME OF THE FRA

International Waters of the Cap de Creus Canyon

2.3 GEOGRAPHIC LOCATION

2.3.1 General location

Cap de Creus Canyon is located at the Mediterranean Costa Brava (42o 18’ 49.202 N – 003o 34’ 6.000 E). It starts in the continental shelf at approximately 90-100 m depth and is 5 km offshore of the coastal line. The Canyon is oriented northwest-southeast, constituting an axis of a V shape structure that gradually opens toward the open sea. The total length of the Canyon is around 40 km and its maximum depth 2000 m.

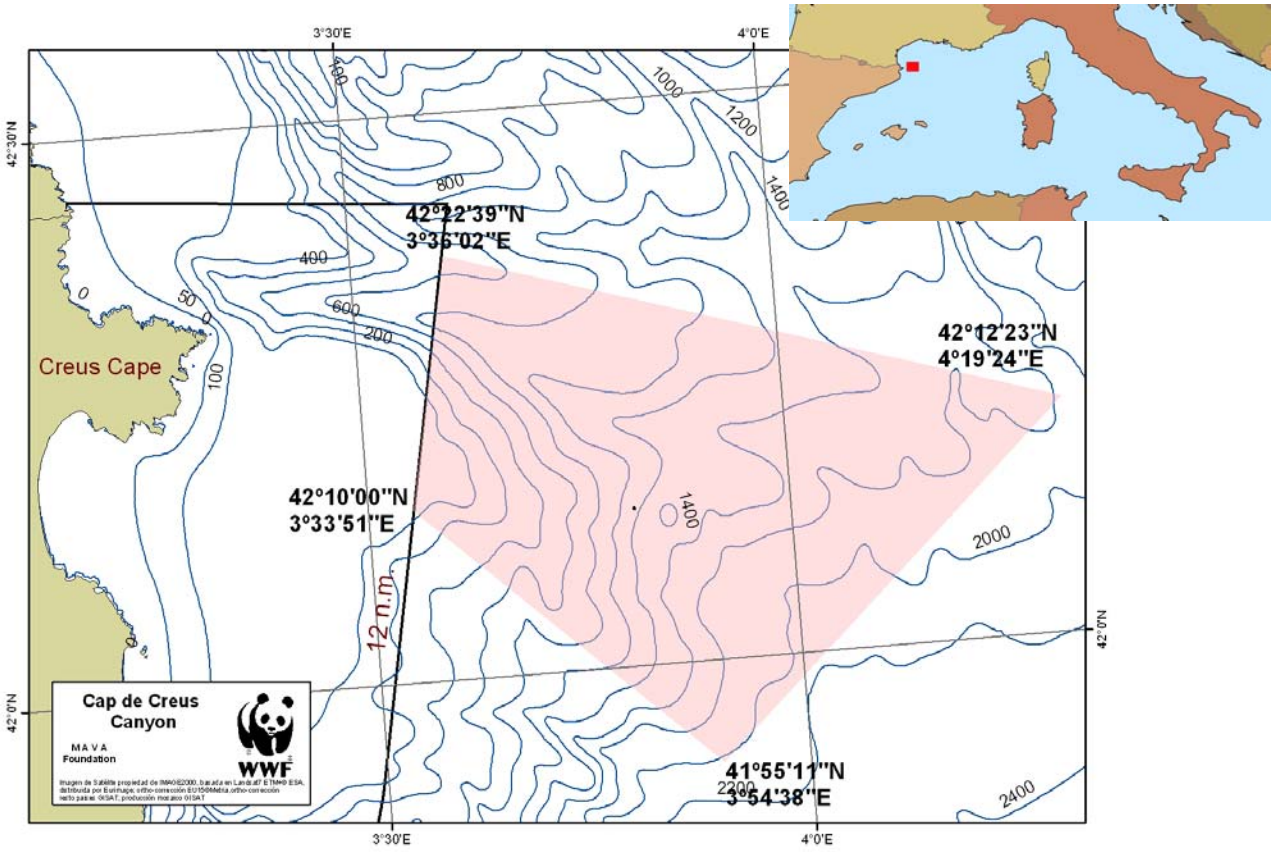
2.3.2. Precise location of the proposed core area: provide geographical coordinates (latitude and longitude in degrees, minutes and seconds) for the vertex of a polygonal area.

Northernmost: 42º22’39’’N – 3º36’02’’E
Southernmost: 41º55’11’’N – 3º54’38’’E
Easternmost: 42º12’23’’N – 4º19’24’’E
Westernmost: 42º10’00’’N – 3º33’51’’E

2.3.3. Buffer area (if applicable) , provide geographical coordinates (latitude and longitude in degrees, minutes and seconds) for the vertex of a polygonal area.

