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MEDITERRANEAN ACTION PLAN

15th Ordinary Meeting of the Contracting Parties to
the Convention for the Protection of the Marine Environment
and the Coastal Region of the Mediterranean
and its Protocols

Almeria (Spain), 15-18 January 2008

Four Annotated formats for the presentation reports for the areas proposed for inclusion in the SPAMI List: MPA "Miramare", MPA "Plemmirio", MPA "Torre Guaceto" and MPA "Tavolara-Punta Coda Cavallo"

UNEP/MAP
Athens, 2007

Ente Gestore: WWF per conto Ministero

ANNOTATED FORMAT FOR THE PRESENTATION REPORTS FOR THE AREAS PROPOSED FOR INCLUSION IN THE SPAMI LIST

MPA “MIRAMARE”

Ente Gestore: WWF per conto Ministero

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1. AREA IDENTIFICATION

1.1. COUNTRY/COUNTRIES (in the case of transboundary areas)

Italy

1.2. ADMINISTRATIVE PROVINCE OR REGION

Region Friuli Venezia Giulia, Province of Trieste

1.3. NAME OF THE AREA

Area Marina Protetta “Miramare”

Miramare Marine Protected Area

1.4. GEOGRAPHIC LOCATION

Describe its geographical boundaries, e.g. rivers, roads, geographical or administrative boundaries (do not describe the co-ordinates here; please make a separate annex with a map and a description of geographical co-ordinates as stated in the legal declaration of the area).

The protected area is located at the foot of the Miramare promontory, a section of coast between the tourist port of Grignano and the Barcola riviera, a summer resort for local residents. The environment of the area is a section of shore made up of rock at the coast itself, becoming blocks, pebbles and sandy bottoms, that are increasingly muddy progressing offshore. The rocks are Carso type descending down to the sea, covered with an extremely rich Mediterranean vegetation (a mixture of blueberries, oleanders, broom, holm oaks, cypresses, maritime pines, olives, figs, elders, rosemary bushes and laurels).

1.5. SURFACE OF THE AREA (total)

30 ha + 97 ha (in national unit)	30 ha + 97 ha (in ha)

1.6. LENGTH OF THE MAIN COAST (Km)

1.8 km

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2. EXECUTIVE SUMMARY (maximum 3 pages)

The Marine Reserve at Miramare was established in 1986 and is managed by the Italian Association for the WWF. The Reserve covers an area of 30 hectares and is surrounded by a 90-hectare section of sea subject to the provisions of the Port Authority (no. 28/98), and making up a *buffer* zone.

The protected area is located at the foot of the Miramare promontory, a section of coast between the tourist port of Grignano and the Barcola riviera, a summer resort for local residents. The environment of the area is a section of shore made up of rock at the coast itself, becoming blocks, pebbles and sandy bottoms that are increasingly muddy progressing offshore. The seabed consists of rock, pebbles and sand down to a depth of about 8 meters, and then mud, to a maximum depth of 18 meters. The coast is made up of limestone rock typical of the Carso, a territory of which the Miramare promontory represents a small extension of the coastline.

The rocky shoreline areas of the Triestino coast generally represent a very disturbed environment, which has been transformed by man's presence; the natural populations are thus very deleted. However, if the Miramare reef is taken as an almost compete reference environment, it is easy to recognise the richness of the communities there. The special geomorphological features of the coastal promontory where the Marine Reserve is located are reflected in the flora and fauna of the waters there: the protected area constitutes a unique environment, in itself able to represent the full complement of special features of the Gulf of Trieste. In addition, there is an important tidal zone with an excursion of about 2 m, which is an unusual feature for the Mediterranean, where tidal excursions are not so large.
The most representative habitats of the Marine Protected Area are: the mediolittoral rock biocenosis, in particular the association with *Lithophillum bissoides* and *Fucus virsoides*; the biocenosis of the well sorted fine sands; the biocenosis of the surface muddy sands in calm waters, in particular the association with *Nanozostera noltii*; the biocenosis of the coarse sands and gravel affected by bottom currents with the Maërl facies; the association of the infralittoral algae with *Cladocora caespitose, Cystoseira crinita* and *C. compressa,* and *Sargassum vulgare*; and finally the biocenoses of the bathyal muds.
The flora is depleted due to the recent activity of sea-urchin feeding, but there are two fairly well populated planes of vegetation – the mesolittoral plane and the upper part of the infralittoral plane. The vegetation is quite strongly limited on the uppermost bionomic planes, owing in part to the combined affects of factors such as: turbidity; poor light penetration; and the sandy and muddy nature of the seabed. These conditions encourage shade-loving (sciaphila) populations, even close to the surface (-3 m). In this environment, there is very strong heterogeneity, with establishment of pre-coralligenic sciaphila populations, *Peyssonnelietum squamariae*, and almost single-type situations typical of port waters, with *Ulva laetevirens*, *Gracilaria armata*. A residual meadow of *Cymodocea nodosa* is present.
The waters of the Gulf of Trieste are mainly affected by fresh water brought down seasonally by the Isonzo and Timavo rivers, as well as the large number of springs

and small seasonal streams (torrents) present along the Trieste coast. The largest influx from the mainland is brought with the spring and autumn rains.
The aim of establishing a protected area is conservation of the environment, and the flora and fauna inhabiting it. The Marine Reserve has always acted as a 'mouthpiece' to promote a policy of experimenting with alternative systems for studying the marine environment; the research makes use of non-invasive instruments. Over the years, increasingly sophisticated instruments have been employed to investigate and protect the area in question.
As well as carrying out scientific studies, the reserve also lays great emphasis on its teaching role. In 1989, in fact, a Centre for Education in Marine Environment (*Centro di Educazione all'Ambiente Marino*, CEAM) was opened. The Centre's goals are to organise and execute educational programmes for schoolchildren at all levels, to give them an opportunity to discover and study the marine ecosystem. The CEAM Centre has succeeded in marrying its activities, using education to bring about conservation; that is, teaching, educational activities and understanding the environment carried out within the area are tools for conservation, the primary goal of the protected marine area. It should, however, be pointed out that Miramare is a 'pilot' project in the field of marine environment education: there are no examples in Italy of similar existing structures, and indeed very little bibliography exists on the topic.
The educational facilities at Miramare begin at the Visitors Centre, a 'communicate through play' area that takes the visitor on a virtual trip to the various habitats of the Marine Protected Area (rock, sand, mud and tidal zone), making full use of the senses.

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3. SITE DESCRIPTION

3.1. TYPOLOGY OF THE SITE

3.1.1. Terrestrial surface, excluding wetlands (ha):		Not applicable to the proposed area
3.1.2. Wetland surface (ha):		Not applicable to the proposed area
3.1.3. Marine surface (Sq. Km):	Marine internal waters	
	Territorial sea	30 ha + 97 ha
	High sea	Not applicable to the proposed area

3.2. MAIN PHYSICAL FEATURES

3.2.1. Geology/Geomorphology

Give a brief description of: (i) geological aspects (lithologic and tectonics); (ii) processes of sedimentation and erosion observable in the area; (iii) coastal geomorphology and (iv) island system. Indicate bibliographical sources.

The coast is made up of limestone that is typical of the Carso, whose territory includes the small coastal extension of Miramare.

The seabed consists of rock, pebbles and sand down to a depth of about 8 meters, and then mud, to a maximum depth of 18 meters.

More details, are encompassed in the document '*PTRP- Relazione geologica*' (geological report).

The Reserve's two outermost zones have a bed with average inclination of 35°- 40° which is made up, down to a seabed depth of 3 meters, of a substrate that is prevalently pebbly, with interstitial sand, giving way to pelitic sand down to a depth of about 12 meters; instead, the seabed of the Reserve's central zone has an average inclination of 55°-60°, and is made up of a substrate of angular blocks and slabs, down to a depth of about 4-5 meters, where it then becomes completely sandy down to the seabed depth of 19 meters.

3.2.2. Other interesting physical features: Such as hydrodynamics, volcanic formations, caves, underwater formations, etc.

The rocky shoreline areas of Trieste province's coastl generally represent a very disturbed environment, which has been transformed by man's presence; the natural populations are thus very deleted. However, if the Miramare reef is taken as an almost compete reference environment, it is easy to recognise the richness of the communities there. The special geomorphological features of the coastal promontory where the Marine Reserve is located are reflected in the flora and fauna of the waters there: the protected area constitutes a unique environment, in itself able to represent the full complement of special features of the Gulf of Trieste.

Miramare Marine Protected Area forms part of the Gulf of Trieste, a small and shallow basin (average depth 17 m, maximum 25 m), lying to the extreme north-east of the Adriatic Sea.
The Gulf of Trieste enjoys a special meteorological regime, with very high winds and the presence of many rivers that flow in. These two factors distinguish it very markedly from the rest of the northern Adriatic sector, and have strong influence on circulation in the basin (very much determined by the winds) and water stratification (largely determined by the inflow of fresh water).
The nature of these influences, clearly subject to strong seasonal variation, leads to parallel variations in the oceanographic characteristics of the basin.
As regards river inflows, the main river coming into the Gulf of Trieste is the Isonzo; in addition there are the Timavo on the Italian side, and the Dragonja and Riana on the Slovenian side; there are also many springs along the Carso on the north-east coast. The flow of fresh water into the Gulf at the river estuaries is obviously affected by variations in meteorological conditions in the neighbouring regions of Friuli and the Carso.
The most significant wind in this area is most certainly the Bora, mainly present in the autumn and winter, though it is still the commonest in spring and summer too, albeit less intense. This is a wind from east-north-east, which brings in masses of Balkan or Russian air. In the Gulf the Bora can be associated with high pressures and clear skies (the so-called 'Bora chiara' or clear Bora), or else with low pressures and dark skies (the 'Bora scura' or dark Bora). The Bora tends to push the waters from west to north-west (including deep waters when it is especially strong) – with a consequent deepening of the Gulf waters, which encroach on the coast to the east. As well as representing the main factor influencing circulation, the Bora is obviously also fundamental in terms of mechanisms for refreshing the water within the Gulf.
Of the other winds, the Scirocco is the only one that actually affects the circulation of the currents. This wind is very stable and constant, even though it is relatively light. It is warm and wet, and blows from the south towards the coast, pushing the waters from outside the Gulf from south to north, causing a rise in sea level, balanced to some extent by deep waters leaving to the west.
The structure of the water column can be described in terms of three layers: the surface layer (to a depth of 3-5 m), strongly affected by the wind – which, as mentioned, typically has cyclonic circulation for winds from the east or north-east. Within the inlets or close to promontories, there are large fluctuations with respect to the general directions; however, the predominant direction of the surface current is in all cases parallel to the coastline: the dynamics of the surface current can be affected by the river Isonzo and other inflowing water, as well as by the wind.
Below this layer are the transition and deep layers (down to 10-13 m and to the seabed, respectively), which follow the general circulation of the northern Adriatic, in particular the coastal currents along the Istrian coast from south-west towards north-east. This induces a cyclonic circulation in the Gulf. Typical speeds measured at the protected marine area range from 10-15 cm/s at the surface to 0-2 cm/s at the sea floor.

The three layers can be quite distinct, depending on the season and meteorological conditions: in the summer, in fact, the stratification is counter-balanced by ventilation of the bottom-layer waters, provoking hypoxic conditions. At the river estuaries, the presence of fresh water at the surface leads to a further increase in stratification, with consequent intensification of the effects mentioned above. In contrast, strong winds can cause the water column to homogenise very quickly, in view of its shallowness, thus representing an efficient mechanism for refreshing the waters.
Furthermore, situations where there is strong inflow of fresh water can lead to an estuary-type mixing of fresh river water with that of the intermediate layer: this causes the layers of saltier water below to be driven towards the river estuaries.

Finally, it is known that the maximum excursion of the tides along the Italian coastline are found here, in the northern Adriatic: in the Gulf of Trieste, the maximum tidal (astronomical) amplitude exceeds 80 cm; the tidal currents can reach 10 cm/s, but their contribution to exchange of water is very limited, this being mainly brought about by the low residual currents.

3.2.3. Length of beaches (in Km), including islands:

a) Length of sandy beaches:	0.150 km
b) Length of pebble or stony beaches:	1.650 km
c) Length, height and depth of active sand-dunes:	Not applicable to the proposed area

3.3. FRESHWATER INPUTS

3.3.1. Mean annual precipitation (in mm)

Trieste city: 976 mm/year

3.3.2. Main water courses (permanent and seasonal)

Timavo river (permanent): 30 m^3/s (annual mean flow)

Rosandra torrent (seasonal): up to 5,800 mc/day

Isonzo river (permanent): 170 m^3/s (annual mean flow)

Tagliamento river (permanent): 70 m^3/s (annual mean flow)

3.3.3. Estuarine areas: Existence and brief description

On the western side of the gulf of Trieste, at the mouth of Isonzo river, starts the Grado-Marano lagoon, followed by the Caorle-Venice one. These are the most important estuarine and lagoon areas of the northern Adriatic sea.

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3.3.4. Freshwater springs: Existence and brief description, including marine offsprings

The waters of the Gulf of Trieste are mainly affected by fresh water brought down seasonally by the Isonzo and Timavo rivers, as well as the large number of springs and small seasonal streams (torrents) present along the Trieste coast. The largest influx from the mainland is brought with the spring and autumn rains.

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3.4. BIOLOGICAL FEATURES (B2, Annex I)

3.4.1. Habitats: A brief description of dominant marine and terrestrial habitats, on the basis of the habitat classifications adopted within the framework of MAP (and their coverage in ha)

Principal biocenosis present
II. 4. 2. Biocenosis of the lower mediolittoral rock
II.4.2.1. Association with *Lithophyllum byssoides*
II.4.2.7. Association with *Fucus virsoides*
III.2.2 Biocenosis of well sorted fine sands
III.2.3. Biocenosis of superficial muddy sands in sheltered waters
III.2.3.5 Association with *Zostera noltii (Nanozostera noltii*) on superficial muddy sands in sheltered water
III.3.2. Biocenosis of coarse sands and fine gravels under the influence of bottom currents
III.3.2.1. Maërl facies (= Association with *Lithothamnion coralloides* and *Phymatolithon calcareum*) (can also be found as facies of the coastal detritic biocenosis)
III.5. POSIDONIA OCEANICA MEADOWS
III.6.1. Biocenosis of infralittoral algae
III.6.1.14. Facies with *Cladocora caespitosa*
III.6.1.16. Association with *Cystoseira crinita*
III.6.1.20. Association with *Sargassum vulgare*
III.6.1.25. Association with *Cystoseira compressa*
IV. 1. 1. Biocenosis of bathyal muds

Other biocenosis are:
- Biocenosis of coarse sands and fine gravels under the influence of bottom currents
- Biocenosis of superficial muddy sands in sheltered waters
- Biocenosis of well sorted fine sands

3.4.2. List of regionally important species (flora and fauna) (B-2a, Annex I)

List here ONLY those species protected by international agreements, particularly those marine species included in Annex II of the Protocol, which are present in the area. Any other species may be listed if it is clearly considered of regional importance given its high representation in the area. Display the species list under the headings Marine Plants, Terrestrial Plants, Marine Invertebrates, Fish, Amphibians and Reptiles, Birds, and Mammals. For each species state:

a) its relative abundance as Common (C), Uncommon (U) or Occasional (O),
b) Its global 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)

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SPECIES	Rel. Abundance (C) (U) (O)	Global STATUS (r) (e) (t)	Local STATUS (R) (B) (F) (W) (M)
MARINE INVERTEBRATES			
PORIFERA			
Spongia (Spongia) officinalis			**(R)**
Spongia (Spongia) zimocca			**(R)**
Aplysina aerophoba		**(t)**	**(R)**
Geodia cydonium		**(t)**	**(R)**
Hippospongia communis			**(R)**
Ircinia foetida (Sarcotragus spinosulus)		**(t)**	**(R)**
Ircinia pipetta (Sarcotragus pipetta)		**(t)**	**(R)**
Tethya aurantium		**(t)**	**(R)**
MOLLUSCA			
Dendropoma petraeum		**(t)**	**(R)**
Luria lurida		**(t)**	**(R)**
Lithophaga lithophaga		**(t)**	**(R)**
Pinna nobilis		**(t)**	**(R)**
Pinna rudis		**(t)**	**(R)**
Pholas dactylus		**(t)**	**(R)**
CRUSTACEA			
Homarus gammarus			**(R)**
Scyllarides arctus			**(R)**
Maja squinado			**(R)**
ECHINODERMATA			
Paracentrotus lividus			**(R)**
PISCES			
Cetorhinus maximus		**(t)**	**(M)**
Prionace glauca			**(M)**
Alosa fallax			**(R)**
Aphanius fasciatus			**(R)**
Hippocampus hippocampus		**(t)**	**(R)**
Hippocampus guttulatus		**(t)**	**(R)**
Sciaena umbra			**(R)**
Umbrina cirrhosa			**(R)**
REPTILIA			
Caretta caretta		**(t)**	**(M)**
AVES			
Phalacrocorax aristotelis		**(t)**	**(R)**
MARINE PLANTS			
MAGNOLIOPHYTA			
Zostera noltii (Nanozostera noltii)		**(t)**	**(R)**
Cymodocea nodosa			**(R)**
RHODOPHYTA			

Lithophyllum lichenoides (Lithophyllum byssoides)		**(t)**	**(R)**

3.4.3. Flora: Describe in a few sentences the main plant assemblages significant in the area.

As distinct from the well-represented fauna here, the flora – although in rapid evolution – has been depleted by the recent feeding activities of the sea urchins. The result is that only two vegetation planes are adequately populated – the mesolittoral plane and the upper part of the infralittoral plane. Furthermore, the vegetation is found to be very much limited to the higher bionomic planes through the combined effects of factors such as: turbidity (sometimes particulate in suspension, whether organic or from water brought in from human-generated waste-water, or inorganic, from rainwater, fed or dispersed by passage currents); low light penetration; the sandy and muddy nature of the seabed. These conditions encourage shade-loving (sciaphila) populations on the solid substratum (rock, reefs, pebbles), even close to the surface (-3 m). Some changes that have occurred in recent years, including rationalisation of inflowing waters and their entry offshore after primary treatment, have improved the environment considerably, marking a transition that also takes account of the changes in climatic conditions.
In this environment, therefore, there are conditions of very strong heterogeneity, some in counter-tendency with respect to measurements and observations from just a few years earlier. For example, there is the regression of the pre-coralligenic sciaphila population, *Peyssonnelietum squamariae* (Feldmann 1937), which tends to colonise the deepest parts of the seabed, at one time subject to greater hypersedimentation, while situations of almost single-type typical of port waters, with *Ulva laetevirens Areschoug*, *Gracilaria armata* J. Ag. arise only in limited areas and in particular temperature ranges. The heterogeneity is found with the gradual reappearance of Cystoseireto with *C. compressa* and *C. barbata* as the accessory species, in sites formerly suffering intense depletion by sea urchins.
The mediolittoral, characterised by brown algae such as *Fucus virsoides* (endemic in the Adriatic), clearly reflects these changes, and the range of this species is increasingly restricted.
Instead, the infralittoral zone is represented by the red algae: *Corallina elongata.*
There is a residual meadow of *Cymodocea nodosa*.
Nanozostera noltii Hornem, *Zostera marina* L. and *Cymodocea nodosa* Asch. used to form submerged meadows that were relatively extensive (Benacchio 1938; Simonetti 1973), though these are described in detail only by more recent authors (Simonetti 1973; Ghirardelli et *al.* 1975). During the 80s, these plants underwent a reduction in range. Some areas have been studied and the regression in range observed (Odorico, 1993), this being linked to inflowing torrents. At present, a gradual revegetation of the sandy floor by residual meadows of *Cymodocea nodosa* is being noted

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3.4.4. Fauna: Describe in a few sentences, which are the main fauna populations present in the area.

The species found in the Reserve are characteristic of some typical biocenoses (in the sense of Pérès and Picard, 1964): calm mode muddy sands; coastal deposit; coastal terrigenic muds; well sorted fine sands; coarse sands subject to seabed currents; *Posidonia* meadows; incoherent (or mobile) sediments; photophilic algae; mud deposit; and finally moderately sheltered sands.
Fish commonly found include the Blennoides (with top spreading and typification), all saragus types, *Dicentrachus labrax* and *Corvina nigra*.
The crustaceans present include: *Eriphia spinifrons, Maya squinado, Maya verrucosa, Homarus gammarus*.
The cnidaires are well represented by *Cladocora caespitosa.*

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3.5. HUMAN POPULATION AND USE OF NATURAL RESOURCES

3.5.1 Human population

a) Inhabitants inside the area:

	Number	Date of data
Permanent	209,520	2001
Seasonal number (additional to permanent)	ca 14,000	2006

Description of the population

The working population of the city of Trieste is engaged as follows:
Number employed in industry: 11,758
Number employed in commerce: 13,662
Number employed in the service industry: 27,404
Number employed in other institutions: 23,724

Main human settlements and their populations

Trieste : 209,520

3.5.2 Current human use and development

a) Briefly describe the current use of the area by subsistence, artisan, commercial and recreational fishing, hunting, tourism, agriculture and other economic sectors.

The proximity of the city of Trieste gives the area an urban marine identity. The limited dimensions of the area mean that in general it reflects the structure and activities of the city. These are primarily linked to fishing and industry.
As regards fishing, this is carried out by around a dozen vessels making use of surrounding nets and lamps; occasionally (autumn), when permission is given, these vessels come in close to the promontory coastline. However, the main fishing season is the summer (for 'blue', or oily-fish, fishing), when the vessels are further offshore (6-10 miles). Some fishing with permanent nets and pots is carried out along the coast, but this is local and limited.

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				
Subsistence	2	2		
Commercial, local	2	2		
Commercial, non-local	1	1		
Controlled recreational	3	3		
Un-controlled recreational	0	0		
Other				
TOURISM				
Regulated	2	3		
Unregulated	0	0		
Indicate the type of tourism				
Boating/sailing	3	3		
Diving	2	2		
.				
Tourism facilities	3	3		
FOREST PRODUCTS				
Subsistence	0	0		
Non-timber commercial, local	0	0		
Non-timber commercial, non-local	0	0		
Timber commercial, local	0	0		
Timber commercial, non-local	0	0		
Agriculture	1	0		
Stockbreeding	1	0		
Aquaculture	3	3		
EXTENSIVE STOCK GRAZING				
Subsistence	1	1		
Commercial, local	1	1		
Commercial, non-local	0	0		
OTHER ACTIVITIES				
-	0	0		
-	0	0		

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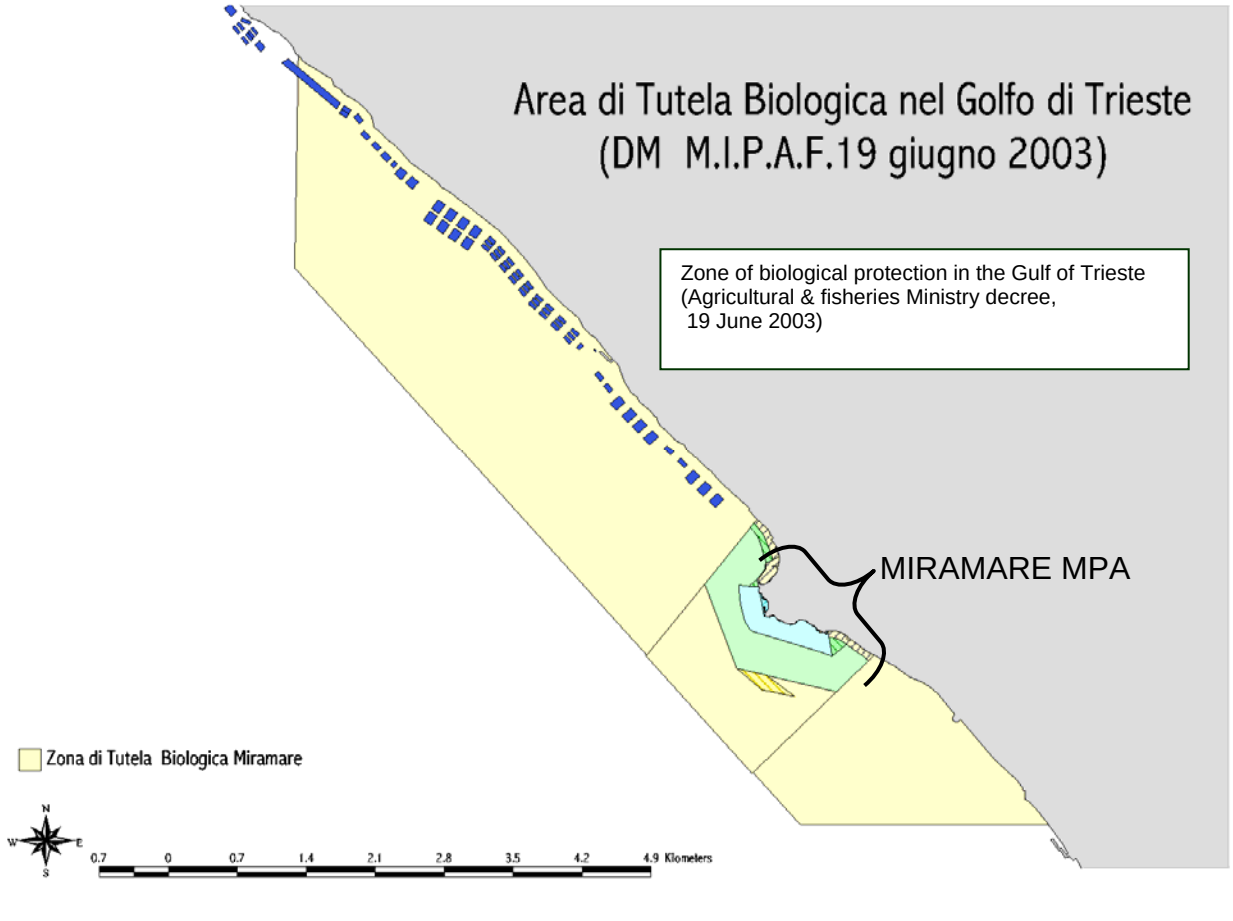
3.5.3. Traditional economic or subsistence uses

Name any environmentally sound traditional activities integrated with nature, which support the well being of the local population. E.g. land, water use, target species, if closed seasons or closed zones are used as management techniques.

There are many extensive areas for mussel-farming, an integral part of activities here, and one that can be viewed as traditional. The activities of the local residents vary widely, owing to the closeness of the city of Trieste, and include the well-established service sector and industry. Also worthy of note are the area's many sailing events, which draw considerable interest locally.

Miramare forms part of the Zone of Biological Protection (ZBP) 'Miramare', covered in a decree issued by the ministry responsible for fishing in 2003. The existence of joint interests of both mussel-producers (in that their permitted areas fall under the ZBP) and individual fishermen operating under an umbrella consortium, implies the need to monitor the environmental conditions and resources together, as well as the need for drawing up plans for common management.



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4. MEDITERRANEAN IMPORTANCE OF THE SITE

This Section aims at stressing the importance of the site for conservation at the regional or global scales, as set in Art. 8 para. 2 of the Protocol and B2-a, B2-b and B2-c in Annex I.

4.1. PRESENCE OF ECOSYSTEMS/HABITATS SPECIFIC TO THE MEDITERRANEAN REGION

Name the type of habitats considered of Mediterranean specificity, on the basis of the habitat classifications adopted within the framework of MAP, and their estimated cover (Ha).

There is a significant tidal zone (about 2 m of tidal excursion): in the Mediterranean sea, the Gulf of Trieste is the only place (together with Gabes) where the mediolitoral is of such importance.
Infralitoral with passage zone for (commercial) fish species.
The tidal zone encompasses endemic species, such as *Fucus virsoides* and other species at the boundaries of their diffusion zone.
Cliffs not disturbed by fishing and anthropic activities and used for special habitat by fish populations.
II. 4. 2. Biocenosis of the lower mediolittoral rock
II.4.2.1. Association with *Lithophyllum lichenoides (L. byssoides)*
II.4.2.7. Association with *Fucus virsoides*
III.2.2 Biocenosis of well sorted fine sands
III.2.3. Biocenosis of superficial muddy sands in sheltered waters
III.2.3.5 Association with *Zostera noltii* (*Nanozostera noltii)* on superficial muddy sands in sheltered water
III.3.2. Biocenosis of coarse sands and fine gravels under the influence of bottom currents
III.3.2.1. Maërl facies (= Association with *Lithothamnion coralloides* and *Phymatolithon calcareum*) (can also be found as facies of the biocenosis of coastal detritic)
III.5. POSIDONIA OCEANICA MEADOWS
III.6.1. Biocenosis of infralittoral algae
III.6.1.14. Facies with *Cladocora caespitosa*
III.6.1.16. Association with *Cystoseira crinita*
III.6.1.20. Association with *Sargassum vulgare*
III.6.1.25. Association with *Cystoseira compressa*
IV. 1. 1. Biocenosis of bathyal muds

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

A critical habitat is an area essential to the conservation of the species concerned. These species should be those included in Annex II of the Protocol. E.g. Islets and sea stacks, as small islands in the sea or in large bodies of water, mostly important for water-bird colonies; caves appropriate for monk seals; undisturbed sand beaches where marine turtle nesting occurs; coastal lagoons where threatened fish or bird species feed or breed; tidal flats, coastal or benthic substrates important for marine invertebrates, etc.

Name the habitat types and the species linked to it.

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II.4.2.1. Association with *Lithophyllum lichenoides (L. byssoides)*
II.4.2.7. Association with *Fucus virsoides*
III.6.1.14. Facies with *Cladocora caespitosa (Pinna nobilis)*
III.6.1.16. Association with *Cystoseira crinita (Cystoseira crinita)*
III.6.1.20. Association with *Sargassum vulgare*
III.6.1.25. Association with *Cystoseira compressa (Cystoseira compressa)*

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4.3. OTHER RELEVANT FEATURES **(Art. 8 paragraph 2 in the Protocol)**

4.3.1. Educational Interest (B-3 in Annex I)

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

The institutional goals of the Miramare Marine Protected Area include provision of opportunities for establishing programmes for education about the environment and for training in natural resource management. Within the Reserve, therefore, a Centre for Education in Marine Environment (CEAM) was opened in 1989. The Centre's goals are to organise and execute educational programmes for schoolchildren at all levels, to give them an opportunity to discover and study the marine ecosystem. The experience of CEAM at Miramare has thus developed within a protected marine area, and is noteworthy for its twin specialisation: the specific nature of the activities proposed satisfy the requirement to develop a cultural tool for management of the marine area, but at the same time these act as a support for teaching about the marine ecosystem. Indeed, the CEAM Centre has succeeded in marrying its activities, using education to bring about conservation; that is, teaching, educational activities and understanding the environment carried out within the area are tools for conservation, the primary goal of the protected marine area. It should, however, be pointed out that Miramare is a 'pilot' project in the field of marine environment education: there are no examples in Italy of similar existing structures, and indeed very little bibliography exists on the topic. Working with an ecosystem that is little known has been, however, an extremely interesting and stimulating aspect, and has required considerable effort in succeeding in shifting teaching that was vague and without firm foundation over to a teaching method that involves direct contact between user and environment, as well as 'experimentation' with that environment itself. For this reason, the teaching activities at the Miramare Reserve not only provide the necessary theoretical basis, but also allow extensive opportunity for personal involvement and in particular understanding, i.e., they aim to provide the tools necessary for study and understanding of the surrounding environment. The topics covered include specific topics on the marine and/or coastal environment, specific ecosystem components, biodiversity, the man-sea relationship.

In detail, the objectives pursued are:
Impart knowledge about the environmental and ecological features of the areas, with technical/scientific activity.
Develop relationships with the adult population through the schools. Here, schoolchildren visiting CEAM can spread knowledge and values within their own social nuclei.
Broaden the physical limits of the protected area. This concept can be included considering that the action of education and consequent response in behaviour can be expressed beyond the limits of the Reserve itself – "if I don't pollute within a protected area because it is wrong, I won't do it outside either". Extending educational activities beyond the limits of the Reserve means a cultural broadening of the protected area.
Propose a new environmental tourism, offering new ways to use the sea.
Modify positively the existing, widespread forms of marine environmental tourism.
Act as a support instrument for schools, offering field activities.
Update and train teachers and/or operators working within areas of a similar kind. The proposals include experimental training courses using simulation to present the methodologies applied in the CEAM activities.

These goals are reached through proposals incorporated in a set of activities that form part of CEAM's ordinary management. They range from simple visits to the Reserve, where the aim is to provide information on why the protected area has been set up, to activities lasting one and a half days, in which not only is information given, but the intention is to secure personal involvement and an understanding of the environment. This latter is the main goal of the so-called '*Settimane Azzurre*' (Blue Weeks) residential courses, of duration 3, 4 or 5 days.

The educational facilities at Miramare begin at the Visitors Centre, a 'communicate through play' area that takes the visitor on a virtual trip to the various habitats of the Reserve (rock, sand, mud and tidal zone), making full use of the senses: vision, observing the various aquariums in which the different environments are proposed; touch, at the open 'touch-tank', where live invertebrates can be handled; and hearing, through the sounds of the sea and divers' breathing played back in the various rooms. Then, especially to encourage a 'contact' with the seabed underfoot, visitors walk bare-foot on a floor covered in sand, shells and marine plants. The experience is therefore first of all tactile, then becoming one of 'observation' of the depths of the sea. Before reaching the area for putting shoes back on, visitors are invited into the 'immersion dome': seated in reclining armchairs made of neoprene (the material wet-suits are made of), they are surrounded by images of fish swimming in front, behind and above them.
The visit finishes with computers offering games to check how much has been learnt during the visit, monitors with photos and videos of the species present in the protected area, and aquariums focused on camouflage and symbiosis.
The observation is extended directly on the shore itself, making use of simple measuring instruments to learn about the main chemical/physical parameters that govern the marine ecosystem. In addition, the significant excursion of the tide here allows study and recognition of the organisms of the intertidal band, with focus on how they have adapted for survival out of the water. The beach in front of the *Bagno Ducale* and the Castle's former stables (*ex Scuderie*) act as true outdoor lecture halls and laboratories.

4.3.2. Scientific Interest (B-3 in Annex I)

Explain if the site represents a particular value for research in the field of natural or heritage sciences.

In view of the logistics and secure conditions for instrumentation and equipment, the zone has been used over the years as an experimental 'gym' by research institutes and universities. Activity of research applied to the marine environment and production (fishing and shellfish-farming) acts as a bridge between the area and the main local activities. Activity of monitoring specifically targeting species and associations, and their dynamics related to the climate, has developed through information exchange with laboratories and institutes in Slovenia and Croatia.
Specific agreements with local administrative bodies (Chamber of Commerce, the Region, the Province, ARPA) govern scientific activities of gathering data and local information, as well as their distribution.

4.3.3. Aesthetic Interest (B-3 in Annex I)

Name and briefly describe any outstanding natural features, landscapes or seascapes.

Scenes of outstanding beauty include the area of the coast within the Reserve in which Miramare Castle is located. This is a rare example of a royal home conserved with very little architectural alteration; the scenery at this site is noteworthy for its conservation and sustainability. There is in fact a small port below the Castle, which leads to the park; however, both navigation and mooring are prohibited. Built in eclectic style between 1856 and 1860 at the request of Archduke Maximilian of Hapsburg – later Emperor of Mexico – as a project by Carl Junker, its interior maintains the original furnishings and decorations of that era. The Castle boasts a large park, of around 22 hectares, in an exquisite location on the sea, created by a promontory originally without vegetation, now home to numerous botanical plants of tropical origin.

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4.3.4. Main cultural features

Indicate if the area has a high representative value with respect to the cultural heritage, due to the existence of environmentally sound traditional activities integrated with nature which support the well-being of local populations.

The MPA overlooks the famous Castle of Miramare, which in turn is part of the Miramare botanical park. The site is one of immense cultural value in terms of the cultural tradition of the area.

Ente Gestore: WWF per conto Ministero

5. IMPACTS AND ACTIVITIES AFFECTING THE AREA

4.1. 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 (sand, water and mineral exploitation, wood gathering, fishing, grazing...) 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.

Possible impact could result from illegal fishing whether as a sport/hobby or as underwater fishing.

5.1.2. Threats to habitats and species

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

Management of Miramare MPA has to take account of the fact that the area lies in an urban but industrialised context – that of the city of Trieste – with the commercial port of Trieste in the bay of Muggia with its oil tankers terminal, the ancient oil refinery, the ironworks plant. The biodiversity protected by the MPA is thus exposed to the classic threats of these two contexts (urban and industrial pressure), where contamination by heavy metals is common to all mobile sediments (muds) of the Gulf of Trieste, as described in studies published by the ICRAM Institute (Afrodite project).
A further phenomenon typical of the waters of the Gulf of Trieste is their low transparency, due to the high levels of production, increased by suspended matter brought in by the rivers and discharges. These affect the development of the vegetation, in particular the marine phanerogams.

Illegal fishing is nowadays very infrequent, since there is good surveillance of the Reserve's outer buffer zone as well as diligent controlling by the marine authorities responsible. If anything, there might be some limited fishing on the area's edges, using surrounding nets and light sources, those these attract only fish close-by along the coast.

5.1.3. Demand by an increased population and infrastructures

Assess whether the current human presence or an expected increase in frequentation (tourism, passage of vehicles and boats) and any human immigration into the area, or plans to build infrastructures, are considered a threat.

The Miramare promontory is an area witnessing a high flow of tourists throughout the year, partly due to the attraction of the well-known Castle of Miramare. However, the disturbance is concentrated on the mainland, and does not affect the MPA, especially since all discharge from tourist hygiene facilities is channelled directly to collecting sewers. Instead, the phenomenon of boats passing close to the Reserve is not related to tourism but rather to local leisure craft, mainly yachts, and occurs only at particular times when there are organised regattas, the best known of these being the Barcolana.

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5.1.4. Historic and current conflicts

Make a brief statement of any historic or current conflicts between users or user groups.

At present there are no relevant local conflicts.

4.2. IMPACTS AND ACTIVITIES AROUND THE SITE

In Art.7.2-e the Protocol calls for the regulation of activities compatible with the objectives for which a SPA was declared, such as those likely to harm or disturb species or ecosystems (Art.6.h), while Section B4 in Annex I asks to consider "the existence of threats likely to impair the ecological, biological, aesthetic or cultural value of the area" (B4-a in Annex I), recommending the existence, in the area and its surroundings, of opportunities for sustainable development (B4-d) and of an integrated coastal management plan (B4-e).

5.2.1. Pollution

Name any point and non-point sources of external pollution in nearby areas, including solid waste, and especially those affecting waters up-current.

Presence of a small port for leisure craft on the western edge (anti-fouling paints, heavy metals) Discharge (occasional heating fuels) brought in by streams along the eastern and western edges of the Reserve Risks connected with shipping (daily mooring of oil tankers at the SIOT and SILONE berths, three miles from the Reserve) Sediments (peilitic) contaminated by heavy metals throughout the Gulf of Trieste, in particular from the industrial port in the bay of Muggia, three miles from the Reserve

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, increase of human presence, significant impacts on landscapes and cultural values, pollution problems, any sectorial development plans and proposed projects, etc.), likely to influence the area in question.

There are (spring 2006) two separate, indipendent projects, each one concerning the building of a GNL vaporisation plant in the waters of the Gulf of Trieste (each one of them producing a flow of 24,000 m^3/hour of cold chlorinated water, equal – in a year – to 5% of the volume of water of the entire Gulf). This hypotesis is bringing some concern on the future of sea-water quality and on the consistency of the food chain (as chlorine could oxydate and disrupt nutrients).

5.2.3. Sustainable development measures

Comment whether the area is covered by an integrated coastal management plan, or bordering upon a zone under such a plan. Are there other opportunities for sustainable development provided for in the neighbouring areas?

The area is largely associated with projects designed to ensure sustainable management of the area. The management plans are tuned to current approaches of policies for protection.

