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IDENTIFICATION AND PROTECTION OF SPECIAL AREAS AND PARTICULARLY SENSITIVE SEA AREAS

Designation of the Strait of Bonifacio a Particularly Sensitive Sea Area

Submitted by France and Italy

SUMMARY

Executive summary: The Strait of Bonifacio and the nearby seas form an area whose ecological, environmental, economic and cultural attributes are seriously threatened by the international shipping that passes through.

The richness and vulnerability of this region and its need of international protection have been recognized officially by the international community since 1989, when the IMO Assembly recommended to its Member States to prohibit or at least strongly discourage transit of the strait by shipping.

Since 1993 the coastal States – Italy and France – have taken steps to ban the passage of ships carrying dangerous and toxic goods. In Italy, the government concluded a voluntary agreement in 2001 with its shipping industry whereby the latter undertook to use only ships that did not pass through the strait.

Despite these measures, the problem of the risk factor associated with international shipping in this area has not been resolved, and the threats to the area's rich resources from international maritime transport are even greater.

As a result, in order to protect the area's environmental, cultural and economic attributes from the serious threats posed by international shipping, France and Italy request that it be designated a particularly sensitive sea area (PSSA) covering the strait and adjacent areas.

In the area covered by this request, the associated protective measures envisaged include: adoption of a mandatory traffic separation scheme (TSS), promulgation of areas to be avoided, establishment of a vessel traffic system, and the introduction of a mandatory pilot system for ships passing through the Strait of Bonifacio while carrying dangerous and toxic goods.

Strategic direction: 7.1

High-level action: 7.1.2

Planned output: 7.1.2.2

Action to be taken:	Paragraph 4
Related documents:	Resolution A.766(18), resolution A.982(24); SN/Circ.201 of 26 May 1998

1 The annex to this document characterizes in detail the ecosystem of the Strait of Bonifacio, the balance and development of which are seriously threatened by pollutant waste originating from ships that pass through these waters.

2 The geographical features of the Strait of Bonifacio contribute to making it a dangerous place for maritime navigation. IMO has already taken action by recommending that governments should prohibit or at least strongly discourage their own ships from passing through the strait carrying dangerous goods, and by introducing a mandatory reporting system for such ships, regardless of their flags. France and Italy have fully implemented the provisions of IMO Assembly resolution A.766(18), which have proved insufficient to prevent the occurrence of further shipwrecks or maritime incidents since that resolution's adoption. Although the Strait of Bonifacio has the status of an international strait, this is not sufficient, owing to the principle of free transit applicable to this type of strait, to permit a permanent ban on navigation by all categories of vessel.

3 France and Italy propose the adoption of the following associated protective measures for the Strait of Bonifacio PSSA:

.1 Adoption by IMO of a mandatory traffic separation scheme (TSS) to replace the existing recommended routes;

.2 Promulgation of areas to be avoided close to reefs that present particular dangers to shipping, such as the Lavezzi and Perduto reefs. France and Italy will notify IMO of the action taken to establish these areas where their territorial waters are concerned;

.3 Establishment of a vessel traffic system (VTS) in accordance with the provisions of the SOLAS Convention (regulation 8-2 of chapter V (Safety of navigation)). Governments may establish a VTS when, in their opinion, the volume of traffic or degree of risk justifies such services. Bonifacio Trafic already constitutes the embryonic stage of such a system;

.4 Establishment of a mandatory pilotage system for ships following the Strait of Bonifacio and whose transit of the area resolution A.766(18) recommends flag States to prevent. The pilots of the French department of Corse Sud have already been active in this regard, with several large ships every year making use of their services.

Action requested of the Committee

4 The Committee is invited to consider the information contained in the annex to this document and to approve the request for the Strait of Bonifacio to be designated a particularly sensitive sea area as described in that annex, together with the associated protective measures.

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ANNEX

INFORMATION SUPPORTING THE REQUEST FOR THE INTERNATIONAL MARITIME ORGANIZATION TO DESIGNATE THE STRAIT OF BONIFACIO A PARTICULARLY SENSITIVE SEA AREA (PSSA)

I DESCRIPTION, SIGNIFICANCE OF THE AREA AND VULNERABILITY

1 Description

The Strait of Bonifacio separates the Italian island of Sardinia from the French island of Corsica; they are only 11 km apart. The strait takes its name from Bonifacio, the southernmost town of Corsica. It enables passage from the Sea of Sardinia in the west to the Tyrrhenian Sea in the east. Its width varies from eight to ten nautical miles and its maximum depth is 100 m.