Not applicable

2.3.4. Location Map: include geographical coordinates of the core and buffer areas, bathymetry, and the boundary of international waters. Add a global reference map of the Mediterranean with the location of the site.



2.3.5. Depth range (in m; specify core and buffer area, if applicable)

200-2000 m

2.4 SURFACE AREA (in ha and km^2; specify core and buffer area, if applicable)

1742 km2 – 174200 ha (core area)

3 SITE DESCRIPTION

3.1 MAIN PHYSICAL FEATURES

3.1.1. Geology/Geomorphology

Give a brief description of the geological aspects; processes of sedimentation and erosion observable in the area and other geomorphologic features or geological risks. Indicate bibliographical sources.

The main geomorphologic feature in the Gulf of Lions continental margin is the numerous submarine canyons incising into it. The sedimentary dynamics (i.e. downward particulate fluxes and currents) have been intensively studied in some of these canyons, particularly in the Lacaze-Duthiers Canyon, located in the southwestern part of the Gulf nearby the Cap de Creus Canyon (Monaco et al., 1990, Monaco et al., 1999). These studies showed that: 1) downward particle fluxes varied seasonally, with maximum fluxes in winter; 2) the summer/winter alternation appeared to correlate with that of major sources of particulate matter (river discharge) and physical forcing (storms, along-slope current variability); 3) fluxes inside the canyons were larger than those on the open slope, suggesting a preferential transport of material through the canyons; and 4) fluxes increased significantly westward, suggesting a preferential export through the southwestern part of the Gulf. However, recent studies conducted in the frame of the EuroSTRATAFORM project, during which seven submarine canyons from the Gulf of Lions were instrumented simultaneously, provided a temporal and spatial perspective of their functioning without precedents, and recognized the importance of the dense shelf water cascading mechanism in exporting shelf waters and particles towards deep-sea regions (see Palanques et al. 2006 for details). The preferential direction of the coastal currents, the narrowing of the shelf and the coastal topographic constrain causes that most of the sediment transport occur through the Cap de Creus Canyon where observed sediment fluxes were two orders of magnitude higher than in the eastern and central submarine Canyons. The abundant supply of organic matter trough the Cap the Creus Canyon are thought to be essential for the maintenance of its associated deep sea ecosystems and high biodiversity, including threatened deep sea coral species.

3.1.2. Other interesting physical or chemical features: Such as hydrodynamics, frontal areas, upwelling, etc than support the proposal.

The northwestern Mediterranean is one of the regions of the world where massive dense water formation occurs because of cooling and evaporation of surface waters during winter-time. Concurrent with the open-sea convection process, coastal surface waters over the wide shelf of the Gulf of Lions also become denser than the underlying waters and cascade down slope until reaching their equilibrium depth (Durrieu de Madron et al. 2005). Through this climate-driven phenomenon, shelf waters carrying large quantities of dissolved and particulate matter are rapidly advected hundreds of meters deep, mainly through submarine canyons, acting as a significant natural carbon sequestration and deep-sea ecosystem fuelling mechanism (Canals et al. 2006). The Cap de Creus Canyon has been identified as the main outlet of dense shelf waters from the Gulf of Lions.

3.2 BIOLOGICAL FEATURES

3.2.1. Habitats: A brief description of the dominant marine habitats including pelagic ones if applicable

1. Benthic communities

From the studies conducted until now in the Cap de Creus canyon we identified three main different benthic communities whose locations are shown in Figure 1 (these are just the three main characteristic communities but there is of course a gradation with many different mixed types):

1. Soft bottom communities dominated by Pennatulaceans. These communities dominated mainly in the shelf areas.
2. Soft bottom communities dominated by Ceriantharia. These communities are dominant in soft bottom shelf areas, but also inside the canyon.
3. Hard bottom communities dominated by Scleractinians. These communities dominated the hard substrate areas, mainly of the southern wall of the canyon. However the rocky promontories of the northern wall presented also cold coral communities. The dominant species in the identified communities until now was *Madrepora oculata,* which mixed with *Lophelia pertusa* and also with *Dendrophyllia cornigera*.

The communities showed a considerable diversity of benthic sessile species, with presence of several sponge species, octocorals, hydroids, bryozoans, brachiopods, ascidians etc., and also of mobile species as ophiuroids, sea urchins and several species of decapods. Moreover, a rich zooplanktonic community live associated with this benthic communities finding there refuge and a nursery place.