6. EXPECTED DEVELOPMENT AND TRENDS[1]

The foreseeable development and trends of the site do not appear in the list of common criteria for the choice of protected marine and coastal areas that could be included in the SPAMI list, as established in the Protocol and its Annex I. Moreover, this is not always easy to assess and it is necessary to have knowledge about the site, which is not always available to all managers of protected areas; Thus, it is not obligatory to fill in the boxes in this Section 6.

On the other hand, the assessment of this foreseeable evolution and trends constitutes a dynamic supplement to the static knowledge of the site, as it appears in Sections 3, 4 and 5 above. Moreover, it is of significant importance for the definition of the objectives and the management plan of the site.

It thus appears desirable to bringing out the main outlines at least in respect to the following points:

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

Deal briefly in succession with:

- The demographic development in and around the site
- The development of economic activities (other than tourism and recreation) within the area
- The development of local demand on tourism and recreation
- The development of tourism pressure on the area

Demographic development is in line with the national standard.

- there are no relevant economic development indicators present
- the development of industrial plants (GNL vaporisation plants, see point 5.2.2) could represent a risk, in the future, for the water quality parameters
- development of tourism in the area has proved constant over recent years
- tourist pressure on the area does not trigger any alarms, except in certain periods of high tourist/sailing traffic.

6.2. POTENTIAL CONFLICTS IN THE AREA

Make a brief statement of potential use conflicts between the users or group of users of the site.

At present there are no relevant local conflicts.

6.3. EXPECTED DEVELOPMENT AND TRENDS OF THE NATURAL LAND ENVIRONMENT AND LANDSCAPES OF THE AREA: as expected arising from the evolution of the pressures

The area has limited dimensions, and forms part of the urban context of the city of Trieste. The possibility of excessive pressure on the area therefore has to be addressed through the management policies of the city itself, which at present do not have relevance.

[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.

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6.4. EXPECTED DEVELOPMENT AND TRENDS OF THE MARINE ENVIRONMENT AND SEASCAPES OF THE AREA: as expected arising from the evolution of the pressures

The threat of alteration to the marine and landscape environment at the moment exists as regards plans for interventions planned out to sea and on the coast: e.g. vaporisation plants, management of Trieste's treatment plants, etc.
As regards leisure boating, the small port has a pilot plant - set up thanks to the intervention of Miramare MPA - for water treatment and disposal of bilge water.

Ente Gestore: WWF per conto Ministero

7. PROTECTION REGIME

7.1. LEGAL STATUS (General Principles "e" and Section C-2 both in Annex I)

7.1.1. Historical background of the protection of the site

The history of the Miramare Marine Nature Reserve dates from 1968 with the newly conceived idea of a 'Marine Park'; this was an area given in concession by the State at the request made by Trieste Section of WWF-Italy to the local Port Authority. In view of the unusual nature of the request for the concession, the Trieste Port Authority made a request to the Transport Ministry. Finally, in 1973, the request for the concession was granted to WWF, so the 'Marine Park of Miramare' was established on 30 hectares – the current 'A' zone – on payment of an annual fee for maritime State concession.
The annual fee and all the running expenses were covered thanks to WWK-Italy funds, with no other external help. Personnel were voluntary workers, students and civil servants.

Experience gained through this scheme for protecting the sea led to the Italian law of 1982 '*Disposizioni per la difesa del mare*' (Provisions for defence of the sea), under which the first protected marine areas were created. The area of Miramare was one of the first, having been set up twenty years previously, on 12 November 1986. The management was granted to WWF-Italy (due to its historical presence in this area which helped starting conservation initiatives), while the funding, from this moment onwards, came mainly from the Ministry of Environment.

Still today it is one of the few examples of management of protect marine areas of a private nature – WWF being an NGO – while all others are public or public-private. Over the years, the area of 30 hectares of this State-owned / privately managed Marine Protected Area has remained unaltered, and only in 1996 was a buffer zone (where fishing is prohibited) of around 90 hectares created under Port Authority regulation.

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7.1.2. Legal texts currently ruling the protection on the site

Enter the national conservation category, the dates and the present enforcement status of the legal instrument declaring the protection of the area. Consider both the land and the marine areas of the site. Include the full text(s) as an annex.

- Law 31 December 1982, no. 979
  Provisions for defence of the sea
  (G.U. – official gazette – of the Italian Republic no. 16 – Ordinary Supplement - of 18 January 1983)
- Law 8 July 1986, no. 349
  Institution of the Ministry of the Environment and regulations regarding damage to the environment
  (G.U. – official gazette – of the Italian Republic no. 162 – Ordinary Supplement no. 59 - of 15 July 1986)
- Interministerial decree 12 November 1986
  Institution of the Miramare Marine Nature Reserve in the Gulf Trieste
  (G.U. – official gazette – of the Italian Republic no. 77 of 2 April 1987)
- Provisions of the Trieste Port Authority 28/98
- Regulations for organisation of the Reserve; interministerial decree 20 July 1989
- Law 6 December 1991, no. 394
  Framework law on protected areas
  G.U. – official gazette – of the Italian Republic no. 292 – Ordinary Supplement - of 13 December 1991)
- Law 8 October 1997, no. 344
  Provisions for the development and qualification of interventions and occupation in the environment sector
  (G.U. – official gazette – of the Italian Republic no. 239 of 13 October 1997)
- Law 9 December 1998, no. 426
  New interventions in the environment sector
  (G.U. – official gazette – of the Italian Republic no. 291 of 14 December 1998)
- Art. 114 Law 23 December 2000, no. 388
  Provisions regarding drawing up the annual and multi-annual State budgets (finance bill 2001)
  (G.U. – official gazette – of the Italian Republic no. 302 of 29 December 2000 – Ordinary Supplement no. 219)
- Law 23 March 2001, no. 93
  Provisions regarding the environment
  (G.U. – official gazette – of the Italian Republic no. 79 of 4 April 2001)
- Law 11 October 2001, no. 391
- Art. 8 and art. 9 Law 31 July 2002, no. 179
  Provisions regarding the environment
  (G.U. – official gazette – of the Italian Republic no. 189 of 13 August 2002)

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7.1.3. Objectives (General Principles "a" and D-1 in Annex I)

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

The 'Miramare Marine Nature Reserve' in the Gulf of Trieste has the following goals in particular:

- protection and enhancement of the environment and geomorphological characteristics, the bentonic and pelagic fauna and flora of the area concerned;
- a systematic development and pursuit of the research programme, partly underway already, carried out by the marine biology laboratory of Aurisina in Trieste, institutes and departments of the University of Trieste, the civic natural history museum of Trieste, as well as the national research council (CNR) talassographic institute in Trieste;
- awareness-raising about the biology of the zone's marine environments and its special mineralogical and geomorphological features;
- pursuit of information campaigns and educational programmes to improve general culture in the field of biology and marine ecology.

7.1.4. Indicate whether the national protection regime arises from international treaties enforced or from implementation measures of treaties (Art. 6.a in the Protocol).

7.2. INTERNATIONAL STATUS

7.2.1. Transboundary or high seas areas

Complete this section only if the area is transboundary, totally or partially in the high sea, or within areas where the limits of national sovereignty or jurisdiction have not yet been defined. In this case, mention the modalities of the consultation (Art. 9 para. 3A in the Protocol and General Principles "d" in Annex I).

7.2.2. International category

Mention if the area, or part of it, has been designated and on what date, with an international conservation category (e.g. Specially Protected Area, Biosphere Reserve, Ramsar Site, World Heritage Site, European Diploma, Natura 2000, Emerald network, etc.).

Miramare is a UNESCO – MAB Biosphere Reserve since1979 (registration number ITA 03)

http://www.unesco.org/mabdb/br/brdir/directory/biores.asp?code=ITA+03&mode=all

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7.3. PREVIOUS LEGAL BACKGROUND AND LAND TENURE ISSUES

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. Describe the land tenure regimes within the area, and append a map if existing.

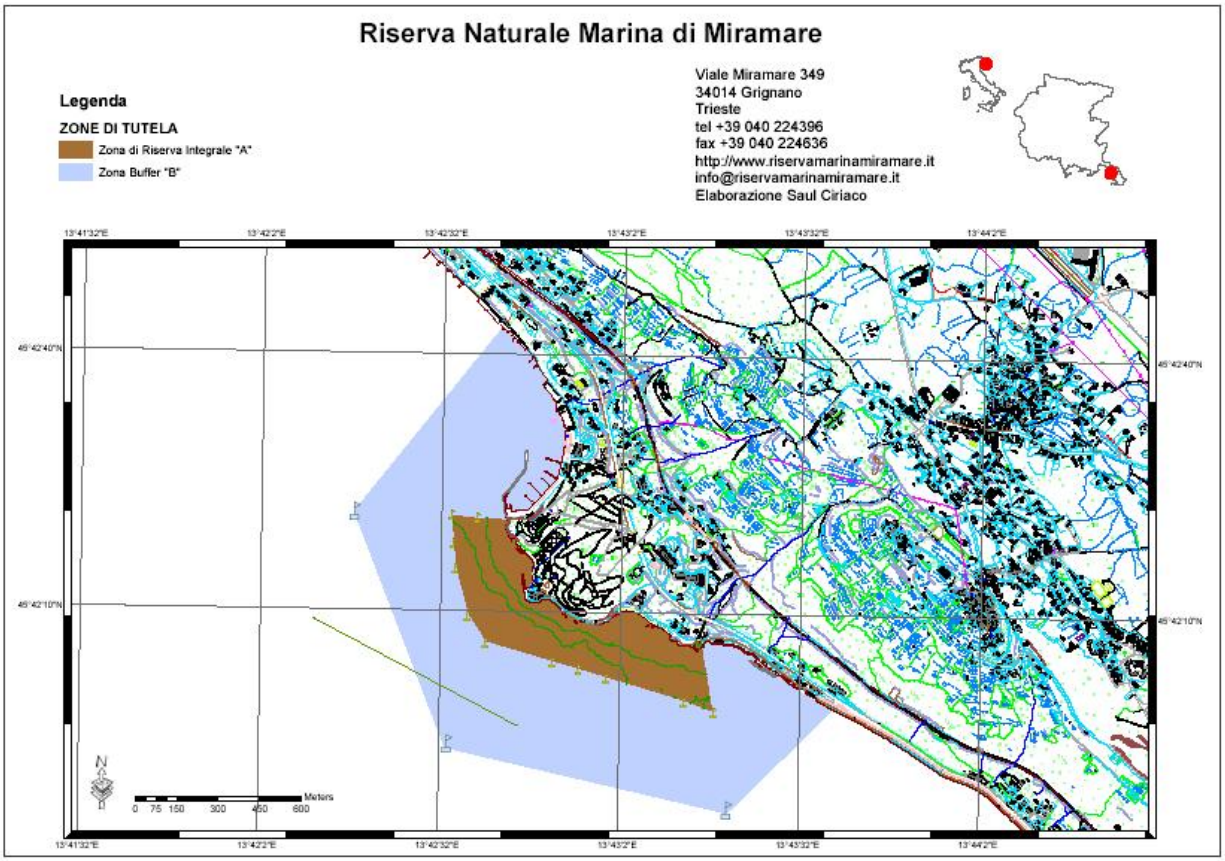
7.4. LEGAL PROVISIONS FOR MANAGEMENT (Section D-1 in Annex I)

7.4.1. Zoning

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 in both land and sea, fishing zones, visitation, gathering, restoration zones etc) and in this case the surface area in ha of these zones. Include a map as an annex

The State Reserve currently comprises a zone 'A' of integral reserve with an area of 30 hectares; this is surrounded by a section of sea of 97 hectares subject to Port Authority Order (no. 28/98).

ZONING MAP



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7.4.2. Basic regulations

Mention the provisions, which apply to the area concerning the implementation of Article 6 of the Protocol (paragraphs a to i), Section D5 (a to d) in the Annex I and Article 17 of the Protocol.

In Miramare MPA, the following activities are forbidden:

- removal of, even partial, or any damage to, rock formations, minerals, flora and fauna in the coastal sub-area and underwater, except for cases of sampling for scientific research, carried out under the supervision of a person in charge for the research itself and authorised by the body responsible for managing the Reserve;
- navigation, access, stopping of boats and floating means of any type, as well as bathing, expect for reasons of surveillance, research and visits that are authorised and under the direct control of the Reserve authorities;
- fishing, whether professional or for sport, using whatever any means that might be employed;
- hunting, capture, collection, damage, and in general any activity at all that may constitute a risk or disturbance to the protection of the animal or vegetal species, including the introduction of extraneous species, except through special authorisation issued for the purposes of study or research;
- alteration through any means whatsoever, whether direct or indirect, of the geophysical environment and of the biochemical characteristics of the water, as well as discharge of solid or liquid refuse or in general the introduction of any object or substance that could modify, even temporarily, the characteristics of the coastal marine environment;
- the introduction of weapons (including underwater devices), explosives, or any means for destroying or capture, or toxic or polluting substances;
- activities that might in any way lead to damage, obstacle or disturbance to realisation of the objectives of protection and the study and scientific research programme envisaged for the area.

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7.4.3. Legal competencies

Section D4 in Annex I states that the competence and responsibility with regard to administration and implementation of conservation measures for areas proposed for inclusion in the SPAMI List must be clearly defined in the texts governing each area. Additionally Art.7.4. of the Protocol calls for the provision of clear competencies and co-ordination between national land and sea authorities, with a view to ensuring the appropriate administration and management of the protected area as a whole. Mention in which way do the legal provisions clearly establish the institutional competencies and responsibilities for the administration and conservation of the area, and if being the case, their co-ordination means, including those between land and sea authorities.

Management of the MPA is entrusted by the Ministero dell'Ambiente e della Tutela del Territorio e del Mare (Ministry for the Environment and Protection of the Territory and the Sea) through a decree to WWF- Italy, which draws on a number of agreements for the management of ordinary, educational and scientific matters, including technical (scientific and administrative). Within the protected marine area there are general bans on access, transit and fishing, with the exception of activities carried out by the managing body. The WWF guarantees delimitation of the area, while monitoring and respect of the bans imposed are carried out by the Coast Guard. The WWF also guarantees the meeting of institutional objectives that are educational, scientific, cultural and conservation in nature, in accordance with the decree of 12 November 1986 and related circulars issued successively by the Ministry for the Environment (19 April 2002 and 23 May 2003).

7.4.4. Other legal provisions

Describe any other relevant legal provisions, such as those requiring a management plan, the establishment of a local participation body, binding measures for other institutions or economic sectors present in the area, allocation of financial resources and tools, or any other significant measures concerning the protection and management of the area or its surrounding zones.

The local community's participation body is the "Commissione di Riserva". See further point 8.1.2 for details.

As from EU legislation, the Zones of Biological Protection (ZBP) requires a management plan meant to establish common rules for the exploitation of fishing grounds and stocks. Miramare MPA is surrounded by a ZBP (see previous point 3.5.3 for details) and should be taking part to the management board of this area.

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8. MANAGEMENT

Through the General Principles, para. (e) in the Annex I, the Parties agree that the sites included in the SPAMI List are intended to have a value as examples and models for the protection of the natural heritage of the region. To this end, the Parties ensure that sites included in the List are provided with adequate legal status, protection measures and management methods and means.

8.1. INSTITUTIONAL LEVEL

8.1.1. Authority/Authorities responsible for the area

Ministero dell'Ambiente e della Tutela del Territorio e del Mare

Fosterage: WWF Italia
Viale Miramare 349, 34136 Trieste - Italy
Tel +39 040.22.41.47
Fax +39 040.22.46.36
E-mail: info@riservamarinamiramare.it

8.1.2. Other participants in the management body

Such as other national or local institutions, as stated in Section D6 in Annex I.

The Reserve Commission nominated through DEC/DPN no. 1145 of 18/06/2004 works alongside the Body entrusted with management of the Reserve, making proposals and suggestions regarding its operation. In particular, it expresses its opinion regarding the drawing up of regulations for management and organisation of the protected marine area, including spending forecasts for the annual management programme, and for any other proposal concerning changes to the perimeter and/or zoning of the protected marine area.
The Reserve Commission comprises:

a) the President, who chairs it;
b) two specialists nominated by the Ministry for the Environment;
c) a representative of the nature associations that are most representative;
d) a representative from the Ministry for the Environment;
e) two representatives from the local coastal municipalities;
f) a representative from the Regions that are affected in terms of territory;
g) a representative from the economic-productive categories concerned, nominated by the chambers of commerce of each of the provinces through whom the Reserve was established;
h) a representative from the local education authority;
i) a representative from the cultural heritage and environment administration;
j) the head of the local Port Authority.

The Technical-Scientific Committee comprises:
the person in charge of the Reserve;
two representatives from the Marine Biology Laboratory at Aurisina (Trieste) ;
two specialists nominated by the Ministry for the Environment.

The Board of Auditor comprises:
a representative from the Treasury, who acts as chairman;
two representatives from the Ministry for the Environment.

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8.1.3. Participants in other committees or bodies

Such as a scientific committee, or a body of representatives from the local stakeholders, the public, the professional and non-governmental sectors, as in Sections B4-b and B4-c in Annex I.

Each year, the Reserve organises a technical roundtable involving various public local institutions, to present the programme activities and financial accounts. The scientific activities are supervised by the Department of Biological Oceanography – OGS.
In addition, the Reserve has excellent relations with the Coast Guard and the marine farming and fishing consortia in the Gulf of Trieste in terms of management of local marine resources.

8.1.4. Effectiveness

As stated in Section B4 of Annex I, assess as very low, low, moderate, satisfactory, very satisfactory, and comment as needed on the following aspects:

a) Effectiveness of the co-ordination, where existing:
Satisfactory

b) Quality of involvement by the public, local communities, economic sectors, scientific community:
Very good

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8.2. MANAGEMENT PLAN (as set out in D7 of Annex I)

8.2.1. Management Plan

State if there is a management plan (MP) and in this case include the document as an annex. In the absence of a MP, mention if the main provisions governing the area and the main regulations for its protection are already in place and how (D7 in Annex I) and if the area will have a detailed management plan within three years (D7 in Annex I).

The managing body draws up a three-year programme of management activities that meet the goals of the founding decree and related circulars from the Environment Ministry (see 7.1.2.). In addition, since 2004 all management activities have been included in the EMAS II programme and environmental policy with annual audit and three-yearly certification. Together with the aspects described under 8.2.3, this programming makes up the management plan for the Miramare protected marine area.

Since 2002, the management plan has also been monitored as case studies by the IUCN-WCPA-NOAA-WWF group, with specific indicators (biological, socio-economical and governance) for assessing the management effectiveness.

8.2.2. Formulation and approval of the Management Plan

Mention how the MP was formulated, e.g. by an expert team and/or under consultation and/or participation with other institutions or stakeholders. State the legal status of the MP, whether it is officialized, and how, and if it is binding for other institutions and sectors involved in the area.

Not applicable

8.2.3. Contents and application of the Management Plan

State the degree of detail in the MP by entering YES or NO in the following list of potential contents, and assess the degree of implementation of the MP by using the 0-1-2-3 score on the right hand side:

	Existing in MP	Degree of application
Detailed management objectives	YES	3
Zoning	YES	3
Regulations for each zone	YES	3
Governing body(ies)	YES	3
Management programmes as:		
Administration	YES	3
Protection	YES	3
Natural resource management	YES	3
Tourism and Visits	YES	3
Education and Training	YES	3
Research and Monitoring	YES	3

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Services and Concessions	YES	3
Fund raising activities	YES	3
Periodic revisions of the MP	YES	3

8.3. PROTECTION MEASURES

By Art. 6 of the Protocol the Parties agree to take all the necessary protection measures required for the conservation of the area, particularly the strengthening the application of the other Protocols to the Convention, and through the regulation of any other activity likely to harm the natural or cultural value of the area, such as economic, recreation or research activities. As per Section D2 in Annex I, the protection measures must be adequate to the site objectives in the short and long term, and take in particular into account the threats upon it.

8.3.1. Boundaries and signing

Briefly, state if the boundaries of the area and its zones are adequately marked in the field, both on land, in the sea, and at the principal points of access.

The area is delimited externally by day-time and night-time signs marking the perimeter, in accordance with Coast Guard and the Ministry for the Environment requirements. Signs indicate the coastal perimeter, and also describe the bans that have to be respected.

8.3.2. Institutional Collaboration

Name the different national and local institutions or organisations with legal responsibilities or involved in the protection and surveillance of land and sea zones, and any measures or mechanisms through which their co-ordination is pursued.

Ente Gestore: WWF per conto Ministero

Miramare MPA institutional collaboration
Scientific and monitorino activity
- Istituto Nazionale per l'Oceanografia e Geofisica Applicata – Dipartimento di Oceanografia Biologica (National Institute for Oceanography and Applied Geophysics – Dept of Biological Oceanography)
- SISSA (Scuola Internazionale Superiore di Studi Avanzati – International School for Advanced Studies)
- University of Trieste – Biology Dept
- University of Udine – Economic Sciences Dept
- University of Bologna *Alma Mater Studiorum* – Faculty of Medicine and Veterinary
- ICRAM – Istituto Centrale per la Ricerca Scientifica e Tecnologica Applicata al Mare - (Central Institute for Scientific and Technological Research Applied to the Sea)
- SIBM – Società Italiana di Biologia Marina (Italian Society for Marine Biology)
- CNR Istituto Talassografico Sperimentale (Experimental Talassographic Institute) F. Vercelli
- APAT – Comitato per l'Ecolabel e per l'Ecoaudit (Committee for Ecolabel and Ecoaudit)
- AREA Science Park Trieste – Science System FVG
- Parco Regionale del Delta del Po Veneto (Regional Park of the Po Estuary, Veneto)
- Faculty of Environmental Sciences – University Ca' Foscari of Venice
- FederParchi – Federazione delle aree protette italiane (Federation of protected areas of Italy)
- Chamber of Commerce of Trieste – ARIES agency
- Faculty of Engineering, University of Trieste
- Fondazione Internazionale Trieste per il Progresso e la Libertà delle Scienze (International Foundation Trieste for the Progress and Freedom of Science)
Communication, Governance
- RTV Koper Slovenian television company
- Autonomous Region of Friuli Venezia Giulia – Agency for Regional Parks and Forests
- Autonomous Region of Friuli Venezia Giulia – Laboratorio di educazione Ambientale - (Environmental education lab)
- Trieste Municipality – offices for environment and education on the environment
- Ministry for Agricultural and Forest Policy – Dept Fishing and Aquaculture
- Ministry for Foreign Affairs, Ministry for Education - Universities and Research AREA Science Park, Trieste
- Province of Trieste – Environment office
- Ministry of Cultural Heritage – Local office
- Trieste Port Authority
- Chamber of Commerce, Trieste – Presidency and Special Agency ARIES
- Ministry for Environment and Protection of the Territory and Sea
- School head offices and Trieste schools

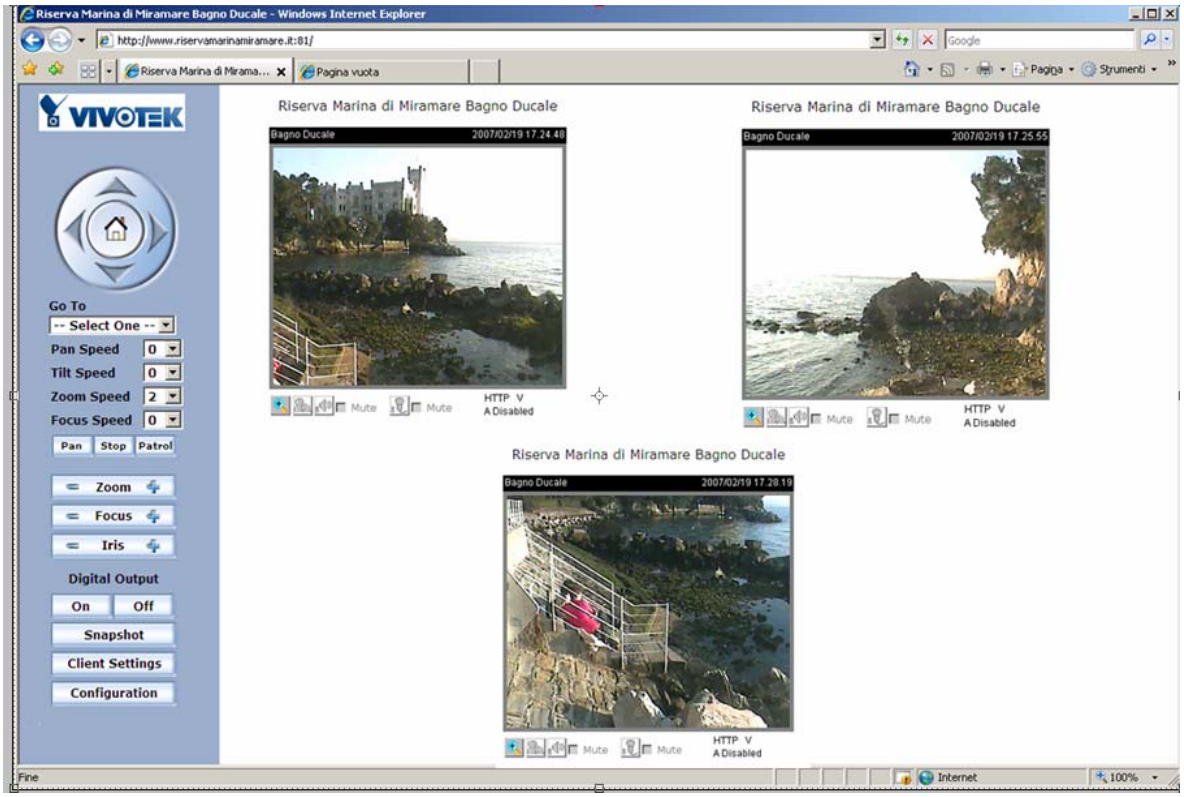
Ente Gestore: WWF per conto Ministero

8.3.3. Surveillance

Consider the adequacy of the existing protection means (human and material), and your present ability to survey land and sea uses and accesses

The area falls under the protection of the Port Authority Police, which provides regular patrolling activity.

Miramare MPA is completing the installation of a video-surveillance network operated by "Web-cameras" with 3 observation points (2 on land, 1 at sea): images will be made available on the internet both to the Port Authority Police and to MPA personnel.



8.3.4. Enforcement

Briefly, consider the adequacy of existing penalties and powers for effective enforcement of regulations, whether the existing sanctions can be considered sufficient to dissuade infractions, and if the field staff is empowered to impose sanctions.

Enforcement and sanction's application are effective.

Miramare MPA keeps the recording of sanctions and fines operated by the Port Authority Police:
The total number of administrative sanctions carried out by the Port Authority Police (years 2001-2005) is 17, 3 of which are relative to the anchorage and/or navigation within the protect area, 1 for improper underwater activity inside of the MPA, 4 for activity of professional fishing within the MPA, 3 for activity of underwater sport-fishing, 6 for bathing inside of the MPA. The highest percentage (34%) has been carried out in 2005, 22% both in 2001 and 2002 and 11% both in 2003 and 2004.

Ente Gestore: WWF per conto Ministero

9. AVAILABLE RESOURCES

9.1. HUMAN RESOURCES (Art. 7.2.f in the Protocol)

9.1.1. Available staff

Assess the adequacy of the human resources available to the management body, in number of employees and training level, both in central headquarters and in the field. Indicate if there are staff training programmes.

Twelve people are employed in the area: teaching secretary, underwater-activity secretary, visitor welcome, administration, scientific monitoring, management, accompanying visitors, management of the various spaces and structural maintenance, management of nautical vehicles, production of educational material.
The human resources available at the Reserve are adequate – in terms of both number and training – allowing it to be run properly. The staff comprise: Marine Reserve Director, secretariat and administration (1), activities in the sea (1), chemical/physical sector (2), educational sector (2), awareness-raising sector (2), marine acoustics sector (1), eco-ethology sector (4).
Eight people collaborate with the area, accompanying visitors, in the welcome/infopoint, and in scientific monitoring.

9.1.2. Permanent field staff

Answer YES or NO on the current existence of the following FIELD staff categories. If YES, enter the number of staff either permanent or part-time in that category, and evaluate on a 0-1-2-3 score (0 is low, 3 is high) the adequacy of their training level.

	YES/NO	NUMBER Permanent/Part-time	ADEQUACY OF TRAINING LEVEL
Field Administrator	YES		3
Field Experts (scientific monitoring)	YES		3
Field Technicians (maintenance, etc)	YES		3
Wardens	YES		3
Of which marine wardens	YES		3
Guides	YES		3
Other	YES		3

9.1.3. Additional Support

Briefly, describe if the area currently has the advantage of other external human resources in support of its objectives, either from other national or local institutions, volunteer programmes, non-governmental organisations, academic or international organisations. Mention if there are any significant changes in prospect for the near future.

The MPA has excellent relations with local research centres and universities.

Ente Gestore: WWF per conto Ministero

9.2. FINANCIAL RESOURCES AND EQUIPMENT

By Art. 7 in the Protocol, the Parties agree to adopt measures or mechanisms to ensure the financing of the specially protected areas (Art.7.2.d), and the development of an appropriate infrastructure (Art.7.2.f). The General Principles para. "e" in the Annex I call upon the Parties to provide the areas with adequate management means.

9.2.1. Present financial means

Note if the basic financing is ensured: a core funding for basic staff, protection and information measures. Who provides this core funding? Briefly assess the degree of adequacy of the present financial means for the area, either low, moderate, satisfactory; e.g. the implementation of the management plan, including protection, information, education, training and research.

The funding is adequate; this derives mainly from the Italian Ministry for the Environment, integrated by the Regione Friuli-Venezia Giulia, by WWF-Italy and from autonomous incomes (visiting and educational activity, services provided to the local scientific community such as on-the field support to monitoring activity).

9.2.2. Expected or additional financial sources

Briefly describe any alternative sources of funding in use or planned, and the perspectives for long-term funding from national or other sources.

9.2.3. Basic infrastructure and equipment

Answer YES or NO to the following questions, and if YES, assess with a score of 1-2-3 (1 is low, 3 is high) the adequacy of the basic infrastructure and equipment.

	YES/NO	ADEQUACY
Office and/or laboratory in the field	YES	3
Signs on the main accesses	YES	2
Guard posts on the main accesses (replaced by webcams network, see 8.3.3)	NO	2
Visitors information centre	YES	3
Self guided trails with signs	YES	2
Terrestrial vehicles	YES	2
Marine vehicles	YES	3
Radio and communications	YES	2
Environmental awareness materials	YES	3

Capacity to respond to emergencies	YES	2
Comment on basic infrastructure and equipment – Miramare educational activities require more classrooms to face the increasing demand coming from public schools. – More storage room (warehouse) is needed to keep scuba and technical equipment and to store goods such as booklets edited and printed by the MPA.		

9.3. INFORMATION AND KNOWLEDGE

By Section D3 of Annex I, the Parties agree that the planning, protection and management of a SPAMI must be based on an adequate knowledge of the elements of the natural environment and of socio-economic and cultural factors that characterize each area. In case of shortcomings in basic knowledge, an area proposed for inclusion in the SPAMI List must have a programme for the collection on the unavailable data and information.

9.3.1. State of knowledge

a) Assess the general state of knowledge of the area.

0	1	2	**3**

b) Briefly describe the extent of knowledge of the area, considering at least specific maps, main ecological processes, habitat distribution, inventories of species and socio-economic factors, such as artisan fishing.

Miramare MPA has completed the mapping and follows the data collection (updating) on:
- Quality of sediments
- Water physical-chemical parameters
- Biocenoses
- Fish communities
- Fishing grounds surrounding the MPA
- Use of land and sea in the surrounding areas
- Fishing effort, revenue of artisanal fishermen

See the following pages for some specimen of thematic maps generated by MPA's GIS

Ente Gestore: WWF per conto Ministero

9.3.2. Data collection

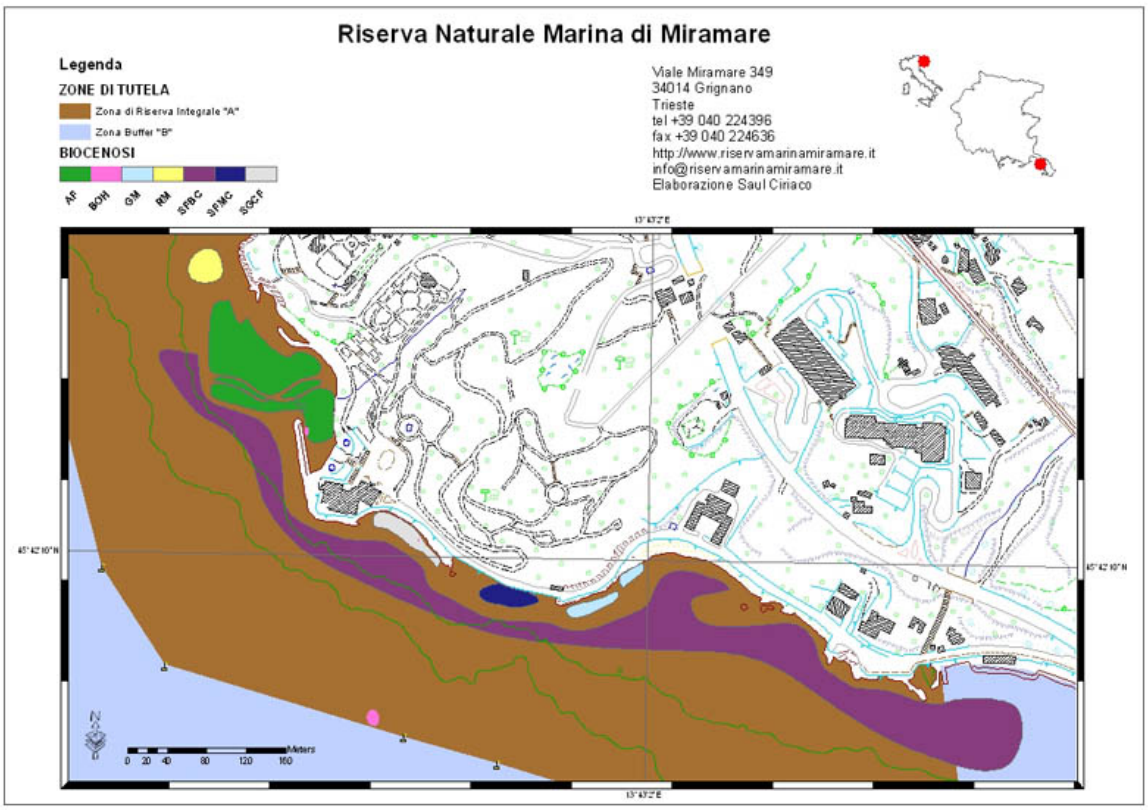
Describe and assess the adequacy of any programme and activities to collect data in the area.

Miramare MPA has been taking part and still is involved in national monitoring programs launched by the Ministry of Environment, ICRAM, Universities such as “Afrodite”.

Miramare’s EMAS certification requires a regular update of data concerning the quality of its environment and its footprint.

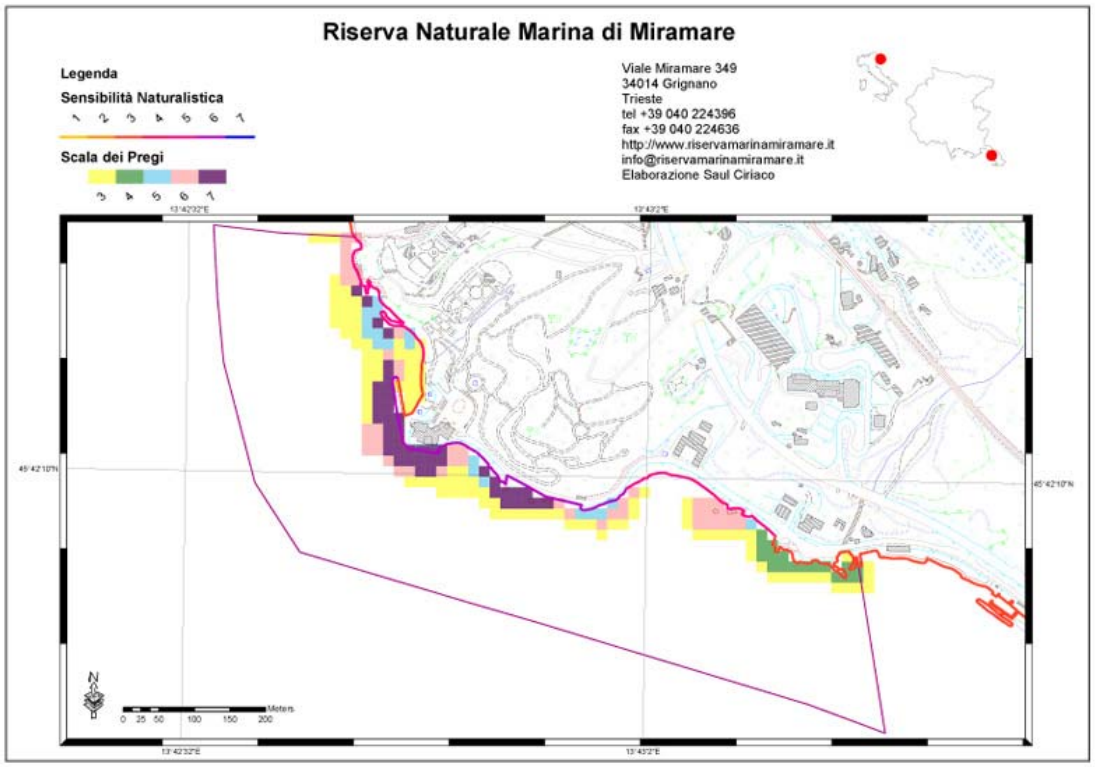
The Fish and Invertebrate species database is regularly updated thanks to the visual census activity (minimum of 35 observations per year on 2 sites: inside /outside the MPA).

Biophysical, socio-economic and governance data are collected after the indication of IUCN-WWF guidebook “How is your MPA Doing?” in order to assess MPA’s management effectiveness.