At the eastern end lies the Italian archipelago of La Maddalena, and Cavallo island and the Lavezzi Islands, belonging to France. This is a sensitive area for navigation. In the northern part of the strait ships have to avoid the reefs of Perduto and the Lavezzi Islands, while in the south lie the Sardinian islands of Razzoli and Persa. Navigation is possible along a narrow three-mile wide stretch, and ships are asked to take a recommended route extending just over one nm.

The meteorological conditions are difficult here: on two in every three days special weather forecasts are broadcast, because the narrowness of the stretch between Corsica and Sardinia gives rise to sudden gusts of wind.

The grounding of a mixed cargo carrier operated by the *Société Nationale Corse Méditerranée*, the **Monte Stello**, on 1 January 1994 and the sinking of the Panamanian cargo ship the **Fenes**, loaded with 2,700 tonnes of wheat, on 24 September 1996, show the risk that transit poses in terms of preserving the marine environment, which is especially fragile. An ecological protection area was established by decree on 8 January 2004. The Corsican Office for the Environment requested on 26 March 2008 that an international marine reserve be set up, and on 9 October of the same year the project was approved by the Corsican Assembly, necessitating an agreement between the Italian and French environment ministries.

The regulations applicable to navigation in the Strait of Bonifacio are based on IMO Assembly resolution A.766(18), adopted in 1993. The text requests ships carrying dangerous substances to avoid this route. It is complemented by IMO circulars SN/Circ.198 and 201 of 26 May 1998 concerning, respectively, *Routeing Measures other than Traffic Separation Schemes* and *Mandatory Ship Reporting Systems,* applicable to the Strait of Bonifacio from 0000 UTC on 1 December, 1998.

France and Italy have implemented all these measures in creating Bonifacio Trafic, adopting an even more restrictive approach in the sense that French or Italian ships carrying dangerous goods are banned from all transit of the Strait of Bonifacio.

To that end, decree No. 1/93 of 15 February 1993, issued by the French maritime prefect for the Mediterranean and applicable only to French vessels, forbids the movement of tankers in the Strait of Bonifacio carrying petroleum products or of ships carrying dangerous or toxic substances. The annex to the decree lists the relevant products and substances, with reference to the MARPOL Convention.

The Italian Merchant Marine decree of 26 February 1993, applicable to Italian ships only, forbids tankers carrying petroleum products or ships carrying dangerous or toxic substances to use the Strait of Bonifacio.

Decree No. 84/98 of 3 November 1998, as amended by decree No. 56/2003, issued by the French maritime prefect for the Mediterranean, regulates navigation in the Strait of Bonifacio with a view to preventing accidental marine pollution. It establishes precautionary areas at the periphery of a two-way recommended route and a mandatory reporting system.

Lastly, a Franco-Italian agreement on operational procedures for the ship reporting system in the Strait of Bonifacio (Bonifacio Trafic) was signed in Rome on 3 June 1999.

2 Importance of the area

2.1 Ecological criteria

The ecological significance of the Strait of Bonifacio region was internationally recognized when it was granted the status of specially protected area of Mediterranean importance (SPAMI) at the sixteenth session of the Conference of Contracting Parties to the Barcelona Convention for the Protection of the Mediterranean Sea against Pollution, which took place from 3 to 5 November 2009 in Marrakesh.

The ecological significance of the French part of the Strait of Bonifacio is recognized by a number of official listings involving a total of 104,000 ha of mainly marine environment:

- Listing as a nature reserve by a decree of 23 September 1999 (80,000 ha);
- Listing as a Natura 2000 site, these being a network of European Union areas which, owing to their great environmental value, need the protection of States:
  - a special protection area under directive No. 79/409/EEC (Birds), "Lavezzi Islands, Strait of Bonifacio", covering 98, 941 ha, designated by inter-ministerial decree of 30 October 2008;
  - three sites of Community importance under directive 92/43/EEC (Habitat) concerning the conservation of natural habitats and wild fauna and flora:
    Strait of Bonifacio, Monk Islands (94, 612 ha);
    Cerbical Islands and coastal strip (3,698 ha);
    Pertusato/Bonifacio plateau and Lavezzi Islands (6,071 ha).