The distribution of *Madrepora oculata* in these communities is very patched, showing maximal abundances of 38 col/m2, which are comparable to abundances of some octocoral species also from the north western Mediterranean (53col/m2 for *Paramuricea clavata* and 56 col/m2 for *Eunicella singularis*).

Lophelia pertusa has been documented alive for first time in this area. Moreover, this finding represents the upper temperature limit cited for this species until now (Orejas et al. submitted). This finding could have important ecological implications when extrapolating the impact of increasing water temperatures on the distribution and persistence of cold-and deep-water coral communities elsewhere.

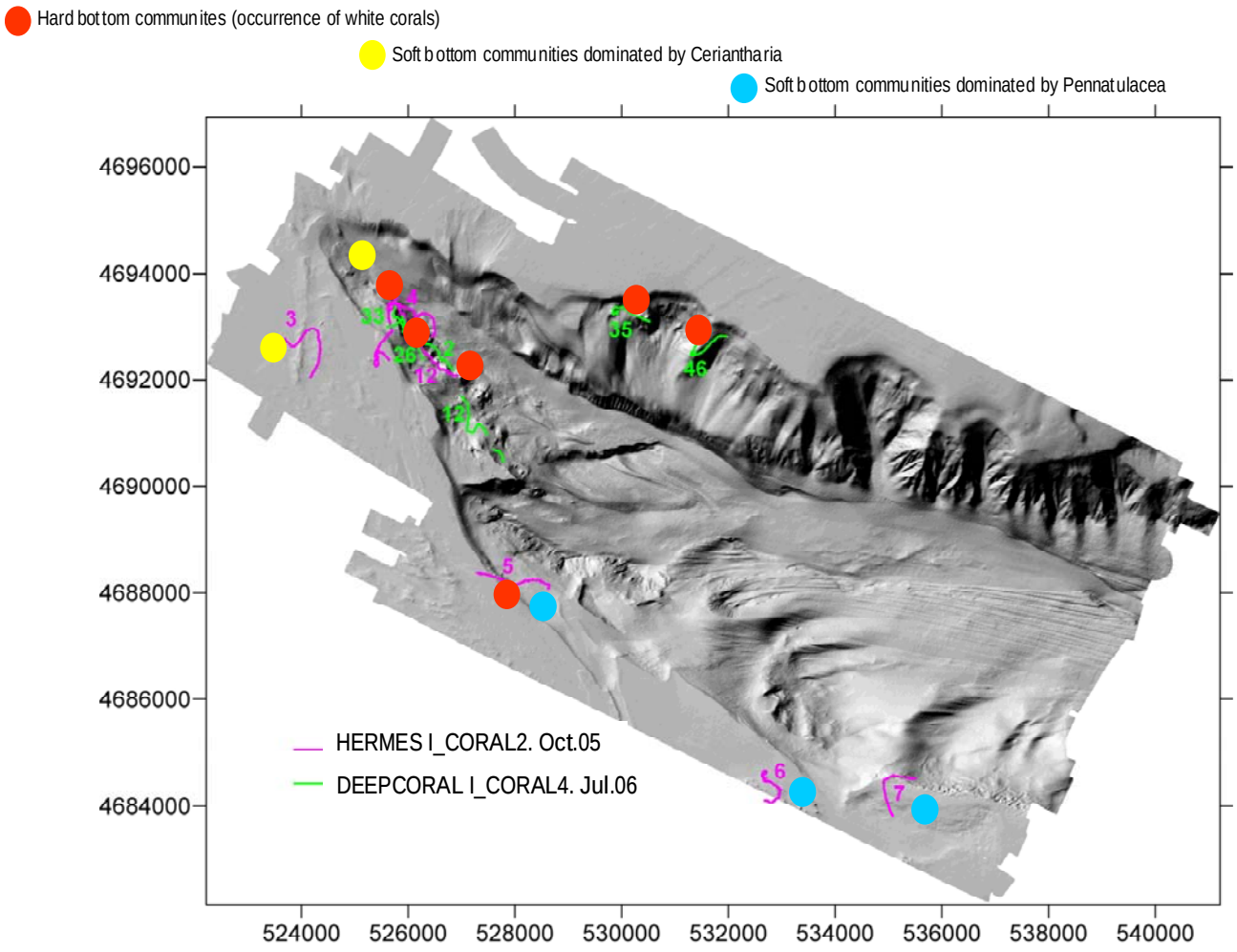
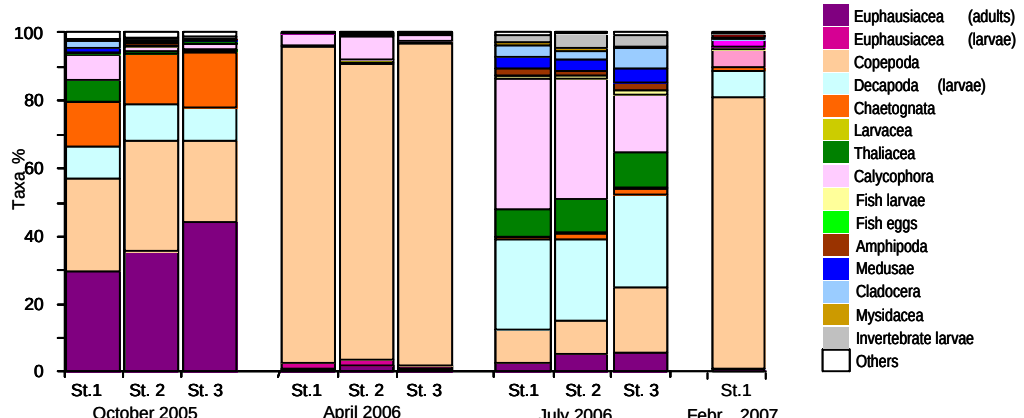