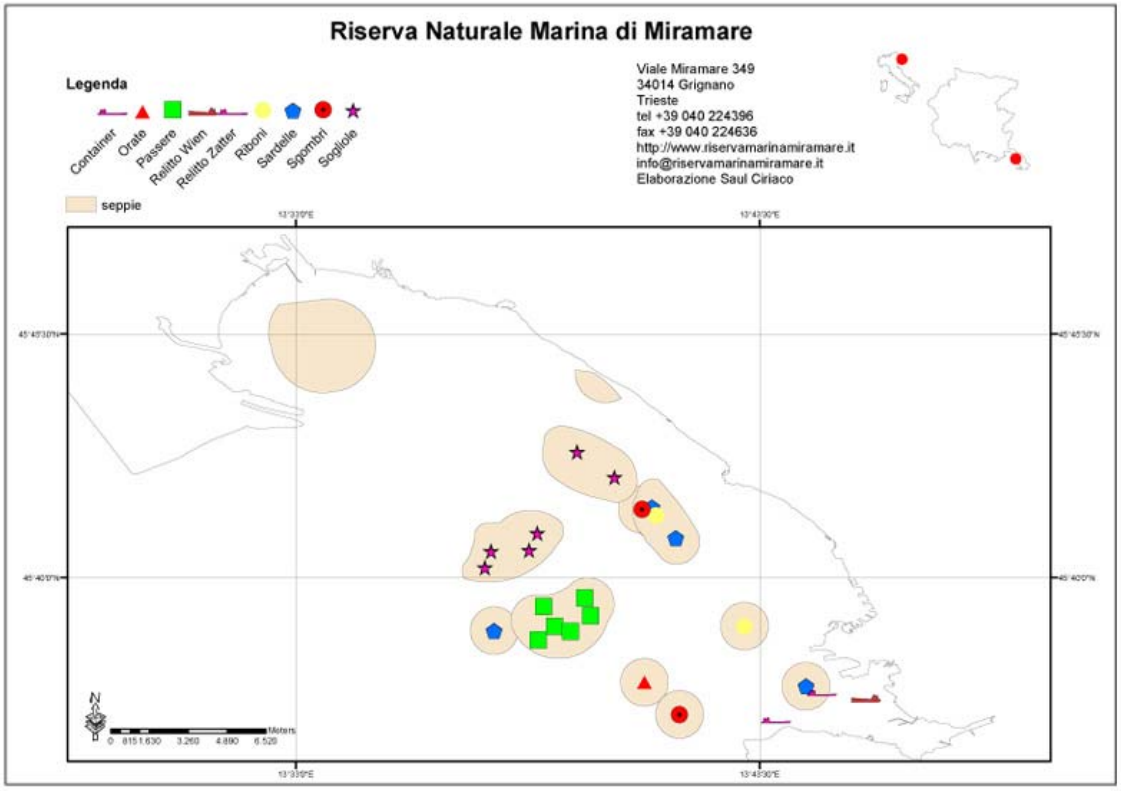


Map of Miramare biocenoses

Ente Gestore: WWF per conto Ministero

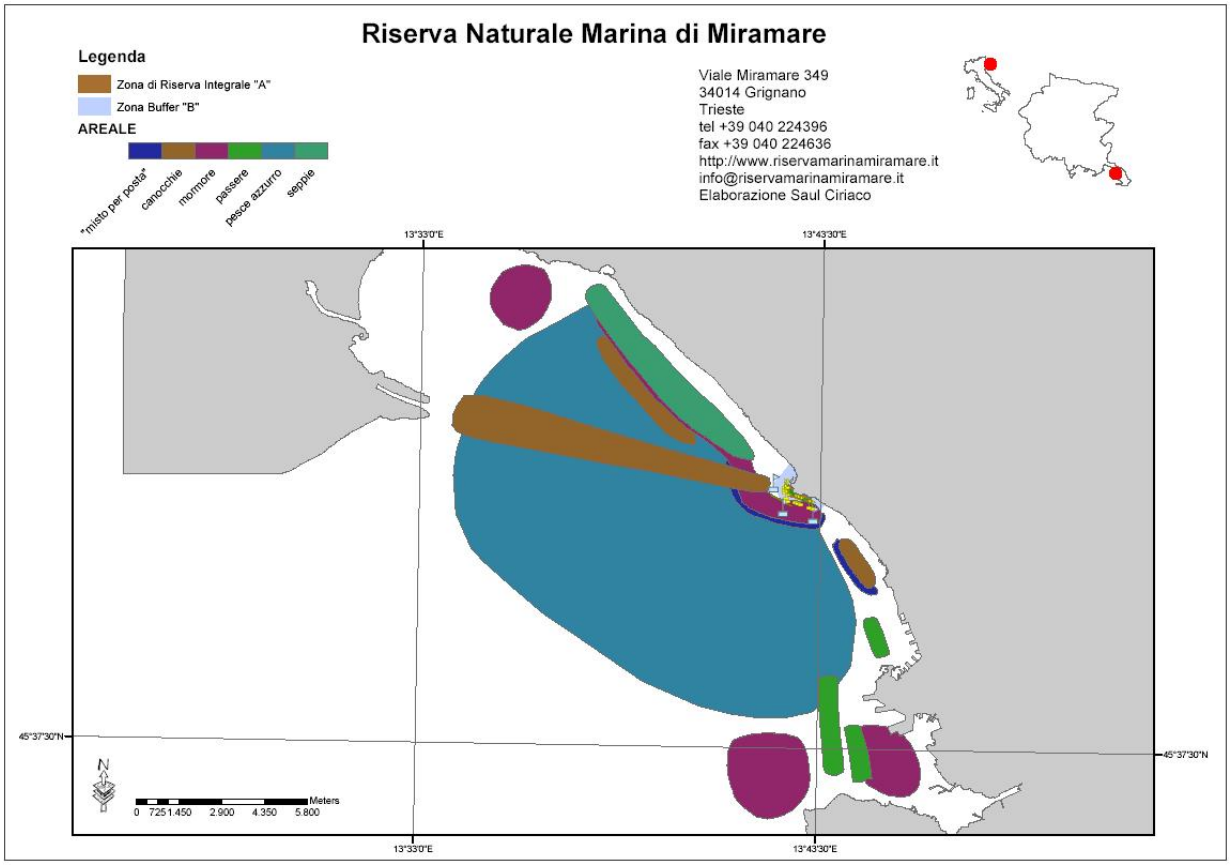


Map of Miramare naturalistic values



Maps of main Fishing Grounds in the Gulf of Trieste (both images)

Ente Gestore: WWF per conto Ministero



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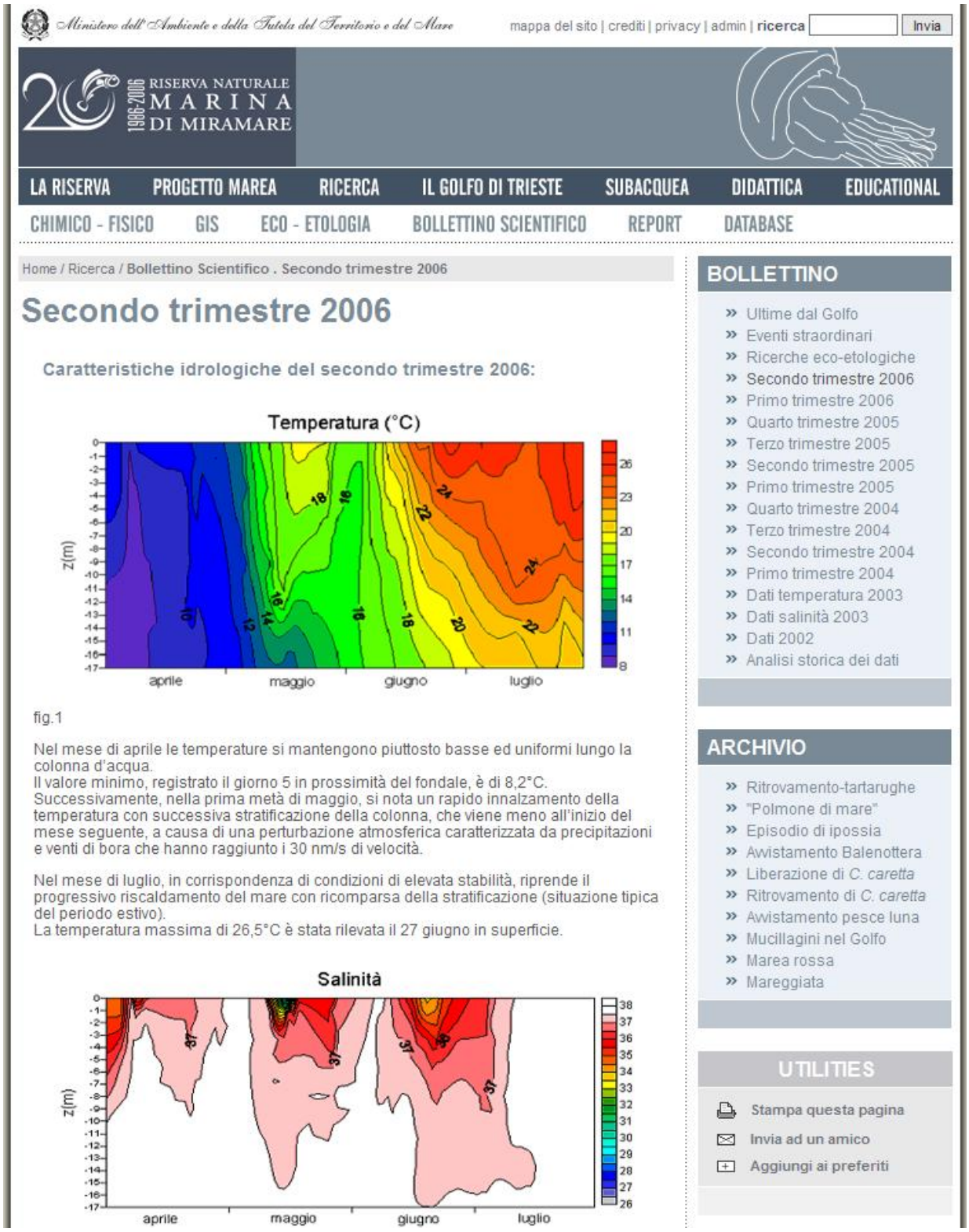


Water quality monitoring data, made available on internet

(http://www.riservamarinamiramare.it/ricerca/bs/secondo_trimestre06.htm)

Ente Gestore: WWF per conto Ministero

9.3.3. Monitoring programme

Section D8 in Annex I states that to be included in the SPAMI List, an area will have to be endowed with a monitoring programme having a certain number of significant parameters, in order to allow the assessment of the state and trends of the area, as well as the effectiveness and protection and management measures, so that they may be adapted if need be (indicators may, for instance, supply information about species status, condition of the ecosystem, land-use changes, extraction of natural resources -sand, water, game, fish-, visiting, adherence to the provisions of the management plan, etc.).

a) Is there a monitoring programme?	YES
b) If NO, are there plans to start one, and when?	
c) If YES, assess as low, medium, satisfactory, its adequacy and present level of development.	Satisfactory with a high level of development

d) If YES, who is/are carrying out the monitoring programme?

Miramare personnel is carrying out the monitoring programme.
The results of the monitoring plan are examinated yearly by the Technical-Scientific Committee and by the Reserve Commission (refer to 8.1.2)

e) If YES, briefly describe how the monitoring programme will be used in reviewing the management plan.

In 2000 the IUCN-World Commission on Protected Areas-Marine (IUCN-WCPA-Marine) and the World Wide Fund for Nature (WWF) initiated the MPA Management Effectiveness Initiative (MEI). A major product of this initiative is the guidebook **"How is your MPA Doing? A Guidebook of Natural and Social Indicators for Evaluating Marine Protected Area Management Effectiveness"**, edited in 2004.
During the program, eighteen pilot MPAs, with diverse management objectives and environments, were selected to field test a draft of the guidebook.
Miramare MPA participated since the beginning to the field-testing process of the Guidebook.
The management body of Miramare marine reserve has set 5 high priority objectives for the three-years period program 2005-2007:

1. Conservation of the specific diversity of the tidal zone.
2. Conservation of the naturalness of the underwater and terrestrial landscapes.
3. Conservation of the ecological integrity of the communities living in the Gulf of Trieste.
4. Part of the people attending the Reserve gets acquaintance with the marine environment and its management, in view of a participative protection of the area shared among all the economic categories which are operating hereby.
5. To help the conversion of fishing activities and pleasure boating habits which are not longer sustainable and/or to lead their adaptation to the environmental directions.

Miramare is keeping up the program: following the "Marine Effectiveness Initiative", the following indicators have been selected to evaluate the management performance:

MPA's objective	Objective(s) & Indicator(s), as from IUCN's guidebook
1 - Conservation of the specific diversity…	Biophysical 1D ; B 1
2 - Conservation of the naturalness…	Biophysical 1D ; B 1
3 - Conservation of the ecological integrity of the communities…	Biophysical 1E; B 7 Socio-economic 5A; S 1
4 - People getting acquaintance with the marine environment and its management…	Socio-economic 3D, 3E ; S 6 Socio-economic 6A ; S 13 Governance 4C ; G 11
5 - Conversion of fishing activities and pleasure boating habits…	Governance 4A ;G 13 Governance 4E ; G 4

Ente Gestore: WWF per conto Ministero

10. Other information, if any

Since 2004, Miramare is awarded of the EMAS certification, which guarantees that its System for Environmental Management is compliant to EU regulation CE 761/2001.

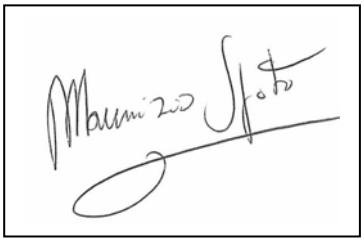
Miramare visiting and educational activities are carried out following a code of conduct compliant to ISO 9001 quality insurance rules, certificated in 2003.

11. CONTACT ADDRESSES (name(s), position(s) and contact address(es) of the person(s) in charge with the proposal and that compiled the report)

Area Marina Protetta "Miramare"
WWF Italia
Viale Miramare 349, 34136 Trieste
Tel +39 040.22.41.47
Fax +39 040.22.46.36
E-mail: info@riservamarinamiramare.it

Director of the Marine Reserve
Maurizio Spoto
E-mail: spoto@riservamarinamiramare.it
Tel +39 040 224147
Fax +39 040 224636

12. SIGNATURE(S) ON BEHALF OF THE STATE(S) PARTY/PARTIES MAKING THE PROPOSAL



13. DATE

ANNOTATED FORMAT FOR THE PRESENTATION REPORTS FOR THE AREAS PROPOSED FOR INCLUSION IN THE SPAMI LIST

MPA “PLEMMIRIO”

Index:

FOR MORE INFORMATION, PLEASE CONTACT:

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P.zza Euripide, 21
96100 - Siracusa
Tel [+39]0931449310
Fax [+39]0931449954
E-mail: info@plemmirio.it

Direttore AMP « Plemmirio » Sig. Vincenzo Incontro
Sede Legale: Consorzio Plemmirio Via Necropoli del Fusco, 7 96100 Siracusa
Tel 0931-709734
335-8276704
Fax 0931- 709732
v.incontro@plemmirio.it

ANNOTATED FORMAT FOR THE PRESENTATION REPORTS FOR THE AREAS PROPOSED FOR INCLUSION IN THE SPAMI LIST

PLEMMIRIO

OBJECTIVE

The objective of this Annotated Format is to guide the Contracting Parties in producing reports of comparable contents, including the information necessary for the adequate evaluation of the conformity of the proposed site with the criteria set out in the Protocol and in its Annex I (Common criteria for the choice of protected marine and coastal areas that could be included in the SPAMI List).

CONTENTS

The presentation report shall include the following main information on: (i) identification of the proposed protected area (ii) site description (iii) its Mediterranean importance (iv) the activities in and around the area and their impacts (v) legal status (vi) management measures (vii) human and financial resources available for the management and the protection of the site.

SUBMISSION OF REPORTS

The reports should be submitted to the RAC/SPA two months before the meeting of National Focal Points for SPA in English or in French.

Dossiers should be compiled on A4 paper (210 mm x 297 mm), with maps and plans annexed on paper with a maximum size of an A3 paper (297 mm x 420 mm). Contracting Parties are also encouraged to submit the full text of the proposal in electronic form.

The requested annexes should be submitted on paper and, if possible, also in electronic form. They are the following:

- Copies of legal texts
- Copies of planning and management documents
- Maps: administrative boundaries, zoning, land tenure, land use, and distribution of habitats and species, as appropriate
- Existing inventories of plant and fauna species
- Photographs, slides, films/videos, CD-ROMs
- List of publications and copies of the main ones concerning the site

N.B.: All the following sections have to be in the report submitted, even those sections or elements that do not apply to the proposed area. Where that is the case, please put “not applicable to the proposed area”.

1. AREA IDENTIFICATION

1.1 COUNTRY/COUNTRIES (in the case of transboundary areas)

ITALY

1.2 ADMINISTRATIVE PROVINCE OR REGION

Regione Sicilia/Sicily
Provincia di Siracusa/Province of Siracusa

1.3 NAME OF THE AREA

Plemmirio Marine Protected Area

1.4 GEOGRAPHIC LOCATION

Describe its geographical boundaries, e.g. rivers, roads, geographical or administrative boundaries (do not describe the co-ordinates here; please make a separate annex with a map and a description of geographical co-ordinates as stated in the legal declaration of the area).

The Plemmirio MPA is off the Maddalena Peninsula, a few kilometres south of the city of Siracusa; it stretches from Punta dela Mola to Punta Milocca.

The Maddalena Peninsula was produced by intense tectonic activity that pushed up a block lying along a NW-SE axis. With a maximum height above sea level of 54 m, the resulting small plateau slopes towards the sea both to the east and west, sloping gently in some places through a series of marine terraces dating from the Plio-Pleistocene Age while in others more brusquely through a series of marine escarpments from the same period caused by eustatic action or erosion by the sea. The coast presents similar features, alternating between low points, with small beaches, and ragged high points. The ragged part of the coast presents a series of highly significant caves scoured by marine abrasion that contain peculiar micro-environments.

1.5 SURFACE OF THE AREA (total)

(in national unit)	about

1.6. LENGTH OF THE MAIN COAST (Km)

15

2. EXECUTIVE SUMMARY (maximum 3 pages)

Supply a summary of the information contained in sections 3 to 9.

The Plemmirio MPA is off the Maddalena Peninsula, a few kilometres south of the city of Siracusa; it stretches from Punta dela Mola to Punta Milocca.

The Maddalena Peninsula is for the most part a calcarenitic platform featuring major sequences of faults and fissures aligned along a NNW-SSE axis, and lesser faults aligned along an E-W axis, evidence of intense tectonic activity in the past. The coastline is formed by cliffs, that rise high in the west and are subject to forms of local erosion (tidal notches, enclaves and rockslides), and low to the east, where calcarenitic rockslides are frequent due to removal at the base of the underlying clay and clay sands. In terms of sedimentation, the sea beds are mostly hard rock with occasional patches of coarse sediment resulting from the breakdown of the carbonate and calcarenitic cliffs and of the *Posidonia oceancia* meadows facies as well as the coastal detritic bottom.

Underwater morphology is of course influenced by the presence of the faults. Starting from the coastline, it chiefly features a hard substrate outlined by a series of terraces alternating with submerged inlets bound by clear morphological ruptures and presenting loose sediments composed mostly of coarse sand and debris, especially at the base of the escarpments that are a defining characteristic of the terraces.

From Capo Castelluccio to Punta Tavernare, the sea bottom is low and uniform for several hundred metres, then it suddenly drops to much deeper levels. From Punta Tavernara to Capo Murro di Porco, the seabed already presents depths of 30-40 m immediately below the coastline. Where the seabed suddenly falls away, there are a great many submerged caves, and there are caves above surface level at Capo Murro di Porco. The Maddalena Peninsula is located in an area where the waters respond to and produce very particular dynamics. There are at least three major factors influencing the marine waters in the area: the alternating force of the powerful currents at work in the Strait of Messina, the meandering course of the current coming from the Atlantic, and the surface, intermediate and deep movements of the Ionian Sea (the so-called Ibleo-Maltese-Pelagic vortex).

The intertidal zone features well-structured belts that follow the stretch of coast between Punto Faro and Punta Milocca; in particular, the upper intertidal zone presents a photophyllic association *Polysiphonio-Lithophylletum papillosi* and a belt in the lower portion presenting the sub-association *Lithophylletosum trochanteris* which, south of Capo Meli and as far as Punta di Milocca, appears fragmented because of the continuous interventions by man along this stretch of coast. The coves and caves present in the stretch of coast between Punta Tavernara and Capo Murro di Porco contain the littoral sciophilous association *Phymatolithetum lenormandii*. Such associations are considered high priority habitats. Moreover, the Maddalena Peninsula is the classic site, the place of first description, for the photophyllic sub-association and association mentioned above. The mid-tide zone is characterized by association with *Cystoseira amentacea* present in the mid-tide fringe that stretches along the whole perimeter of the peninsula followed, at depths of 3 to 5 metres, by association with *Cystoseira crinita*, where the leading species is represented by *Cystoseira brachycarpa*. On the north side of the peninsula, at depths of 7 to 15 metres, we find the association with *Cystoseira sauvageauana*, where the leading species is represented by *Cystoseira spinosa* v. *tenuior*. The sheer cliff walls at Capo Meli and Punta Tavernara present at depths between 5 and 10 metres the mid-tidal sciophilous association with *Flabellio-Peyssonnelieturn squamariae*. Between depths of 30 to 50 metres, on the detritic bottom, the biocoenosis of the coastal detritic strip spreads across the whole area, in effect an elongated strip

running parallel to the coastline. On the north side, from Capo Faro to Punta Tavernara, this biocoenosis is contiguous to the biocoenosis of the mid-tide zone Algae, while on the south side, from Capo Murro di Porco to Punta Milocca, the algae biocoenosis is contiguous with the coralligenous biocoenosis. The latter extends throughout the area over hard bottoms at depths between 25 and 50 metres, sometimes penetrating even further down than the -50 m isobaths. On the north side, between Capo Faro and Punta Tavernara the biocoenosis is present at depths of between 35 and 50 metres below the biocoenosis of the coastal detritic strip, while in the span of coast between Punta Tavernara and Capo Murro there is a small strip between the biocenotic complex of the mid-tide zone Algae and the coastal detritic strip (CD). To the south, between Capo Murro and Punta di Milocca, the strip does not go beyond -40 metres and is bound above by the *Posidonia* meadow and below by the coastal detritic bottom.

At Punta Tavernara, between depths of 36 and 45 metres, there is a sciophilous population belonging to *Lithophyllo-Halimedetum tunae* and *Rodriguezelletum strafforellii,* colonized in a higher layer by a population of *Phyllariopsis brevipes*, a species originally from the Atlantic and found in the western part of the Mediterranean and off the island of Linosa in areas with very strong currents where it forms extensive populations. This species is always associated with *Mesophyllun lichenoides,* because the microscopic gametophyte latches onto the calcareous alga using a parasite's haustoriam.

On loose substrates from Capo Faro to Punta Milocca, we find the meadow of *Posidonia oceanica*, which is quite widespread here. On the north side of the peninsula, from Punto Faro to Capo Murro di Porco, because the loose beds are interrupted by outcrops of rock, the meadow appears discontinuous, and alternates with the biocoenosis of the mid-tide zone Algae. The biocoenosis appears continuous only in the stretch between Punta Tavola and Punta del Gigante, where at depths between 20 and 30 metres there is a sandy plane running parallel to the coastline bound by two rocky escarpments. On the south side, between Capo Murro di Porco and Punta Milocca, the biocoenosis does not present any interruptions although there are variations in its bathometric spread. Between Capo Murro di Porco and Capo Meli, the biocoenosis extends below the cliff-face to depths between 15 and 30 metres, while in the rest of the area it spreads at depths of between 2 and 30/35 metres. At Capo Meli, at depths of between 18 and 26 metres, a meadow of *Halophila stipulacea* was found.

The sea bottom around the Maddalena Peninsula is rich in benthic fauna. Where the seabed suddenly drops away, there are a number of submerged caves teeming with benthic and nektonic life, such as solitary corals, sponges, bryozoa, slipper lobsters, nudibranchs and numerous species of fish. The sea bottoms featuring meadows of *Posidonia oceanica* often harbour large examples of *Pinna nobilis*. Higher up and nearer the coast, there is a strong presence of colonial corals such as *Astroides calcularis* with its intense red colour, reminding us that the Ionian Sea also has distinct tropical characteristics. Along the spray zone, it is quite common to come across in highly interesting structures (trottoirs). The last remaining grouper fish to have survived intensive fishing have abandoned the low sea bottom and have taken refuge higher up. Due to its geographical features and the peculiar nature of the sea bottom, Capo Murro di Porco is an ideal place from which to observe some of the large pelagic fish such as tuna, the greater amberjack, sharks, as well as marine mammals such as dolphins, whales and sperm whales.

The benthic fringe just before the marine area is teeming with Mediterranean biodiversity, thanks to a variety of naturally-occurring factors, such as the geo-morphological make-up of the sea bottom that has encouraged the settlement of bivalve molluscs, an indispensible ingredient of the food chain, as well as the flow of nutrients carried by the confluence of the rivers and streams that empty their food-rich waters into the sea here. These factors have all helped the development of numerous species of

Mediterranean fauna such as , Sparidae Labridae, Serranidae, Bleniodiae and so on. There is also an abundance of invertebrates, such as Acraniates, Tunicates, Echinoderms, Cephalopods, Nudibranchs, Bryozoa, as well as various species of marine phanerogams, including *Posidonia oceanica*.

To conclude, the exceptional wealth of natural resources present in and around the Maddalena Peninsula, coupled with highly efficient management, show that this MPA should be strongly considered as a candidate for swift recognition and granting of ASPIM status, especially in light of possible future development with the creation of a provincial network of MPA involving the other two recognized sites (Capo Passero and Vendicari), with the management of the wetlands in the Vendicari Reserve entrusted to the regional Forestry Corps, and the further possibility of creating an international MPA embracing Malta, raising the profile of and making optimum use of the area outlined by the Maltese-Ibleo-Pelagic Vortex which could well become a second Cetacean Sanctuary in the Ionian stretch of the Mediterranean.

3. SITE DESCRIPTION

1.1. TYPOLOGY OF THE SITE

3.1.1. Terrestrial surface, excluding wetlands (ha):		
3.1.2. Wetland surface (ha):		
3.1.3. Marine surface (Sq. Km):	Marine internal waters	
	Territorial sea	2000 ha
	High sea	

3.2 MAIN PHYSICAL FEATURES

3.2.1. Geology/Geomorphology

Give a brief description of: (i) geological aspects (lithologic and tectonics); (ii) processes of sedimentation and erosion observable in the area; (iii) coastal geomorphology and (iv) island system. Indicate bibliographical sources.

The Maddalena Peninsula is for the most part a calcarenitic platform featuring major sequences of faults and fissures aligned along a NNW-SSE axis, and lesser faults aligned along an E-W axis, evidence of intense tectonic activity in the past. The coastline is formed by cliffs, that rise high in the west and are subject to forms of local erosion (tidal notches, enclaves and rockslides), and low to the east, where calcarenitic rockslides are frequent due to removal at the base of the underlying clay and clay sands. In terms of sedimentation, the sea beds are mostly hard rock with occasional patches of coarse sediment resulting from the breakdown of the carbonate and calcarenitic cliffs and of the *Posidonia oceancia* meadows facies as well as the coastal detritic bottom.

Underwater morphology is of course influenced by the presence of the faults. Starting from the coastline, it chiefly features a hard substrate outlined by a series of terraces alternating with submerged inlets bound by clear morphological ruptures and presenting loose sediments composed mostly of coarse sand and debris, especially at the base of the escarpments that are a defining characteristic of the terraces. These geo-morphological features are for the most part traceable to the tectonic activity that shaped the area in question, but there are also signs of the various forms of erosion that have affected the platform during the changes in the level of the sea, in particular the abrasion platforms opposite the various bathometric steps (especially along the western coast) and the many notches in the rocky substrate, in all likelihood linked to the action of an early fluvial network of streams created during periods of high tide that left behind it some typical forms of erosion such as deposits of debris and round hollows of various diameter, some even metres a cross (the giants' muffler).

AMORE C, 1990-1995 - Relazione tra processi carsici ed oscillazioni del livello marino nel Massiccio Carbonatico Ibleo del Siracusano. Ani 1° Conv. Reg. Speleologia della Sicilia, Ragusa, Dic. 1990, 13 pp.

DI GRANDE A. & RAIMONDO W,, 1982. Linee di costa Plio-Pleistoceniche e schema litostratigrafico del Quatemario Siracusano. Estratto da: Geologia Romana vol. XXI.

3.2.2. Other interesting physical features: Such as hydrodynamics, volcanic formations, caves, underwater formations, etc.

The Maddalena Peninsula, within the Plemmirio MPA, is located in a marine area that is crucial because of its peculiar dynamics of the waters. At least three significant factors determine the flow of water here: the alternating influence of the powerful currents at work in the Strait of Messina, the meandering course of the jet stream that develops in the Atlantic and comes from the Strait of Sicily, and the movement of the Ionian sea, the surface, intermediate and deep flow of its waters.
The shifting configuration over time and space of these three factors that drive the hydro-dynamics of the coastal waters in the area in question (sometimes acting together, sometimes separately) make it impossible to establish unequivocally average measures for the flow of water.
In any case, save for particular circumstances arising from stress produced by local winds, and for the occasional occurrence when a mesoscale system (triggered by a filament constantly present to the east of Capo Passero) extends as far as the peninsula, the stretch of sea facing Sicily's south-west coast is subject to a coastal current that heads south until it reaches Capo Passero. At the same time, and going a little further out to sea, the area is also subject to a major flow moving in the opposite direction, from south to north, of surface waters coming from the Sicily Channel. Surface communication between the Ionian Sea and the Sicily Channel is provided principally by a jet stream of Atlantic origin, altered, and localized in the area between Malta and Sicily, and which, north of Capo Passero, turns north, affecting the east coast of Sicily and southern Calabria.
These two currents are usually very active, ensuring not only unhindered transport of suspended material, but also a rapid turnover in coastal waters, which enhances the quality of the marine environment.
We would like to emphasize the significance of the episodic occurrence of a filament that stretches east of Capo Passero, producing baroclinic effects that may lead to vertical remixing, thus providing another opportunity for water turnover, as well as a mechanism to draw up waters coming from the depths out to sea off Eastern Sicily's continental escarpment.
At the beginning of the 1990s, a major phenomenon was recorded in the East Mediterranean, known in the literature as East Mediterranean Transient (EMT). What occurred was a shift in the site of deep-water formation from the Adriatic to the Aegean. The cause of the event was reported to be due to changes in the make-up of the body of water in the Aegean triggered by major meteorological anomalies in the eastern basin.
Thereafter, a new inversion of flow was recorded in the Ionian Sea, the area the Plemmirio MPA belongs to. This change in flow, which even had repercussions on the Levantine Intermediate Waters, provoke a flow of Atlantic waters towards the far eastern side of the Levantine Basin rather than towards the southern Ionian Sea, as had been the case. Salinity levels in the Ionian Sea rose as a result of the flow of highly saline waters coming from both the Levantine Basin and the Aegean, waters from the later flowing mainly towards the Adriatic.
Examination of the thermohaline circulation today shows that the Adriatic has regained its leading role as the site for the formation of dense water, while in the Ionian Sea cyclonic circulation has been restored, involving surface and intermediate layers. A major transitional layer (800-1200 m), situated between the intermediate level dominated by the LIW and the deep level dominated by the dense waters of the Adriatic and/or Aegean appears to be currently occupied by waters that previously were found on the bottom layer.

From Capo Castelluccio to Punta Tavernara, the sea bottom remains low and uniform for hundreds of meters before plunging suddenly to deeper levels. From Punta Tavernara to Capo Murro di Porco, on the

3.2.3. Length of beaches (in Km), including islands:

a) Length of sandy beaches:

b) Length of pebble or stony beaches:

c) Length, height and depth of active sand-dunes:

FRESHWATER INPUTS

3.3.1. Mean annual precipitation (in mm)

350mm

3.3.2. Main water courses (permanent and seasonal)

3.3.3. Estuarine areas: Existence and brief description

3.3.4. Freshwater springs: Existence and brief description, including marine offsprings

BIOLOGICAL FEATURES (B2, Annex I)

3.4.1. Habitats: A brief description of dominant marine and terrestrial habitats, on the basis of the habitat classifications adopted within the framework of MAP (and their coverage in ha)

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. 1. Association with *Lithophyllum byssoides (L.trochanter)*
II. 4. 2. 8. Concretion with *Neogoniolithon brassica-florida*
II. 4. 3. Mediolittoral caves
II. 4. 3. 1. Association with *Phymatolithon lenormandii* and *Hildenbrandia rubra*

III. 2. 2. 2. Association with *Halophila stipulacea*
III. 5. 1. Posidonia oceanica meadows (= Association with *Posidonia oceanica*)
III. 6. 1. 2. Association with *Cystoseira amentacea*
III. 6. 1. 15. Association with *Cystoseira brachycarpa* (v. *brachycarpa* and v. *claudiae*)

III. 6. 1. 16. Association with *Cystoseira crinita*

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. 2. 2. 7. Association with *Laminaria rodriguezii* on detritic
IV 3. 1. 1. Association with *Cystoseira zosteroides*

IV. 3. 1. 3. Association with *Cystoseira dubia*
IV. 3. 1. 5. Association with *Sargassum* spp. (indigenous)
IV. 3. 1. 9. Association with *Rodriguezella strafforelloi*
IV. 3. 1. 10. *Facies* with *Eunicella cavolinii*
IV. 3. 1. 11. *Facies* with *Eunicella singularis*
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)

Other biocenosis are :
II. 4. 1. 1. Association with *Bangia atropurpurea* (*Bangia fuscopurpurea*)
II. 4. 2. 4. Association with *Ceramium ciliatum* and *Corallina elongata*
III. 6. 1. 1. Overgrazed facies with encrusting algae and sea urchins
III. 6. 1. 5. Association with *Corallina elongata* and *Herposiphonia* secunda
III. 6. 1. 13. Association with *Ceramium rubrum* (*Ceramium virgatum*)

III. 6. 1. 32. Association with *Flabellia petiolata* and *Peyssonnelia squamaria*
IV. 2. 1.Biocenosis of the muddy detritic bottom
IV. 2. 2.Biocenosis of the coastal detritic bottom
IV. 2. 4.Biocenosis of coarse sands and fine gravels under the influence of bottom currents (biocenosis

3.4.2. List of regionally important species (flora and fauna) (B-2a, Annex I)

List here ONLY those species protected by international agreements, particularly those marine species included in Annex II of the Protocol, which are present in the area. Any other species may be listed if it is clearly considered of regional importance given its high representation in the area. Display the species list under the headings Marine Plants, Terrestrial Plants, Marine Invertebrates, Fish, Amphibians and Reptiles, Birds, and Mammals. For each species state:

a) its relative abundance as Common (C), Uncommon (U) or Occasional (O),
b) Its global 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)	Global STATUS (r) (e) (t)	Local STATUS (R) (B) (F) (W) (M)
Examples: BIRDS			
Pelecanus onocrotalus	(C)	(e) (t)	(R)
Falco eleonorae	(U)	(e) (t)	(B)
MARINE INVERTEBRATES			
CNIDARIANS			
Astroides calycularis	(C)		(R)
Corallium rubrum	(U)	(t)	(R)
MOLLUSCS			
Dendropoma petraeum	(C)	(t)	(R)
Pinna nobilis	(C)	(r) (t)	(R)
Pinna rudis	(U)	(r) (t)	(R)
Erosaria spurca	(C)	(r) (t)	(R)
Luria lurida	(C)	(t)	(R)
Ranella olearia	(C)	(t)	(R)
Charonia tritonis	(C)	(t)	(R)
Lithophaga lithophaga	(U)	(t)	(R)
CRUSTACEANS			
Palinurus elephas	(C)	(t)	(R)
Scyllarides latus	(C)	(t)	(R)
Scyllarus arctus	(C)	(t)	(R)
Scyllarus pygmaeus	(C)	(t)	(R)
Maja squinado	(C)	(t)	(R)
Homarus gammarus	(C)	(t)	(R)
ECHINODERMS			
Centrostephanus longispinus	(U)	(t)	(R)
Paracentrotus lividus	(C)		(R)
Ophidiaster ophidianus	(U)	(t)	(R)
FISHES			
Epinephelus marginatus	(C)	(t)	(R)

Sciaena umbra	(C)	(t)	(R)
Thunnus thynnus	(U)	(t)	(M)
Xiphias glaudius	(C)	(t)	(R)
Hippocampus hippocampus	(U)	(t)	
Alosa fallax			
Anguilla anguilla			
Prionace glauca	(C)	(t)	(R)
MARINE VERTEBRATES			
Caretta caretta	(U)	(t)	(M)
Tursiops truncatus	(U)	(t)	(M)
Stenella coeruleoalba	(U)	(t)	(M)
Steno bredanensis	(U)	(t)	(M)
Balenoptera acutirostris	(U)	(t)	(M)
Balenoptera physalus	(U)	(t)	(M)
Delphinus delphis	(U)	(t)	(M)
MARINE PLANTS			
Posidonia oceanica	(C)	(e) (t)	(R)
Cymodocea nodosa	(C)	(e) (t)	(R)
MACROALGAE			
Cystoseira amentacea	(C)	(e) (t)	(R)
Cystoseira spinosa	(U)	(e) (t)	(R)
Cystoseira zosteroides	(U)	(t)	(R)
Laminaria rodriguezii	(C)	(e) (t)	(R)
Lithophyllum byssoides	(C)	(t)	(R)
Lithophyllum trochanter	(C)	(t)	(R)

3.4.3. Flora: Describe in a few sentences the main plant assemblages significant in the area.

The intertidal zone features well-structured belts that follow the stretch of coast between Punto Faro and Punta Milocca; in particular, the upper intertidal zone presents a photophyllic association *Polysiphonio-Lithophylletum papillosi* and a belt in the lower portion presenting the sub-association *Lithophylletosum trochanteris* which, south of Capo Meli and as far as Punta di Milocca, appears fragmented because of the continuous interventions by man along this stretch of coast. The coves and caves present in the stretch of coast between Punta Tavernara and Capo Murro di Porco contain the littoral sciophilous association *Phymatolithetum lenormandii*. Such associations are considered high priority habitats. Moreover, the Maddalena Peninsula is the classic site, the place of first description, for the photophyllic sub-association and association mentioned above.

The mid-tide zone is characterized by association with *Cystoseira amentacea* present in the mid-tide fringe that stretches along the whole perimeter of the peninsula followed, at depths of 3 to 5 metres, by association with *Cystoseira crinita*, where the leading species is represented by *Cystoseira brachycarpa*. On the north side of the peninsula, at depths of 7 to 15 metres, we find the association with *Cystoseira sauvageauana*, where the leading species is represented by *Cystoseira spinosa* v. *tenuior*. The sheer cliff walls at Capo Meli and Punta Tavernara present at depths between 5 and 10 metres the mid-tidal sciophilous association with *Flabellio-Peyssonnelieturn squamariae*. Missing from the representative sample is *Osmundaria volubilis*, which prefers gentler, sandier slopes. *Peyssonnelia squamaria* reaches a high degree of cover.

Between depths of 30 to 50 metres, on the detritic bottom, the biocoenosis of the coastal detritic strip spreads across the whole area, in effect an elongated strip running parallel to the coastline. On the north side, from Capo Faro to Punta Tavernara, this biocoenosis is contiguous to the biocoenosis of the mid-tide zone Algae, while on the south side, from Capo Murro di Porco to Punta Milocca, the algae biocoenosis is contiguous with the coralligenous biocoenosis. The latter extends throughout the area over hard bottoms at depths between 25 and 50 metres, sometimes penetrating even further down than the -50 m isobaths. On the north side, between Capo Faro and Punta Tavernara the biocoenosis is present at depths of between 35 and 50 metres below the biocoenosis of the coastal detritic strip, while in the span of coast between Punta Tavernara and Capo Murro there is a small strip between the biocenotic complex of the mid-tide zone Algae and the coastal detritic strip (CD). To the south, between Capo Murro and Punta di Milocca, the strip does not go beyond -40 metres and is bound above by the *Posidonia*

At Punta Tavernara, between depths of 36 and 45 metres, there is a sciophilous population belonging to *Lithophyllo-Halimedetum tunae* and *Rodriguezelletum strafforellii,* colonized in a higher layer by a population of *Phyllariopsis brevipes*, a species originally from the Atlantic and found in the western part of the Mediterranean and off the island of Linosa in areas with very strong currents where it forms extensive populations. This species is always associated with *Mesophyllun lichenoides*, because the microscopic gametophyte latches onto the calcareous alga using a parasite's haustoriam.

On loose substrates from Capo Faro to Punta Milocca, we find the meadow of *Posidonia oceanica*, which is quite widespread here. On the north side of the peninsula, from Punto Faro to Capo Murro di Porco, because the loose beds are interrupted by outcrops of rock, the meadow appears discontinuous, and alternates with the biocoenosis of the mid-tide zone Algae. The biocoenosis appears continuous only in the stretch between Punta Tavola and Punta del Gigante, where at depths between 20 and 30 metres there is a sandy plane running parallel to the coastline bound by two rocky escarpments. On the south side, between Capo Murro di Porco and Punta Milocca, the biocoenosis does not present any interruptions although there are variations in its bathometric spread. Between Capo Murro di Porco and Capo Meli, the biocoenosis extends below the cliff-face to depths between 15 and 30 metres, while in the rest of the area it spreads at depths of between 2 and 30/35 metres. At Capo Meli, at depths of between 18 and 26 metres, a meadow of *Halophila stipulacea* was found.

