
CIESM Workshop Monographs



Marine Peace Parks in the Mediterranean – a CIESM proposal

Siracusa, 18 - 20 November 2010

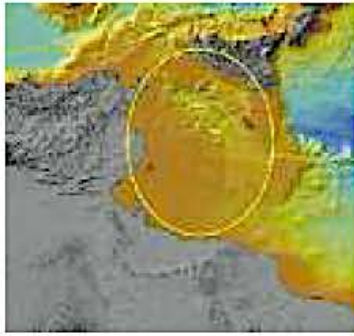
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6.2 The Pelagian Sea Peace Park



Being a transitional zone between the Eastern and Western basins of the Mediterranean Sea, the Sicily Channel is an area of high productivity – coupled with important pelagic and demersal fisheries – and one of the Mediterranean marine biodiversity hotspots. Because of its geographical position, the area is influenced by human activities, in particular maritime traffic and coastal development that generate a heavy pressure on the marine environment.

Key features in need of protection

- A complex and shallow orography with seamounts, volcanic islands and submerged volcanoes, slow-flux seeps and pockmarks;
- Active volcanic processes, leading to expulsions of warm fluids that may be leading to hot spots of specific symbiotic biological communities;
- An “ocean triad” – enrichment processes (upwelling, mixing), concentration processes (convergence) and processes favouring retention of eggs and larvae within - or drift towards – appropriate habitat (fronts, vortices);
- A feeding, spawning and nursery ground for many species of ecological (white shark, fin whale, bottlenose dolphin, devils’ ray, loggerhead turtle, white corals) and economic importance (bluefin tuna, sword fish, greater fork beard, hake, red mullet and pink shrimp);
- Rare or endemic species unique of this area, such as the Maltese ray *Leucoraja melitensis* and the colonial scleractinian coral *Cladopsammia rolandi*;
- One of the main bird migration routes between Europe and Africa and an important breeding site for procellariiforms.

Complementary information

Located along the African/ Europe plate boundary, the Pelagian Sea is an area of active tectonics cut by large grabens (Pantelleria, Malta)

and intruded by few active submerged and emerged volcanoes.

The two main currents, the W-E Atlantic surface water and the denser, deeper E- W Mediterranean water, convey high amounts of energy which interact with the complex seabed orography and the dominant winds, forming peculiar hydrographic features (upwelling, mixing, gyres) in the area. These generate high biological productivity, resulting in high diversity and biomass of pelagic and demersal fish. The Sicily Strait and the area around Malta still remain a major fishing ground for the bluefin tuna *Thunnus thynnus*, whose stocks are declining.

Essential Fish Habitats (EFH) have been identified in the form of spawning aggregations and nursery grounds of hake (*Merluccius merluccius*) at 100 - 200m on the Adventure and Malta Banks; nursery grounds of the greater fork beard (*Phycis blennoides*) at 200 - 400m on Adventure Bank and in the eastern Straits; spawning and nursery grounds of the red mullet (*Mullus barbatus*) to 100m on Adventure and Malta Banks. Pink shrimp (*Parapenaeus longirostris*) spawning and nursery grounds do coincide with the Adventure Bank and the Ionian Shelf vortices, respectively.

Nesting colonies of the endangered loggerhead turtle (*Caretta caretta*) still exist on the islands of Lampedusa and Linosa in the Pelagic Archipelago. The area off the coastline of Lampedusa is a feeding ground for the fin whale (*Balaenoptera physalus*) and possibly bottlenose dolphin (*Tursiops truncatus*).

The region is also one of the main migration pathways for many birds such as shearwaters, storm petrels. Breeding colonies of Cory’s shearwater (*Calonectris diomedea*) exist on islands and rocky coastline of the Sicilian Straits.

Habitat forming key species are a rare feature of this area: the Mediterranean endemic scleractinian coral *Cladopsammia rolandi*, white coral mounds composed of *Lophelia pertusa*, *Madrepora oculata*, the yellow tree coral *Dendrophyllia cornigera*, the octocorals *Isidella elongata*, red coral *Corallium rubrum* and *Funiculina quadrangularis* create unique habitats characterised by high biodiversity.

Major pressures

In the area several human activities are present, mainly fishing, aquaculture, shipping and tourism while others are planned like wind farm plants. Furthermore, extensive oil exploration takes place in the zone. As several concessions for oil exploration in the Sicily Strait have been recently granted by the Italian government, creating a marine park in the region represents a urgent priority. The windmill development (59 marine windmills planned in the Bank of Talbot) adds up further threats to the ecosystem. The intensive fishing efforts, especially for pelagic species (bluefin tuna, swordfish) and the dolphin fish *Coryphaena hippurus* are seriously undermining the important stocks in the area.