Fig. 1: Location of the different kind of benthic communities identified until now in the head of the Cap de Creus canyon. Different colors correspond to different communities. In green and purple the ROV transects carried out during two oceanographic cruises, in October 2005 and July 2006.

2. Zooplancton: suprabenthic communities

Related to the suprabenthic community, Figure 2 shows the taxonomic composition of the samples in the different year seasons which shows a clear seasonality in the composition of suprabenthic communities of the southern wall in the canyon head (by approximately 200 meters depth).



Until now 12 fish taxa have been identified from the sampled larvae (Table 1) and 11 larvae were identified at species level. Some of these species are commercially important in the Mediterranean, specially hake (*Merluccius merluccius*).

The upper wall of submarine canyons has been considered elsewhere as an important refuge habitat for several abundant zooplanktonic species such as the swarms of euphausiacea. But also the coral forests and other habitats inside the canyon play an important role such as nursery of juvenile and larvae of pelagic and nektonic species. Together with these ontogenic stages other rich zooplankton communities concentrate near the bottom, fact that is observed with the available data from the Palamós marine canyon.

Table 1: List of the fish larvae found until now in the suprabenthic communities of the Cap de Creus Canyon head.

Familia	Species
Gobidae	
	Crystallogobius linearis
Sternoptychidae	
	Maurolicus muelleri
	Argyropelecus hemigymnus
Merluccidae	
	Merluccius merluccius
Callyonimidae	
	***Callyonimus* sp.**
Cepolidae	
	Cepola macrophthalma
Myctophidae	
	Benthosema glaciale
	Myctophum punctatum
Bothidae	
	***Arnoglossus* sp**.
Soleidae	
	Buglossidium luteum
Ammodytidae	
	Gymnammodytes semisquamatus
	Gymnammodytes cicerelus
Serranidae	
	Serranus hepatus
Blenniidae	
Sparidae	

3.2.2. List of regionally important species

List here those marine species protected by international agreements (specify the agreement) and/or included in the GFCM priority list. If applicable, give the IUCN category. Any other species may be listed if it is clearly considered of regional importance given its high representation in the area. For each species state:

a) its relative abundance as Common (C), Uncommon (U) or Occasional (O),
b) Its regional status as rare (r), endemic (e) and/or threatened (t), and

c) its status as an important resident population (R), or important for its breeding (B), feeding (F), wintering (W) or migratory passage (M)

SPECIES	Rel. Abundance (C) (U) (O)	Regional STATUS (r) (e) (t)	Local STATUS (R) (B) (F) (W) (M)
Madrepora oculata	**C**	**r,t**	**R**
Lophelia pertusa	**C**	**r,t**	**R**
Corallium rubrum		**t**	**R**
Palinurus elephans		**t**	**R**
Conger conger		**t**	**R**

3.2.3. Occurrence of biological and ecological processes relevant to fish resources (essential fish habitats)

Not applicable

3.3 USE OF NATURAL RESOURCES

3.3.1. Current human use and development of fisheries

a) Briefly describe the current use of the area by artisanal, industrial and recreational fishing.

The presence of remnants of ropes and fishing gears found in the areas suggests the existence of opportunistic fishing activities (trawling and bottom long-liners) in the Canyon. However, until recent times its presence was limited mostly due to the inaccessibility of some of these deep zones. Due to the recent development of high technology fishing equipment, an increase of the fishing practices can be expected in the area.