3.4.4. Fauna: Describe in a few sentences, which are the main fauna populations present in the area.

The sea bottom around the Maddalena Peninsula is rich in benthic fauna. Where the seabed suddenly drops away, there are a number of submerged caves teeming with benthic and nektonic life, such as solitary corals, sponges, bryozoa, slipper lobsters, nudibranchs and numerous species of fish. The sea bottoms featuring meadows of *Posidonia oceanica* often harbour large examples of *Pinna nobilis*. Higher up and nearer the coast, there is a strong presence of colonial corals such as *Astroides calcularis* with its intense red colour, reminding us that the Ionian Sea also has distinct tropical characteristics. Along the spray zone, it is quite common to come across in highly interesting structures (trottoirs). The last remaining grouper fish to have survived intensive fishing have abandoned the low sea bottom and have taken refuge higher up. Due to its geographical features and the peculiar nature of the sea bottom, Capo Murro di Porco is an ideal place from which to observe some of the large pelagic fish such as tuna, the greater amberjack, sharks, as well as marine mammals such as dolphins, whales and sperm whales. In June 2004, six specimens of common whale calf and humback whale were sighted.

The benthic fringe just before the marine area is teeming with Mediterranean biodiversity, thanks to a variety of naturally-occurring factors, such as the geo-morphological make-up of the sea bottom that has encouraged the settlement of bivalve molluscs, an indispensible ingredient of the food chain, as well as the flow of nutrients carried by the confluence of the rivers and streams that empty their food-rich waters into the sea here. These factors have all helped the development of numerous species of Mediterranean fauna such as ,Sparidae Labridae, Serranidae, Bleniodiae and so on. There is also an abundance of invertebrates, such as Acraniates, Tunicates, Echinoderms, Cephalopods, Nudibranchs, Bryozoa, as well as various species of marine phanerogams, including *Posidonia oceanica*.

3.5. HUMAN POPULATION AND USE OF NATURAL RESOURCES

3.5.1 Human population

a) Inhabitants inside the area:

	Number	Date of data
Permanent	(city)121.000	2001
Seasonal number (additional to permanent)	*c* 4000	

Description of the population

In the province of Siracusa, the labour force is divided into the following occupations:
Industry: 3,685
Commerce/retail 5,122
Services: 8,561
Other activities: 9,029

Main human settlements and their populations

Siracusa: 121,000

3.5.2 Current human use and development

a) Briefly describe the current use of the area by subsistence, artisan, commercial and recreational fishing, hunting, tourism, agriculture and other economic sectors.

Local activities reflect the make-up of the province. Mainly traditional craftwork, fishing and tourism.

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 Impact	Conserv.	Estimated No. of Users	Seasonality
FISHING				
Subsistence	2	3		
Commercial, local	2	3		
Commercial, non-local	2	2		
Controlled recreational	1	2		
Un-controlled recreational	3	3		
Other				
TOURISM				
Regulated	2	3		
Unregulated	3	3		
Indicate the type of tourism				
Culturale	3	3		
Balneare	3	3		
.				
Tourism facilities	3	3		
FOREST PRODUCTS				
Subsistence	0	0		
Non-timber commercial, local	0	0		
Non-timber commercial, non-local	0	0		
Timber commercial, local	0	0		
Timber commercial, non-local	0	0		
Agriculture	1	1		
Stockbreeding	2	1		
Aquaculture	3	3		

EXTENSIVE STOCK GRAZING Subsistence Commercial, local Commercial, non-local	 1 1 0	 1 2 0		
OTHER ACTIVITIES - -	0	0 0		

3.5. HUMAN POPULATION AND USE OF NATURAL RESOURCES

3.5.1 Human population

a) Inhabitants inside the area:

	Number	Date of data
Permanent	(city)121.000	2001
Seasonal number (additional to permanent)	*c* 4000	

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In the province of Siracusa, the labour force is divided into the following occupations:
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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				
Subsistence	2	3		
Commercial, local	2	3		
Commercial, non-local	2	2		
Controlled recreational	1	2		
Un-controlled recreational	3	3		
Other				
TOURISM				
Regulated	2	3		
Unregulated	3	3		
Indicate the type of tourism				
Culturale	3	3		
Balneare	3	3		
.				
Tourism facilities	3	3		
FOREST PRODUCTS				
Subsistence	0	0		
Non-timber commercial, local	0	0		
Non-timber commercial, non-local	0	0		
Timber commercial, local	0	0		
Timber commercial, non-local	0	0		
Agriculture	1	1		
Stockbreeding	2	1		
Aquaculture	3	3		
EXTENSIVE STOCK GRAZING				
Subsistence	1	1		
Commercial, local	1	2		
Commercial, non-local	0	0		
OTHER ACTIVITIES	0	0		
-		0		
-				


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3.5.3. Traditional economic or subsistence uses

Name any environmentally sound traditional activities integrated with nature, which support the well being of the local population. E.g. land, water use, target species, if closed seasons or closed zones are used as management techniques.

The area belongs to the farming/rural tradition. All the same, the presence of nearby Siracusa has always fostered a high degree of culture-based tourism.

4. MEDITERRANEAN IMPORTANCE OF THE SITE

This Section aims at stressing the importance of the site for conservation at the regional or global scales, as set in Art. 8 para. 2 of the Protocol and B2-a, B2-b and B2-c in Annex I.

4.1 PRESENCE OF ECOSYSTEMS/HABITATS SPECIFIC TO THE MEDITERRANEAN REGION

Name the type of habitats considered of Mediterranean specificity, on the basis of the habitat classifications adopted within the framework of MAP, and their estimated cover (Ha).

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. 1. Association with *Lithophyllum byssoides*
II. 4. 2. 8. Concretion with *Neogoniolithon brassica-florida*
II. 4. 3. Mediolittoral caves
II. 4. 3. 1. Association with *Phymatolithon lenormandii* and *Hildenbrandia rubra*

III. 2. 2. 2. Association with *Halophila stipulacea*
III. 5. 1. Posidonia oceanica meadows (= Association with *Posidonia oceanica*)
III. 6. 1. 2. Association with *Cystoseira amentacea*
III. 6. 1. 15. Association with *Cystoseira brachycarpa* (v. *brachycarpa* and v. *claudiae*)

III. 6. 1. 16. Association with *Cystoseira crinita*

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. 2. 2. 7. Association with *Laminaria rodriguezii* on detritic
IV 3. 1. 1. Association with *Cystoseira zosteroides*

IV. 3. 1. 3. Association with *Cystoseira dubia*
IV. 3. 1. 5. Association with *Sargassum* spp. (indigenous)
IV. 3. 1. 9. Association with *Rodriguezella strafforelloi*
IV. 3. 1. 10. *Facies* with *Eunicella cavolinii*
IV. 3. 1. 11. *Facies* with *Eunicella singularis*
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)

At the current time, it is not possible to give an absolute value for cover


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

A critical habitat is an area essential to the conservation of the species concerned. These species should be those included in Annex II of the Protocol. E.g. Islets and sea stacks, as small islands in the sea or in large bodies of water, mostly important for water-bird colonies; caves appropriate for monk seals; undisturbed sand beaches where marine turtle nesting occurs; coastal lagoons where threatened fish or bird species feed or breed; tidal flats, coastal or benthic substrates important for marine invertebrates, etc.

Name the habitat types and the species linked to it.

II. 4. 2. 1. Association with *Lithophyllum byssoides* (***Lithophyllum byssoides***)

III. 5. 1. Posidonia oceanica meadows (***Posidonia oceanica; Pinna nobilis; Hippocampus hippocampus; Paracentrotus lividus; Lithophaga lithophaga ; Luria lurida***)

III. 6. 1. Biocenosis of infralittoral algae (***Lithophaga lithophaga; Maya squinado***)

III. 6. 1. 3. Facies with Vermetids (***Dendropoma petraeum***)

III. 6. 1. 2. Association with *Cystoseira amentacea* (***Cystoseira amentacea***)

III. 6. 1. 19. Association with *Cystoseira spinosa* (***Cystoseira spinosa***)

III. 6. 1. 31. Facies a *Astroides calycularis* (***Astroides calycularis***)

IV. 2. 2. 7. Association with *Laminaria rodriguezii* on detritic (***Laminaria rodriguezii***)

IV. 3. 1. Coralligenous biocenosis (***Centrostephanus longispinus; Sciaena umbra; Homarus gammarus***)

IV 3. 1. 1. Association with *Cystoseira zosteroides* (***Cystoseira zosteroides***)

IV. 3. 2. Semi-dark caves (also in enclave in upper stages) (***Palinurus elephas; Scyllarides latus; Scyllarus pygmaeus; Sciaena umbra; Ephinephelus marginatus***)

4.3 OTHER RELEVANT FEATURES **(Art. 8 paragraph 2 in the Protocol)**

4.3.1. Educational Interest (B-3 in Annex I)

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

Ever since it was founded, the Plemmirio Marine Protected Area has striven to achieve total access for differently-able persons, and the MPA was the first in Italy to devote maximum attention to ensuring equal opportunities for all to enjoy and use the site. Educational itineraries have been devised and the role of escort to accompany differently-able persons while at sea has been created. No other institution in Italy employs provides this kind of staff who take their place alongside the MPA volunteer workers.

Professional training courses have been sponsored by the Ministry for Equal Opportunities, the Ministry of Labour and Social Policy and by the regional department for family matters. As part of the ongoing scheme to maintain, recover and restore the coastal areas of the Maddalena Peninsula, the Plemmirio Consortium has identified no fewer than seven access points to the sea for differently-able people living in different parts of the Siracusa MPA.

The most original project, and another first in Europe, is the creation of two underwater itineraries in the area near Capo Meli and Punta delle Monache designed for blind people, and making use of Braille to provide informative materials on this very special underwater visit, the idea being that even people with sight problems may be able to go for a dive among the splendid sea beds of the Plemmirio MPA, in absolute safety, in a spirit of education and information.

4.3.2. Scientific Interest (B-3 in Annex I)

Explain if the site represents a particular value for research in the field of natural or heritage sciences.

Despite being close to the coast that has been heavily affected by human activity, the Plemmirio MPA presents a very high degree of biodiversity. There are 25 priority habitats and 42 species listed in Annex II ASPIM.

4.3.3. Aesthetic Interest (B-3 in Annex I)
Name and briefly describe any outstanding natural features, landscapes or seascapes.

The Maddalena Peninsula is without doubt an area of considerable prestige and importance, both because of the characteristics of its coasts and sea beds, rich in cliffs and caves, and because of the many habitats worth preserving and species to be protected.

The stretch of coast between Punta della Mola and Capo Murro di Porco is a designated SIC (site of community importance), regulated and protected by Directive 92/43/EC.

Moreover, the whole peninsula is protected by landscape regulations based on decree 6/04/1998 issued by the regional Dept. for Cultural and Environmental Heritage and Education. The Department issued another decree dated 29/01/2003 that accorded the status of archaeological areas of considerable public interest to some stretches of sea opposite the peninsula's coast.

4.3.4. Main cultural features
Indicate if the area has a high representative value with respect to the cultural heritage, due to the existence of environmentally sound traditional activities integrated with nature which support the well-being of local populations.

Given its closeness to the city, the eastern side of the Maddalena Peninsula, known to the inhabitants of Siracusa as the "Island", has always been subject to human intervention, carried out for different reasons, that show close ties between this slice of coast and the Greek city. We only have to remember that in just six kilometres of coast (the area bound by regulatory restrictions), there is a great deal of evidence of human presence from prehistory to the modern day.

The "Grotta Pellegrina" was the object of extensive studies that demonstrated how the cavern was used as shelter by prehistoric man. At Punta della Mola, there is a Bronze Age necropolis with vestiges of an adjacent village. There are six ancient Greek quarries situated along the coast, further proof that the site was the location of the ancient suburban district of Plemmyrion, long since vanished.At Punta della Mola and Capo Murro di Porco, there are extensive underground tunnels used as air-raid shelters in the Second World War. And in the Grotta Pellegrina area there are two cisterns to collect rain water, probably dating back to the nineteenth century. The scene is completed by the endless kilometres of dry stone walls, executed according to the finest local tradition. A little outside the regulated area there are a number of marvellpous farmsteads and stately homes that have been abandoned, like the villa of the Baron Beneventano del Bosco

5. IMPACTS AND ACTIVITIES AFFECTING THE AREA

5.1IMPACTS 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 (sand, water and mineral exploitation, wood gathering, fishing, grazing...) 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.

The area is particular popular with divers and fishermen. As many as 150 divers a day enjoy the area in high season.

5.1.2. Threats to habitats and species

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

The presence of a strong flow of diver-tourists constitutes a potential nuisance for the species.

5.1.3. Demand by an increased population and infrastructures

Assess whether the current human presence or an expected increase in frequentation (tourism, passage of vehicles and boats) and any human immigration into the area, or plans to build infrastructures, are considered a threat.

At the present time, the area seems to be keeping the external human pressure under control.

5.1.4. Historic and current conflicts

Make a brief statement of any historic or current conflicts between users or user groups.

No local conflicts to report

5.2 IMPACTS AND ACTIVITIES AROUND THE SITE

In Art.7.2-e the Protocol calls for the regulation of activities compatible with the objectives for which a SPA was declared, such as those likely to harm or disturb species or ecosystems (Art.6.h), while Section B4 in Annex I asks to consider "the existence of threats likely to impair the ecological, biological, aesthetic or cultural value of the area" (B4-a in Annex I), recommending the existence, in the area and its surroundings, of opportunities for sustainable development (B4-d) and of an integrated coastal management plan (B4-e).

5.2.1. Pollution

Name any point and non-point sources of external pollution in nearby areas, including solid waste, and especially those affecting waters up-current.

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, increase of human presence, significant impacts on landscapes and cultural values, pollution problems, any sectorial development plans and proposed projects, etc.), likely to influence the area in question.

5.2.3. Sustainable development measures

Comment whether the area is covered by an integrated coastal management plan, or bordering upon a zone under such a plan. Are there other opportunities for sustainable development provided for in the neighbouring areas?

The area is engaged in activities in support of sustainable development and the population is particularly aware of the issue.

6. EXPECTED DEVELOPMENT AND TRENDS[1]

The foreseeable development and trends of the site do not appear in the list of common criteria for the choice of protected marine and coastal areas that could be included in the SPAMI list, as established in the Protocol and its Annex I. Moreover, this is not always easy to assess and it is necessary to have knowledge about the site, which is not always available to all managers of protected areas; Thus, it is not obligatory to fill in the boxes in this Section 6.

On the other hand, the assessment of this foreseeable evolution and trends constitutes a dynamic supplement to the static knowledge of the site, as it appears in Sections 3, 4 and 5 above. Moreover, it is of significant importance for the definition of the objectives and the management plan of the site.

It thus appears desirable to bringing out the main outlines at least in respect to the following points:

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

Deal briefly in succession with:

- The demographic development in and around the site
- The development of economic activities (other than tourism and recreation) within the area
- The development of local demand on tourism and recreation
- The development of tourism pressure on the area

The area's demographic development does not present any significant variation compared with the National trend.
-The local economy is geared towards tourism and essential accommodation and hospitality services.
-There is a great deal of potential for developing tourism and leisure activities, and development in this direction has been forecast.
-As of today, there are no critical indication related to the pressures of tourism in the area.

6.2. POTENTIAL CONFLICTS IN THE AREA

Make a brief statement of potential use conflicts between the users or group of users of the site.

There are no significant conflicts to report in the area. However, the low level of awareness on the part of the resident population often represents an obstacle to the management of the area and the proper implementation of conservation policies for the area.

1 r in the a

6.3. EXPECTED DEVELOPMENT AND TRENDS OF THE NATURAL LAND ENVIRONMENT AND LANDSCAPES OF THE AREA: as expected arising from the evolution of the pressures

No growth indications have been recorded, although the area is affected by the proximity of the city of Siracusa and its heavy traffic.

6.4. EXPECTED DEVELOPMENT AND TRENDS OF THE MARINE ENVIRONMENT AND SEASCAPES OF THE AREA: as expected arising from the evolution of the pressures

The major threat in this sense is represented by the high number of craft used for diving.

7. PROTECTION REGIME

7.1 **LEGAL STATUS** (General Principles "e" and Section C-2 both in Annex I)

7.1.1. Historical background of the protection of the site

Identified as a recognized marine area «Penisola Maddalena -Capo Murro di Porco» by Italian law L. 394/91 (L. 93/01); Istituited by means of D.I. dated 15.09.2004 (published in the G.U. n° 32 dated 9/02/05).

Managing body: Consorzio costituito tra la Provincia Regionale di Siracusa e il Comune di Siracusa; Responsabile dell'Area Marina Protetta: Sig. Vincenzo Incontro.

7.1.2. Legal texts currently ruling the protection on the site

Enter the national conservation category, the dates and the present enforcement status of the legal instrument declaring the protection of the area. Consider both the land and the marine areas of the site. Include the full text(s) as an annex.

SEE THE ATTACHED: "Decreto Istitutivo Ministeriale del 15.09.2004 (G.U. n° 32 del 9/02/05)

7.1.3. Objectives (General Principles "a" and D-1 in Annex I)

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

The Plemmirio Marine Protected Area pursues the environmental safeguard of the area in question and sets itself the following goals:

a) The safeguard and optimal use of the natural, chemical and physical characteristics as well as the marine and coastal biodiversity, with particular regard to the protection of the Posidonia meadows and coralligenous biocoenosis, including by means of environmental renewal operations;
b) The promotion of environmental education and the spread of knowledge of the marine and coastal environments of the marine protected area, including by means of educational programmes;
c) The realization of programmes for the study, monitoring and scientific research in fields of natural science and environmental stewardship, to ensure the systematic knowledge of the area;
d) The promotion of sustainable development in the area, with particular regard to raising the profile of traditional skills and activities, local cultures, ecological tourism and the use of the area by socially challenged groups.


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7.1.4. Indicate whether the national protection regime arises from international treaties enforced or from implementation measures of treaties (Art. 6.a in the Protocol).

7.2 INTERNATIONAL STATUS

7.2.1. Transboundary or high seas areas

Complete this section only if the area is transboundary, totally or partially in the high sea, or within areas where the limits of national sovereignty or jurisdiction have not yet been defined. In this case, mention the modalities of the consultation (Art. 9 para. 3A in the Protocol and General Principles “d” in Annex I).

7.2.2. International category

Mention if the area, or part of it, has been designated and on what date, with an international conservation category (e.g. Specially Protected Area, Biosphere Reserve, Ramsar Site, World Heritage Site, European Diploma, Natura 2000, Emerald network, etc.).

Codice Natura 2000: ITA090008 - **Capo Murro di Porco, Penisola della Maddalena e Grotta Pellegrino** D.M. 3 April 2000

7.3 PREVIOUS LEGAL BACKGROUND AND LAND TENURE ISSUES

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. Describe the land tenure regimes within the area, and append a map if existing.

7.4 LEGAL PROVISIONS FOR MANAGEMENT (Section D-1 in Annex I)

7.4.1. Zoning

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 in both land and sea, fishing zones, visitation, gathering, restoration zones etc) and in this case the surface area in ha of these zones. Include a map as an annex

The Plemmirio marine area is divided as follows:
Zone A full reserve, including the stretch of sea facing the Capo Murro di Porco coastline.
The following are permitted:
-rescue operations, surveillance, assistance;


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7.4.2. Basic regulations

Mention the provisions, which apply to the area concerning the implementation of Article 6 of the Protocol (paragraphs a to i), Section D5 (a to d) in the Annex I and Article 17 of the Protocol.

SEE THE ATTACHED: “Disciplinare”

7.4.3. Legal competencies

Section D4 in Annex I states that the competence and responsibility with regard to administration and implementation of conservation measures for areas proposed for inclusion in the SPAMI List must be clearly defined in the texts governing each area. Additionally Art.7.4. of the Protocol calls for the provision of clear competencies and co-ordination between national land and sea authorities, with a view to ensuring the appropriate administration and management of the protected area as a whole. Mention in which way do the legal provisions clearly establish the institutional competencies and responsibilities for the administration and conservation of the area, and if being the case, their co-ordination means, including those between land and sea authorities.

Identified as a recognized marine area «Penisola Maddalena -Capo Murro di Porco» by Italian law L. 394/91 (L. 93/01); Istituited by means of D.I. dated 15.09.2004 (published in the G.U. n° 32 dated 9/02/05).

Managing body: Consorzio costituito tra la Provincia Regionale di Siracusa e il Comune di Siracusa; Responsabile dell'Area Marina Protetta: Sig. Vincenzo Incontro.

The Plemmirio Marine Protected Area pursues the environmental safeguard of the area in question and sets itself the following goals:

e) The safeguard and optimal use of the natural, chemical and physical characteristics as well as the marine and coastal biodiversity, with particular regard to the protection of the Posidonia meadows and coralligenous biocoenosis, including by means of environmental renewal operations;
f) The promotion of environmental education and the spread of knowledge of the marine and coastal environments of the marine protected area, including by means of educational programmes;
g) The realization of programmes for the study, monitoring and scientific research in fields of natural science and environmental stewardship, to ensure the systematic knowledge of the area;
h) The promotion of sustainable development in the area, with particular regard to raising the profile of traditional skills and activities, local cultures, ecological tourism and the use of the area by socially challenged groups.

7.4.4. Other legal provisions

Describe any other relevant legal provisions, such as those requiring a management plan, the establishment of a local participation body, binding measures for other institutions or economic sectors present in the area, allocation of financial resources and tools, or any other significant measures concerning the protection and management of the area or its surrounding zones.

8. MANAGEMENT

Through the General Principles, para. (e) in the Annex I, the Parties agree that the sites included in the SPAMI List are intended to have a value as examples and models for the protection of the natural heritage of the region. To this end, the Parties ensure that sites included in the List are provided with adequate legal status, protection measures and management methods and means.

8.1INSTITUTIONAL LEVEL

8.1.1. Authority/Authorities responsible for the area

A joint Consortium between the Province of Siracusa and the City of Siracusa.

8.1.2. Other participants in the management body

Such as other national or local institutions, as stated in Section D6 in Annex I.

The commission nominated by DEC/DPN n° 2334 dated 18/11/2005 works alongside the body delegated to manage the reserve, formulating proposal and suggestions for matters related to the running of the same. The commission expresses its opinion regarding the drawing of the regulations for managing the reserve and organizing the MPA, including budget forecasts and annual management programme, and concerning any suggestions related to changes in the perimeter or zoning of the MPA.
The commission is composed as follows:

a) Chairman or Chairwoman who chairs the commission;
b) Two experts designated by the Minister for the Environment,
c) A representative from the principal nature associations involved;
d) A representative from the Ministry of the Environment,
e) Two representatives from the local municipalities;
f) A representative of the regions whose territories are concerned
g) A representative from the business and industry community designated by the Chamber of Commerce for each province where the reserve has been instituted;
h) A representative from the local education authority
i) A representative from the department for cultural and environmental heritage;
j) The commander of the local Harbour Police.

8.1.3. Participants in other committees or bodies

Such as a scientific committee, or a body of representatives from the local stakeholders, the public, the professional and non-governmental sectors, as in Sections B4-b and B4-c in Annex I.

8.1.4. Effectiveness

As stated in Section B4 of Annex I, assess as very low, low, moderate, satisfactory, very satisfactory, and comment as needed on the following aspects:

a) Effectiveness of the co-ordination, where existing: b) Quality of involvement by the public, local communities, economic sectors, scientific community:

8.2 MANAGEMENT PLAN (as set out in D7 of Annex I)

8.2.1. Management Plan

State if there is a management plan (MP) and in this case include the document as an annex. In the absence of a MP, mention if the main provisions governing the area and the main regulations for its protection are already in place and how (D7 in Annex I) and if the area will have a detailed management plan within three years (D7 in Annex I).

Not applicable to the proposed area

8.2.2. Formulation and approval of the Management Plan

Mention how the MP was formulated, e.g. by an expert team and/or under consultation and/or participation with other institutions or stakeholders. State the legal status of the MP, whether it is officialized, and how, and if it is binding for other institutions and sectors involved in the area.

8.2.3. Contents and application of the Management Plan

State the degree of detail in the MP by entering YES or NO in the following list of potential contents, and assess the degree of implementation of the MP by using the 0-1-2-3 score on the right hand side:

	Existing in MP	Degree of application			
Detailed management objectives	YES	0	1	2	3
Zoning	YES	0	1	2	3
Regulations for each zone	YES	0	1	2	3
Governing body(ies)	YES	0	1	2	3
Management programmes as:					
Administration	YES	0	1	2	3
Protection	YES	0	1	2	3
Natural resource management	YES	0	1	2	3
Tourism and Visitation	YES	0	1	2	3
Education and Training	YES	0	1	2	3
Research and Monitoring	YES	0	1	2	3
Services and Concessions	YES	0	1	2	3
Fund raising activities	YES	0	1	2	3
Periodic revisions of the MP	YES	0	1	2	3

8.3 PROTECTION MEASURES

By Art. 6 of the Protocol the Parties agree to take all the necessary protection measures required for the conservation of the area, particularly the strengthening the application of the other Protocols to the Convention, and through the regulation of any other activity likely to harm the natural or cultural value of the area, such as economic, recreation or research activities. As per Section D2 in Annex I, the protection measures must be adequate to the site objectives in the short and long term, and take in particular into account the threats upon it.

8.3.1. Boundaries and signing

Briefly, state if the boundaries of the area and its zones are adequately marked in the field, both on land, in the sea, and at the principal points of access.

Indications and buoys are efficient and well-organized.

8.3.2. Institutional Collaboration

Name the different national and local institutions or organisations with legal responsibilities or involved in the protection and surveillance of land and sea zones, and any measures or mechanisms through which their co-ordination is pursued.

8.3.3. Surveillance

Consider the adequacy of the existing protection means (human and material), and your present ability to survey land and sea uses and accesses

Surveillance of the MPA is carried out by Siracusa Harbour Police (Piazzale IV novembre, 8 - 96100 SR; tel. 0931481011; fax 093169260), as well as by the security forces of the local bodies responsible for managing the area.

8.3.4. Enforcement

Briefly, consider the adequacy of existing penalties and powers for effective enforcement of regulations, whether the existing sanctions can be considered sufficient to dissuade infractions, and if the field staff is empowered to impose sanctions.

9. AVAILABLE RESOURCES

1.1. HUMAN RESOURCES (Art. 7.2.f in the Protocol)

9.1.1. Available staff

Assess the adequacy of the human resources available to the management body, in number of employees and training level, both in central headquarters and in the field. Indicate if there are staff training programmes.

5 full-time staff and 5 short-term contract staff with the following responsibilities: 1 head of the scientific and research activity ; 1 Head of Promotion and Education services Educazione, 1 Head of administration and finance, 2 administrative employees 1 secretariat employee, 3 employees for activities at sea, 1 press officer

9.1.2. Permanent field staff

Answer YES or NO on the current existence of the following FIELD staff categories. If YES, enter the number of staff either permanent or part-time in that category, and evaluate on a 0-1-2-3 score (0 is low, 3 is high) the adequacy of their training level.

	YES/NO	NUMBER Permanent/Part-time	ADEQUACY OF TRAINING LEVEL			
Field Administrator	YES	3 permanent	0	1	2	**3**
Field Experts (scientific monitoring)	YES	1 permanent	0	1	2	**3**
	YES	1 permanent	0	1	2	**3**
Field Technicians (maintenance, etc)	YES	1 part-time	0	1	2	**3**
Wardens	YES	1 part-time	0	1	2	**3**
Of which marine	YES	1 part-time	0	1	2	**3**
wardens	YES		0	1	2	**3**
Guides						
Other						

9.1.3. Additional Support

Briefly, describe if the area currently has the advantage of other external human resources in support of its objectives, either from other national or local institutions, volunteer programmes, non-governmental organisations, academic or international organisations. Mention if there are any significant changes in prospect for the near future.


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9.2 FINANCIAL RESOURCES AND EQUIPMENT

By Art. 7 in the Protocol, the Parties agree to adopt measures or mechanisms to ensure the financing of the specially protected areas (Art.7.2.d), and the development of an appropriate infrastructure (Art.7.2.f). The General Principles para. ”e” in the Annex I call upon the Parties to provide the areas with adequate management means.

9.2.1. Present financial means

Note if the basic financing is ensured: a core funding for basic staff, protection and information measures. Who provides this core funding? Briefly assess the degree of adequacy of the present financial means for the area, either low, moderate, satisfactory; e.g. the implementation of the management plan, including protection, information, education, training and research.

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9.2.2. Expected or additional financial sources

Briefly describe any alternative sources of funding in use or planned, and the perspectives for long-term funding from national or other sources.

9.2.3. Basic infrastructure and equipment

Answer YES or NO to the following questions, and if YES, assess with a score of 1-2-3 (1 is low, 3 is high) the adequacy of the basic infrastructure and equipment.

	YES/NO	ADEQUACY			
Office and/or laboratory in the field	YES	0	1	2	**3**
Signs on the main accesses	YES	0	1	2	**3**
Guard posts on the main accesses	YES	0	1	2	**3**
Visitors information centre	YES	0	1	2	**3**
Self guided trails with signs	YES	0	1	2	**3**
Terrestrial vehicles	YES	0	1	2	**3**
Marine vehicles	YES	0	1	2	**3**
Radio and communications	YES	0	1	2	**3**
Environmental awareness materials	YES	0	1	2	**3**
Capacity to respond to emergencies	YES	0	1	2	**3**
Comment on basic infrastructure and equipment					

9.3 INFORMATION AND KNOWLEDGE

By Section D3 of Annex I, the Parties agree that the planning, protection and management of a SPAMI must be based on an adequate knowledge of the elements of the natural environment and of socio-economic and cultural factors that characterize each area. In case of shortcomings in basic knowledge, an area proposed for inclusion in the SPAMI List must have a programme for the collection on the unavailable data and information.

9.3.1. State of knowledge

a) Assess the general state of knowledge of the area

2			

b) Briefly describe the extent of knowledge of the area, considering at least specific maps, main ecological processes, habitat distribution, inventories of species and socio-economic factors, such as artisan fishing.

In terms of biodiversity, the available data are sufficuent and recent enough as far as the flora and benthic marine vegetation is concerned. The peninsula's sea beds have been the object of numerous studies by the Univeristy of Catania's Algae department.

The information on benthic fauna are sufficient if we consider the southern side of the peninsula as documented in "Cartografia delle biocenosi e dei sedimenti della piattaforma continentale del Golfo di Noto tra Capo Murro di Porco e Capo Passero" produced by the Dept. Of Animal Biology, University of Catania.

The major scientific works on the area are listed in the appendix.

9.3.2. Data collection

Describe and assess the adequacy of any programme and activities to collect data in the area.

There is a scientific partnership between the University of Catania's CUTGANA and since 2005 there is a « PdG » which also provides for the monitoring of the natural conditions and the effects of underwater activities in zone A. The management in both cases is efficient and well-organized, and a number of programmes have been developed specifically for differently-able people, and well-defined partnership agreements have been drawn up with scuba diving clubs, environmental associations, local fishermen and tour operators and hospitality providers. The university and public research bodies are involved in professional training courses.

9.3.3. Monitoring programme

Section D8 in Annex I states that to be included in the SPAMI List, an area will have to be endowed with a monitoring programme having a certain number of significant parameters, in order to allow the assessment of the state and trends of the area, as well as the effectiveness and protection and management measures, so that they may be adapted if need be (indicators may, for instance, supply information about species status, condition of the ecosystem, land-use changes, extraction of natural resources -sand, water, game, fish-, visiting, adherence to the provisions of the management plan, etc.).

a) Is there a monitoring programme?	**YES**	NO
b) If NO, are there plans to start one, and when?		
c) If YES, assess as low, medium, satisfactory, its adequacy and present level of development.	Medium	

d) If YES, who is/are carrying out the monitoring programme?

MPA-CUTGANA

e) If YES, briefly describe how the monitoring programme will be used in reviewing the management plan.

The five years lasting monitoring programme, will be used in order to:
- evaluate the sustainable number of visitors and regulate the activity of local diving centers
- control the maintainance of the naturality of the site and the state of health of *Posidonia oceanica* meadows
- detect possible changes of the geomorphology of the coastal belt
- prevent damages to submerged archaeological heritage

Other information, if any

11.CONTACT ADDRESSES (name(s), position(s) and contact address(es) of the person(s) in charge with the proposal and that compiled the report)

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12. SIGNATURE(S) ON BEHALF OF THE STATE(S) PARTY/PARTIES MAKING THE PROPOSAL

13. DATE

ANNOTATED FORMAT FOR THE PRESENTATION REPORTS FOR THE AREAS PROPOSED FOR INCLUSION IN THE SPAMI LIST

MPA “TORRE GUACETO”

Index:

FOR MORE INFORMATION, PLEASE CONTACT:
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OBJECTIVE

The objective of this Annotated Format is to guide the Contracting Parties in producing reports of comparable contents, including the information necessary for the adequate evaluation of the conformity of the proposed site with the criteria set out in the Protocol and in its Annex I (Common criteria for the choice of protected marine and coastal areas that could be included in the SPAMI List).

CONTENTS

The presentation report shall include the following main information on: (i) identification of the proposed protected area (ii) site description (iii) its Mediterranean importance (iv) the activities in and around the area and their impacts (v) legal status (vi) management measures (vii) human and financial resources available for the management and the protection of the site.

SUBMISSION OF REPORTS

The reports should be submitted to the RAC/SPA two months before the meeting of National Focal Points for SPA in English or in French.

Dossiers should be compiled on A4 paper (210 mm x 297 mm), with maps and plans annexed on paper with a maximum size of an A3 paper (297 mm x 420 mm). Contracting Parties are also encouraged to submit the full text of the proposal in electronic form.

The requested annexes should be submitted on paper and, if possible, also in electronic form. They are the following:

- Copies of legal texts
- Copies of planning and management documents
- Maps: administrative boundaries, zoning, land tenure, land use, and distribution of habitats and species, as appropriate
- Existing inventories of plant and fauna species
- Photographs, slides, films/videos, CD-ROMs
- List of publications and copies of the main ones concerning the site

N.B.: All the following sections have to be in the report submitted, even those sections or elements that do not apply to the proposed area. Where that is the case, please put “not applicable to the proposed area”.

1. IDENTIFICATION

1.1 COUNTRY/COUNTRIES (in the case of transboundary areas)

Italy

1.2 ADMINISTRATIVE PROVINCE OR REGION

Province of Brindisi

Region Puglia

1.3. NAME OF THE AREA

Area Marina Protetta “Torre Guaceto”

Marine Protected Area and Natural Reserve of “Torre Guaceto”

1.4 GEOGRAPHIC LOCATION

Describe its geographical boundaries, e.g. rivers, roads, geographical or administrative boundaries (do not describe the co-ordinates here; please make a separate annex with a map and a description of geographical co-ordinates as stated in the legal declaration of the area).

The Marine Protected Area, falling within the municipalities of Brindisi and Carovigno, is about 8 km long from the zone of Apani till the littoral of Punta Penna Grossa.

The coastline is characterized, along the western sector, by a series of small subrectangular coves with pocket beaches, until the eastwards projecting promontory of Torre Guaceto. At east of this promontory the coast is mainly sandy, with reduced rocky formations and low rocks emerging right in front of the promontory and eastwards from it (Scogli di Apani), and is characterized by a regular, sinuous coastline. The eastern coastal sector, furthermore, is incised by ten little valleys, oriented from South to North, some continuing also underwater.

Torre Guaceto, besides a MPA, is also a State Natural Reserve extending fro about 1.200 ha, having a marine front of 8 km.

The area is more or less rectangular, reaching up to 3 km from the coast, and is crossed by the State Route 379.

The systems at both sides of the state route are radically different. The inland part is devoted to the typical agricultural practices of the area, continuing the plant cover present also outside the Reserve, with secular olive trees, mixed cultures, and red soils, not covered by vegetation.

In the area between the road and the coast, terrains are in a more natural condition.

The spatial succession ranging from beach, dune, and Mediterranean scrub ends up with agricultural areas (mainly vegetable gardens) and some reforestation of not high quality.

The second coastal stretch, developing southwards, does not include neither dunes nor beach. It is characterized by a low and rocky coast, with small beaches and whose vegetation reaches the coastline.

1.5. SURFACE OF THE AREA (total)

2.227 ha

1.6. LENGTH OF THE MAIN COAST (Km)

8.405 Km

2. EXECUTIVE SUMMARY (maximum 3 pages)

The first activities to protect Torre Guaceto date back to 1970, when the marquise Luisa Romanazzi Carducci entered the board of W.W.F. Italy, promoting the interest of the association for this territory. On May 18 1981 The Ministry of Agriculture and Forests, following the international Ramsar Convention, conferred the state of wetland of international interest to Torre Guaceto.

In 1987, the Ministry of Merchant Marine appointed W.W.F. Italia to set up a plan of feasibility for the institution of a marine reserve at Torre Guaceto. The reserve was then established with Ministerial Decree on December 4, 1991. The Ministry of Environment, with a Decree dated February 4 2000 declares the State Natural Reserve of Torre Guaceto. The 4th article of the Decree declares that the management of the reserve is a mixed consortium comprising the Town Administration of Brindisi and the no-profit environmentalist association World Wildlife Fund Italia-W.W.F. Italia.

The Marine Protected Area of Torre Guaceto has an extension of about 8 km, from the zone of Apani to the littoral of Punta Penna Grossa.

This MPA continues inland with the Terrestrial Reserve « Torre Guaceto ». The spatial succession ranging from beach, dune, and Mediterranean scrub ends up with agricultural areas (mainly vegetable gardens) and some reforestation of not high quality.

The second coastal stretch, developing southwards, does not include neither dunes nor beach. It is characterized by a low and rocky coast, with small beaches and whose vegetation reaches the coastline.

In the past, the wetland present in back of the promontory of Torre Guaceto was reclaimed, and this is detectable by the presence of tracks of canals. Such reclamation was aimed at draining the waters that were gathered in this zone due to the reduced slope of the terrain and to the surfacing of groundwaters. In spite of reclamation, part of the area always remained a wetland. When reclaimed grounds were not devoted to agriculture any more, they were again flooded, with the formation of permanent pools. The growth of groves of reeds partially closed the surfaces not covered by water. The wetland of Torre Guaceto is sustained by freshwater springs; its own name stems from the Arabic word GAW SIT: “site of the freshwater”. Being located along the coastline, however, the wetland is brackish. The system that originated from these processes has a great environmental interest, since it is ideal for the stopping over of migratory birds and, furthermore, is constantly inhabited by waterfowls, amphibians and insects typical of wetlands.

The part of territory between the state road and the coastline is characterized by a low density of settlements: the buildings of Punta Penna Grossa and the Tower of Guaceto are on the coast, whereas immediately inland there is the house of the watchman and, beyond the shrubs, some farmer houses.

The coastal stretch that delimits the MPA, in spite of being relatively short, is characterized by a much varied coastline; in particular, South of Torre Guaceto, the coast is linear and is made of cliffs of clay soil. In the vicinity of the tower, and for some hundred meters northwards, the coast is characterized by a small, notched rocky cliff with a series of small coves. After this coastal stretch, towards Punta Grossa, the shore becomes low and sandy.

At Torre Guaceto the dunes maintain their maximal expansion, since there are wide stretches of grey dunes that reach 15 m in height. The dune environment is diverse and is characterized by habitats of interest for the EU such as: dunes with meadows of *Brachypodietalia* and annual vegetation; mobile littoral dunes with *Ammophila arenaria* (“White Dunes”); annual

vegetation of marine deposition lines, and the coastal rocks with Mediterranean coastal vegetation, with endemic *Limonium* spp..