The ecological significance of the Italian part of the Strait of Bonifacio is recognized by several listings, as follows:

The La Maddalena archipelago national park, by decree of the President of the Republic dated 17 May 1996, covering 5,100 ha on land and 15,046 ha at sea;

The Asinara national park, by decree of the President of the Republic dated 13 October 2002, covering 5,170 ha on land;

The Isola Asinara protected marine area, by ministerial decree of 12 August 2002, covering 10,732 ha at sea;

The Tavolara Punta Coda Cavallo protected marine area, by ministerial decree of 12 December 1997, amended by ministerial decree of 28 November 2001, covering 15,357 ha;

- Listings of Natura 2000 sites, as follows:
  - Six special protection areas under directive No. 79/409/EEC (Birds):
    Isola Asinara (9,669 ha)
    Isola Piana – Golfo dell'Asinara (399 ha)
    Stagno di Pilo, Casaraccio e Saline di Stintino (1,290 ha)
    Arcipelago La Maddalena (20,955 ha)
    Isole del Nord-Est tra Capo Ceraso e Stagno di San Teodoro (18,174 ha)
    Capo Figari, Cala Sabina, Punta Canigione e Isola Figarolo (4,053 ha)

  - Twelve sites of Community significance under directive No. 92/43/EEC (Habitat), in connection with the conservation of natural habitats and wild fauna and flora:
    Coste e Isolette a Nord Ovest della Sardegna (3, 731 ha)
    Isola Asinara (9,669 ha)
    Isola Piana (510 ha)
    Stagno di Pilo e di Casaraccio (1,879 ha)
    Stagno e ginepreto di Platamona (1,618 ha)
    Foci del Coghinas (2, 267 ha)
    Isola Rossa – Costa Paradiso (5,409 ha)
    Monte Russu (1,971 ha)
    Capo Testa (1,217 ha)
    Arcipelago La Maddalena (20,955 ha)
    Isola Tavolara, Molara e Molarotto (3,764 ha)
    Capo Figari e Isola Figarolo (851 ha).

The European Commission approved the above-mentioned list of sites of Community importance by its decision of 22 December 2009 in relation to the Mediterranean biogeographical region enforceable under Directive No. 92/43/EEC.

The following information is taken from the declaration forms of the Natura 2000 sites mentioned above and from the biological evaluation of the Strait of Bonifacio nature reserve for the 2007-2011 management plan.

This sector is also covered by the Pelagos Agreement for the Creation of a Mediterranean Sanctuary for Marine Mammals, signed in Rome on 25 November 1999 by France, Italy and the Principality of Monaco. The aim of the agreement is to maintain a level of conservation beneficial to marine mammal populations, and to that end monitor the cetacean populations, strengthen the application of the existing external legislation for certain types of fishing and to reduce pollution, regulate the numbers of tourists who come to observe cetaceans, and improve the information provided for the public. The bottlenose dolphin is a regular visitor to the edges of this area.

The exceptional ecological wealth of the area comprises a wide range of marine environments, including:

- inclines and rocky shallows harbouring varied fauna and flora;
- well preserved Posidonia beds;
- near Figari, a rare estuary system in which areas emerge at low tide on the island.

Species and habitats whose rarity or significance are recognized at national, Community or international level find the environmental conditions ideal here.

2.1.1 Uniqueness or rarity

The Strait of Bonifacio area contains 37 per cent of species of Mediterranean importance (SPAMI Annex II and III, Barcelona Convention). The flora includes some 15 endemic species (Corsican or Corsican-Sardinian or Corsican/Sardinian/ Balearic), with one endemic to the island of Lavezzu.

The area contains between 40 and 50 per cent of the sites for *Silene velutina*, a small endemic flower whose distribution is limited to the extreme south of Corsica and the north of Sardinia. Another protected plant belonging to the first rank in terms of floral heritage is *Limonium lambinonii*, which is endemic to Lavezzu island.