Due to the location of the proposed core area beyond the 12-miles of territorial seas, it seems highly likely that its current fisheries importance remains only marginal to the fleets based in the nearest base ports in Spain and France. Preliminar consultation with both the French fishing authority and Catalan fishermen organisations from NE Spain confirm that current fisheries importance of the High Seas area proposed seems to be negligible. Lacking accurate quantitative information on the vessels potentially affected by the protection of this area -if any at all-, WWF considers Article 7 (point 7.5.1) of the FAO Code of Conduct for Responsible Fisheries is of application. It reads as follows:

> "States should apply the precautionary approach widely to conservation, management and exploitation of living aquatic resources in order to protect them and preserve the aquatic environment. The absence of adequate scientific information should not be used as a reason for postponing or failing to take conservation and management measures".

b) Enter how many of the users depend on these resources, seasonality, and assessment of the social and economic importance of their use and of the perceived impact on the conservation of the area, in a score of 0-1-2-3 (meaning null, low, medium, high).

ACTIVITY AND CATEGORY	ASSESS IMPORTANCE OF SOCIO-ECONOMIC	CONSERV. IMPACT	ESTIMATED No. of USERS	SEASONALITY
FISHING				
Artisanal	0 1 2 3	0 1 2 3		
Industrial	0 1 2 3	0 1 2 3		
Other:				
- Acuiculture				
-				

3.3.2. Current human use and development (except for fisheries)

a) Briefly describe the current use of the area for other economic sectors.

b) Enter how many of the users depend on these resources, seasonality, and assessment of the social and economic importance of their use and of the perceived impact on the conservation of the area, in a score of 0-1-2-3 (meaning null, low, medium, high).

ACTIVITY AND CATEGORY	ASSESS IMPORTANCE OF		ESTIMATED No. of USERS	SEASONALITY
	SOCIO-ECONOMIC	CONSERV. IMPACT		
OTHER ACTIVITES				
Tourism	0 1 2 3	0 1 2 3		
Transport	0 1 2 3	0 1 2 3		
Mining				
-				
-				

4 REGIONAL IMPORTANCE OF THE SITE

This Section aims at stressing the importance of the site for conservation at the regional scale.

4.1 PRESENCE OF ECOSYSTEMS/HABITATS OF PARTICULAR IMPORTANCE IN THE MEDITERRANEAN

The Cap de Creus Canyon constitutes a unique habitat in the northwestern Mediterranean. The communities observed in the Canyon, between 190 and 250 m depth, are clearly different to those of the shelf. The studies carried out of benthic and planktonic communities show the peculiarities of this sector. The funcionality of the head of the Canyon is crucial to mantain the whole system from the coastal head to the deeper part of the canyon. The species that seems to present a main role in the hard substrate areas as a three-dimensional constructor, is the Scleractinian coral *Madrepora oculata* accompanied in some locations with *Lophelia pertusa*. *M. oculata* is present in deep and cold waters, and constitutes an important element for building three dimensional habitats which are vital for many benthic species as well as suprabenthic ones. The three dimensionality of these systems implies habitat complexity and therefore high species biodiversity. It constitutes refuge for numerous benthic mobile (e.g. ophiuroids, crabs) and sessile species (e.g. brachiopods, sponges), as well as a nursery for fish larvae and decapods, in some cases of high commercial interest, like hake and red shrimp. Other Scleractinian species are present in the area (i.e. *Dendrophyllia cornigera*), as well as octocoral species (e.g. *Eunicella singularis Eunicella verrucosa, Lophogorgia sarmentosa* and *Alcyonium palmatum*) among them also some spots of red coral (*Corallium rubrum*) are present. In soft bottom areas, cerianthids, pennatulaceans, actinians and hydrozoans are the organisms most frequently observed. Sponges species, mainly hexactenillidae (i.e. *Spongia agaricina*) are frequent, as well as echinoderms mainly from the genus Echinus and, Cidaris). Several species of polychaetes (mainly Sabellidae), bryozoans and brachiopods are part of the common fauna of the benthic habitats of the canyon. Mobile fauna is represented by decapods (i.e G. Munidae, G. Pagurus, G. Palinurus). Also several demersal fish species have been documented belonging mainly to the families Congridae, Gadidae, Bythidae, Caproidae, Scorpenidae, Trichuridae, Macrouridae, and pelagic family species as Carangidae and Scombridae. One shark specie has been reported (*Scyliorhinus canicula*). Cephalopods (Octopus) have also been recorded. All this information corresponds mainly to the observations carried out in this area by means of the employment of underwater remoted operated vehicles (ROVs), and also by the partial analyses of samples.