The coastal area is incised by numerous and almost flat valleys, usually dry and not more than 10-15 m-deep, originating at the base of the ridge and running parallel to each other towards the Adriatic Sea. The Canale Reale is the most important of these incisions. It originated in the inner zones of the Taranto Murgia and, running for some dozens of km, pours water into the reserve, after having received the outflows of some large municipalities.

The euryhaline, eurythermic, brackish water community is characterized by the presence of the marine phanerogame *Nanozostera noltii*. The waters facing on the coast are inhabited by bird species with strong affinity for marine environments (e.g. divers, grebes, petrels, cormorants) and for swamps, like those of the order Anseriformes, that often rest and forage in the waters of the marine reserve). Many anatids rest in marine waters both during migration and in other periods of the year, when they are not active.

The species that make up the lagoonal, euryhaline and eurythermic community are usually buried in the sediments or live sessile to the substrates, such as polychaetes, bivalve molluscs and some anthozoans.

The submarine landscape is constantly characterized by two subsequent escarpments, parallel to the coastline and with a medium slope; their articulated physiognomy has a main convexity towards NE and is probably due to the control of tectonic lines directed towards the Appennines (NW-SE). The edge of the proximal escarpment is at 15/18 m depth, whereas that of the distal escarpment is at about 30/35 m. A third escarpment, of lesser extension, is localized off the western coast and is characterized by a medium-high sloping and whose edge is at about 35/38 m depth. These escarpments are divided by flat surfaces due both to erosion and, mostly, to deposition.

The rocky midlittoral is characterised by the presence of red algae as *Laurencia* sp, and *Corallina elongata* and by a Cystoserietum that forms belts along the rocky littoral.

The rocky infralittoral is characterized by photophylous algae and by sea urchin barrens and encrusting alge accompanied by the few animal species that resist the grazing activity of sea urchins. *Posidonia oceanica* meadows are one of the most characteristic habitats of the sandy infralittoral. The intricate morphology of the meadows forms a series of microhabitats that provide both food and shelter to numerous organisms, from fish and crustaceans to sponges, bryozoans, hydroids, anthozoans and bivalve molluscs. Patches of *Cymodocea nodosa* are also present.

In the C zone there are stretches of precoralligenous formations with many organisms in perfect state; particularly numerous are both the yellow and the white sea fans (*Eunicella cavolini*, *Eunicella singularis*). The localised abundance of such species confers to this habitat a special ecological value. Also the bryozoans *Sertella* sp. and *Myriapora truncata* are very common.

Coralligenous formations are comprised between 22 and 30 m depth, with discontinuous distribution and forming a series of patches on the sandy bottom. Coralligenous formations become scarcer at depths greater than 30 m, reaching a depth of 45 m, where the sandy bottom is replaced by mud.

Muddy bottoms are inhabited by a rich fauna of molluscs, brittle stars, sea stars, sea cucumbers, vagile and tubiculous polychaetes, with various types of tubular protections.

The low level of awareness demonstrated by local communities in respect to the potential of the institution of a nature Reserve, set one of the main targets of the MPA, aiming at rising the level of public appreciation and information so to rise trust in the Reserve and in the

Managing Consortium, informing locals about the opportunities offered by all models of sustainable development and by all the available benefits and special terms for any kind of activity allowed in the area.

The programmes of environmental education envisage a fundamental relationship with the school system and the Reserve of Torre Guaceto, after years of continuous activity, is now an important benchmark for environmental education in the whole Apulia Region, being visited thousands of students every year. Torre Guaceto is one of the most representative natural areas of the whole region.

3. SITE DESCRIPTION

3.1 TYPOLOGY OF THE SITE

3.1.1. Terrestrial surface, excluding wetlands (ha):		3,60 ha
3.1.2. Wetland surface (ha):		Not applicable to the proposed area
3.1.3. Marine surface (Sq. Km):	Marine internal waters	Not applicable to the proposed area
	Territorial sea	2.227 (ha)
	High sea	Not applicable to the proposed area

3.2 MAIN PHYSICAL FEATURES

3.2.1. Geology/Geomorphology

Give a brief description of: (i) geological aspects (lithologic and tectonics); (ii) processes of sedimentation and erosion observable in the area; (iii) coastal geomorphology and (iv) island system. Indicate bibliographical sources.

The analysis of the detailed bathymetric map, compared with the mapping of communities, evidenced the salient morphological and sedimentological aspects of the coastal trait facing Torre Guaceto. This coastal belt (Ricchetti et al., 1994; Ricchetti e Pieri, 1999), characterized by the medium-low slope of the emerged area, presents in the western sector a series of small subrectangular coves with pocket beaches, reaching the little pronounced and eastward promontory of Torre Guaceto. Eastwards from the promontory, the geometry of the coast, mainly sandy with reduced rocky outcrops (Scogli di Apani), is characterized by a regular and sinuous coastline. The western sector, furthermore, is incised by ten valleys oriented from S to N, some continuing also in the submarine environment. Some of these incisions, especially at more than 30 m depth, present small detrital conoids of sandy nature at their mouths (Ambrosano et al., 1986).

The marine bottoms are always characterised by the presence of two orders of submarine cliffs, running parallel to the coast line, with a medium slope, whose phisiognomy is articulated and presents a convexity towards NE, probably due to the control of tectonic lines directed towards the Appennines (NW-SE). The edge of the proximate cliff is at 15-18 m depth, whereas that of the most distal one is at 30/35 m. A third, lesser escarpment is localized off the western coastal sector and is characterized by a medium-high slope and whose edge is at 35/38 m depth. These escarpments are divided from each other by flat surfaces due to either erosion or, mainly, to deposition (Aiello et al., 1994).

The coastal platform goes from the coastline to about 5 m depth and at some places, for instance in the coves SE of Torre Guaceto, is wider and incised by grooves modelled in the emerged sector, where they are rich in sediments.

The submerged cliff, of recent genesis and at a short distance from the coast, reaches 25/30 m depth. Strips of marine terraces at about 8/10 and 12/15 m depth are present on it, probably due to pleistocenic establishment of the sea level, now colonized by coralligenous formations. As a whole, the phisiography of the proximal cliff is almost straight in the western trait, whereas in the central-eastern one is convex northwards and sinuous, being incised by submarine V-shaped grooves.

Therefore, the morphological evolution of the coast in this zone generated a peculiar horizontal inversion of the coastal relief, due to the progressive replacement, by erosion phenomena of the late pleistocene-holocene, of a prominent cliff with the present-day bay with a concave northwards morphology.

The distal, submerged coastal cliff, of most ancient age, is at a short distance from the foot of the proximal one and has its base at about 46/48 m depth, probably being confined at its margins by minor tectonic alignments of anti-Appenine orientation (NE-SW) that controlled its structuring (Argnani et al., 1996), on which deeper valley incisions were formed, with a bowl section, especially in the eastern area. Along this escarpment, at about 35 m in the western part, and 40 m depth in the eastern part, circumscribed strips of marine terraces are present, covered by fine sand or, at greater depth, by silts.

At some places, both at the foot and along the proximate and distal escarpments and perpendicular to the submarine incisions, the isobate have a convex trend, suggesting the presence of depositional morphologies probably formed by sediment accumulation due to mass or dejection movements, mainly made of sandy or silt-sandy deposits and also by detritic and more coarse materials.

It is probable that structural paleocliffs were modelled during the postglacial rise of the sea level, as witnessed by the presence of terraces and paleoincisions due to a riverine genesis in emerged environments, being then dislocated by late-quaternary tectonic movements (Westaway, 1993) that dismembered them laterally.

The emerged coast, modelled by the mechanic action of waves, is characterized both at east and west of the Promonthory of Torre Guaceto by two primary grooves that generate two coastal coves and proceed underwater in SW-NE direction, with a sinusoidal path reaching about 15 m depth. Between this depth and about 25/30 m, the grooves cut the proximal escarpment reaching the margin of the most distal one. At greater depth, up to 35 m, at the base of the distal escarpment, it is evident the continuation of the western valley, masked by sediments.

Numerous secondary grooves, oriented as the primary ones, can be detected in the whole submarine area, forming a late-pleistocenic hydrographic reticulum with parallel pattern.

At greater depths, the morphology of the bottom is more regular, with a constant and feeble slope, whereas the soft bottom is mainly made of silt (Viel *et al.*, 1986).

BIBLIOGRAPHY:

Aiello G., Bravi S., Budillon F., Caruso A., D'Argenio B., De Lauro M., Ferraro L., Marsella E., Molosso F., Pelosi N., Sacchi M., Toscano F., Tramontano M.A., 1994. La piattaforma continentale pugliese al largo di Brindisi e tra Capo d'Otranto e S. Maria di Leuca (Adriatico meridionale): approccio ad uno studio integrato di geologia marina. Crociera GMS 94-01, agosto 1994 - Primo leg, Rapp. Tecnico n.2, C.N.R., *Ist. Geol. Mar. Geomare Sud*, Napoli: 59 pp.

Ambrosano E., Ferretti O., Falcinelli F., 1986. Tipologia geomorfologica costiera e caratterizzazione mineralogica dei sedimenti di spiaggia del litorale pugliese. In: Indagine Ambientale del Sistema Marino Costiero della Regione Puglia. Elementi per la Definizione del Piano delle Coste. ENEA, Roma: 55-67.

Argnani A., Bonazzi C., Evangelisti D., Favali P., Frugoni F., Gasperini M., Ligi M., Marani M., Mele G., 1996. Tettonica dell'Adriatico meridionale. *Mem. Soc. Geol. It.*, **51** (1): 227-237.

Ricchetti G., D'Alessandro A., De Fino M., La Volpe L., Luperto Sinni E., Piccarreta G., Posenato R., Reina A., 1994. Geologia delle aree di avampaese. Guida alla escursione precongressuale e alla escursione tematica sul Cretaceo murgiano. *Soc. Geol. It.*: 86 pp.

Ricchetti G., Pieri P., 1999. Guide Geologiche Regionali. (A cura di) Puglia e Monte Vulture. *Soc. Geol. It.*, BE-MA Ed.: 287 p

Viel M., Damiani V., Setti M., 1986. Caratteristiche granulometriche e composizione mineralogica dei sedimenti della Piattaforma Pugliese. In: Indagine Ambientale del Sistema Marino Costiero della Regione Puglia. Elementi per la Definizione del Piano delle Coste. ENEA, Roma: 127-146.

Westaway R., 1993. Quaternary uplift of Southern Italy. *J. Geoph. Res.*, **98** (B12): 741- 772.

3.2.2. Other interesting physical features: Such as hydrodynamics, volcanic formations, caves, underwater formations, etc.

The Marine Protected Area of Torre Guaceto is located in the southern part of the Adriatic Sea, where the basin reaches its maximal depths: the South Adriatic trench reaches 1200 m. The basin has a crucial importance since it is there that the deep thermohaline current of the Eastern Mediterranean is triggered, providing nutrients to the surface portion of the water column and creating proper conditions for the development of complex trophic chains.

The southern part of the Adriatic is the richest of the whole basin in terms of diversity of water masses, being characterized by surface, intermediate and deep waters. The *Adriatic Surface Waters* (ADSW) undergo a clear seasonal temperature cycle, with maximal values in the summer and maximal depth of the mixed layer during the winter. Coastal waters are always separated and can be distinguished from the other water masses during all seasons, due to the inflow of freshwater during both spring and summer. The *Levantine Intermediate Water* (LIW) is found between 150 and 400 m, it is defined by salinity higher than 38.6 psu, and temperature higher than 13.5°C, occupying almost the whole water column during the fall. At deeper levels both the deep water masses formed in the Adriatic are found: the *Northern Adriatic Deep Water* (NAdDW) formed by the cooling effect caused by strong north-west winds, and the *Southern Adriatic Deep Water* (SAdDW) formed in the southern part of the basin due to an almost permanent cyclonic circulation that is stronger in the winter creating conditions that are conducive to the production of dense water through a convective mechanism. These two water masses of the southern Adriatic basin spread through the Ionian Sea, the first flowing along the Italian shelf and the other along the sea bottom.

The surface circulation of the whole Adriatic is cyclonic, with a coastal current that flows along the eastern coasts of the basin, hence named *East Adriatic Current* (EAC), then flowing along the southwards along the western coast, the *Western Adriatic Current* (WAC), reaching the strait of Otranto. The intensity and wideness of the WAC depend on winds and riverine inputs, having a prominent role in providing nutrients for the primary production of the Adriatic basin.

Within the general cyclonic circuit, the Adriatic shows three cyclonic sub-circulations, located in the northern, central and southern part of the basin respectively; the localization and dynamics of the third one are sharply influenced by the presence of the South-Adriatic trench. The zone of Torre Guaceto, along the Italian coast, is primarily influenced by the WAC. Along the Italian coast, the coastal flow towards SE is about 45-70 km wide, with velocities reaching 30 cm/s. In the southern Adriatic the current expands offshore during summer, fall, and winter, whereas it tends to become narrower during the spring; the greatest width of this current is 50 km, and the highest velocities, stronger in the summer than in the winter, are reached at about 10 km offshore the Apulian coast.

3.2.3. Length of beaches (in Km), including islands:

a) Length of sandy beaches:	3 Km
b) Length of pebble or stony beaches:	5,405 Km
c) Length, height and depth of active sand-dunes:	2 km, 15 m, 11 m

3.3 FRESHWATER INPUTS

3.3.1. Mean annual precipitation (in mm)

630-720 mm

3.3.2. Main water courses (permanent and seasonal)

The coastal area is crossed by numerous valley grooves with almost flat bottom, generally dry and not more than 10-15 m deep, that originate at the base of the escarpment and run parallel towards the Adriatic (Table 13) ; the only exception is the Canale Reale, the most important of these grooves, that originates in the inner zones of the Tarantine Murgia and, after a course of some dozens of km, pours just in the reserve of Torre Guaceto, after having received the wastewaters of several large municipalities. The Canale Reale is normally dry for its whole length, with the exception of the last part that is nourished by the waters of some spring, the main one, Pozzella, has a fairly good capacity (ca15 l/sec), near the mouth of the canal, for other infiltrations, the capacity is even higher (ca 40 l/sec).

3.3.3. Estuarine areas: Existence and brief description

Not applicable to the proposed area

3.3.4. Freshwater springs: Existence and brief description, including marine offsprings

The wetland of Torre Guaceto is fed by freshwater springs; its name derives from the Arabic word GAW SIT, namely “place of fresh water”. Being located along the coast, however, the wetland is brackish.

3.4 BIOLOGICAL FEATURES (B2, Annex I)

3.4.1. Habitats:

A brief description of dominant marine and terrestrial habitats, on the basis of the habitat classifications adopted within the framework of MAP (and their coverage in ha)

The main biocenosis present in MPA of Torre Guaceto are:

I. 2. 1. Biocenosis of supralittoral sands

I. 2. 1. 5. Facies of phanerogams which have been washed ashore (upper part)

I. 4. 1. Biocenosis of supralittoral rock

I. 4. 1. 2. Pools with variable salinity (mediolittoral enclave)

II. 3. 1. 1. Facies of banks of dead leaves of *Posidonia oceanica* and other phanerogams

II. 4. 1. Biocenosis of the upper mediolittoral rock

II. 4. 1. 3. Association with *Nemalion helminthoides* and *Rissoella verruculosa*

II. 4. 2. Biocenosis of the lower mediolittoral rock

II. 4. 2. 4. Association with *Ceramium ciliatum* and *Corallina elongata*

II. 4. 2. 6. Association with *Enteromorpha compressa* (*Ulva compressa*)

III. 1. 1. Euryhaline and eurythermal biocenosis

III. 1. 1. 4. Association with *Zostera noltii* (*Nanozostera noltii*) in euryhaline and eurythermal environment

III. 2. 2. Biocenosis of well sorted fine sands

III. 2. 3. 4. Association with *Cymodocea nodosa* on superficial muddy sands in sheltered waters

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

III. 5. 1. 3. Facies of dead « mattes » of *Posidonia oceanica* without much epiflora

III. 6. 1. Biocenosis of infralittoral algae

III. 6. 1. 1. Overgrazed facies with encrusting algae and sea urchins

III. 6. 1. 2. Association with *Cystoseira amentacea*

III. 6. 1. 35. Facies and association of Coralligenous biocenosis (in enclave)

IV. 1. 1. Biocenosis of coastal terrigenous muds

IV. 3. 1. Coralligenous biocenosis

IV. 3. 1. 7. Association with *Lithophyllum frondosum* e *Halimeda tuna*

IV. 3. 1. 10. Facies with *Eunicella cavolinii*

IV. 3. 1. 11. Facies with *Eunicella singularis*

IV. 3. 1. 14. Facies a *Parazoanthus axinellae*

Other biocenosis present in the reserve are :

I. 2. 1. 1. Facies of sands without vegetation, with scattered debris

II. 4. 2. 9. Association with *Gelidium* spp.

It is evident an increasing cover of the invasive algae *Caulerpa racemosa*

The terrestrial habitats present in are (from the Appendix F):

I.1.1.2 Mediterranean halo-nitrophilous pioneer communities
I.1.3.3 Mediterranean halo-psammophile meadows
I.1.6 Mediterranean salt steppes (Limonietalia)
I.1.6.1 Mediterranean sea-lavender salt steppes
I.2.1.1 Unvegetated sand beaches and microbial mats
I.2.1.2 Sand beach driftline communities
I.2.2.1.2 White dunes (Shifting dunes along the shoreline with Ammophila arenaria)
I.2.2.2.3 Dune fine-grass therophyte communities
I.2.2.4 Dune *juniper thickets*
I.4 Sea-cliffs and rocky shore
I.5.1 Lithogenic rock stacks and islets
II.1 Standing freshwater
III.2.1.2.2 Oleo-Lentiscetum matorral without carob tree
III.2.1.3.1 *Juniperus oxycedrus* arborescent matorral
III.2.1.3.2 *Juniperus phoenicea* arborescent matorral
III.2.1.3.3 *Calycotome infesta* arborescent matorral
IV.4 Temperate broad-leaved evergreen forests
V.1.1.1 Common reed beds
V.1.1.2 Common clubrush beds
V.1.1.3 Reedmace beds

3.4.2. List of regionally important species (flora and fauna) (B-2a, Annex I)

List here ONLY those species protected by international agreements, particularly those marine species included in Annex II of the Protocol, which are present in the area. Any other species may be listed if it is clearly considered of regional importance given its high representation in the area. Display the species list under the headings Marine Plants, Terrestrial Plants, Marine Invertebrates, Fish, Amphibians and Reptiles, Birds, and Mammals. For each species state:

1. its relative abundance as Common (C), Uncommon (U) or Occasional (O),
2. Its global status as rare (r), endemic (e) and/or threatened (t), and
3. 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)	Global STATUS (r) (e) (t)	Local STATUS (R) (B) (F) (W) (M)
MARINE INVERTEBRATES			
PORIFERA			
Aplysina aerophorba	(U)	(t)	(R)
Axinella cannabina	(C)	(t)	(R)
Axinella polypoides	(C)	(t)	(R)
Ircinia foetida (Sarcotragus spinosulus)	(C)	(t)	(R)
Spongia (Spongia) officinalis	(U)	(t)	(R)
CNIDARIA			
Eunicella cavolini	(C)	(t)	(R)
Eunicella singularis	(C)	(t)	(R)
Eunicella verrucosa	(C)	(t)	(R)
Parazoanthus axinellae	(C)	(t)	(R)
Cladocora caespitosa	(C)	(t)	(R)
Balanophyllia europea	(C)	(t)	(R)

ECHINODERMATA			
Paracentrotus lividus	(C)	(t)	(R)
MOLLUSCA			
Dendropoma petraeum	(C)		
Lithophaga lithophaga	(C)	(t)	(R)
Luria lurida	(O)		
Pinna nobilis	(O)	(t)	(R)
Tonna galea	(O)		
CRUSTACEA			
Homarus gammarus	(C)	(t)	(R)
Palinurus elephas	(C)	(t)	(R)
BRYOZOA			
Myriapora truncata	(C)	(t)	(R)
Sertella sp.	(C)	(t)	(R)
Pentapora fascialis	(C)	(t)	(R)
PISCES			
Epinephelus marginatus	(C)	(t)	(R)
Pomatoschistus sp.		(t)	
Sciaena umbra	(C)	(t)	(R)
Umbrina cirrosa	(O)	(t)	(R)
REPTILES			
Caretta caretta	(O)	(t)	(M)
AVES			
Calonectris diomedea	(C)	(t)	(W)
Puffinus yelkouan	(C)	(t)	(W)
MARINE PLANTS			
MAGNOLIOPHYTA			
Posidonia oceanica	(C)	(e) (t)	(R)
Zostera noltii (Nanozostera noltii)	(C)	(e) (t)	(R)
PHAEOPHYTA			
Cystoseira amentacea=	(C)	(t)	(R)
RHODOPHYTA			
Lithophyllum lichenoides (L. bissoides)	(C)	(t)	(R)

3.4.3. Flora: Describe in a few sentences the main plant assemblages significant in the area.

Coastal Habitats of European Interest (Direttiva Habitat) present within the MPA boundaries are:

- Dunes with *Brachypodietalia* meadows and annual vegetation
- Mobile dunes of the littoral cordon including the presence of *Ammophila arenaria* (“White Dunes”)
- Annual vegetation of marine deposits
- Rocky shores with coastal Mediterranean vegetation with endemic *Limonium* spp.

Marine habitats:

In the rocky mesolittoral, *Laurencia* spp. and *Corallina elongata* are particularly abundant.

Cystoseira spp. fringes are present along the rocky shores, with low percent cover both near the tower of the MPA and on the north coast of the islands within the A zones.

In the rocky inlets near the tower featured by low water movements, the assemblage is dominated by algae of the genus *Ulva*.

In the shallow sublittoral, algal assemblages are well represented at a depth comprised between 1 and 8 meters, both in the two A zones and in the C zone. Those assemblages are dominated by *Acetabularia acetabulum* and *Halimeda tuna*, by the brown algae *Padina pavonica* and by the red algae *Amphiroa rigida*.

Posidonia oceanica rappresents the 20% of the whole area, mostly in the C zone, interspersed between patches of sands and dead matte until a depth of 17 meter. Only the 0.5% of the *Posidonia* meadow is under full protection regime, and also small patches of *Cymodocea nodosa* has been found. The invasive species *Caulerpa racemosa* is also very common. Euryhaline and eurythermal biocenosis is featured by the presence of the marine phanerogam *Nanozostera noltii*.

3.4.4. Fauna: Describe in a few sentences, which are the main fauna populations present in the area.

In close proximity of the coastline lives bird species, such as divers, grebes, petrels, cormorants. There are also typically swampy species of the order of Anseriformes, which use the waters of the AMP as a stop area. Many species pf Anatidae use the AMP waters as a rest stop during the migratory phase and during the daily inactivity during the other periods of the year as well.

Bare rocks with encrusting red algae (RCEO) are characterised by the grazing activity of sea urchins, namely *Paracentrotus lividus* and, above all *Arbacia lixula*. On these rocky barrens there are few organisms that are able to cope with the sea urchin's grazing pressure. Among these can be cited the sponge *Chondrilla nucula*, the anthozoan *Balanophillia europaea* and vermetid molluscs.

Some traits of precoralligenous formations, mostly localised in front of the Tower of Guaceto, at 15-17 meter depth, are characterised by patches of high density of gorgonians of the species *Eunicella cavolinii, E. singularis* and *E. verrucosa*. The localised abundance of such species confers to this habitat a special ecological value, also considering that gorgonians are usually found at higher depths elsewhere in the Mediterranean.

Hard bottoms made by biogenetic formations (coralligenous) are present between 22 and 35 meter depth. The distribution of coralligenous habitat is not continuous, with patches that alternate with sandy bottom. Below 35 meters the presence of coralligenous is only occasional and it disappear at a depth of 45 meter, where the sands are substitute by muddy substrates. The basal portion of the biogenetic formations is mostly made by calcareous red algae of the genus *Peyssonnelia* and by encrusting bryozoans. The higher portion is mostly represented by by massive sponges (*Agelas oroides, Axinella* sp. and *Petrosia ficiformis*), the anthozoan *Parazoanthus axinellae*, erect bryozoans (*Myriapora truncata*, *Pentapora* sp. and *Adeonella* sp.) and the ascidian *Halocynthia papillosa*. It is also worthy noting, at 25-30 m depths the presence of the erect sponges of the genus *Axinella*. The large size of these colonies confers a peculiar aspect to the subtidal environment of the AMP of Torre Guaceto.

Within the *Posidonia oceanica* seagrass meadows the typical species are anthozoans (*Cerianthus membranaceus*), bivalves molluscs (*Pinna nobilis*) and bryozoans (*Electra posidoniae, Schizobrachiella* sp., *Calpensia* sp,.).

The species characterizing the euryhaline and eurythermal biocenosis generally are buried in the sediments or fixed to the substratum such as polychaetes (*Arenicola marina*, *Sabella spallanzanii*, *Myxicola infundibulum*, *Fabricia stellaris*), bivalve molluscs (*Pecten jacobeus*, *Tellina* sp., *Tapes* sp., *Donax* sp., *Callista* sp., ecc.) and some anthozoans (*Condylactis aurantiaca*). This species has been found very abundant in the A zone on sandy substrate.

Muddy substrate is featured by high density values with molluscs, ophiuroids, asteroids, holoturians, and several species of polychaetes (vagiles, with chitinous tubes, or with aggregates of inorganic grains).

3.5. HUMAN POPULATION AND USE OF NATURAL RESOURCES

3.5.1 Human population

a) Inhabitants inside the area:	Number	Date of data
Permanent	Not applicable to the proposed area	
Seasonal number (additional to permanent)	Not applicable to the proposed area	

DESCRIPTION OF THE POPULATION

Not applicable to the proposed area

MAIN HUMAN SETTLEMENTS AND THEIR POPULATIONS

There are no residents in the MPA. The municipalities of Brindisi, with 91.664 inhabitants, and Carovigno, with 15.098 inhabitants, plus the coastal settlements deriving from these communities in the summer season, are present near the MPA.

3.5.2 Current human use and development

Briefly describe the current use of the area by subsistence, artisan, commercial and recreational fishing, hunting, tourism, agriculture and other economic sectors.

The main activities in the vicinity of the MPA are devoted to tourism, coastal fisheries, handmade production, and small-scale agriculture.

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				
Subsistence	2	2		
Commercial, local	1	1		
Commercial, non-local	0	0		
Controlled recreational	1	1		
Un-controlled recreational	2	1		
Other				
TOURISM				
Regulated	2	2		
Unregulated	2	2		
Indicate the type of tourism				
-.....	0 1 2 3	0 1 2 3		
-.....	0 1 2 3	0 1 2 3		
.				
.				
Tourism facilities	1	1		
FOREST PRODUCTS				
Subsistence	0	0		
Non-timber commercial, local	0	0		
Non-timber commercial, non-local	0	0		
Timber commercial, local	0	0		
Timber commercial, non-local	0	0		
Agriculture	1	1		
Stockbreeding	1	1		
Aquaculture	2	2		
EXTENSIVE STOCK GRAZING				
Subsistence	1	1		
Commercial, local	1	0		
Commercial, non-local	0	0		
OTHER ACTIVITIES				
-	0 1 2 3	0 1 2 3		
-	0 1 2 3	0 1 2 3		

3.5.3. Traditional economic or subsistence uses

Name any environmentally sound traditional activities integrated with nature, which support the well being of the local population. E.g. land, water use, target species, if closed seasons or closed zones are used as management techniques.

The main activities in the MPA are related to fishery, tourism and environmental education.

4. MEDITERRANEAN IMPORTANCE OF THE SITE

This Section aims at stressing the importance of the site for conservation at the regional or global scales, as set in Art. 8 para. 2 of the Protocol and B2-a, B2-b and B2-c in Annex I.

4.1 PRESENCE OF ECOSYSTEMS/HABITATS SPECIFIC TO THE MEDITERRANEAN REGION

Name the type of habitats considered of Mediterranean specificity, on the basis of the habitat classifications adopted within the framework of MAP, and their estimated cover (Ha).

I. 2. 1. Biocenosis of supralittoral sands

I. 2. 1. 5. Facies of phanerogams which have been washed ashore (upper part)

I. 4. 1. Biocenosis of supralittoral rock

I. 4. 1. 2. Pools with variable salinity (mediolittoral enclave)

II. 3. 1. 1. Facies of banks of dead leaves of *P. oceanica* and other phanerogams

II. 4. 1. Biocenosis of the upper mediolittoral rock

II. 4. 1. 3. Association with *Nemalion helminthoides* and *Rissoella* verruculosa

II. 4. 2. Biocenosis of the lower mediolittoral rock

II. 4. 2. 4. Association with *Ceramium ciliatum* and *Corallina elongata*

II. 4. 2. 6. Association with *Enteromorpha compressa (Ulva compressa)*

III. 1. 1. Euryhaline and eurythermal biocenosis

III. 1. 1. 4. Association with *Nanozostera noltii* in euryhaline and eurythermal environment

III. 2. 2. Biocenosis of well sorted fine sands

III. 2. 3. 4. Association with *Cymodocea nodosa* on superficial muddy sands in sheltered waters

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

III. 5. 1. 3. Facies of dead «mattes» of *Posidonia oceanica* without much epiflora

III. 6. 1. Biocenosis of infralittoral algae

III. 6. 1. 1. Overgrazed facies with encrusting algae and sea urchins

III. 6. 1. 2. Association with *Cystoseira amentacea*

III. 6. 1. 35. Facies and association of Coralligenous biocenosis (in enclave)

IV. 1. 1. Biocenosis of coastal terrigenous muds

IV. 3. 1. Coralligenous biocenosis

IV. 3. 1. 7. Association with *Lithophyllum frondosum* e *Halimeda tuna*

IV. 3. 1. 10. Facies with *Eunicella cavolinii*

IV. 3. 1. 11. Facies with *Eunicella singularis*

IV. 3. 1. 14. Facies a *Parazoanthus axinellae*

For the moment it is impossible to give an absolute value of covering

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

A critical habitat is an area essential to the conservation of the species concerned. These species should be those included in Annex II of the Protocol. E.g. Islets and sea stacks, as small islands in the sea or in large bodies of water, mostly important for water-bird colonies; caves appropriate for monk seals; undisturbed sand beaches where marine turtle nesting occurs; coastal lagoons where threatened fish or bird species feed or breed; tidal flats, coastal or benthic substrates important for marine invertebrates, etc.

Name the habitat types and the species linked to it.

I. 2. 1. 5. Facies of phanerogams which have been washed ashore (upper part)

II. 3. 1. 1. Facies of banks of dead leaves of *P. oceanica* and other phanerogams

II. 4. 1. 3. Association with *Nemalion helminthoides* and *Rissoella verruculosa*

III. 1. 1. 4. Association with *Nanozostera noltii* in euryhaline and eurythermal environment ***(Nanozostera noltii)***

III. 5. 1. Posidonia oceanica meadows (***Posidonia oceanica; Pinna nobilis; Paracentrodus lividus***)

III. 6. 1. Biocenosis of infralittoral algae ***(Lithophaga lithophaga)***

III. 6. 1. 2. Association with *Cystoseira amentacea* (***Cystoseira amentacea***)

III. 6. 1. 35. Facies and association of Coralligenous biocenosis (in enclave)

IV. 3. 1. Coralligenous biocenosis **(*Homarus gammarus, Palinurus elephas)***

IV. 3. 1. 10. Facies with *Eunicella cavolinii* ***(E. cavolini)***

IV. 3. 1. 11. Facies with Eunicella singularis (**E. singularis**)

4.3 OTHER RELEVANT FEATURES (Art. 8 paragraph 2 in the Protocol)

4.3.1. Educational Interest (B-3 in Annex I)

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

Since the weakest aspect for the success of the Reserve is the scarce awareness of the local community in respect to the potential for development deriving from the institution of the Reserve itself, a great effort was devoted to activities aimed at informing the locals so to increase their trust in the Reserve and in the Managing Committee, providing information on the opportunities offered by the models of sustainable development and on the available benefits and special terms for the populations living in the vicinity of the Reserve.

In the formats of environmental education, the relationships with schools were paramount and the Reserve of Torre Guaceto is an important reference in all programmes of environmental education since many years, being visited by many thousands of students every year, being one of the most representative natural areas of the whole region.

Activities of environmental information, formation and education are parts of a wider regional strategy, since the Experience Centre of Torre Guaceto, located in the Visitors Centre at Serranova, is part of the network In.F.E.A. (Informazione, Formazione ed Educazione Ambientale: Environmental Information, Formation and Education) of the region Apulia.

Activities devoted to environmental education:

ciclotrekking, to explore the various landscapes of the Reserve;

walking excursions to become familiar with nature through the hands, feet, eyes, nose, and mouth, to think and remember;

seawatching activities, snorkeling in the Mediterranean to collect impressions and emotions.

Yoga and nature, experiences of yoga in the Reserve. Cradled by the waves, massaged by warm sand, to slowly walk and stop to breath energy and enhance self-awareness;

Looking for Gold in the Park, walks in the secular olive tree garden of the reserve, with tasting of Apulian oils to discover the value of biological agriculture, of the Lands and the Gold of the Park;

Invitation to sailing, experiences to discover sailing in the Reserve, under the guidance of the Sailing Centre;

Apnea environment, experiences of discovery of the wonders of the submarine world, of the wellbeing of apnea diving and of the techniques of relax to increase self-confidence;

Invitation to snorkeling, short introduction courses to learn how to snorkel in security to discover the submarine world.

4.3.2. Scientific Interest (B-3 in Annex I)

Explain if the site represents a particular value for research in the field of natural or heritage sciences.

The scientific interest of the MPA resides in the presence of environments of EU interest such as: coastal dunes, brackish lagoons with *Zostera noltii* (*Nanozostera noltii)*, infralittoral sands with *Posidonia oceanica* meadows and the presence of both precoralligenous and coralligenous formations. All these habitats are important and must be monitored over the long term.

4.3.3. Aesthetic Interest (B-3 in Annex I)

Name and briefly describe any outstanding natural features, landscapes or seascapes.

The spatial succession, from beach to dunes to Mediterranean shrub, are particularly captivating from a point of view that is not only scientific but also aesthetic.

The wetlands and the dune system have a great environmental interest, since they are sites for the rest of migratory birds and, furthermore, are characterized by a permanent fauna of birds, amphibians and reptiles living in wetland environments, being also inhabited by species of floristic importance.

Large, secular olive groves are carefully maintained, and the divisions of properties is made with ancient stone walls made with local stones taken from the ground during plowing.

One objective is to qualify the management of secular olive groves, a strong and distinctive mark of the agricultural landscape of the area of Torre Guaceto, meanwhile reducing the impact of agriculture on ecosystem health. The Reserve of Torre Guaceto, within the framework of TWReferenceNET, is promoting a pilot action named "Oro del Parco" (Gold of the Park) to convert live and oil production to biological practices.

The littoral trait of the MPA, in spite of its short extension, is characterized by a much varied coastline. In particular, in the southern part, the straight coast is caracterized by a clay cliff. Near the tower, and northwards to it, the coast is characterized by a rocky cliff with a series of small coves and pocket beaches. Further north, following this rocky trait, the coast is low and sandy.

4.3.4. Main cultural features

Indicate if the area has a high representative value with respect to the cultural heritage, due to the existence of environmentally sound traditional activities integrated with nature which support the well-being of local populations.

Tourism has a great potential aimed at the offer of a diverse array of services, aimed at enhancing ecotourism, seaside tourism, rural tourism, eno-gastronomic tourism. All these activities can be connected with the thematic itineraries already present in the Reserve (Road of the DOP Oil Hill of Brindisi, or the Itinerary of Rupiculous Settlements).

The high archaeological relevance of the Reserve, due to the presence of a neolithic village, justifies the proposal of a series of actions to enhance the value and the knowledge to the public at large of this cultural heritage.

The presence of a rural village (Serranova) outide the reserve, allows the creation of a logistic centre, with services and laboratories, to be used for the scopes of the Reserve itself, giving renewed momentum to a rural village subjected to depopulation.

5. IMPACTS AND ACTIVITIES AFFECTING THE AREA

5.2 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 (sand, water and mineral exploitation, wood gathering, fishing, grazing...) 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.

Use of maritime national properties and adjacent areas: impact on aquatic populations deriving from the collection of coastal benthic organisms by visitors of the Reserve; impact on the abiotic compartment of the aquatic environment due to non-authorized entrance of aquascooters in the southern zone of the MPA; impact on the soil of the coastal zone due to non-authorized parking of cars the cause an emergency situation in the A Zone of Apani, where the cliff is liable to collapse and the consequent prohibition to remain within 5 m from the foot of the cliff itself.

5.1.2. Threats to habitats and species

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

Waters from the Canale Reale. The water of the Canale Reale pours into the A zone of the MPA, subjected to total protection, in front of the terrestrial reserve. The total that receives fresh- and brackish water is of 144 ha. Impact on the biotic components or on the abiotic variables of the water compartment due to the overcoming of the Law Decree 152/99 and for non controlled discharges of undetermined organic and inorganic pollutants. Impact on the soil compartment of the coastal zone due to the possible presence of pollutants that can percolate into the soil.

5.1.3. Demand by an increased population and infrastructures

Assess whether the current human presence or an expected increase in frequentation (tourism, passage of vehicles and boats) and any human immigration into the area, or plans to build infrastructures, are considered a threat.

- Navigation in the MPA with the vessels of the Managing Agency (impact on the abiotic compartment of water and air, and on the soil compartment of the coastal zone);

- SCUBA diving to monitor and control the state of submerged habitats and infrastructures; being carried out for scientific and control scopes, these activities are authorized in the three zones of the MPA (A, B, C). In order to reduce environmental pressures, these activities are carried out by specialized personnel. Operators, however, might cause damage to the benthos with trampling if not properly balanced. This might present some problem when sea fans are present, i.e. in the C zone;

- Tourist diving; the impact might be due to scant experience in diving by the visitors who, if not properly balanced, might cause damage the benthic populations on hard bottoms.

5.1.4. Historic and current conflicts

Make a brief statement of any historic or current conflicts between users or user groups.

No conflicts among stakeholders are present

5.2 IMPACTS AND ACTIVITIES AROUND THE SITE

In Art.7.2-e the Protocol calls for the regulation of activities compatible with the objectives for which a SPA was declared, such as those likely to harm or disturb species or ecosystems (Art.6.h), while Section B4 in Annex I asks to consider "the existence of threats likely to impair the ecological, biological, aesthetic or cultural value of the area" (B4-a in Annex I), recommending the existence, in the area and its surroundings, of opportunities for sustainable development (B4-d) and of an integrated coastal management plan (B4-e).

5.2.1. Pollution

Name any point and non-point sources of external pollution in nearby areas, including solid waste, and especially those affecting waters up-current.

- Waters from the wetland. The water coming from the wetland, covering an extension of 1,2 km2, pours in the A no-take zone of the MPA through a series of superficial canals. Impact on the communities and on the abiotic variables of the water compartment and on the populations of the coastal zone for the overcoming of the ex Legislative Decree 152/99 and for uncontrolled discharges of undetermined organic and inorganic pollutants in the wetland. Impact in the compartment soil of the coastal zone due to the possiblity of presence of pollutants that can percolate into the soil; - Marine pollution due to the stranding of solid inorganic reject and to the organic charge that is transported along the littoral from the Northern Adriatic and from Albania due to winds and currents, causing their accumulation near the Promontory in the A Zone. The accumulation of detritus of varied nature is particularly critical when northern winds blow (about 180 days per year). Impact on the communities of the water compartment since the presence of hydrocarbons might represent an impact for benthic organisms; impact on the abiotic variables of the water compartment since the intense passage of large ships offshore the MPA can determine the presence of episodes of oil spills in the water, impact on the coastal zone due to the stranding of oil on the coastline. The accumulation of stranded rejects on the coast also represents an aestethic impact.

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, increase of human presence, significant impacts on landscapes and cultural values, pollution problems, any sectorial development plans and proposed projects, etc.), likely to influence the area in question.