The leatherback turtle has not been seen here since the 1960s, but the loggerhead turtle has been spotted more regularly in the Strait of Bonifacio in the past decade. In October 2001 its nests were even discovered on the beaches of Palombaggia, south of the Cerbicale archipelago.

While the alga *Goniolothon byssoides* is difficult not to notice, sightings are very rare. It appears to be vulnerable, given the small number of sites where it can be found. Also, its pads detach very easily, making it highly vulnerable to trampling by fishermen and swimmers (Boudouresque *et al*., 1990). Verlaque (1991) noted its presence around the Lavezzi Islands.

2.1.2 Critical habitat

This area offers great potential for the conservation of a large number of nationally important habitats and species. Certain species (the European shag, the giant limpet *Patella ferruginea*) are present in numbers which provide the nucleus of genetically stable populations that may be considered source populations capable of providing the starting point for colonization (natural or artificial) of potential habitats, to differing degrees, depending on the manner in which the larvae and individual representatives of those species are distributed. This area of the Strait of Bonifacio is thus of vital importance for declining populations or small sub-populations of species. For example, conservation of the national gene pool of threatened meta-populations of species such as the giant limpet could allow it to be reintroduced into areas of the Mediterranean where it is now extinct.

The care of this area is also very important to marine avifauna. This is a major site for the European shag (*Phalacrocorax aristotelis aristotelis*) and for sizeable numbers of Cory's shearwater (*Calonectris diomedea*). The Strait of Bonifacio is also a main point for the passage, roosting and feeding of the Yelkouan shearwater. The whole area is a feeding ground for these species.

The European shag population does not exceed 10, 000 pairs across the whole of its small area of distribution in the Mediterranean. The Strait of Bonifacio has high priority in the conservation of this species. In 2001, the nesting population of the Strait of Bonifacio represented more than 50 per cent of the French population and 7 per cent of the world population. The main problems for this species are disturbance to nesting sites, accidental capture during small-scale fishing and the disappearance of habitats owing to the expansion of tourism.

The nesting population of Cory's shearwater accounts for 40 per cent of the national nesting total. With 345 pairs, the Lavezzu island colony is the most numerous in France. This species is on the decline owing to the introduction of allocthonous species (dogs, cats and rats), the removal of eggs from certain colonies and the development of tourism, which disturbs colonies and destroys habitat.

With around 200 nesting pairs within the perimeter of the area, the population of the highly unobtrusive storm petrel (*Hydrobates pelagicus*) represents around one third of the French Mediterranean population and between 15 and 18 per cent of the French population including Atlantic birds. Europe's smallest marine bird (15 cm) is in steep decline in the Mediterranean, mainly owing to the introduction of predators such as the black rat (*Rattus rattus*). The colonies are now highly localized and concentrated, making them very vulnerable.

2.1.3 Dependency

The main ecosystems of the Strait of Bonifacio area, whether deep-sea or coastal, are closely interconnected: pelagic open-water systems, gulfs, intertidal zone, supralittoral environments, islets and lagoons.

Being an open system, the marine environment does not experience fragmentation of habitats to the same degree as the land environment. In the Strait of Bonifacio the long-protected areas of the Lavezzi, the fish confinement areas and the decreed biotopes of the Monk and Bruzzi islands shelter balanced populations which embrace all age-groups and assure the reproduction of larvae (fish, crustaceans, ...) and their diffusion to more recently established nature reserves. Plankton production and the gathering of animal larvae condition the introduction of both marine and littoral trophic chains. By virtue of its geographical position and the existence of violent currents which facilitate larva distribution, the Strait of Bonifacio could play a not inconsiderable role in coastal fishing management in the north-western Mediterranean.

While the plankton-eating organisms are an indispensable resource for large pelagic species, seriolae and tuna, not to mention cetaceans (particularly bottlenose dolphins), they are also attractive to the marine birds present (European shag, Cory's shearwater, seagulls ...).