4.2 PRESENCE OF HABITATS THAT ARE CRITICAL TO ENDANGERED, THREATENED OR ENDEMIC SPECIES

Name the habitat types and the species linked to it. Give information about its status (IUCN classification, etc.).

The submarine canyon of Cap de Creus seems to be one of the last places in the Mediterranean where the benthic communities dominated by cold corals still have good structured communities covering some times extended areas (Fig. 3). This situation is a consequence of the topography of the canyon which has difficult access for fishermen due to the characteristics of the seafloor and its considerable depth. Therefore, the probability of losing its nets or other fisheries gears was very high. However the increasing demand and the exhaustion of many fishing areas endanger areas as the Cap de Creus canyon because fishers are going deeper and deeper in the search for new areas. The protection of the Canyon is thus essential to preserve these benthic ecosystems.

Fig. 3: ROV's image of the Southern wall of the Cap de Creus Canyon (218 m depth). Rocky outcrops on this canyon wall are covered by dense colonies of *Madrepora oculata* and *Lophelia pertusa*

4.3 OTHER RELEVANT FEATURES

4.3.1. Educational Interest

E.g. particular values for activities of environmental education or awareness

Recent images from the deep water of the Cap de Creus Canyon have revealed valuable information of the structure of the coral formations, its dimensions and its conservation status. They also constitute an effective tool for awareness of bottom habitats destruction by human activities.

The benthic communities close to the coast, in several parts of the shelf and inside the canyon are one of the best preserved in the North West Mediterranean. This situation shows the natural state of the marine communities when far from the impact of human activities. The special circumstances that facilitate this phenomenon, such as the difficult access for fishers due to the complex topography of the canyon and the reduced number of coastal towns around, are interesting facts that help to understand the importance of these ecosystems, and to propose conservation policies.

4.3.2. Scientific Interest

Explain if the site represents a particular value for research.

The area has a very particular research interest, both for biologists and geologist. Current scientific projects include the still unknown ecological role of coral communities in the Mediterranean. Dense shelf water cascading in the Gulf of Lions seems to influence benthic ecosystems inhabiting submarine canyon heads. In the Cap de Creus Canyon, most of the colonies were found in the southern flank of the canyon, in an area directly affected by periodical arrivals of dense, cold, and particle rich shelf water, suggesting a clear relationship between the location of cold-water coral communities and the preferential pathway of dense shelf water cascades. However, the implications that this transport mechanism may have in this particular marine ecosystem have not been studied yet, and their investigation at a trans- disciplinary level will definitively open a new productive line of research.

The marine habitats around the Cap de Creus coast, shelf and canyon are one of the best preserved in the north-western Mediterranean and have a very rich biota that are not yet well known. The state of preservation is one of the major environmental and biodiversity hits of the area which warrant to be maintained avoiding the possible increase of human activities.

The deep macrobenthic communities of the Mediterranean are very poorly unknown. We are starting now to elucidate the role of the communities inhabiting these areas as well as the connection between these deep environments and the shelf ones. In order to know the ecological role of the cold coral dominated communities a comprehensive study is being actually carried out with a multidisciplinary work team which includes geologists, biologists and oceanographers in order to understand the functioning of the system and the meaning of such phenomena as the cascading for the communities living there.

The scientist of the Instituto de Ciencias del Mar (CSIC) have collected living exemplars of three coral species from the canyon (see Figure 4) in order to study the growth process of theses species, as well as their trophic ecology and physiology.

Moreover, the presence of the same species of the cold water coral through the Atlantic and in the Mediterranean basin, made this species highly interesting in order to better understand the origin of the fauna of both geographical regions.

Furthermore, the hard skeleton of these organisms make of them excellent paleontological and climate archives.

These investigations are part of two research projects: HERMES (Hot Spot Ecosystem in the Margins of European Seas) funded for the European Union and DEEP CORAL, funded by the Spanish Ministry of Education and Science.

Fig. 4: From left to right Madrepora oculata, Lophelia pertusa and Dendrophyllia cornigera. These colonies are, since July 2006, living in the Experimental Aquaria Area of the Instituto de Ciencias del Mar (CSIC) of Barcelona.

5 IMPACTS AND ACTIVITIES AFFECTING THE AREA

5.1 IMPACTS AND ACTIVITIES WITHIN THE SITE

5.1.1. Exploitation of natural resources

Assess if the current rates of exploitation of natural resources within the area (e.g. fishing, sand and mineral exploitation) are deemed unsustainable in quality or quantity, and try to quantify these threats, e.g. the percentage of the area under threat, or any known increase in extraction rates.