Countries : Italy, Malta, Tunisia

Scientific rationale for the proposed CIESM Pelagian Sea Marine Peace Park

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INTRODUCTION

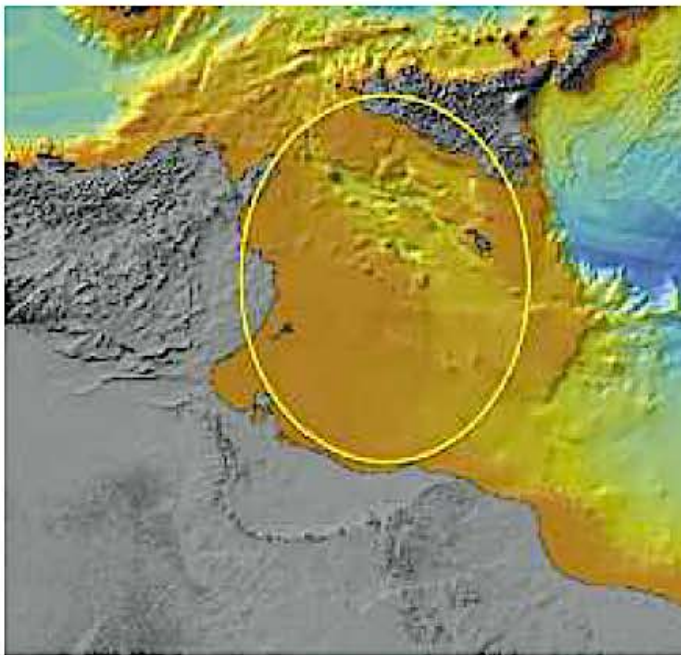


Figure 1. Shaded bathymetry of the CIESM Pelagian Sea Marine Peace Park (within yellow circle) based on swath bathymetry (DTM at 500m grid). Adapted from L. Brosolo and J. Mascle (2007).

seeps, and pockmarks (Mascle, this volume). Shallow, offshore banks found in this region are also important for marine biodiversity.

From the oceanographic view point this zone is considered a choke point where the surface Atlantic Water enters in eastern basin and the Levantine intermediate waters flows into the western basin

The geological, oceanographic, and biological characteristics suggest that the marine zone within the oval illustrated on the satellite and geological maps (Fig. 1), referred to as the Pelagian Sea, would benefit from conservation actions that should be achieved through collaborative efforts in research, monitoring and effective management (Gačić, this volume; Greenpeace, 2009; Mascle, this volume; Vella, 1998; 2000; 2001; 2002; 2005; 2008; 2009; 2010a,b).

The following highlights some aspects of the region, and provides a base line on which to develop further research collaboration and knowledge exchange toward the conservation needs of the area.

Topographic features of biological importance in this region include: seamounts, volcanic islands and submerged volcanoes, slow-flux

(Gačić, this volume); the area is also characterised by several mesoscale features (upwelling, filaments, and meanders) that play an important role in the biogeochemistry dynamics of the Sicily Strait and surrounding area (Fig. 2).

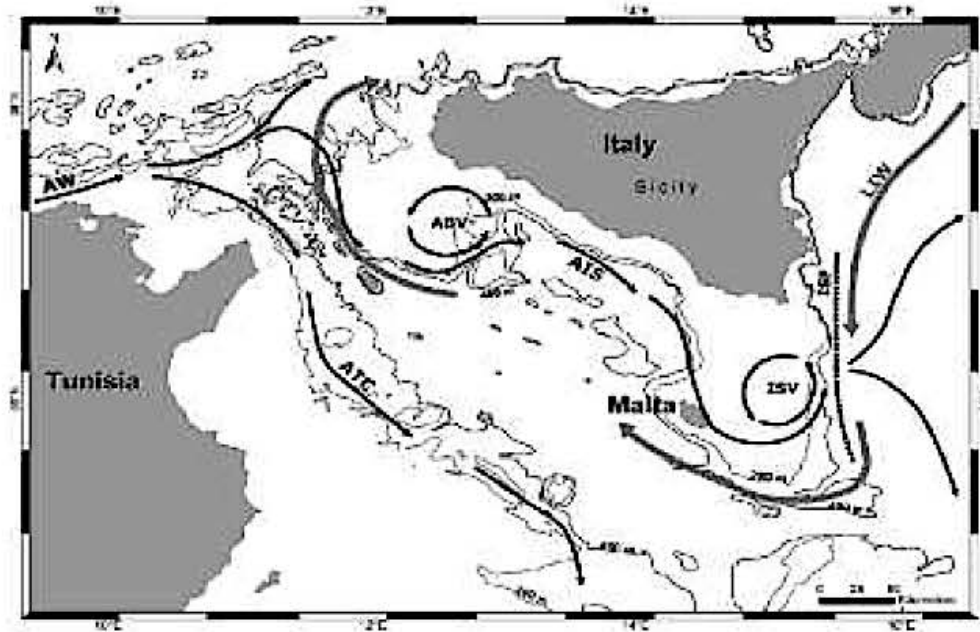


Figure 2. Features of the Strait of Sicily/Malta/Pelagian Islands: AW= Atlantic Water; LIW=Levantine Intermediate Water; AIS = Atlantic Ionian Stream; ATC=Atlantic Tunisian Current; ABV=Adventure Bank Vortex; ISV=Ionian Shelf-break Vortex—After Lermusiaux (1999); Lermusiaux and Robinson (2001); Béranger *et al.* (2004); Poulain and Zambianchi (2007).