5.2.3. Sustainable development measures

Comment whether the area is covered by an integrated coastal management plan, or bordering upon a zone under such a plan. Are there other opportunities for sustainable development provided for in the neighbouring areas?

The area is engaged in activities that are compatible with a policy of sustainable development

6. EXPECTED DEVELOPMENT AND TRENDS[1]

The foreseeable development and trends of the site do not appear in the list of common criteria for the choice of protected marine and coastal areas that could be included in the SPAMI list, as established in the Protocol and its Annex I. Moreover, this is not always easy to assess and it is necessary to have knowledge about the site, which is not always available to all managers of protected areas; Thus, it is not obligatory to fill in the boxes in this Section 6.

On the other hand, the assessment of this foreseeable evolution and trends constitutes a dynamic supplement to the static knowledge of the site, as it appears in Sections 3, 4 and 5 above. Moreover, it is of significant importance for the definition of the objectives and the management plan of the site.

It thus appears desirable to bringing out the main outlines at least in respect to the following points:

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

Deal briefly in succession with:

- The demographic development in and around the site
- The development of economic activities (other than tourism and recreation) within the area
- The development of local demand on tourism and recreation
- The development of tourism pressure on the area

In relation to the individuated driving forces (touristic diving, visits on federal properties and nearby areas, illegal fisheries, outflow of water from the Canale Reale and from the wetland, marine pollution) the environmental analysis for the EMAS registration of the Reserve set these objectives:

TOURIST DIVING:

- Maintainance of vessels according to the current norms so to minimize impacts;
- Adoption of the Regulations for the Use of Vessels;
- Predispose a register of the submarine SCUBA activities; for each guided visit the date, the site of diving, the generalities of participants and of the guides will be recorded;
- Regulation of the modalities of development of submarine activities:
  - Diving in the MPA must be carried out by respecting the current regulations and, in any way, in the presence of one guide for each group of five divers.
  - Divers will be accompained to the diving site with the vessels and the personnel of the Management Agency, that will provide technical assistance to the diving activities.
  - The maximum number of daily dives is 72, including the dives of the guides; in no case it is allowed that more than 12 divers (ten visitors and 2 guides) visit the same site together.

[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.

- It is forbidden to touch the marine bottom during the dives.
- Implementation of courses organized by the Managing Agency finalized to the respect of the MPA by its visitors.

USE OF FEDERAL PROPERTIES AND NEARBY AREAS:

- Environmental restoration of dunes and prohibition of entrance in this environmental system.
- Activities of awareness about the ways of non impacting visits of the MPA.
- Control activities by the Coast Guard
- Integrative actions to control the MPA
- Decrease of the number of illegal parkings present on the maritime federal property.
- Service conferences with the organs appointed at controlling the territory to foster the integration and the efficacy of the control activities and of the federal property, including the disposal of rejects.
- Involvement of Civil Protection (Protezione Civile) in the management of the traffic of vehicles near the maritime federal property in the periods of maximal affluence of visitors
- Indication in the contractual phase with professional Subjects about the ways of carrying out the development of educational and touristic activities

ILLEGAL FISHERIES

- Coordination with the forces aimed at control and defence of the resources
- Information about the prohibitions enforced in the MPA

WATERS OF THE CANALE REALE

- Assemblage of the data about balneability collected by ARPA Apulia, Province of Brindisi

WATERS OF THE WETLANDS

- Activities are in course to involve the farmers present in the terrestrial reserve into sustainable agricultural practices;
- Set up of signals evidencing the prohibitions in the terrestrial Reserve;
- Characterize the optimal periods for the activities of control and monitoring by weekly meeting to plan activities
- Stipulate a protocol with the certification agency ICEA, to promote techniques of sustainalbe agriculture in the Terrestrial Reserve

MARINE POLLUTION

- Use of special vessel to collect solid rejects transported by marine currents
- Cleaning of marine bottoms by volunteers
- Enhance the awareness about the problems of marine pollution in the visitors of the reserve.
- Analysis of the merceological typologies according to the Ronchi decree about the rejects present on the marine bottom and on the maritime federal property
- Activities of visual control inside the MPA of the presence of oil and organic pollutants

6.2. POTENTIAL CONFLICTS IN THE AREA

Make a brief statement of potential use conflicts between the users or group of users of the site.

No real socio-economic conflicts are running in the area.

6.3. EXPECTED DEVELOPMENT AND TRENDS OF THE NATURAL LAND ENVIRONMENT AND LANDSCAPES OF THE AREA:

as expected arising from the evolution of the pressures

not applicable to the proposed area

6.4. EXPECTED DEVELOPMENT AND TRENDS OF THE MARINE ENVIRONMENT AND SEASCAPES OF THE AREA:

as expected arising from the evolution of the pressures

No real changes are expected, because the activities of control and protection are efficient

7. PROTECTION REGIME

7.2 LEGAL STATUS (General Principles "e" and Section C-2 both in Annex I)

7.1.1. Historical background of the protection of the site

The first initiatives to enhance protection of the area of Torre Guaceto date back to 1970 when the marquise Luisa Romanazzi Carducci entered the national board of W.W.F. Italia and started to promote interest on the territory.

After the failure of the hypothesis of building a nuclear power plant in the zone, and of another plan of touristic development in the area with the contruction of touristic settlements, on May 18 1981, the Ministry of Agriculture and Forests, after the decree of the President of the Republic of March 13 1976, according to the Ramsar Convention of February 2 1971, declared Torre Guaceto as a wetland of international interest.

In 1987, W.W.F. Italia, appointed by the Ministry of Merchant Marine, realized the feasability plan for the institution of a marine reserve at Torre Guaceto. The reserve was instituted on December 4 1991, with a decree of the Ministry. The MPA was entrusted to the Brindisi Coast Guard that, in those years, carried out a precious action of guardianship of the territory.

Within the framework of the EU programme "Natura 2000" and of the linked Italian programme "Bioitaly", the Region Apulia, according to the EU Habitat Directive 92/43 proposed Torre Guaceto as a site of Communitary Interest naming it "Torre Guaceto Macchia San Giovanni (IT9140005)". Furthermore, the Region Apulia individuated the wetland of Torre Guaceto as a Zone of Special Protection (ZPS) (IT9140008) according to the EU directive 79/409 "Birds".

For all the above reasons, the Ministry of the Environment, with a Decree of February 4 2000 instituted the Natural State Reserve of Torre Guaceto. The decree individuated in its article 4 the management organisms as a mixed consortium among the Municipality of Brindisy, the Municipality of Carovigno and the no-profit Environmentalist Association World Wildlife Italia-W.W.F. Italia. In the same article, the decree individuates the same consortium as management agency of the marine natural reserve of Torre Guaceto.

7.1.2. Legal texts currently ruling the protection on the site

Enter the national conservation category, the dates and the present enforcement status of the legal instrument declaring the protection of the area. Consider both the land and the marine areas of the site. Include the full text(s) as an annex.

Interministerial decree 4 December 1991. Institution of the marine Natural Reserve "Torre Guaceto". (Attached)

Decree of the Ministry of the Environment, 4 February 2000. Institution of the State Natural Reserve named «Torre Guaceto». (Attached)

Regulation decreed by Ordinance of the Coast Guard of Brindisi N° 25/2006 (Attached)

7.1.3. Objectives (General Principles "a" and D-1 in Annex I)

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

The MPA pursues the following objectives:

* The conservation and valorization of the national marine and coastal natural heritage of the area, with special reference to water quality, to the geomorphological features, to the flora and the fauna and, especially, to the bird fauna in relation to the designation of part of the area as wetland of international interest as envisaged by the decree of the President of the Republic n. 448/1976;

* The realization of programmes of study and research aimed at the systematic knowledge of the area, also to modify and integrate the delimitation and the planning of the protected area as established in the institution decree, and also to define an optimal model of integrated management of the area itself, so to pursue the conservation and the valorization of the natural heritage;

* The study and the planning of a rational management of the fish resources in the various zones, according to the modalities envisaged by the institutional decree, so to reach a level of compatibility of fisheries activities with the primary aim of the reserve, i.e. nature conservation, envisaging, then, within the framework of systematic research, also the interventions aimed at the repopulation of the fish communities in the nearby zones;

* The promotion of a socio-economic development compatible with the naturalistic and landscape relevance of the area, also privileging the already existing traditional activities; within the framework of the promotion of a sustainable development of the above stated aims, for the activities of canalization of touristic fluxes and of guided visits, the determination of the regulation of these activities will envisage specific facilitations for collective transport vehicles preferably managed by residents in the municipalities of Brindisi and Carovigno.

7.1.4. Indicate whether the national protection regime arises from international treaties enforced or from implementation measures of treaties (Art. 6.a in the Protocol).

not applicable to the proposed area

7.2 INTERNATIONAL STATUS

7.2.1. Transboundary or high seas areas

Complete this section only if the area is transboundary, totally or partially in the high sea, or within areas where the limits of national sovereignty or jurisdiction have not yet been defined. In this case, mention the modalities of the consultation (Art. 9 para. 3A in the Protocol and General Principles "d" in Annex I).

The Torre Guaceto MPA is not a transboundary area

7.2.2. International category

Mention if the area, or part of it, has been designated and on what date, with an international conservation category (e.g. Specially Protected Area, Biosphere Reserve, Ramsar Site, World Heritage Site, European Diploma, Natura 2000, Emerald network, etc.).

Ramsar site no. 215 Italy, Torre Guaceto, designated 21/07/81, 940 ha, Montreux Record 31/12/93, removed 21/03/00
Natura2000-Special Protection Area (SIC): IT9140005 "Torre Guaceto Macchia San Giovanni"
Natura2000-Special Protection Area (ZPS): IT9140008 "La zona umida di Torre Guaceto"

7.3 PREVIOUS LEGAL BACKGROUND AND LAND TENURE ISSUES

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. Describe the land tenure regimes within the area, and append a map if existing.

not applicable to the proposed area

7.4 LEGAL PROVISIONS FOR MANAGEMENT (Section D-1 in Annex I)

7.4.1. Zoning

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 in both land and sea, fishing zones, visitation, gathering, restoration zones etc) and in this case the surface area in ha of these zones. Include a map as an annex

The Marine Protected Area is located in front of Torre Guaceto Nature Reserve and its maximum depth is 50 meters. It is delimitated by the lines joining the points showed below (see the atthached map, number 1, at the institutive decree):

A) latitude 40°45'24"North; longitude 17°46'04"East;

B) latitude 40°43'15" North; longitude 17°50'56"East;

C) latitude 40°41'44"North; longitude 17°49'36"East;

D) latitude 40°43'24"North; longitude 17°46'00"East.

The Marine Protected Area has been divided into zones having different type of protection:

A Zone, no-entry, no-take zone. It includes the marine area defined by the lines joining the points showed below(see the atthached map, number 1, at the institutive decree):

E) latitude 40°43'09"North; longitude 17°47'48"East;

F) latitude 40°42'45"North; longitude 17°48'54"East;

G) latitude 40°42'15"North; longitude 17°48'28"East;

H) latitude 40°42'57"North; longitude 17°47'36"East;

Also it includes the marine area defined by the lines joining the points showed below (see the atthached map, number 1, at the institutive decree):

I) latitude 40°42'28"North; longitude 17°49'24"East;

L) latitude 40°42'16"North; longitude 17°49'48"East;

M) latitude 40°41'56"North; longitude 17°49'30"East;

N) latitude 40°42'06"North; longitude 17°49'09"East;

B Zone, the General Reserve. It includes the marine area defined by the lines joining the points showed below (see the atthached map, number 1, at the institutive decree):

O) latitude 40°43'54"North; longitude 17°46'24"East;

E) latitude 40°43'09"North; longitude 17°47'48"East;

H) latitude 40°42'57"North; longitude 17°47'36"East;

P) latitude 40°43'18"North; longitude 17°46'24"East;

C Zone of Partial Reserve. It includes the marine area remaining.

7.4.2. Basic regulations

Mention the provisions, which apply to the area concerning the implementation of Article 6 of the Protocol (paragraphs a to i), Section D5 (a to d) in the Annex I and Article 17 of the Protocol.

The delimitation of the MPA Torre Guaceto as well as its division into the areas A, B and C are established by the Decree issued by the Ministry of the Environment, on 4 February 2000.

The total MPA Torre Guaceto has a surface of 2.227 ha.

Torre Guaceto MPA is divided in three zones, according to the different protection:

A ZONE: no entry-no take zone.

B ZONE, the General Reserve:

In this zone, fishing, harvesting; entry, sailing and approaching of all kinds of craft are forbidden, according to the Decree of the Ministry of the Environment.

C ZONE, Partial Reserve.

In this zone fishing is allowed according to the Decree of the Ministry of the Environment.

7.4.3. Legal competencies

Section D4 in Annex I states that the competence and responsibility with regard to administration and implementation of conservation measures for areas proposed for inclusion in the SPAMI List must be clearly defined in the texts governing each area. Additionally Art.7.4. of the Protocol calls for the provision of clear competencies and co-ordination between national land and sea authorities, with a view to ensuring the appropriate administration and management of the protected area as a whole. Mention in which way do the legal provisions clearly establish the institutional competencies and responsibilities for the administration and conservation of the area, and if being the case, their co-ordination means, including those between land and sea authorities.

The MPA Torre Guaceto has been established with the law of the Department of the Environment (Ministery of the Environment) of 4h December 1991.

The establishment of this MPA is provided for by two national laws: the *Legislation regarding the defense of the sea* (n. 979 of 31st December 1982) and the *Outline Law on protected areas* (n. 394 of 6th December 1991).

The aims of MPA Torre Guaceto areas are both the safeguard of the sea biodiversity and biological resources and the promotion and the enhancement of the local economic activities, provided that they are compatible with the importance of the naturalistic aspects and of the landscape of the area.

The Management Consortium is formed by the Municipality of Brindisi, Municipality of Carovigno and W.W.F. Italy for Nature Onlus.

7.4.4. Other legal provisions

Describe any other relevant legal provisions, such as those requiring a management plan, the establishment of a local participation body, binding measures for other institutions or economic sectors present in the area, allocation of financial resources and tools, or any other significant measures concerning the protection and management of the area or its surrounding zones.

Tourist operators

Professional fishermen

Scuba divings

Representatives of the scholastic Institutions, of working associations and of the recognized environmental associations

Agricultural operators

8. MANAGEMENT

Through the General Principles, para. (e) in the Annex I, the Parties agree that the sites included in the SPAMI List are intended to have a value as examples and models for the protection of the natural heritage of the region. To this end, the Parties ensure that sites included in the List are provided with adequate legal status, protection measures and management methods and means.

8.1 INSTITUTIONAL LEVEL

8.1.1. Authority/Authorities responsible for the area

The responsible of the MPA is a Consortium constituted by the Municipalities of Brindisi, Carovigno and W.W.F. Italy for Nature Onlus.

8.1.2. Other participants in the management body

Such as other national or local institutions, as stated in Section D6 in Annex I.

The Reserve Commission, established with DEC/DPN n. 1377, 12/07/2004, supports the Management Consortium in the management of the marine protected area, by elaborating proposals and suggestions related to its functioning and management. In particular, it states its opinion:

about the enforcement and organization regulations of the marine protected area and any proposal of change regarding them;

about the annual management programs;

about the budget and the final balance;

about the annual report on the functioning of the marine protected area;

about the request of change in the perimeter of the marine protected area and in the relative discipline of safeguard suggested by the Managing Authority;

any time it is required by these regulations.

The Reserve Commission consists of:

Chairman;

Two experts designated by the Minister of the Environment;

A member of the environmental association more representative;

A member of the Environmental Ministry;

Two members of the coastal Municipality;

A member of the territorial Region interested;

A member of the interested economy and productive categories designated by the Chamber of Commerce for every province of the Reserve;

A member of Education Office ;

A member of the cultural and environmental administration;

The commander of Coastal Guard.

8.1.3. Participants in other committees or bodies

Such as a scientific committee, or a body of representatives from the local stakeholders, the public, the professional and non-governmental sectors, as in Sections B4-b and B4-c in Annex I.

TORRE GUACETO MPA COUNCILS
Tourist operators Council
Professional fishermen Council
Scuba divings Council
Agricultural Council

8.1.4. Effectiveness

As stated in Section B4 of Annex I, assess as very low, low, moderate, satisfactory, very satisfactory, and comment as needed on the following aspects:

A) EFFECTIVENESS OF THE CO-ORDINATION, WHERE EXISTING:

Very satisfactory

B) QUALITY OF INVOLVEMENT BY THE PUBLIC, LOCAL COMMUNITIES, ECONOMIC SECTORS, SCIENTIFIC COMMUNITY:

Moderate for the public community; satisfactory for the economic sectors and very satisfactory for scientific community.

8.2 MANAGEMENT PLAN (as set out in D7 of Annex I)

8.2.1. Management Plan

State if there is a management plan (MP) and in this case include the document as an annex. In the absence of a MP, mention if the main provisions governing the area and the main regulations for its protection are already in place and how (D7 in Annex I) and if the area will have a detailed management plan within three years (D7 in Annex I).

The area is managed trough the regulation of the reserve formulated by the management body, approved by the Reserve Commission and enforce by a ordinance of the Coast Guard of Brindisi.(attached).

The Management Consortium of Torre Guaceto has approved the management plan of the Site of Communitary Interest (MP) (Dir. 92/43 EC) "Torre Guaceto Macchia San Giovanni" code IT9140005 (attached); The document has been sent to the Ministry of Environment for its approval.

8.2.2. Formulation and approval of the Management Plan

Mention how the MP was formulated, e.g. by an expert team and/or under consultation and/or participation with other institutions or stakeholders. State the legal status of the MP, whether it is officialized, and how, and if it is binding for other institutions and sectors involved in the area.

The MP has been formulated according to the guide lines of Ministerial Decree 03 09 2002 "Management SCI guide lines"

The MP has been formulated by an expert team with the participation of institutions and stakeholders.

8.2.3. Contents and application of the Management Plan

State the degree of detail in the MP by entering YES or NO in the following list of potential contents, and assess the degree of implementation of the MP by using the 0-1-2-3 score on the right hand side:

	Existing in MP	Degree of application
Detailed management objectives	YES	3
Zoning	YES	3
Regulations for each zone	YES	3
Governing body(ies)	YES	3
Management programmes as:		
Administration	YES	3
Protection	YES	3
Natural resource management	YES	3
Tourism and Visitation	YES	2
Education and Training	YES	2
Research and Monitoring	YES	3
Services and Concessions	YES	2
Fund raising activities	YES	3
Periodic revisions of the MP	YES	2

8.3 PROTECTION MEASURES

By Art. 6 of the Protocol the Parties agree to take all the necessary protection measures required for the conservation of the area, particularly the strengthening the application of the other Protocols to the Convention, and through the regulation of any other activity likely to harm the natural or cultural value of the area, such as economic, recreation or research activities. As per Section D2 in Annex I, the protection measures must be adequate to the site objectives in the short and long term, and take in particular into account the threats upon it.

8.3.1. Boundaries and signing

Briefly, state if the boundaries of the area and its zones are adequately marked in the field, both on land, in the sea, and at the principal points of access.

The boundaries of the area and its zones are adequately marked in the land with signs, in the sea with buoys; The signs are also present in the main street of access to the area, in the airport of Brindisi and in the harbour of Bari.

8.3.2. Institutional Collaboration

Name the different national and local institutions or organisations with legal responsibilities or involved in the protection and surveillance of land and sea zones, and any measures or mechanisms through which their co-ordination is pursued.

The National Forestry Guard has the responsibility of the surveillance of the protected land; the Municipality Police of Brindisi and Carovigno has also the responsibility of the surveillance of the protected land; the National Coast Guard has the responsibility for the surveillance of the protected sea zones; the Regional Agency for Environmental Protection has the responsibility for the environmental monitoring protection.

The Management Consortium of Torre Guaceto each year organized a meeting for the coordination of protection and surveillance measures.

8.3.3. Surveillance

Consider the adequacy of the existing protection means (human and material), and your present ability to survey land and sea uses and accesses

The management body of Torre Guaceto integrate the activity of surveillance of the national and local institutions with own personnel (five units).

The Torre Guaceto MPA has two rubber boats and one jeep for the surveillance and the protection of the area. The Management body has also a boat to collect floating rubbish and debris.

The adequacy of the surveillance and protection is very high, this is demonstrated by international scientific publication.

8.3.4. Enforcement

Briefly, consider the adequacy of existing penalties and powers for effective enforcement of regulations, whether the existing sanctions can be considered sufficient to dissuade infractions, and if the field staff is empowered to impose sanctions.

The existing penalties are adequate and they are sufficient to dissuade infractions, the field staff is not empowered to impose sanctions, but in the next months the Province of Brindisi will organize a course for Volunteer Ecological Guard.

The personnel of MPA Torre Guaceto will attend this course, at the end of the course the field staff will be empowered to impose sanctions.

Consorzio di Gestione di
Torre Guaceto
Area Marina Protetta • Riserva Naturale dello Stato

Direzione Protezione della Natura

CoNISMa
Consorzio Nazionale Interuniversitario per le Scienze del Mare

9 AVAILABLE RESOURCES

9.1HUMAN RESOURCES (Art. 7.2.f in the Protocol)

9.1.1. Available staff

Assess the adequacy of the human resources available to the management body, in number of employees and training level, both in central headquarters and in the field. Indicate if there are staff training programmes.

11 members are involved with the following functions: Director, environmental responsible, administrative responsible, public relationship responsible, administrative secretary, field staff.

Some consultants are involved in monitory activities.

9.1.2. Permanent field staff

Answer YES or NO on the current existence of the following FIELD staff categories. If YES, enter the number of staff either permanent or part-time in that category, and evaluate on a 0-1-2-3 score (0 is low, 3 is high) the adequacy of their training level.

	YES/NO	NUMBER Permanent/Part-time	ADEQUACY OF TRAINING LEVEL
Field Administrator	YES	1	3
Field Experts (scientific monitoring)	YES	4	3
	YES	5	3
Field Technicians (maintenance, etc)	YES	5	2
	YES	2	2
Wardens	YES	4	3
Of which marine wardens	NO		
Guides			
Other			

9.1.3. Additional Support

Briefly, describe if the area currently has the advantage of other external human resources in support of its objectives, either from other national or local institutions, volunteer programmes, non-governmental organisations, academic or international organisations. Mention if there are any significant changes in prospect for the near future.

The local unit of CONISMA (Inter-Universitary National Consortium of sea science) is involved in the monitory program and in a lot of research activities about the marine habitats of MPA.

There are many forming Agency which select students involved in many activities of the MPA.

9.2 FINANCIAL RESOURCES AND EQUIPMENT

By Art. 7 in the Protocol, the Parties agree to adopt measures or mechanisms to ensure the financing of the specially protected areas (Art.7.2.d), and the development of an appropriate infrastructure (Art.7.2.f). The General Principles para. ”e” in the Annex I call upon the Parties to provide the areas with adequate management means.

9.2.1. Present financial means

Note if the basic financing is ensured: a core funding for basic staff, protection and information measures. Who provides this core funding? Briefly assess the degree of adequacy of the present financial means for the area, either low, moderate, satisfactory; e.g. the implementation of the management plan, including protection, information, education, training and research.

The funding for the basic staff, protection and information measures are provided by the Environmental Ministry

These financial means aren't sufficient for the implementation of the management plan, including protection, information, education, training and research.

9.2.2. Expected or additional financial sources

Briefly describe any alternative sources of funding in use or planned, and the perspectives for long-term funding from national or other sources.

The Management Body provides funds adhering to Communitary Program (INTERREG, LIFE, LEADER), because of the insufficient funds given by the Environmental Ministry.

9.2.3. Basic infrastructure and equipment

Answer YES or NO to the following questions, and if YES, assess with a score of 1-2-3 (1 is low, 3 is high) the adequacy of the basic infrastructure and equipment.

	YES/NO	ADEQUACY
Office and/or laboratory in the field	YES	2
Signs on the main accesses	YES	2
Guard posts on the main accesses	NO	
Visitors information centre	YES	2
Self guided trails with signs	NO	
Terrestrial vehicles	YES	2
Marine vehicles	YES	2
Radio and communications	YES	1
Environmental awareness materials	YES	2
Capacity to respond to emergencies	YES	2
Comment on basic infrastructure and equipment		

9.3 INFORMATION AND KNOWLEDGE

By Section D3 of Annex I, the Parties agree that the planning, protection and management of a SPAMI must be based on an adequate knowledge of the elements of the natural environment and of socio-economic and cultural factors that characterize each area. In case of shortcomings in basic knowledge, an area proposed for inclusion in the SPAMI List must have a programme for the collection on the unavailable data and information.

9.3.1. State of knowledge

a) Assess the general state of knowledge of the area. 3

b) Briefly describe the extent of knowledge of the area, considering at least specific maps, main ecological processes, habitat distribution, inventories of species and socio-economic factors, such as artisan fishing.

The knowledge of the AMP is high, considering the main ecological processes, habitat distribution, inventories of species and socio-economic factors the AMP. This is due to the numerous research programme that have been realized, with the production of the biocenotic map.

9.3.2. Data collection

Describe and assess the adequacy of any programme and activities to collect data in the area.

The Management Body with the collaboration of the University of Lecce and Inter-Universitary National Consortium of Sea Science is carrying out many studies about marine biodiversity; particularly, attention is given to the structure and dynamics of benthic communities to evaluate the protection effect.

The structure and abundance of fish populations are recorded periodically too, and the spill over effect evaluated.

The main physical and chemical parameters of the water column are checked periodically (see monitoring)

9.3.3. Monitoring programme

Section D8 in Annex I states that to be included in the SPAMI List, an area will have to be endowed with a monitoring programme having a certain number of significant parameters, in order to allow the assessment of the state and trends of the area, as well as the effectiveness and protection and management measures, so that they may be adapted if need be (indicators may, for instance, supply information about species status, condition of the ecosystem, land-use changes, extraction of natural resources -sand, water, game, fish-, visiting, adherence to the provisions of the management plan, etc.).

a) Is there a monitoring programme?	YES
b) If NO, are there plans to start one, and when?	
c) If YES, assess as low, medium, satisfactory, its adequacy and present level of development.	The adequacy of the MP is satisfactory.

d) If YES, who is/are carrying out the monitoring programme?

The monitoring programme is carrying out by the field staff, consultants and University Departement.

e) If YES, briefly describe how the monitoring programme will be used in reviewing the management plan.

If the MP will point out some mistakes about the management plan and action plans, the Management body will modify the Management Plan.

10. Other information, if any

11. CONTACT ADDRESSES

(name(s), position(s) and contact address(es) of the person(s) in charge with the proposal and that compiled the report)

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12. SIGNATURE(S) ON BEHALF OF THE STATE(S) PARTY/PARTIES MAKING THE PROPOSAL

13. DATE

AREA MARINA PROTETTA TAVOLARA PUNTA CODA CAVALLO

Direzione Protezione della Natura

CoNISMa Consorzio Nazionale Interuniversitario per le Scienze del Mare

ANNOTATED FORMAT FOR THE PRESENTATION REPORTS FOR THE AREAS PROPOSED FOR INCLUSION IN THE SPAMI LIST

MPA “TAVOLARA-PUNTA CODA CAVALLO”

Index:

FOR MORE INFORMATION, PLEASE CONTACT:

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1. AREA IDENTIFICATION

1.1 COUNTRY/COUNTRIES (in the case of transboundary areas)

Italy

1.2 ADMINISTRATIVE PROVINCE OR REGION

Region: Sardinia
Province: Olbia - Tempio Pausania

1.3 NAME OF THE AREA

Tavolara–Punta Coda Cavallo Marine Protected Area

1.4 GEOGRAPHIC LOCATION

Describe its geographical boundaries, e.g. rivers, roads, geographical or administrative boundaries (do not describe the co-ordinates here; please make a separate annex with a map and a description of geographical co-ordinates as stated in the legal declaration of the area).

Tavolara–Punta Coda Cavallo Marine Protected Area is located in the North - Western cost of the Sardinia, in the South of Olbia Gulf, facing the Tyrrhenian Sea.

The MPA boundaries are delimitated by Ceraso Cape, in the North, and Finocchio Creek, in the South including the Islands present in this zone (i.e. Tavolara, Molara and Molarotto Rossa and Piana).

The local governments of Olbia, Lori (Porto S. Paolo) and S. Teodoro combine in Tavolara MPA.

1.5 SURFACE OF THE AREA (total)

15.091 ha

1.6. LENGTH OF THE MAIN COAST (Km)

~ 80 km (76.094 m)

2. EXECUTIVE SUMMARY (maximum 3 pages)

Tavolara MPA surface extends for 15.091 ha and includes 80 km of littoral coast.
The rectangular shape of Tavolara Island is strictly related to its geomorphologic development and to the constant action of the atmospheric agents.
The South part of the Island, named "Spalmatore di Terra", is characterised by an almost level rocky line that divides two different sides.
The Eastern side presents several pebbles inlets delimitated by granitic rocks. Instead the Western side forms a large sandy gulf that ends at the base of an high limestone cliff rich in conglomerates.
During the low tide a sandy bar emerges from the extreme south point of "Spalmatore di Terra" leading the Island to a big granitic clod from which depart the shallow sea bottoms reaching the Gallura coast.
The North – Western part of Tavolara Island, named "Spalmatore di Fuori", facing the open sea, is characterised by an hill whose base resembles a widen cone (Timone Point). This part is linked to the rest of the Island by an isthmus, few meters large, delimiting two inlets: Ponente's Creek (West side) and Levante's Creek (Est side).
Pink granular pegmatite constitutes the granitic basement of Tavolara Island. Pegmatite outcrops in correspondence of the North - South extremities of the Island and it constitutes the concave base on which the Mesozoic calcareous-dolomite stone lies.
The Island is surrounded by active cliffs incised in limestone and dolomites. Platforms of basal abrasion are also present and these are characterised by littoral karstification.
In the North – Eastern sector of the Island, more exposed to the wind and sea action, the frame of caves and littoral arches are interested by of backing processes.
The submerged bottoms are characterised by isolated relieves, such as the Pope's bank showing a pinnacle like shape. These relieves are interrupted by quartzes-feldspathic sandy covers and Triassic levelling surface, originated during the Jurassic marine transgression, constitutes the base of the carbonate succession of the Island.
In the southern part of the Island, at the depth of 50 – 60 meters, a discontinuity surface divides the granite rock from the carbonate one.
Differently Molara Island is characterised by a completely granitic rock composition directly connected to the granite basement of Tavolara Island and the Sardinia. Furthermore the granitic sea bottoms of Molara are marked by residuals paleoforms, such as *inselberg*, *thor*.
Molarotto, the little Island, emerges in the Olbia Gulf far from Tavolara and Molara It is 50 meters high and almost completely granitic, carachterised by a scarse vegetation.
Shallow submerged abrasion platforms, presenting several fractural canals, are located between Molarotto and Molara.
The coast between Ceraso Cape and S. Teodoro is rich in inlets and emerging rocks.
In the MPA are also present terrestrial habitat of primary importance for environmental conservation, such as San Teodoro.
The Islands and the coast, geomorphologically strongly different among them, favours the presence of different marine and terrestrial habitats.
In the territories of Tavolara MPA are present psammophillous and halophyte littoral areas (such as calcareous cliff with *Seseli bocconei*) associated to the garrigue and the thermoxerophile communities of siliceous and calcareous environment.
The terrestrial landscape is also characterised by *phryga* of *Centaurea horrida*, endemic of the Tavolara mountain and of Juniper matorral, such as *Juniperus phonicea*, tipical of Molara.

About 30 endemic plants species are present in Tavolara Island, some of these have their *locus classicus* in this Island, such as *Asplenuim petrarche*, others have an important phytogeographic value.
The Islands of Tavolara-Punta Coda Cavallo MPA are important Mediterranean breeding sites for migratory birds, such as for example Yelkouan Shearwater (*Puffinus yelkouan*) Cory's Shearwater (*Calonectris diomedea*), Shag (*Phalacrocorax aristotelis*), Audouin's Gull (*Larus adouinii*), Little Heron (*Egretta garzetta*).
Regarding the marine environment, the upper mediolittoral rock of Molara and Molarotto are characterised by the presence of belts colonized mainly by *Patella ferruginea* and *Lithophyllum byssoides*. The distribution of this last encrusting coralline algae is specially developed in the South – Western side of Tavolara, because of the presence of calcareous cliffs, and in the North – Western side of Molara, because of the wider exposition to the wave action (ENEA 1990).
In Tavolara Island, in the limestone sector, two perforator bivalves *Lithophaga lithophaga* and *Pholas dactylus* are commonly such as the Vermetid *Dendropoma petraeum* (Schiaparelli *et al.* 2003).
The wide Cloroficee algae phytocoenosis of the upper infralittoral rock, including *Caulerpa prolifera* and *Penicillus capitatus*, associated to sciophilous species, such as *Halimeda tuna* and *Flabellia spp.* probably developed after a regression process of the *Posidonia oceanica* meadow (Solazzi *et al*. 1984).
The mobile benthos has been studied during different periodic sampling activities focusing mainly on marine and saltish sandy interstial Crustacea species. Among these, particular attention has been focused on Copepods belonging to the Cylindropsyllidae, a Family adapted to the marine interstitial environments. Further the finding of a new *Ingolfiella* (Anfipoda, Crustacea) species has been recorded (Ruffo & Vigna Taglianti 1989).
At Tavolara Island a well structured *Posidonia oceanica* meadow extends in the lower infralittoral, up to the depth of about 30 meters, resulting discontinuous in the internal part of the inlets or in the submerged abrasion platform (ENEA 1990).
In the infralittoral and circalittoral rocky bottoms it is common to find various nudibranch species, such as *Cuthona ocellata* and *Cerberilla bernadettae*, the last one can be considered a relict species (Cattaneo *et al.* 1992), together with numerous colonies of *Eunicella singularis*, *Eunicella cavolinii* and *Paramuricea clavata* and, rarely, colonies of *Paramuricea macrospina* and *Gerardia savaglia* (Pais *et al.* 1992).
The fish fauna is characterised by an important biodiversity at the Species level specially in proximity of *Posidonia oceanica* meadow during the night and the winter. The more common Families belong to Pomacentrids, Scorpenids, Labrids and Sparids (Pais *et al.* 1999).
In Tavolara MPA is commonly present *Epinephelus marginatus* with individuals of different size (Pais *et al.* 1999).
The visual census performed on the fish fauna has allowed to estimate the densities and the size / frequency of same *target* species of the recreational and professional fishery (i.e. *Epinephelus marginatus*, *Sciaena umbra*, *Diplodus sargus*).

The results indicated marked differences among zone A *vs* B, C zones and the area outside the MPA. In fact, higher densities and individual of larger size have been recorded in the zone A despite the other sites. Further, *S. umbra*, in some sites outside the MPA, is not present.
In Tavolara MPA is marked the presence of *Tursiops truncatus*, *Grampus griseus* and *Balenoptera physalus* even if in lower densities than others sectors of the North Sardinia.

Cattaneo-Vietti R., Chemello R., Trainito E., 1992. An account on the Opisthobranchs of North Eastern Sardinia with a record of *Cerberilla bernadettae* Tardy, 1965 (Nudibranchia; Aeolidiina). *Lavori S.I.M.* 24: 61-68

Cottarelli V., Venanzetti F., 1989. Ricerche zoologiche della nave oceanografica "Minerva" (C.N.R.) sulle isole circumsarde. II. Cylindropsyllidae del meiobenthos di Montecristo e delle isole circumsarde (Crustacea, Copepoda, Harpacticoida). *Ann. Mus. Civ. St. Nat. "G. Doria"*, Genova, 87: 183-235

Pais A., Chessa L. A., Serra S., Mura F., Ligios L., 1999. Ittiofauna di una prateria di *Posidonia oceanica* nella Riserva Marina di Tavolara- Capo Coda Cavallo (Sardegna nord- orientale). *Biol. Mar. Medit.* 6(1): 591-594

Pais A., Trainito E., Romor M., Conti P., 1992. Sulla presenza di *Gerardia savaglia* (Bertoloni, 1819) nelle acque dell'Isola di Tavolara (Sardegna nord-orientale). *Oebalia* 17: 377-378

Ruffo S., Vigna Taglianti A., 1989. Ricerche zoologiche della nave oceanografica "Minerva" (C.N.R.) sulle isole circumsarde. III. Description of a new cavernicolous Ingolfiella species from Sardinia, with remarks on the systematics of the genus (Crustacea, Amphipoda, Ingolfiellidae). *Ann. Mus. Civ. St. Nat. "G. Doria"*, Genova

Schiaparelli S., Guidetti P., Cattaneo-Vietti R., 2003. Can mineralogical features affect the distribution patterns of sessile gastropods? The Vermetidae case in the Mediterranean Sea. *J. Mar. Biol. Ass.* U.K. 83: 1267-1268

Solazzi A., Tolomio C., Marzocchi M., 1984. Segnalazione di una fitocenosi bentonica lungo le coste Nord-Orientali della Sardegna. *Atti Mem. Acc. Patavina Sci.*, Lett. ed Arti, XCVI (II):31-36

3. SITE DESCRIPTION

3.1 TYPOLOGY OF THE SITE

3.1.1. Terrestrial surface, excluding wetlands (ha):		400 ha
3.1.2. Wetland surface (ha):		190 ha
3.1.3. Marine surface (Sq. Km):	Marine internal waters	4.5 ha
	Territorial sea	1.500 ha
	High sea	Not applicable to the proposed area

3.2 MAIN PHYSICAL FEATURES

3.2.1. Geology/Geomorphology

Give a brief description of: (i) geological aspects (lithologic and tectonics); (ii) processes of sedimentation and erosion observable in the area; (iii) coastal geomorphology and (iv) island system. Indicate bibliographical sources.

Tavolara MPA territory, widely diversified, is characterised by the presence of pink granite, connected to the plutonian granitic of the Gallura, sandy littoral quartzes - felsphatic and calcareous – dolomitic relieves, concentrated in Tavolara Island. The limestone of Tavolara rests on a granitic basement, made of pink granular pegmatite, characterised by a surface completely levelled by the atmospheric agents about 225 M years ago.

The coast of the MPA is characterised the alternation of small, isolated inlets and long falcate beaches among high promontories. Along the coast dunes and hind - dunes are also present. Here the actives riverbeds, of the Padrongiano, Lutturai, San Teodoro rivers, together with the sea connection channel create salt - marshes and littoral lagoons.

This environment characterise Ceraso Cape beach, the salt marsh of Istana, Ponto of the Taverna and Brandinchi Creek, the sandy beach and the lagoon of Porto San Paolo, the sandy beach of Cinta and the lagoon of San Teodoro.

Along the coast granitic cliffs, such as Ceraso Cape, Molara Point, Coda Cavallo Point Also, break these landscape.

Molara Island and the small Islands present the typical granitic morphology relieves: isolated block of different irregular shape exposed to erosion phenomenon.

The submerged geomorphologic environment of Tavolara MPA

Tavolara MPA marine and terrestrial environmental are among the most diversified of the Sardinian Region. The landscape is important as the natural environment and similarly needs to be protected

Geomorphology of the continental platform

The continental platform extends for about 10 miles; the convexity of its hedge, usually not marked, is site of spread sediment, except in correspondence of two canyon heads: Molara in the North and Posada in the South.

In the external platform the Holocene sedimentation is scarce allowing the outcrop of shore lines, such as *beach rock*, developing for several kilometers at different depth, up to –120 m.

The internal coastal platform shows characters strictly related to the structure of the emerged sector.

The submerged cliff

Tavolara Island is surrounded by active cliff incised in the limestone and dolomite. In the Southern part of the Island the cliffs are more than 200 meters high while, in the North part, they are moderately high and steep. In the Northern and Eastern side the cliff is partially buried by wide detrital table of *eboulis ordonnès tardo-wurmiane*.