Current levels of exploitation of certain target fishery species such as crustaceans and demersal fishes can destroy the valuable sessile communities found in the canyon, thus resulting in an important biodiversity loss and impeding their use as shelter and food by numerous marine organisms.

5.1.2. Threats to habitats and species

Mention any serious threats to the habitat (e.g. modification, disturbance, pollution) or to species (e.g. disturbance, poaching, introduced alien species...) within the area.

- Even though the deep waters of the canyon are not easily accessible to fishermen due to the characteristics of the seafloor and the considerable depth, the progressive development of new technology in fishing equipment, as well as a possible increase in the fishing intensity in the canyon, may put at risk the preservation of the identified biological communities.
- Recent studies pointed out the important role of the Cap de Creus canyon in the transport of some pollutants such as organochlorine compounds towards deep sea areas. Concentrations of PCBs detected in the Cap de Creus canyon were 7 times higher than those generally encountered in the other canyons or in the open slope areas. Other pollutants such as 4,4'-
DDE also exhibit the same differences between concentrations in Cap de Creus and open slope. Overall it seems that the compounds accumulated in the continental shelf either by autochthonous processes or by water course inputs are transported preferentially through the Cap de Creus on occasion of the cascading events.

5.2 IMPACTS AND ACTIVITIES AROUND THE SITE

5.2.1. Pollution

Name and describe sources of pollution.

The origin of the pollutants is probably coastal.

5.2.2. Other external threats, natural and/or anthropogenic

Briefly describe any other external threat to the ecological, biological, aesthetic or cultural values of the area (such as unregulated exploitation of natural resources, serious threats on habitats or species, pollution problems) likely to influence the area in question.

- Recent numerical simulations show that the intensity of the downward cascades could be affected and even interrupted by global warming. This may have important implications for nutrient supply to deep ocean ecosystems, as well as for carbon storage in the deep ocean (Canals et al. 2006).

5.2.3. Sustainable development measures

Comment whether the area is covered by a management plan, or bordering upon a zone under such a plan.

The area is not covered by any management plan. Mediterranean waters deeper than 1000 m are already bottom trawling banned but the adverse effect of fishing gears on coral communities in the Canyon are found in waters not as deep as that.

6 EXPECTED DEVELOPMENT AND TRENDS[1]

This is not always easy to assess and thus, it is not obligatory to fill in this Section.

6.1 EXPECTED DEVELOPMENT AND TRENDS OF THREATS TO AND PRESSURES UPON THE AREA

Deal briefly with the development of economic activities within the area

Deep waters of the Canyon are not easily accessible for fisheries. However, due to the recent development of high technology fishing equipment, an increase of the fishing practices is expected in the area.

[1] By expected development and trends are meant the development, which is thought most likely to occur in the absence of any deliberate intervention to protect and manage the site.

7 MANAGEMENT AND PROTECTION REGIME

7.1 LEGAL STATUS (if applicable)

7.1.1. Historical background of the management related to the area

The General Fisheries Commission for the Mediterranean (GFCM) is the RFMO responsible for the management of the fisheries activities in the area. The area considered is totally within the high seas. There is not a legal text protecting specifically the area. However, by Recommendation GFCM/2005/1 the members of the General Fisheries Commission for the Mediterranean shall prohibit the use of towed dredges and trawl nets at depth beyond 1000 m.
This recommendation protects only the deeper part of the canyon, and only from towed dredges and trawling, but leaves the activities of bottom longliners, proved to be very harmful in the area, unrestricted.

7.1.2. Regulatory measures currently ruling the mangement on the site

Mention if the area, or part of it, has been designated and on what date, with an international conservation category.

Not applicable

7.1.3. Objectives

Name in order of importance the objectives of the area as stated in its legal declaration.

Not applicable

7.2 LEGAL BACKGROUND

Briefly mention if the area or part of it is subject to any legal claim, or to any file open in that connection within the framework of an international body.

In 2001 the coast part of the Cap de Creus Canyon was declared as a Specially Protected Area of the Mediterranean (SPAMI) through the SPA/BD that implements the 1992 Convention of Barcelona on Biological Diversity.

7.3 LEGAL PROVISIONS FOR MANAGEMENT

7.3.1. Zoning regulating the area

Briefly state if the legal text protecting the area provides for different zones to allocate different management objectives of the area (e.g. core and scientific zones, fishing zones, etc) and in this case the surface area of these zones. Include a map as an annex.

Not applicable

7.3.3. Legal competencies

Legal competence and responsibility with regard to administration and implementation measures

Members of the GFCM involved in fishing activities in the area have the responsibility of the implementation of the conservation measures.