Greenpeace published a proposal for a regional network of large-scale marine reserves with the aim of protecting the full spectrum of life in the Mediterranean (Greenpeace, 2006; 2009). The Sicilian Straits Channel was identified as one of the areas to be protected within the network.

The network was drawn up with the help of experts and used a variety of data sets including distribution of species, areas important for key life stages e.g. spawning grounds, important habitats such as seamounts, and sites previously identified as priority sites for protection, such as Specially Protected Areas of Mediterranean Importance (SPAMIs) (Greenpeace, 2009).

In the context of Ecologically and Biologically Significant Areas (EBSA) the Pelagian Sea offers various scientific criteria, and protocols for conservation and management measures, including the establishment of representative networks of marine protected areas in accordance with international law (Convention on Biological Diversity Decision IX/20). All the seven CBD EBSA criteria adopted are relevant in this area.

UNIQUENESS OR RARITY

Rare habitats/assemblages are found in this region, such as the facies formed by *Isidella elongata* and that formed by *Funiculina quadrangularis*, and white corals. Rare and endemic species in the area include the Maltese ray, *Leucoraja melitensis* and the scleractinian coral *Cladopsammia rolandi* (Pipitone *et al.*, 1992).

SPECIAL IMPORTANCE FOR LIFE HISTORIES OF SPECIES

The area includes spawning, and nursery grounds for several species of ecological (fin whales, turtles, seabirds) and economic importance (bluefin tuna, deep sea gadoids, swordfish). To this extent, a 25 nm fisheries conservation zone around Malta has been established (Aissi *et al.*, 2008; Dalli and Vella, 2006; Greenpeace, 2009; Vella, 1998; 2000; 2001; 2002; 2005; 2008; 2009;

2010a,b).

IMPORTANCE FOR THREATENED, ENDANGERED OR DECLINING SPECIES AND/OR HABITATS

Common dolphins (*Delphinus delphis*) and various other cetaceans including bottlenose, striped, and Risso's dolphins, sperm and fin whales, elasmobranchs, including great white shark (*Carcharodon carcharias*), basking shark (*Cetorhinus maximus*) and devil's ray (*Mobula mobular*), sea birds including shearwater species (*Calonectris diomedea* and *Puffinus yelkouan*) are vulnerable species resident or frequently observed in the region; some of them have been classified in the red list as threatened or endangered species. *Posidonia oceanica* meadows are still extensive in this region (Dalli and Vella, 2006; Greenpeace, 2009; Vella, 1998; 2000; 2001; 2002; 2005; 2008; 2009; 2010a,b; Vella and Vella, 2010).

VULNERABILITY, FRAGILITY, SENSITIVITY, SLOW RECOVERY

Vulnerable deep coral assemblages, cold seep assemblages and benthic and pelagic species affected by over-exploitation and habitat degradation are found in the region (Vella, 2010). Overall, marine biodiversity impoverishment and change due to increasing human activities including oil exploration, aquaculture, maritime and fisheries activities, climate change and alien species from both sides of Gibraltar and Suez Canal openings.

BIOLOGICAL PRODUCTIVITY

Mesoscale structures referred to by Gačić (this volume) are related to wind driven upwelling, which affect both the Mazurka del Vallo fishing area and the Capopassero upwelling. While these structures may be stationary when wind-driven, they can move when influenced by sea currents. In the latter case the effects are temporary and last up to 20 days. The hydrography, canyons and complex fluxes in the region need to be considered in the light of their effects on biological productivity too. The region is recognised as being important for spawning and as a nursery for various species including bluefin tuna (*Thunnus thynnus*) spawning areas (Vella, 2009; 2010a), swordfish (*Xiphias gladius*), anchovy (*Engraulis encrasicolus*), and several demersal species (Fortibuoni *et al.*, 2010). The area around Malta was also found to be important for fisheries conservation, and a 25 nm fisheries conservation zone around these islands was established.

BIOLOGICAL DIVERSITY

This area is important from an evolutionary point of view due to different sea level changes and isolation episodes, and therefore secondary contacts that may have paved the way to speciation and separation between basins. Molecular genetics studies of species and populations in this region in comparison with other region in the Mediterranean are important for conservation and for monitoring changes in this region and in the Mediterranean distribution of species.

NATURALNESS

Though human use of the region is extensive, with impacts on its biological and environmental status, unique natural conditions found here are essential to safeguard the marine life present, and to study the various unknown geological and environmental characteristics of this region in more detail. The region is geologically complex, even though the Pelagian Sea overlies the African platform and is thus mostly limestone. Extensive oil research takes place in the region, but the data collected have not so far been released, and thus full bathymetric data for the area is not yet available (Mascle, this volume).