The Southern submerged cliff is instead reach the depth of 25 meter extending up to 5 km.

The basement of the submerged cliff is usually covered by sub - angular collapsed stone blocks over ten meters high.

The granitic bottoms

Active abrasion platforms, incised in granite rock, edge regularly the coast. The continuity of the rocky outcrops is interrupted in the submerged beach by sandy quartos – feldsphatic covers designing modest inlets.

The beach-rock

Fossil littoral bar cemented in *facies* of *beach-rock* are present in the marine bottoms of the Spurlatta Gulf. Four order of *beach-rock* can be recognised at different depths (–40, –25, –5 e –0,5 meters). The deeper fossil beach result to be most complete, in fact, the others present a series of orthogonal fracture. Evidence of the undermining processes are detectable in the bends proxy to coast.

Sediments

Quartzes – feldsphatic sand characterises the submerged beaches among the coast and the frame of the rocky platform.

In the submerged beaches have been found ripple or megaripple structure modelled by the drift.

In the Porto Taverna Bay and Cinta of S. Teodoro littoral bar are organised in two symmetric order oriented to South.

Under the lower limit of the *Posidonia oceanica* meadow (– 30; – 40 meters) are present bioclastic sediment level. In proximity to this limit the organogenic component is mainly composed by bryozoa, foraminifers and other organisms of carbonate skeleton coming from the meadow.

Evolution

In the submerged beaches active erosion processes are detachable because of the scarce presence of sediments, such processes are linkable to the human impact (tourist harbour, anchoring, draw fish). The alteration caused by the human activities influence also the distribution of *Posidonia oceanica* meadows, with detrimental effects on the deeper sedimentation dynamics.

3.2.2. Other interesting physical features: Such as hydrodynamics, volcanic formations, caves, underwater formations, etc.

Tavolara – Punta Coda Cavallo MPA is located in the Eastern sector of the central-Northern Tyrrhenian Sea. This MPA shares with the Tyrrhenian Sea the typical stratification of the water column, characterised by Atlantic water (MAW – *Modified Atlantic Water*) in the surface, Levantine water (LIW – *Levantine Intermediate Water*) in the middle and Thyrrenian water in the depth (TDW – *Tyrrhenian Deep Water*). It has been hypothesised that this stratification can originate in proximity of the North – Western coast of Sardinia.
In the Northern and central part of the basin the circulation is organised in cyclonic and anticyclonic structures. The MPA is located in proximity of the most important structure of the basin, that the Eastern winds canalise in the Bonifacio' Strait. This structure consists of a cyclonic vortex (NTC – *North Tyrrhenian Cyclone*), its form and disposition vary according to the variability of the water flux direct to North.
During the winter season, when the thermal gradient between the Ligurian Sea and the Tyrrhenian Sea grows, the direct flux to North increase pushing the vortex to drawn in to the Bonifacio' Strait, resulting to be oriented to South and confined in the Eastern part of the Thyrrenian Sea.
During the summer the NTC is confined to the North of the Strait presenting internal vortexes and smaller structures.
An anticyclone vortex of about 100 km is presents in the South, less stable that the previous one but able to influence the waters dynamics of Tavolara MPA.
The information regarding the water movements inside the MPA are scarce, the actual knowledge are related to the Northern part of the MPA.
Outside the MPA the water stream presents a S – SE direction interrupted by Tavolara Island so to originate an anticyclonic circulation. In case of Western winds this anticycolnic vortex laps the trait between Timone Point and Aranci Gulf, while in case of Easter winds it laps the area between Ceraso Cape and Timone Point.
The stream speed is strongly influenced by the depth of the marine bottoms, in the surface the maximum value recorded is of 25 cm/s.

3.2.3. Length of beaches (in Km), including islands:

a) Length of sandy beaches:	11.531 km
b) Length of pebble or stony beaches:	0.314 km
c) Length, height and depth of active sand-dunes:	

3.3 FRESHWATER INPUTS

3.3.1. Mean annual precipitation (in mm)

Data regarding the annual precipitation of the area are recorded by SAR (Agro-meteorological Sardinian Service) and by the Airport Service of Olbia and such data are available paying.

Data regarding the precipitation recorded by the thermo-pluvial-metric stations of the Hydrographic Statal Service, dislocated on Monte Mario littoral hill 15 m high (Lat. N 40° 55', Long. W 002° 57'), are available for the periods 1921-70 and 1977-86.

The climate of the Northern part of Sardinia is affected by its geographical position, exposition to the wind of the IV quarter and to the air mass coming form Africa.

Hence the precipitations in this area are related to the cyclonic rains, determined by the central – Western Europe baric pressures and they are irregularly distributed during the seasons.

3.3.2. Main water courses (permanent and seasonal)

The rivers Padrongiano, Lutturai, San Teodoro create salt marshes and littoral lagoons nearby the MPA boundaries.
A little seasonal source is present in Molara Island.

3.3.3. Estuarine areas: Existence and brief description

An estuarine area is present in correspondence of the San Teodoro salt marsh. The sandy bar forming the dunes, limiting the salt marsh, is characterised by sandy shores, with scarce or pioneer vegetation (Cakiletea) and by dunes with fragmented associations of *Agropyron* and *Ammophilion*.

The most peculiar aspect are the vascular vegetation of the salt marsh water (*Ruppia* spp.), the halophytic vegetation dominated by Chenopodiacee and the *Juncus* spp. dune communities (*Juncus acutus* and *Juncus maritimus*)

The San Teodoro salt marsh will be embodied in the MPA boundaries in a short time.

3.3.4 Freshwater springs: Existence and brief description, including marine offsprings

Not applicable to the proposed area

3.4 BIOLOGICAL FEATURES (B2, Annex I)

3.4.1. Habitats: A brief description of dominant marine and terrestrial habitats, on the basis of the habitat classifications adopted within the framework of MAP (and their coverage in ha)

I. 2. 1 Biocenosis of supralittoral sands
I. 2. 1. 5. Facies of phanerogams which have been washed ashore (upper part)
II. 1. 1. 1. Association with halophytes
II. 3. 1. 1. Facies of banks of dead leaves of *P. oceanica* and other phanerogams
II. 4. 1. 3. Association with *Nemalion helminthoides* and *Rissoella verruculosa*
II. 4. 2. 1. Association with *Lithophyllum byssoides* (= entablature with *L. tortuosum*)
II. 4.2.10. Pools and lagoons sometimes associated with vermetids (infralittoral enclave)
II. 4. 3. 1. Association with *Phymatolithon lenormandii* and *Hildenbrandia rubra*
III. 2. 3. 3. Facies with *Loripes lacteus, Tapes* spp.
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. 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. 1. 2. Association with *Cystoseira amentacea (* var. *amentacea*, var. *stricta*, var. *spicata)*
III. 6. 1. 3. Facies with Vermetids
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. 20. Association with *Sargassum vulgare*
III. 6. 1. 25. Association with *Cystoseira compressa*
IV. 2. 2. 10. Facies with large Bryozoa
IV. 3. 1. Coralligenous biocenosis
IV. 3. 1. 1. Association with *Cystoseira zosteroides*
IV. 3. 1. 5. Association with *Sargassum* spp. (indigenous)
IV. 3. 1. 10. Facies with *Eunicella cavolinii*
IV. 3. 1. 11. Facies with *Eunicella singularis*
IV. 3. 1. 13. Facies with *Paramuricea clavata*
IV.3. 2. Semi-dark caves (also in enclave in upper stages)

Marine Plants & Algae			
Posidonia oceanica	C	T	R
Nanozostera noltii	C	E	R
Cystoseira amentacea var. stricta	C	E	R
Cystoseira zosteroides	C	E	R
Lithophyllum byssoides	C	E	R
Marine Invertebrates			
Aplysina sp. plur.	C	E	R
Axinella polypoides	C	E	R
Ircinia fetida (Sarcotragus spinosulus)	C	E	R
Ircinia(Sarcotragus) pipetta	C	E	R
Tethya sp. plur.	C	E	R
Gerardia savaglia	C	R	R
Asterina pancerii	C	E	R
Centrostephanus longispinus	C	E	R
Ophiodiaster ophidianus	C	E	R
Dendropoma petraeum	C	E	R
Lithophaga lithophaga	U	T	R
Luria lurida (= Cypraea lurida)	C	T	R
Mitra zonata	C	E	R
Patella ferruginea	U	T	R
Pholas dactylus	C	E	R
Pinna nobilis	C	T	R
Fish			
Cetorhinus maximus	C	T	
Hippocampus guttulatus	U	T	R
Hippocampus hippocampus	U	T	R
Mobula mobular	C	T	R
Amphibians and Reptiles			
Caretta caretta	C	T	M
Eretmochelys imbricata	U	T	M
Birds	C	T	M
Calonectris diomedea	C	T	M
Larus audouinii	U	T	M
Hydrobates pelagicus	C	T	M
Phalacrocorax aristotelis	C	T	M
Phalacrocorax pygmeus	C	T	M
Phoenicopterus ruber	C	T	M
Puffinus puffinus yelkouan (P. yelkouan)	C	T	R
Sterna albifrons	C	T	M
Sterna sandvicensis	O	T	M
Pandion haliaetus			
Mammals	U	T	M
Balaenoptera physalus	U	T	M
Delphinus delphis	O	T	M
Physeter catodon	O	T	M
Stenella coeruleoalba	O	T	R

Tursiops truncatus *Monachus monachus*	O	T	

3.4.3. Flora: Describe in a few sentences the main plant assemblages significant in the area.

The marine biocenosis of the lower mediolittoral rock present in Tavolara MPA are characterised by *Lithophyllum byssoides* bends, a coralline algae recognised also as "trottoir", associated with *Patella ferruginea*, the *Posidonia oceanica* meadows and the paleo -beaches or *beach rocks*.
The hard bottom to the depht of 40 meters are the most attractive for the SCUBA diving turists, an eco – sostenibile activity of high importance for the MPA. This bottoms are populated by photophilic communities developed according a light gradient. Brown, red and green algae create the base for the development of high biodiversity.
The terrestrial dominant habitats are the hind - dunes, the beaches, and the granite and carbonate cliffs.
The Tavolara MPA vegetation, similar to those of the limestone mountain of the Western Sardinia, is composed by 463 entities, belonging to 71 Families, 34 of these are endemic species. The naturalistic importance of these Island is mainly due to their florist peculiar vegetation.
Among the 34 endemic plants 7 create a particular biotope of high scientific interest. Tavolara is the *locus classicus*, that is the locality in which the plant has been described for the first time, this first sample, conserved in a herbarium, became the *typus* (the plant of reference).
The plant that have their *locus classicus* in Tavolara are:

Alyssum tavolara	Endemic species of Tavolara, it leaves on the limestone mountains of Oliena and Orgosolo, in the central part of Sardinia
Limonium hermaeum	Strictly calcicolous plant
Asperula deficiens	Endemic plant of Tavolara. This plant is very rare: it leaves only on the North Sardinia cliffs
Cephalaria mediterranea	Present on the calcarous cliff of Tavolara and of the central Western Sardinia
Campanula forsythii	Mountain plant. This plant is endemic central Western Sardinia and Tavolara limestone
Buphtalmum inuloides	Plant recorded for the first time on the cliff of Tavolara and then found also in Budelli Island, Testa Cape, Mortorio and Molara Island
Centaurea filiformis	This plant is endemic of the limestone of the central Western Sardinia form Figari Cape to Tavolara and M. Arbu of Seui. This plant is a rock plant usually located in area of not strong illumination, it is able to tolerate different high from the sea level reaching 1200 meters.
Centaurea horrida	Sardinian endemic plant distributed only in the Nurra (North – Western Sardinia) and in the Asinara and Tavolara Islands. This plant is the only protected form the Habitat Directive (92/43/CEE). Tavolara Island is the only site in which the *Centaurea filiformis* distribution touch the one of *Centaurea horrida*.

3.4.4. Fauna: Describe in a few sentences, which are the main fauna populations present in the area.

Marine fauna

The taxomic data obtained from the feasibility study (1990)on the MPA reveal that the area is mainly interested by a typical nephritic environment.

In Molara and Molarotto Islands, in the mesolittoral, *Patella ferruginea* is well distributed, while *Lithophaga lithophaga* and *Pholas dactylus* are particularly present in the North and East part of Tavolara in correspondence of the limestone formation. In contrast *Dendropoma petraeum* is more abundant on the granite rocks, confirming the important role of the bio-mineralogy in influencing the distribution of the marine benthos.

It is also well represented, among the benthos fauna, the big Mediterranean bivalve *Pinna nobilis*, protected according to the Habitat Directive (92/43 CEE; IV)

The Mollusca distribution, in particular that of the Opistobranch, reflects the Thyrrenian distribution, resembling that found for the Liguria Sea and the Naples Gulf. To remark is the presence of two Eolidi not common in the Mediterranean Sea: *Cuthona ocellata* and *Cerberilla bernadettae*.

Modest colonies of *Gerardia savaglia* are present in La Mandria point, in the circalittoral.

Regarding the fish fauna young *Epinephelus marginatus* individuals are common in the infralittoral while bigger individuals are mainly present in the circalittoral.

The bottoms of Pope's point (Tavolara) and Arresto Point (Molara) are rich in Gorgonians such as: *Paramuricea clavata*, *Eunicella cavolinii*, *Eunicella singularis* and *Eunicella verrucosa*.

In the submerged cliffs it is common to find different fishes such as moray (*Muraena helena*), conger (*Conger conger*) and several groupers (*Epinephelus marginatus*). During the spring season it is also possible to see *Seriola dumerili* and *Lichia glauca*, lipping to the coast, in particular to Molarotto, to hunt smaller coastal fishes.

Among the species protected by the Habitat Directive (92/43 CEE) it is possibile to find in Tavolara MPA *Centrostephanus longispinus* (the only species, among the Mediterranean sea urchin, belonging to the Family of Diadematids), *Scyllarides latus*, *Lithophaga lithophaga*

Birds

Some of the most common birds present in Tavolara MPA:

Phalacrocorax aristotelis	The most representative bird of the area
Puffinus yelkouan	Tavolara is the representative breeding site of this species, for this reason the MPA has been included among the area of international importance in the 1986 "Alghero Declaration"
Larus audounii	Molara Island represents an important breeding site of this species

In the cliffs it is also possible to find Peregrine (*Falco peregrinus*), Kestrel (*Falco tinnunculus*), Raven (*Corvus corax*) and the the Ospery (*Pandion haliaetus*), an occasional host of the coastal salt marsh.

The S. Teodoro salt marsh offers an ideal environment for the bird fauna, and among the most reprehensive species there is Greater Flamingo (*Phoenicopterus ruber*).

3.5. HUMAN POPULATION AND USE OF NATURAL RESOURCES

3.5.1 Human population

a) Inhabitants inside the area:

	Number	Date of data
Permanent	20.000	
Seasonal number (additional to permanent)	100.000	2006

Description of the population

Prof. Nicolini, University of Pisa, is working on the human population characterisation

Main human settlements and their populations

The main human settlements are Olbia and Loiri – Porto San Paolo.
For their populations see above.

3.5.2 Current human use and development

a) Briefly describe the current use of the area by subsistence, artisan, commercial and recreational fishing, hunting, tourism, agriculture and other economic sectors.

The area is interested by a season tourism, mainly composed by families and young people, less frequent a tourism linked to congresses. This flow of people supports the commercial activities, in particular that linked to Hotels. Hence restoration and location are the main employment sectors together with business activities and rearing while agriculture is not developed.

Regarding the diving activities 11 diving centre are in the MPA while 15 are outside the MPA but dive inside the MPA. There are about 16 diving spots, 8 are the more visited, for a total of 9429 SCUBA dives per year.

Only a small amount of the population is employed in the professional fishing, about 10 fisherman in the MPA territories. The recreative fish, instead, counts about 2000 fisherman per year.

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				
Subsistence	0 1 2 3	0 1 2 3	0 1 2 3	
Commercial, local	**1**	**2**	**10**	**NO**
Commercial, non-local	0 1 2 3	0 1 2 3	0 1 2 3	
Controlled recreational	0 1 2 3	0 1 2 3	0 1 2 3	
Un-controlled recreational	**3**	**3**	**2.000**	**YES**
Other	0 1 2 3	0 1 2 3	0 1 2 3	
TOURISM				
Regulated	**3**	**3**	**100.000**	**YES**
Unregulated	0 1 2	0 1 2	0 1 2	
Indicate the type of tourism	3	3	3	
FAMILIARE -.....	0 1 2	0 1 2	0 1 2	
GIOVANILE	3	3	3	
CONGRESSUALE -.....	**2**	**3**	0 1 2	
.	**3**	**3**	3	
.	**1**	**1**	0 1 2	
Tourism facilities	0 1 2	0 1 2	3	
	3	3	0 1 2	
	0 1 2	0 1 2	3	
	3	3	0 1 2	
	3	**3**	3	
			0 1 2	
			3	
			0 1 2	
			3	
FOREST PRODUCTS				
Subsistence	0 1 2 3	0 1 2 3		
Non-timber commercial, local	0 1 2 3	0 1 2 3		
Non-timber commercial, non-local	0 1 2 3	0 1 2 3		
Timber commercial, local	0 1 2 3	0 1 2 3		
Timber commercial, non-local	0 1 2 3	0 1 2 3		
Agriculture	0 1 2 3	0 1 2 3		
Stockbreeding	**1**	0		
Aquaculture	**2**	**1**	6	
EXTENSIVE STOCK GRAZING				
Subsistence	**1**	**1**		
Commercial, local	0 1 2 3	0 1 2 3		
Commercial, non-local	0 1 2 3	0 1 2 3		
OTHER ACTIVITIES				
Edilizia	**3**	**3**		

3.5.3. Traditional economic or subsistence uses

Name any environmentally sound traditional activities integrated with nature, which support the well being of the local population. E.g. land, water use, target species, if closed seasons or closed zones are used as management techniques.

The Olbia Gulf is characterised by a traditional mussel farmer, while in the S. Teodoro salt marsh is present a Mugilids farmer. Both the activities are typical of the Region and part of the economical reality.

4 MEDITERRANEAN IMPORTANCE OF THE SITE

This Section aims at stressing the importance of the site for conservation at the regional or global scales, as set in Art. 8 para. 2 of the Protocol and B2-a, B2-b and B2-c in Annex I.

4.1 PRESENCE OF ECOSYSTEMS/HABITATS SPECIFIC TO THE MEDITERRANEAN REGION

Name the type of habitats considered of Mediterranean specificity, on the basis of the habitat classifications adopted within the framework of MAP, and their estimated cover (Ha).

II. 3. 1. 1. Facies of banks of dead leaves of *P. oceanica* and other phanerogams
II. 4. 1. 3. Association with *Nemalion helminthoides* and *Rissoella Verruculosa*
II. 4. 2. 1. Association with *Lithophyllum byssoide*
II. 4.2.10. Pools and lagoons sometimes associated with vermetids (infralittoral enclave)
II. 4. 3. 1. Association with *Phymatolithon lenormandii* and *Hildenbrandia rubra*
III. 2. 3. 3. Facies with *Loripes lacteus*, *Tapes* spp.
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. 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. 1. 2. Association with *Cystoseira amentacea (* var. *amentacea*, var. *stricta*, var. *spicata)*
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. 20. Association with *Sargassum vulgare*
III. 6. 1. 25. Association with *Cystoseira compressa*
IV. 2. 2. 10. Facies with large Bryozoa
IV.3.1. Biocenosi del coralligeno
IV. 3. 1. Coralligenous biocenosis
IV. 3. 1. 1. Association with *Cystoseira zosteroides*
IV. 3. 1. 5. Association with *Sargassum* spp. (indigenous)
IV. 3. 1. 10. Facies with *Eunicella cavolinii*
IV. 3. 1. 11. Facies with *Eunicella singularis*
IV. 3. 1. 13. Facies with *Paramuricea clavata*

4.1PRESENCE OF HABITATS THAT ARE CRITICAL TO ENDANGERED, THREATENED OR ENDEMIC SPECIES

A critical habitat is an area essential to the conservation of the species concerned. These species should be those included in Annex II of the Protocol. E.g. Islets and sea stacks, as small islands in the sea or in large bodies of water, mostly important for water-bird colonies; caves appropriate for monk seals; undisturbed sand beaches where marine turtle nesting occurs; coastal lagoons where threatened fish or bird species feed or breed; tidal flats, coastal or benthic substrates important for marine invertebrates, etc.

Name the habitat types and the species linked to it.

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

Terrestrial habitats
Biocenosis of supralittoral sands: dunes
Sandy beaches: *Phalacrocorax aristotelis desmarestii*, *Puffinus puffinus yelkouan* and *Larus audouinii*

4.3 OTHER RELEVANT FEATURES (Art. 8 paragraph 2 in the Protocol)

4.3.1. Educational Interest (B-3 in Annex I)

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

The MPA collaborates with the Institute of Marine Civilities (I.CI.MAR.) of S. Teodoro.
In the Sea Museum, inside the Institute, it is possible to visit the archaeological founds and the historical steps of the Gallura civility.
Further the MPA collaborates also with the Centre for the Recovery of Marine Mammals (CRiMM).
The main objective of the centre is to update the information about marine mammals present in the MPA, to awaken the public, to start activities of environmental information and to help the MPA in the recovery of the mammals.
In the Centre has been also created an Info Point to distribute information about the MPA and its rules.
Further a new Centre, Sea Turtles and Cetaceans First Rescue Centre, sponsored by the MPA, has been open to allow the recovery and the protection of the sea turtles and marine mammals from the threatened caused by fishery and boat navigation.
All these projects are part of the main objective of the MPA Management Body, that is the protection of biodiversity and the conservation of the marine environment.
For these reasons the MPA has decided to promote its participation to the Count Down 2010. This is a project, in which take part also the World's Governments, and its objective is to obtain in the 2010 a reduction in the loss of the global biodiversity and a reduction of the global poverty.

4.3.2. Scientific Interest (B-3 in Annex I)

Explain if the site represents a particular value for research in the field of natural or heritage sciences.

In Tavolara MPA there are different aspects of scientific interest. First of all the particular geology, mainly of Tavolara. The rocky composition and disposition has favoured the development of several endemic plants species of Mediterranean interest.
Regarding the marine environment several *beach rocks* formation are present at different depth in the MPA. Other important scientific site are the lagoon, the salt marshes and the dunes.
Further Tavolara MPA is object of several studies focused on evaluate the human impact inside and outside the protected area, such as the impact of the fishery on the fish fauna.

4.3.3. Aesthetic Interest (B-3 in Annex I)

Name and briefly describe any outstanding natural features, landscapes or seascapes.

The principal aesthetic aspect is linked to the particular conformation of the granitic cliffs of the MPA and to suggestive shape of Tavolara.
Also appreciable are the dune and its typical vegetation.
While regarding the marine environment the Pope's bank is one of the most appreciate diving point in the Mediterranean Sea for its high biodiversity, colours (such as the bicolour sea fans) and fish fauna.

4.3.4. Main cultural features

Indicate if the area has a high representative value with respect to the cultural heritage, due to the existence of environmentally sound traditional activities integrated with nature which support the well-being of local populations.

In Molara are present the rests of the medieval village of Gurgurai.
In the same Island in 235 d.C.the Imperator Massimo Trace exiled the Pope Ponziano and the anti Pope Ippolito, the ruin of Church's Creek are the historical heritage of this event.

Tavolara is considered a site of industrial archaeology because of the presence of lime furnaces of the 1800.

Every year during the month of July Tavolara is the set of the "Italian Cinema Festival of Tavolara", an important Italian cinematographic event.

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 (sand, water and mineral exploitation, wood gathering, fishing, grazing...) 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.

The main exploitation activity of natural resources is represented by the fishery. In the Tavolara MPA operate a fishery fleet composed of 22 boats with 31 fisherman.
In the MPA are used very selective tools, such as trammel net (86,4%).
The fisherman that operate in the area have declared to perceived the protection effect exercised by the MPA on the fish fauna, in fact, 96% of them fish inside the MPA, in the respect of the MPA rules.

5.1.2. Threats to habitats and species

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

The high human pressure during the summer and the related production of solid waste are the higher threatened to the environment of the Island. Hence, nowadays the MPA Management Body is focusing its effort in reducing and better organizing the management of the wastes.

Further threatens for the MPA are represented by the building of new structure to host the summer tourism but specially by the detrimental abusive building industry in San Teodoro and in Porto San Paolo. Such unregulated activities can modify the natural environment causing a loss in biodiversity.

The marine fauna results to be primary threatened during the summer because of the traffic of yachts. For example several studies have demonstrated how the noise generated by the navigation, over the limits suggested by the MPA rules, can affect the natural behaviour of Cetaceans.

In 2003, after the discovery of *Caulerpa taxifolia* at “Spalmatore di Terra” (Tavolara), a monitoring program of this invasive species has been started. Hence this algae has been manually removed according to the French scientific community principles. In fact, these principles suggest immediate solutions whether *Caulerpa taxifolia* is present near important naturalistic area.

5.1.3. Demand by an increased population and infrastructures

Assess whether the current human presence or an expected increase in frequentation (tourism, passage of vehicles and boats) and any human immigration into the area, or plans to build infrastructures, are considered a threat.

The constant grow, during the years, of the summer population has caused an enlargement of the building industry pressure that could affect some natural particular habitats (see also 5.1.2.)

5.1.4. Historic and current conflicts

Make a brief statement of any historic or current conflicts between users or user groups.

No remarkable conflicts are present inside the MPA. While an historical completion due to the fishing activities is present between the municipal districts of the MPA and Aranci Gulf fishery fleet.

5.2. IMPACTS AND ACTIVITIES AROUND THE SITE

In Art.7.2-e the Protocol calls for the regulation of activities compatible with the objectives for which a SPA was declared, such as those likely to harm or disturb species or ecosystems (Art.6.h), while Section B4 in Annex I asks to consider “the existence of threats likely to impair the ecological, biological, aesthetic or cultural value of the area” (B4-a in Annex I), recommending the existence, in the area and its surroundings, of opportunities for sustainable development (B4-d) and of an integrated coastal management plan (B4-e).

5.2.1. Pollution

Name any point and non-point sources of external pollution in nearby areas, including solid waste, and especially those affecting waters up-current.

There are some problems related to the management of human solids wastes during the summer season in the Islands even if a system of collection, named “spazza-mare”, is present.

Further the hygienic service on the Islands are not adequate to the human pressure.

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, increase of human presence, significant impacts on landscapes and cultural values, pollution problems, any sectorial development plans and proposed projects, etc.), likely to influence the area in question.

During the summer season in the salt marshes, nearby the MPA, there can be natural problems due to eutrophication that can cause problems of smell and irritation to the human population.

5.2.3. Sustainable development measures

Comment whether the area is covered by an integrated coastal management plan, or bordering upon a zone under such a plan. Are there other opportunities for sustainable development provided for in the neighbouring areas?

The objective of the Management Plan is to reach a sustainable use of the coast.
The program has identified the vulnerable points of the MPA and has designed the strategies of management to limit the impacts.
The model has been studied to be applied also to the area nearby the MPA.

6. EXPECTED DEVELOPMENT AND TRENDS[60]

The foreseeable development and trends of the site do not appear in the list of common criteria for the choice of protected marine and coastal areas that could be included in the SPAMI list, as established in the Protocol and its Annex I. Moreover, this is not always easy to assess and it is necessary to have knowledge about the site, which is not always available to all managers of protected areas; Thus, it is not obligatory to fill in the boxes in this Section 6.

On the other hand, the assessment of this foreseeable evolution and trends constitutes a dynamic supplement to the static knowledge of the site, as it appears in Sections 3, 4 and 5 above. Moreover, it is of significant importance for the definition of the objectives and the management plan of the site.

It thus appears desirable to bringing out the main outlines at least in respect to the following points:

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

Deal briefly in succession with:

- The demographic development in and around the site
- The development of economic activities (other than tourism and recreation) within the area
- The development of local demand on tourism and recreation
- The development of tourism pressure on the area

It is expected an increasing trend of the seasonal tourism.

The policy of the MPA Management Body is to enhance a sustainable tourism in the respect of the environment.

The general financial balance of the municipal districts in the MPA is growing in these last years.

6.2. POTENTIAL CONFLICTS IN THE AREA

Make a brief statement of potential use conflicts between the users or group of users of the site.

Among the different productive sectors are present some conflicts due to the scarce capability of the stakeholders to organise cooperation to distribute the different economic opportunities.

[60] 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.

6.3. EXPECTED DEVELOPMENT AND TRENDS OF THE NATURAL LAND ENVIRONMENT AND LANDSCAPES OF THE AREA: as expected arising from the evolution of the pressures

The expected development is focused on the application of the sustainable use of the natural resources.
Hence a sustainable system is linked to a reduction of the building industry activity, to an enhancement of the services and of the surveillance during the summer season.
In this contest the MPA Management Body operate to redistribute the tourism flow along the year promoting Eco – Tourism programs.

6.4. EXPECTED DEVELOPMENT AND TRENDS OF THE MARINE ENVIRONMENT AND SEASCAPES OF THE AREA: as expected arising from the evolution of the pressures

Applying the M.P. guide lines it is suited the development of a sustainable marine tourism. Such policy aims to reduce the human seasonal impact

The fishing and diving activities and their impact on the environment are monitored by the MPA Management Body.

7. PROTECTION REGIME

7.1 LEGAL STATUS (General Principles "e" and Section C-2 both in Annex I)

7.1.1. Historical background of the protection of the site

Identified as possible marine protected area in 1982 (Law no 979); Instituted as MPA in 1997 (D.M. 12.12.1997) (G.U. n. 47 del 26.02.1998); (modified in 2001 D.M. 28.11.2001) (G.U. del 19.02.2002)

7.1.2. Legal texts currently ruling the protection on the site
Enter the national conservation category, the dates and the present enforcement status of the legal instrument declaring the protection of the area. Consider both the land and the marine areas of the site. Include the full text(s) as an annex.

Harbour office Ordinance n° 34/2005 Annex to the format

7.1.3. Objectives (General Principles "a" and D-1 in Annex I)
Name in order of importance the objectives of the area as stated in its legal declaration.

The MPA policy is focused on the protection of the marine and coastal environments, together with the promotion of scientific research, educative and cultural activities and a sustainable tourism. Hence the main objective of the Management Body is to conserve and preserve the natural environment also considering the economics trends of the area. The MPA represents an opportunity for creating a tourism focused on the environment, historic, architecture and gastronomic.

7.1.4. Indicate whether the national protection regime arises from international treaties enforced or from implementation measures of treaties (Art. 6.a in the Protocol).

Not applicable to the proposed area

7.2 INTERNATIONAL STATUS

7.2.1. Transboundary or high seas areas

Complete this section only if the area is transboundary, totally or partially in the high sea, or within areas where the limits of national sovereignty or jurisdiction have not yet been defined. In this case, mention the modalities of the consultation (Art. 9 para. 3A in the Protocol and General Principles "d" in Annex I).

The Tavolara-Punta Coda Cavallo is not a transboundary area

7.2.2. International category

Mention if the area, or part of it, has been designated and on what date, with an international conservation category (e.g. Specially Protected Area, Biosphere Reserve, Ramsar Site, World Heritage Site, European Diploma, Natura 2000, Emerald network, etc.).

Not applicable to the proposed area

7.3 PREVIOUS LEGAL BACKGROUND AND LAND TENURE ISSUES

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. Describe the land tenure regimes within the area, and append a map if existing.

Not applicable to the proposed area

7.4 LEGAL PROVISIONS FOR MANAGEMENT (Section D-1 in Annex I)

7.4.1. Zoning

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 in both land and sea, fishing zones, visitation, gathering, restoration zones etc) and in this case the surface area in ha of these zones. Include a map as an annex

The delimitation of the MPA Tavolara as well as its division into the areas A, B and C are established by the Decree issued by the Department of the Environment (D.M. 12.12.1997), enclosing cartography (G.U. n. 47 del 26.02.1998);

Yellow buoys delimit the different zones.

Tavolara MPA is divided in three zones, according to the different protection regime:

A zone (no entry-no take zone) includes two site one in Tavolara and the other one in Molarotto Island. In Tavolara Island the boundaries of the no take zone are: the Southern point of Levante's Creek, the Pope's Point, the South-Est side of Passo Malo Point. Molarotto Island no take zone corresponds to the pentagonal area around the Island.

B zone, general reserve and zone C partial reserve.

For further information relative to the extension and the coordinate points of the zone see the MPA attached map and Ordinance no 34/2005

7.4.2. Basic regulations

Mention the provisions, which apply to the area concerning the implementation of Article 6 of the Protocol (paragraphs a to i), Section D5 (a to d) in the Annex I and Article 17 of the Protocol.

Zone A: no take zone. In the no take zone are allowed the scientific research activities and SCUBA diving (along fixed way) asking previously the permission to the Management Body.

Zone B: general reserve. In this area are allowed sailing up to the limit of 10 kns, regulated SCUBA diving activities, bathing and mooring, those only in special structure created by the Management Body. Not destructive selective fishing is allowed to the fisherman that live in the municipal boundaries of the MPA, the fish total amount is decided from the MPA Management. Trawl-net and not professional fish are not admitted.

Zone C: partial reserve. In this area are allowed sailing, regulated mooring, SCUBA diving, not destructive selective fishing to the fisherman that live in the municipal boundaries of the MPA and recreational fishing line.

7.4.3. Legal competencies

Section D4 in Annex I states that the competence and responsibility with regard to administration and implementation of conservation measures for areas proposed for inclusion in the SPAMI List must be clearly defined in the texts governing each area. Additionally Art.7.4. of the Protocol calls for the provision of clear competencies and co-ordination between national land and sea authorities, with a view to ensuring the appropriate administration and management of the protected area as a whole. Mention in which way do the legal provisions clearly establish the institutional competencies and responsibilities for the administration and conservation of the area, and if being the case, their co-ordination means, including those between land and sea authorities.

The MPA Istitutive Decree constitutes the juridical tool of the management. It is applied to the sea area of the MPA and the terrestrial boundaries are marked by the State demesne competencies.
For a correct management of the MPA it is necessary a cooperation among the Management Body and local administration. To this aim the Management Body of Tavolara MPA has realised a Management Plan.

7.4.4. Other legal provisions

Describe any other relevant legal provisions, such as those requiring a management plan, the establishment of a local participation body, binding measures for other institutions or economic sectors present in the area, allocation of financial resources and tools, or any other significant measures concerning the protection and management of the area or its surrounding zones.

The Management Plan develops the MPA policy and includes the terrestrial management for the costal area afferents the MPA.
The Management tools are addressed to the local administrations and the Sardinia Region Government whether their are not of competence of the Environmental Ministry.
The Management Plan foresees activities in cooperation with the local economy, such as the local business activities, and with the voluntary associations.

8. MANAGEMENT

Through the General Principles, para. (e) in the Annex I, the Parties agree that the sites included in the SPAMI List are intended to have a value as examples and models for the protection of the natural heritage of the region. To this end, the Parties ensure that sites included in the List are provided with adequate legal status, protection measures and management methods and means.

8.1. INSTITUTIONAL LEVEL

8.1.1. Authority/Authorities responsible for the area

The Ministry Decree (D.M.12.12.1997, successively modified in with the D.M. 28.11.2001) recognises a Consortium of three littoral local administrations, i.e. Olbia, Loiri –S. Paolo and S. Teodoro, as Management Body. The Consortium is active since 1.1.2004.

8.1.2. Other participants in the management body
Such as other national or local institutions, as stated in Section D6 in Annex I.

The reserve commission is nominated by DEC/DPN no 606 (20.04.2004) and collaborates with the Management Body bringing proposes and suggestions
In particular the commission collaborates in the preparation of the Management Plan and it is active part in the MPA organisation, including the financial decisions, the annual program and the zoning.
The reserve commission is composed by:

a) President;
b) Two experts indicated by the Environmental Ministry;
c) A delegate of the naturalistic association;
d) A delegate of the Environmental Ministry;
e) Two delegates of the coastal local administration;
f) A delegate of the Sardinia Region;
g) A delegate of the economic and productive categories nominated by the Commercial Room for each Province
h) A delegate of the local director of education
i) A delegate of the environmental and cultural administration;
j) The Captain of the Harbour.

8.1.3. Participants in other committees or bodies

Such as a scientific committee, or a body of representatives from the local stakeholders, the public, the professional and non-governmental sectors, as in Sections B4-b and B4-c in Annex I.

- Scientific committee
- Diving Centre association
- Bathing operators consortium

a) Effectiveness of the co-ordination, where existing:

Satisfactory

b) Quality of involvement by the public, local communities, economic sectors, scientific community:

Satisfactory

8.2. MANAGEMENT PLAN (as set out in D7 of Annex I)

8.2.1. Management Plan

State if there is a management plan (MP) and in this case include the document as an annex. In the absence of a MP, mention if the main provisions governing the area and the main regulations for its protection are already in place and how (D7 in Annex I) and if the area will have a detailed management plan within three years (D7 in Annex I).

The Management Plant has been approved (21.12.2006) and it considers the ASPIM protocol (see also 7.4.4)

8.2.2. Formulation and approval of the Management Plan

Mention how the MP was formulated, e.g. by an expert team and/or under consultation and/or participation with other institutions or stakeholders. State the legal status of the MP, whether it is officialized, and how, and if it is binding for other institutions and sectors involved in the 60 area.

The M.P. has been formulated taking into account the guide line proposed by the Environmental Ministry, the Sardinia Region referring to the Habitat Directive 92/43 CEE and to the Bird Directive 79/409 CEE.
The M.P. is composed by the biological, geological, ecological, and socio – economical frames.
The analysis includes the ecological needs of habitats and species together with the clarification of the general management objectives
The M.P. represent the guide line for the activities of management also for the public and private authorities involved.

8.2.3. Contents and application of the Management Plan
State the degree of detail in the MP by entering YES or NO in the following list of potential contents, and assess the degree of implementation of the MP by using the 0-1-2-3 score on the right hand side:

	Existing in MP	Degree of application
Detailed management objectives	YES	3
Zoning	YES	3
Regulations for each zone	YES	3
Governing body(ies)	YES	3
Management programmes as:		
Administration	YES	
Protection	YES	3
Natural resource management	YES	3
		2
Tourism and Visitation	YES	
Education and Training	YES	3
Research and Monitoring	YES	3
Services and Concessions	YES	3
Fund raising activities	YES	3
Periodic revisions of the MP	YES	0
		2

8.3. PROTECTION MEASURES

By Art. 6 of the Protocol the Parties agree to take all the necessary protection measures required for the conservation of the area, particularly the strengthening the application of the other Protocols to the Convention, and through the regulation of any other activity likely to harm the natural or cultural value of the area, such as economic, recreation or research activities. As per Section D2 in Annex I, the protection measures must be adequate to the site objectives in the short and long term, and take in particular into account the threats upon it.

8.3.1. Boundaries and signing
Briefly, state if the boundaries of the area and its zones are adequately marked in the field, both on land, in the sea, and at the principal points of access.

The informative MPA advertise posters and directional signals are present along all the MPA coastal territory.

The no take zone is signalled by yellow buoys illuminated during the night.

8.3.2. Institutional Collaboration

Name the different national and local institutions or organisations with legal responsibilities or involved in the protection and surveillance of land and sea zones, and any measures or mechanisms through which their co-ordination is pursued.

The Harbour Office (Coast Guard) is involved in the surveillance. The management body cooperate also with Revenue Guard Corps and Forestall Corps.

8.3.3. Surveillance

Consider the adequacy of the existing protection means (human and material), and your present ability to survey land and sea uses and accesses

The surveillance service is present only during the summer period. The AMP is wide and the surveillance force should be enhanced.
The following MPA motorboats are used for the surveillance and rescue services: Mako 6.50 m, rubber boat 7.50m, Sciallino 10 m.

8.3.4. Enforcement

Briefly, consider the adequacy of existing penalties and powers for effective enforcement of regulations, whether the existing sanctions can be considered sufficient to dissuade infractions, and if the field staff is empowered to impose sanctions.