7.3.4. Other legal provisions

Describe any other relevant legal provisions, such as those requiring a management plan or any other significant measures concerning the protection and management of the area.

Members of the GFCM involved in fishing activities in the area have the responsibility of the implementation of the conservation measures.

8 OBJECTIVES OF THE FRA AND PROPOSED MANAGEMENT MEASURES

8.1 OBJECTIVES OF THE FRA

State the reasons that justify the designation of the FRA

The Cap de Creus Canyon constitutes a unique habitat in the north-western Mediterranean and, in its current state, one of the best preserved. It is a high biodiversity area with high habitat complexity, important as refuge and nursery for numerous benthic mobile species, fish larvae and decapods, some of them with strong commercial interests (like hake and red shrimp). Current level of fisheries exploitation is resulting in an important biodiversity lost, destroying valuable sessile communities and impeding its use as shelter and food by numerous marine organisms. Benthic communities of the Canyon dominated by cold corals are still relatively well structured. The reason for their currently still healthy state is that the deep waters of the Canyon are not easy to access by fishermen due to the characteristics of the seafloor and its considerable depth. But the progressive development of new technology in fishing equipment, as well as the possible increase in the fishing intensity in the canyon, will surely add additional pressure to the marine environment of the area. The area also has a strong scientific interest. It represents an invaluable laboratory for the study of the ecological role of the cold coral dominated communities (currently in process). Scientists have recently succeeded in cultivating three coral species from the Canyon in the laboratory to study its growth, trophic ecology and physiology. They have also documented alive one of these species (*Lophelia pertusa*) for the first time in the area, under the upper temperature limit cited for this species. This finding could be extremely important in the study of ecological implications of raising water temperatures on coral and deep water coral communities. The designation of the Cap the Creus Canyon as a FRA by the GFCM is a necessary step to ensure the protection of this high biodiversity area and to protect its benthic communities from the destruction by fishing gears.

8.2 PROPOSED PROTECTION MANAGEMENT MEASURES FOR THE FRA

8.2.1. Management measures

Suggest management measures to be implemented in the FRA

A Recommendation of the GFCM should prohibit the used of towed dredges, bottom trawl nets and bottom longliners to protect this unique area.

8.2.2. Monitoring, Control and Surveillance measures

Suggest measures to effectively enforce the FRA

Contracting parties of the GFCM should effectively control the fishing activities of its own fleet. Any fishing vessel operating in the surrounding area shall be equipped by VMS.

8.2.3 Socioeconomic impact(s) of the FRA

Prevision of the socioeconomic impact(s) of the proposed measures

Short-term negligible impacts on the profit of fishing fleets based in neighbouring ports. Mid-term and long-term **positive** effects on these fleets due to the rebuild of comercial stocks within the protected areas and associated spillover effects.

8.2.3.1. Economic evaluation of the ecosystems services (not only marketable)

Economic value of the goods and services that the ecosystem support

9 OTHER RELEVANT INFORMATION

a) Relevant scientific missions sampling and studying the site

Oceanographic campaigns 2005

- HERMES I_CORAL 2 / October 2005 / Institute of Marine Sciences (ICM_CSIC), Barcelona University, Seville University / European funded project HERMES

Oceanographic campaigns 2006

- HERMES II_CORAL 3 / April 2006 / Institute of Marine Sciences (CMIMA_CSIC), Seville
University/ European funded project HERMES

- DEEPCORAL I_CORAL 4 / July 2006 / Institute of Marine Sciences (CMIMA_CSIC), WWF/ National funded project DEEP CORAL

- HERMES III_CORAL 5 / October 2006 / Institute of Marine Sciences (ICM_CSIC) / European funded project HERMES

Oceanographic campaigns 2007

- DEEPCORAL II_CORAL 6 / February 2007 / Institute of Marine Sciences (ICM_CSIC) / National funded project DEEP CORAL

- DEEP CORAL III_CORAL 7 /April 2007 / Institute of Marine Sciences (ICM_CSIC) / National funded project DEEP CORAL

Web sites: www.eu-hermes.net; www.icm.csic.es

b) Relevant projects studying or having studied the site

- HERMES project, April 2005-april 2009.The HERMES consortium comprises 45 partners including 9 small companies, from 15 European countries. Funded by the European Commission. Web: www.eu-hermes.net

- DEEP CORAL project, january 2006 – january 2009, Institute of Marine Sciences (CMIMA_CSIC), Seville University. Funded by the Ministry of Education and Science.

c) Relevant papers and other scientific contributions

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