The existing penalties are adeguate to dissuade infractions.
The problem related to the surveillance is the impossibility of the MPA operators to sanction

9. AVAILABLE RESOURCES

9.1. HUMAN RESOURCES (Art. 7.2.f in the Protocol)

9.1.1. Available staff

Assess the adequacy of the human resources available to the management body, in number of employees and training level, both in central headquarters and in the field. Indicate if there are staff training programmes.

1. Dr. Augusto Navone – Director – full time

2. Dr. Pieraugusto Panzalis – Environmental office – full time

3. Dr. Franceso Piras – Administrative office - full time (local administration of Loiri Porto San Paolo)

4. Dr.ssa Ilaria Ruiu – Communication office - full time

5. Sig. Salvatore Vitale – full time

6. Sig.ra Graziella Dedola – Public relations office – full time

7. Rag. Nicola Saba – Financial services– part-time (Olbia)

8. Rag. Antonietta Niccoli – accountant – part-time (local administration of Olbia)

9. Dr.ssa Cardia Paola – Administrative office – part-time (local administration of Olbia)

10. Geom. Eugenio Lecca – Technical office – part-time (local administration of S.Teodoro)

11. Dr.ssa Bruna Fontana – Technical office – part-time (local administration of S.Teodoro)

12. Sig. Gian Franco Roglia – Administrative office – part-time (local administration of Olbia)

13. Geom. Marisa Pala – Technical office – full time

14. Sig. Stanislao Ledda – Administrative office – part-time

Periodical training program are actuated

9.1.2. Permanent field staff

Answer YES or NO on the current existence of the following FIELD staff categories. If YES, enter the number of staff either permanent or part-time in that category, and evaluate on a 0-1-2-3 score (0 is low, 3 is high) the adequacy of their training level.

	YES/NO	NUMBER Permanent/Part-time	ADEQUACY OF TRAINING LEVEL
Field Administrator	YES	10	3
Field Experts (scientific monitoring)	YES	4	3
Field Technicians (maintenance, etc)	YES	1	3
Wardens	NO		0 1 2 3
Of which marine	YES	1	3
wardens	YES	6	3
Guides		1	3
Other			

9.1.3. Additional Support

Briefly, describe if the area currently has the advantage of other external human resources in support of its objectives, either from other national or local institutions, volunteer programmes, non-governmental organisations, academic or international organisations. Mention if there are any significant changes in prospect for the near future.

The MPA is supported by the help of the volunteers of the Marine Mammals Research Centre. Further the MPA collaborates with the Universities of Cagliari, Sassari and Genoa for the scientific activities.

9.2. FINANCIAL RESOURCES AND EQUIPMENT

By Art. 7 in the Protocol, the Parties agree to adopt measures or mechanisms to ensure the financing of the specially protected areas (Art.7.2.d), and the development of an appropriate infrastructure (Art.7.2.f). The General Principles para. ”e” in the Annex I call upon the Parties to provide the areas with adequate management means.

9.2.1. Present financial means

Note if the basic financing is ensured: a core funding for basic staff, protection and information measures. Who provides this core funding? Briefly assess the degree of adequacy of the present financial means for the area, either low, moderate, satisfactory; e.g. the implementation of the management plan, including protection, information, education, training and research.

The MPA is annually financed by the Environmental Ministry and by the local administrations involved in the Management Body.
The financial budget is divided in three chapters: ordinary administration, intervention and investment.
The interventions and the investments are based on project defined *a priori* valuated yearly by the Environmental Ministry
The Management Body provides to cover the staff’s cost
The financial means are low especially those addressed to the staff, this situation penalise the MPA management.

9.2.2. Expected or additional financial sources

Briefly describe any alternative sources of funding in use or planned, and the perspectives for long-term funding from national or other sources.

The main alternative financing sources are European grants and Italian Ministry grants.
Actually the amounts allocated by these institutions amount to 3 Million Euro.
At the moment do no exist any long-term fundings from national or other sources.

9.2.3. Basic infrastructure and equipment
Answer YES or NO to the following questions, and if YES, assess with a score of 1-2-3 (1 is low, 3 is high) the adequacy of the basic infrastructure and equipment.

	YES/NO	ADEQUACY
Office and/or laboratory in the field	YES	2
Signs on the main accesses	YES	3
Guard posts on the main accesses	NO	0 1 2 3
Visitors information centre	YES	3
Self guided trails with signs	YES	2
Terrestrial vehicles	YES	3
Marine vehicles	YES	3
Radio and communications	YES	3
Environmental awareness materials	YES	3
Capacity to respond to emergencies	YES	2
Comment on basic infrastructure and equipment At the moment the MPA offices are in a rented building. The definitive MPA offices are in restoration.		

9.3. INFORMATION AND KNOWLEDGE

By Section D3 of Annex I, the Parties agree that the planning, protection and management of a SPAMI must be based on an adequate knowledge of the elements of the natural environment and of socio-economic and cultural factors that characterize each area. In case of shortcomings in basic knowledge, an area proposed for inclusion in the SPAMI List must have a programme for the collection on the unavailable data and information.

9.3.1. State of knowledge

a) Assess the general state of knowledge of the area.
stimare lo stato di conoscenza dell'area

			3

b) Briefly describe the extent of knowledge of the area, considering at least specific maps, main ecological processes, habitat distribution, inventories of species and socio-economic factors, such as artisan fishing.

In the ’60 and ’70 the scientific interested was focused mainly on the terrestrial environment. The bird fauna has been deeply studied by Schenk during the ‘80.
Same studies related to marine environment have been conducted between the ’60 and ’80.
Despite this the wide data regarding Tavolara MPA marine environment have been collected by ENEA during the feasibility research program realised prior the institution of the MPA.
As a result of this study different maps of the area have been produced, such as geomorphology of the sea bottoms, biocenoses of the sea bottoms, historic-architectonic and naturalistic emergencies, soil use and environmental detractors, emergencies values on multi-criteria hierarchical base.

Since then the scientific activities in the MPA are increasing. During the Afrodite project the protection effect on benthos and fish fauna has been evaluated with positive results.
The particular geology of Tavolara MPA has induced to study the effect of the biomineralogy on the benthos assemblages distribution.
Mapping programs have been focused on invasive species, such as *Caulerpa taxifolia*, and on marine plants, in particular *Posidonia oceanica*

9.3.2. Data collection
Describe and assess the adequacy of any programme and activities to collect data in the area.

Environmental program: “Ecoporto” focused on the management of liquid wastes produced by the boat in the harbour included in the MPA.

Environmental restoration: “Ecocoste” focused on the environmental and engineering restoration of the littoral threatened by the erosion.

Environmental program: “Ecomotori” focused on the recycle of the old two time engine with the four times ones.

Monitoring programmes:

- Detection of diving site of high naturalistic interest and diving activity monitoring program
- Conservation and monitoring of *Podarcis tiliguerta ranzii*
- Characterisation and monitoring of marine sea birds
- Monitoring of *Paracentrotu lividus* populations
- Monitoring of the fishery

9.3.3. Monitoring programme

Section D8 in Annex I states that to be included in the SPAMI List, an area will have to be endowed with a monitoring programme having a certain number of significant parameters, in order to allow the assessment of the state and trends of the area, as well as the effectiveness and protection and management measures, so that they may be adapted if need be (indicators may, for instance, supply information about species status, condition of the ecosystem, land-use changes, extraction of natural resources -sand, water, game, fish-, visiting, adherence to the provisions of the management plan, etc.).

a) Is there a monitoring programme?	YES
b) If NO, are there plans to start one, and when?	
c) If YES, assess as low, medium, satisfactory, its adequacy and present level of development.	satisfactory

d) If YES, who is/are carrying out the monitoring programme?

The MPA staff and the scientific committee

e) If YES, briefly describe how the monitoring programme will be used in reviewing the management plan.

The results of the monitoring programmes will be used to asses the objectives of the M.P.

10. Other information, if any

11. CONTACT ADDRESSES (name(s), position(s) and contact address(es) of the person(s) in charge with the proposal and that compiled the report)

Prof. Riccardo Cattaneo-Vietti and Dr. Ilaria Vielmini
Dip.Te.Ris. (Dipartimento per lo Studio del Territorio e delle sue Risorse)
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07026 Olbia
phone: 0789/203013,
fax: 0789/204514
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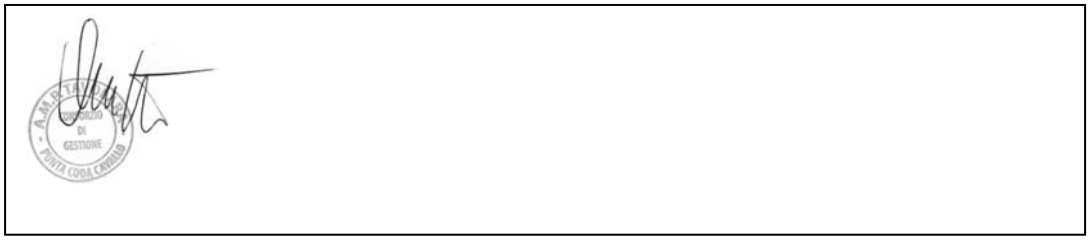
12. SIGNATURE(S) ON BEHALF OF THE STATE(S) PARTY/PARTIES MAKING THE PROPOSAL



13. DATE

ANNEX III

REVISED DRAFT STANDARD DATA-ENTRY FORM (SDF) FOR NATIONAL INVENTORIES OF NATURAL SITES OF CONSERVATION INTEREST

TAVOLARA-PUNTA CODA CAVALLO

1. SITE IDENTIFICATION

1.1. SITE CODE

I	T	S	A	0	5	T	V	L

1.2. IDENTIFICATION DATE

1	9	9	7	1	2
Y	Y	Y	Y	M	M

1.3. COMPILATION DATE

2	0	0	6	0	5
Y	Y	Y	Y	M	M

1.4. UPDATE

Y	Y	Y	Y	M	M

1.5. RESPONDENT(S):

Prof. Riccardo Cattaneo-Vietti and Dr. Ilaria Vielmini
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07026 Olbia
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fax: 0789/204514
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1.6. SITE NAME:

Marine Protected Area Tavolara - Punta Coda Cavallo

2.SITE LOCATION

2.1. SITE CENTRE LOCATION:

LONGITUDE			LATITUDE		
E 09	41	41	40	53	43

W/E (Greenwich)

2.2. SITE SURFACE AREA (ha):

Terrestrial area:	
Marine area:	150911.00
TOTAL AREA:	150911.00

2.3. SITE LENGTH(Km):

76094

2.4. ALTITUDE/DEPTH (m):

	+/- MINIMUM	MAXIMUM	MEAN
Altitude:	0	+4	+2
Depth:	0	-85	-40

2.5. ADMINISTRATIVE REGION:

CODE	REGION NAME	%COVER
	Regione Sardinia	100
	Marine area not covered by a NUTS-region	100

3. ECOLOGICAL INFORMATION

3.1. GENERAL SITE CHARACTER:

	% cover
COASTAL AREAS	
Coastal wetlands (lagoons, estuaries, deltas, salt works)	1
Salt marshes	
Coastal sand dunes, Sand beaches, Shingle beaches	
Sea cliffs and Rocky shores	
Mud flats and Sand flats	
Scrub, Maquis and Garrigue, Phrygana	
Forests	
Agricultural land	
Other land (including Towns, Villages, Roads, Waste places, Mines, Industrial sites)	
MARINE AREAS	
Hard beds	
Rocks	5
Muds	
Sands	
Gravels	
Stones and pebbles	
Seagrass meadows	31
Caves	1
Other Sea bottom areas (SEA INLETS)	67
Other site characteristics:	

3.2. HABITAT types present on the site and their assessment :

3.2.a. MARINE HABITAT TYPES AS FROM THE REFERENCE LIST OF MARINE AND COASTAL HABITAT TYPES FOR THE SELECTION OF SITES TO BE INCLUDED IN THE NATIONAL INVENTORIES OF NATURAL SITES OF CONSERVATION INTEREST:

CODE				%COVER	REPRESENTATIVITY	RELATIVE SURFACE	CONSERVATION STATUS	VULNERABILITY
I	2	1		3 0	B	C	A	A B C
I	2	1	5		B	C	A	A B C
II	1	1			B	C	A	A B C
II	1	1	1		B	C	A	A B C
II	3	1	1		B	C	A	A B C
II	4	1			B	C	A	A B C
II	4	1	3		B	C	A	A B C
II	4	2	1		B	C	A	A B C
II	4	2	10		B	C	A	A B C
II	4	3			B	C	A	A B C
II	4	3	1		B	C	A	A B C
III	2	3	3		B	C	A	A B C
III	3	2			B	C	A	A B C
III	3	2	1		B	C	A	A B C
III	3	2	2		B	C	A	A B C
III	5	1				C	A	B
III	5	1	1		B	C	A	A B C
III	5	1	2		B	C	A	A B C
III	6	1	2		B	C	A	A B C
III	6	1	3		B	C	A	A B C
III	6	1	14		B	C	A	A B C
III	6	1	15		B	C	A	A B C
III	6	1	16		B	C	A	A B C
III	6	1	20		B	C	A	A B C
III	6	1	25		B	C	A	A B C
IV	2	2	10		B	C	A	A B C
IV	3	1			B	C	A	A B C
IV	3	1	1		B	C	A	A B C
IV	3	1	5		B	C	A	A B C
IV	3	1	10		B	C	A	A B C
IV	3	1	11		B	C	A	A B C
IV	3	1	13			C	A	A B C
IV	3	2			B	C	A	A B C

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3.2.b. COASTAL AND WETLAND HABITAT TYPES AS FROM THE REFERENCE LIST OF MARINE AND COASTAL HABITAT TYPES FOR THE SELECTION OF SITES TO BE INCLUDED IN THE NATIONAL INVENTORIES OF NATURAL SITES OF CONSERVATION INTEREST:

CODE							%COVER		REPRESENTATIVITY				RELATIVE SURFACE			CONSERVATION STATUS		
III	2	2	5				1	5	A						C	A		
III	2	1	3				1	0	A						C	A		
I	1	4	2				0	5	A						C	A		
I	4	1					0	5	A						C	A		
III	3	1					0	2			C				C	A		
III	2	4	1	1			0	2		B					C	A		
VI	2						0	1	A						C	A		
I	2	2	2	1	2		0	1				D						
I	2	2	2	4	1		0	1				D						
I	1	1					0	1			C				C		B	

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3.2.c. SURFACES COVERED BY OTHER HABITAT TYPES:

CODE									%COVER		
		.									
		.									
		.									
		.									
		.									
		.									
		.									
		.									
		.									
		.									
		.									

3.3. SPECIES

covered by the Reference List of Species for the selection of sites to be included in the national inventories of natural sites of conservation interest and their assessment:

3.3.a. MARINE FAUNA SPECIES included in the reference list of species::

CODE	NAME	POPULATION								SITE ASSESSMENT													
		RESIDENT		MIGRATORY						Population				Conservation				Endemism			Role of site		
		Breeding	Non breed	Breeding	Wintering	Staging																	
3	0	1	8	***Aplysina sp. plur.***		**C**							**C**		**A**			**Y**				**B**	
2	5	6	5	***Axinella polypoides***		**C**							**C**		**A**			**Y**				**B**	
3	0	3	2	***Hippospongia communis***		**C**							**C**		**A**			**Y**				**B**	
3	0	0	4	***Sarcotragus spinosulus***		**C**							**C**		**A**			**Y**				**B**	
3	0	0	5	***Sarcotragus pipetta***		**R**							**C**		**A**			**Y**				**B**	
3	0	0	6	***Spongia agaricina***		**C**							**C**		**A**			**Y**				**B**	
3	0	0	7	***Spongia officinalis***		**R**							**C**		**A**			**Y**				**B**	
3	0	0	9	***Tethya sp. plur.***		**C**							**C**		**A**			**Y**				**B**	
1	0	0	1	***Corallium rubrum***		**R**								**D**									
2	5	6	2	***Gerardia savaglia***		**R**								**D**									
2	5	8	7	***Asterina pancerii***		**C**								**D**									
1	0	0	8	***Centrostephanus longispinus***		**R**								**D**									
2	5	8	8	***Ophiodiaster ophidianus***		**C**								**D**									
3	0	1	1	***Paracentrotus lividus***		**C**							**C**		**A**			**Y**				**B**	
2	5	7	0	***Dendropoma petraeum***		**C**							**C**		**A**			**Y**				**B**	
1	0	2	7	***Lithophaga lithophaga***		**C**							**C**		**A**			**Y**				**B**	
2	5	7	2	***Luria lurida (= Cypraea lurida)***		**C**							**C**		**A**			**Y**				**B**	
2	5	7	3	***Mitra zonata***		**R**							**C**										
1	0	1	2	***Patella ferruginea***		**R**							**C**		**A**			**Y**				**B**	
2	5	8	1	***Pholas dactylus***		**C**							**C**										
1	0	2	8	***Pinna nobilis***		**C**							**C**		**A**			**Y**				**B**	
3	0	1	3	***Homarus gammarus***		**C**							**C**		**A**			**Y**				**B**	
3	0	1	4	***Maja squinado***		**C**							**C**		**A**			**Y**				**B**	

3	0	1	5	Palinurus elephas		C							C		A			Y			B	
1	0	9	0	Scyllarides latus		R							C		A			Y			B	
3	0	1	6	Scyllarus pigmaeus		C							C		A			Y			B	
3	0	1	7	Scyllarus arctus		C							C		A			Y			B	
1	1	0	3	Alosa fallax		R								D								
3	0	1	9	Anguilla anguilla		C								D								
3	0	2	0	Cetorhinus maximus		R								D								
3	0	2	1	Epinephelus marginatus		C							C			B		Y			B	
2	5	3	9	Hippocampus guttulatus		R								D								
2	5	3	8	Hippocampus hippocampus		R								D								
3	0	2	4	Mobula mobular			V							D								

3	0	2	5	***Prionace glauca***		**R**								**D**										
3	0	2	7	***Sciaena umbra***		**C**							**C**			**B**		**Y**			**B**	
3	0	2	8	***Squatina squatina***		**R**								**D**							**B**	
3	0	2	9	***Thunnus thynnus***			**R**						**C**			**B**		**Y**			**B**	
3	0	3	0	***Umbrina cirrosa***		**C**								**D**							**B**	
3	0	3	1	***Xiphias gladius***			**R**							**D**								
1	2	2	4	***Caretta caretta***			**V**							**D**								
12	2	2	5	***Eretmochelys imbricata***			**V**							**D**								
2	6	2	1	***Balaenoptera physalus***			**R**							**D**								
1	3	5	0	***Delphinus delphis***			**R**							**D**								
2	6	2	4	***Physeter catodon***			**R**							**D**								
2	0	344	4	***Stenella coeruleoalba***			**R**						**C**			**B**		**Y**		**A**		
1	3	4	9	***Tursiops truncates***			**C**					**B**				**B**		**Y**		**A**		
1	3	6	6	***Monachus monachus***			**V**							**D**								

3.3.b. MARINE FLORA SPECIES included in the reference list of species:

CODE				NAME		POPULATION	SITE ASSESSMENT			
							Population	Conservation	Endemism	Isolation
2	2	7	6	***Posidonia oceanica***			**C**	**B**	**Y**	**C**
3	0	0	1	***Nanozostera noltii***			**C**	**B**	**N**	**C**
2	0	4	3	***Cystoseira amentacea var. stricta***			**C**	**B**	**Y**	**C**
2	0	4	7	***Cystoseira zosteroides***			**C**	**B**	**N**	**C**
2	0	4	0	***Lithophyllum byssoides***			**C**	**B**	**Y**	**C**

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3.3.c. COASTAL FAUNA SPECIES included in the reference list of species:

CODE				NAME	POPULATION					SITE ASSESSMENT			
					RESIDENT		MIGRATORY			Population	Conservation	Endemism	Isolation
					Breeding	**Non-breed**	**Breeding**	**Wintering**	**Staging**				
A	0	1	0	***Calonectris diomedea***			**>500 p**			**C**	**B**		
A	1	8	1	***Larus audouinii***			**<150 p**			**C**	**B**		
A	0	1	4	***Hydrobates pelagicus***			**R**			**D**			
A	0	1	8	***Phalacrocorax aristotelis***			**<500 p**			**D**	**B**		
A	3	93	3	***Phalacrocorax pygmeus***			**C**			**D**	**B**		
A	0	3	5	***Phoenicopterus ruber***			**C**			**D**	**B**		
A	6	0	1	***Puffinus yelkouan***			**<2000 p**			**D**	**B**		
A	1	9	5	***Sterna albifrons***					**R**	**D**			
A	0	9	4	***Pandion haliaetus***					**R**	**D**			
A	1	9	1	***Sterna sandvicensis***			**<10 p**			**D**			

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3.3.d. COASTAL FLORA SPECIES included in the reference list of species:

CODE	NAME	POPULATION	SITE ASSESSMENT			
			Populatio	Conservati	Endemis	Isolatio

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3.4. Other Important Species of Flora and Fauna:

GROUP							SCIENTIFIC NAME	POPULATION	MOTIVATION			
B	M	A	R	F	I	P						
						X	***Alyssum tavolarae***	C		B		
						X	***Arenaria balearica***	C		B		
						X	***Aristolochia rotunda* spp. *insulari***	C		B		
						X	***Asperula deficiens***	C		B		
						X	***Bellium bellidioides***	C		B		
						X	***Brassica insularis***	C		B		
						X	***Bryonia mormorata***	C		B		
						X	***Buphthalmum inuloides***	C		B		
						X	***Campanula forsythii***	C		B		
						X	***Centaurea filiformis* spp. *filiform***	C		B		
						X	***Cephalaria mediterranea***	C		B		
						X	***Dracunculus moscivoros***	C			C	
						X	***Erodium corsicum***	C		B		
						X	***Euphorbia cupanii***	C		B		
						X	***Genista corsica***	C		B		
						X	***Limonium articulatum***	C			C	
						X	***Limonium hermaeum***	C		B		
						X	***Limonium protohermaeum***	C		B		
						X	***Orchis brancifortii***	C		B		
						X	***Pancratium illyricum***	C		B		
						X	***Ptilostemon casabonae***	C			C	
						X	***Ptychotis sardoa***	C		B		
						X	***Romulea requieni***	C		B		
						X	***Sargassum vulgare***	C				D
						X	***Scrophularia ramosissima***	C				D
						X	***Scrophularia trifoliata***	C		B		
						X	***Seseli bocconei* spp. *praecox***	C		B		
						X	***Sesleria insularis* spp. *insularis***	C		B		
						X	***Silene corsica***	C		B		
						X	*Silene nodulosa*	C		B		
						X	*Soleirolia soleirolii*	C		B		
						X	*Spergularia macrorhiza*	C		B		
						X	*Stachys glutinosa*	C		B		
						X	*Thesium italicum*	C		B		

					X		*Paramuricea clavata*	C				D
					X		*Paramuricea macrospina*	V				D
					X		*Eunicella cavolinii*	C				D
					X		*Tylodina perversa*	R				D
			X				*Podarcis tiliguerta ranzii*	V		B		
				X			*Schedophilus ovalis*	R				D
X							*Egretta garzetta*	C				D
X							*Falco peregrinus*	D				
X							*Hieraaetus fasciatus*	C				D
X							*Larius collurio*	D				
X							*Pandion haliaetus*	D				
X							*Sylvia sarda*	D		B		
X							*Sylvia undata*	D				
X							*Aquila chrysaetos*	D				
X							*Sterna hirundo*	D				
X							*Caprimulgus europaeus*	D				
	X						*Rhinolophus ferrum-equinum*	C				D
	X						*Miniopterus schreibersi*	C				D
			X				*Phyllodactylus europaeus*	C				D
			X				*Testudo marginata*	B				D
			X				*Testudo hermanni*	D				
			X				*Testudo graeca*	D				

(M = Mammals, B = Birds, R = Reptiles, A = Amphibians, F = Fishes, I = Invertebrates, P = Plants)

4. SITE DESCRIPTION

Tavolara-Punta Coda Cavallo Marine Protected Area is located in the North-Western part of Sardinia, named Gallura. Its coasts extends from Ceraso Cape, in the North, to Isuledda Point, in the South. Between these two points the morphology of the coast is irregularly articulated and hence presents different exposure degrees, such as high rocky promontories, alternated to wide sandy beaches and little granitic inlets.

The Islands Tavolara, Molara, Proratora, Reulino, Cana increase the landscape value of the marine environment while the terrestrial one is enhanced by the hind-dunes. These are characterized by pools and marshes of different extension adjacent to littoral sandy dunes representing very important wetlands points for migratory birds. In this contest San Teodoro is the most important salt water coastal marsh (240 ha) in Tavolara MPA.

The Mediterranean climate of the Sardinian region favors the rocky erosion processes. The results of the hydrolysis, hydration and oxidation processes are particularly relevant in the granitic areas of the Gallura.

The fracture processes together with the stream waters canals and the erosions have generated an huge variety of forms and structures in the granitic rocks resulting of particular natural suggestive effect.

The sandy detritus, originated by the degradation processes of granite composes the Gallura's grounds and its sands This alteration surface has been partially removed after the tectonics lifting movements and the past climate changes. These geological processes have allowed the outcrop of the below structures, still unaltered, creating particular granitic morphologies, such as *tors*, *inselberg* and *split*.

Tavolara Island is constituted by a Jurassic calcareous cover based on a Paleozoic granite basement.

Tavolara morphology is also enriched by the spectacular arch in Levante's Creek, product of the combined effects of waves, winds and Karstification.

The MPA submerged bottoms are mainly granitic, in part covered by *Posidonia oceanica* (L.) Delile. Erosion surfaces of homogeneous morphology and *inselberg* are presents at the depth at about 50 m.

The shallower bottoms are instead characterised by irregular active abrasions strongly fracturated. Instead the Molara Island's sea bottoms are mainly composed by *thor*.

Along the Tavolara submerged cliff, under the actual lower tidal limit is present a platform composed by coralline encrusting algae.

At about the depth of 20 – 25 m coralligeneous formations and overhangs ends in canals up to the abrasion platform characterized by biogenic sands and *ripple marks.*

Further important *beach rock* formations are presents at different depths (- 60m, - 40m, - 25m, - 5m e – 0.5m).

The MPA presents two different no - take zones naturally isolated: Tavolara Island and Molarotto.

4.1. QUALITY AND IMPORTANCE:

Tavolara MPA is a unique area for its geological aspects. The complexity and heterogeneity of the land is of fundamental importance for the development and conservation of particular marine and terrestrial communities.

In the MPA territories are present more than 30 endemic plants species.

Tavolara MPA is also an important breeding site for different birds such as Yelkouan Shearwater (*Puffinus yelkouan*) Cory's Shearwater (*Calonectris diomedea*), Shag (*Phalacrocorax aristotelis*), Audouin's Gull (*Larus adouinii*), Little Heron (*Egretta garzetta*).
Further are present some *Prolagus sardous* fossil deposits and different archeological sites (about 40), such as, the most famous, the Pope's Cave, where Neolithic graffito are presents.

The last monk seal (*Monachus monachus*) sighting goes back to 1992.

4.2. CONSERVATION STATUS:

The general status of conservation is good.

4.3. VULNERABILITY:

Some problems related to the summer tourist impact can be noted.
An intensive human presence, during the tourist season, on the sandy beaches could contribute to the natural erosion processes of the dunes.
While the anchoring could reduce the extension of the *Posidonia oceanica* meadows.

4.4. SITE DESIGNATION (remarks concerning quantitative data below):

4.5. OWNERSHIP:

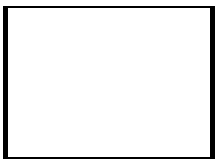
National Marine Protected Area. Established by decree of the Ministry of the Environment on 12.12.199, based upon laws n. 979/1982 and n. 394/1991.

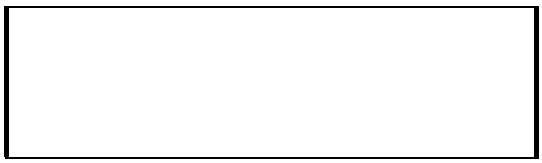
4.6. DOCUMENTATION:

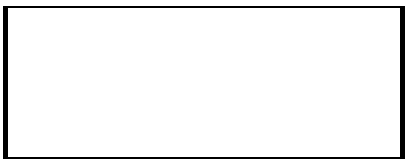
Update references are presents at the end of the present document.

4.7. HISTORY:

Date	Field Changed	Description
2007	All	Initial notification







5. SITE PROTECTION STATUS AND RELATION WITH OTHER SITES:

5.1. DESIGNATION TYPES at National and sub-national level:

CODE	%COVER	CODE	%COVER	CODE	%COVER
I T 0 3	4				
I T 0 9	2 0				
I T 2 6	7 6				

5.2. RELATION OF THE DESCRIBED SITE WITH OTHER SITES:

designated at National or sub-national level:

TYPE CODE	SITE NAME	OVERLAP TYPE	OVERLAP %COVER

designated at the International level:

TYPE	SITE CODE (if appropriate)	SITE NAME	OVERLAP TYPE	OVERLAP %COVER
World Heritage Site:				
Biosphere Reserve:				
Ramsar Convention:				
Biogenetic Reserve:				
Eurodiploma Site:				
Barcelona Convention - SPA:				
Barcelona Convention - SPAMI:				
Natura2000-Special Protection Area				
Natura2000-Special Area for Conservation:	ITB010010	Tavolara, Molara e Molarotto Islands		2 0
	ITB010011	San Teodoro salt-marsh		4
Bern Convention: Emerald site				
Other:				

6. HUMAN ACTIVITIES IN AND AROUND THE SITE

6.1. IMPACTS / ACTIVITIES AND PROPORTION OF THE SURFACE AREA OF THE SITE AFFECTED:

IMPACTS AND ACTIVITIES WITHIN THE SITE:

CODE	INTENSITY	% OF SITE	INFLUENCE	CODE	INTENSITY	% OF SITE	INFLUENCE
200	A		-	900	B		-
210	A		-	948	B		-
240	A		-		A B C		-
402	A		-		A B C		-
421	C		-		A B C		-
621	A		-		A B C		-

IMPACTS AND ACTIVITIES AROUND THE SITE:

CODE	INTENSITY	% OF SITE	INFLUENCE	CODE	INTENSITY	% OF SITE	INFLUENCE
200	A		-	621	A		-
210	A		-	900	B		-
240	A		-	948	B		-
402	A		-		A B C		-
421	C		-		A B C		-
520	A		-		A B C		-

6.2. SITE MANAGEMENT:

BODY(IES) RESPONSIBLE FOR THE SITE MANAGEMENT AND OTHER INSTITUTIONS INVOLVED:

The Management Body is composed of an association of three local administration: Olbia, Loiri – Porto S. Paolo and S. Teodoro.

The Harbour Office (Coast Guard) is involved in the surveillance. The Management Body cooperate also with Revenue Guard Corps and Forestall Corps.

SITE MANAGEMENT AND PLANS:

A Zone: no take zone. This area includes two site one in Tavolara and the other one in Molarotto Island. In Tavolara Island the boundaries of the no take zone are: the Southern point of Levante's Creek, the Pope's Point, the South-Est side of Passo Malo Point. Molarotto Island no take zone corresponds to the pentagonal area around the Island.
In no take zone are allowed the scientific research activities and SCUBA diving (along fixed way) asking previously the permission to the Management Body.
B Zone: general reserve. In this area are allowed sailing up to the limit of 10 kn, regulated SCUBA diving activities, bathing and mooring in special structure created by the Management Body. Not destructive selective fishing is allowed to the fisherman that live in the municipal boundaries of the MPA, the fish total amount is decided from the MPA Management. Trawl-net and not professional fish are not admitted.
C Zone: partial reserve. In this area are allowed sailing, regulated mooring, SCUBA diving, not destructive selective fishing to the fisherman that live in the municipal boundaries of the MPA, recreational fishing line.

7. MAP OF THE SITE

- **Physical map:**

NATIONAL MAP NUMBER	SCALE	PROJECTION
I.I.M. n. 42-43	1:100.000	Mercator

REFERENCE TO AVAILABILITY OF BOUNDARIES IN DIGITISED FORM

It is available a GIS System.

- **Map of designated sites described in 5:**

Please indicate this information on a map with the same characteristics as above !

- **Aerial photograph(s) included:**

[X] YES [ ] NO

NUMBER DATE	AREA	SUBJECT		COPYRIGHT

8. SLIDES

NUMBER DATE	PLACE	SUBJECT	COPYRIGHT

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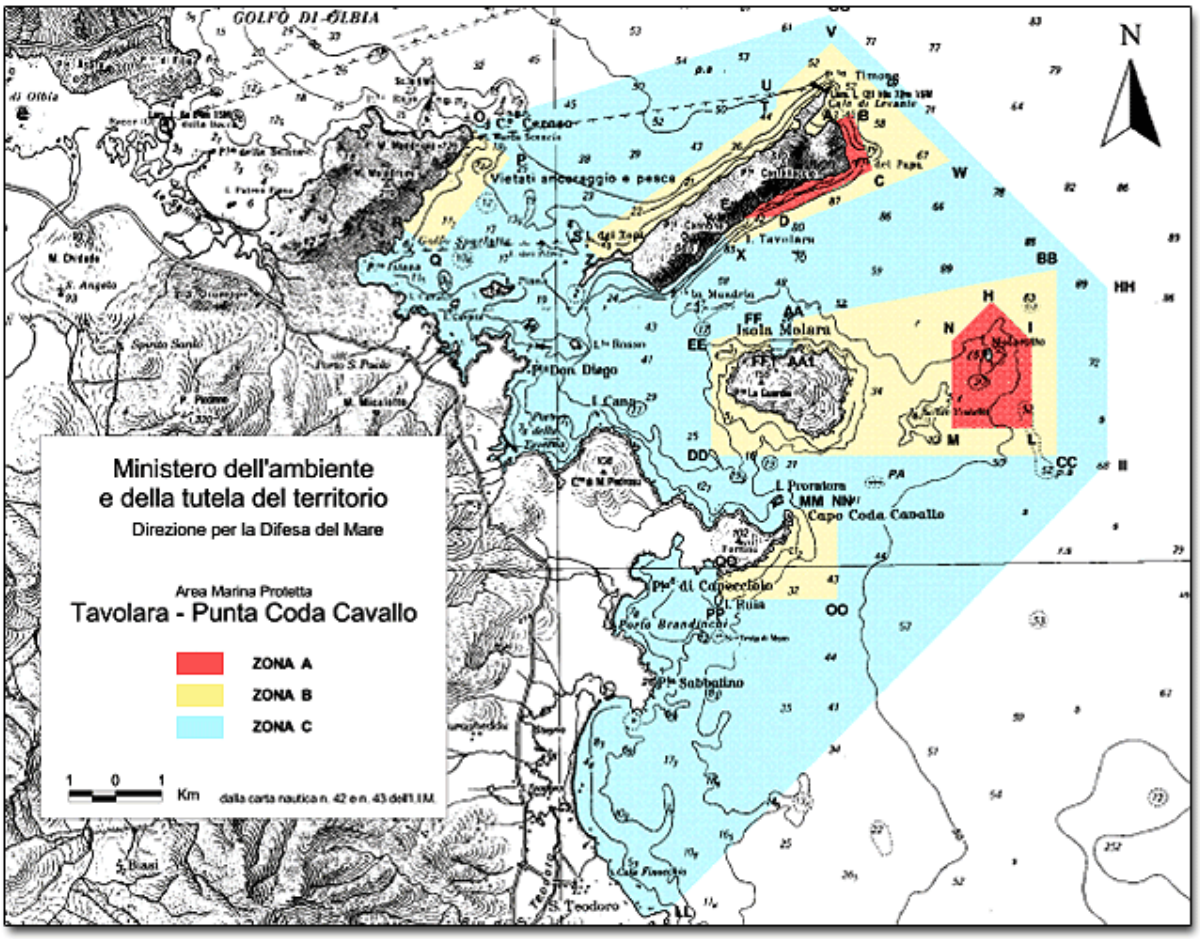

Figura 1 I.I.M. n. 42-43

TAVOLARA

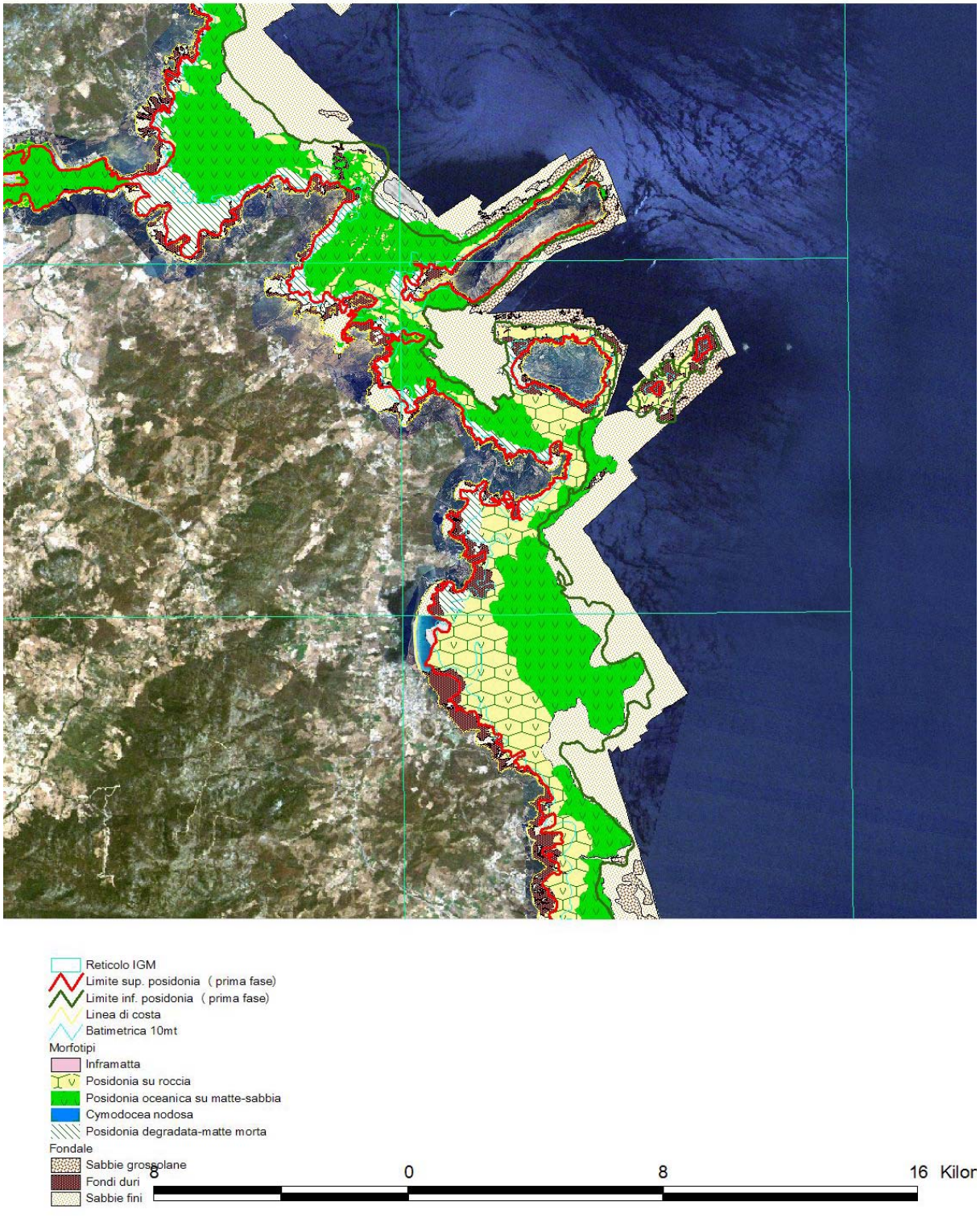

Figura 2