2.1.4 Representativeness

Beds of *Posidonia oceanica*, high-priority protected habitats, are widely represented. A Posidonia bed is a very valuable ecosystem from the biodiversity point of view, and is also very important to fishing, coastal protection and the enrichment of certain other coastal ecosystems. It is an excellent indicator of the overall quality of the natural environment. In many parts of the Mediterranean, it has been seriously affected by human activities, and some beds are in serious decline. Beds of *Posidonia oceanica* are characteristic of the infralittoral stage in the Mediterranean. Those in the Strait of Bonifacio area cover more than 5,000 ha and are in excellent condition. They play a leading role in the area's productivity and provide sites for breeding, spawning and raising young.

The alga *Lithophyllum lichenoides* found in belts in the intertidal zone is included in annex I of the "Habitat" directive. This species is well represented along the battered granite and limestone coasts of the Strait of Bonifacio. The oldest and largest belts are found along the cliffs at Bonifacio and in the Lavezzi Islands.

Like other algae typical of sheltered sites in the infralittoral stage, certain types of *Cystoseira* have become rare because its habitat is suffering from pollution or eutrophication or has been destroyed by coastal management. Overgrazing by sea urchins, whose predators have been partially eliminated by man, also has to be taken into account. The *Cystoseira* are very well represented in the strait and certain species such as *C. Funkii* are seen on rare occasions at near-surface depths (Ballesteros & Pineda, 2003).

2.1.5 Diversity

The number of species recorded to date in the Strait of Bonifacio is 1,745. Among the 977 species of fauna are 18 mammals, 165 birds, seven reptiles, two amphibians, 187 fish, 11 protochordates, 13 echinoderms, 262 insects, 11 arachnids, six bryozoans, 103 crustaceans, 143 molluscs, seven annelids, 23 cnidarians and 19 spongarians.

Considering the faunistic taxons as a whole, it should be noted that:

- Twenty-three animal species are of Community significance. Care of this area is particularly important for two amphibians (*Discoglossus sardus* and *Hyla arborea sarda*), the bottlenose dolphin (*Tursiops truncatus*), chiroptera, marine molluscs, the fish *Aphanius fasciatus*, the loggerhead turtle *Caretta caretta*, the gecko *Phyllodactylus europaeus* , the lizards *Podarcis tiliguerta* and *Lacerta bedriagae* and the snake *Coluber viridiflavus*. Among the animal species of Community significance whose capture in natural surroundings and cultivation can be managed, only the red coral *Corallium rubrum*, can be and is being cultivated;

- Seventy-seven taxons are listed in the "Birds" directive (all annexes combined). Among these birds are 16 species nesting in the area (including 10 from annex I), 24 regular migrants, 30 occasional migrants and five accidental migrants;

- The taxons strictly protected under the Berne Convention (annex II) amount to 139, with 70 other species being considered as protected species whose exploitation must be regulated (annex III);

- Three migratory species are in danger of extinction, namely the Audouin's gull *Larus audouinii* and the loggerhead and leatherback turtles *Caretta caretta* and *Demochelys coriacea*, which require strict protection under annex I of the Bonn Convention. Sixty-seven other species (reptiles, mammals and birds) are considered to be in a poor state of conservation under that convention. All these species are also listed under the Berne Convention;

- Thirty-seven rare species are listed in the three annexes of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (Washington Convention), for example the peregrine falcon *Falco peregrinus*, the loggerhead turtle *Caretta caretta*, the bottlenose dolphin *Tursiops truncates*, and Hermann's Tortoise (*Testudo hermanii);*

- Thirty-three species are identified as endangered or threatened under the Barcelona Protocol concerning specially protected areas of Mediterranean importance (SPAMI) (annex II) and 14 as requiring control over their exploitation. These species are also listed in the annexes to the Berne Convention. Among the exploited species, we note two large fish: the swordfish *Xiphias gladius* and the red tuna *Thunnus thynnus*;

- There are 148 wildlife taxons protected at national level, of which the great majority comprises birds (121 species). Nineteen of these nest in the Strait of Bonifacio area. Thirteen mammals present are protected at national level: seven cetaceans, four bats, the hedgehog *Ericeanus europeus italicus* and the weasel *Mustella nivalis corsicana*. Also protected are four land reptiles, two amphibians, two marine turtles and one fish, namely the Mediterranean shad (*Alosa fallax nilotica).* Among the marine species the needle-spined sea urchin *Centrostephanus longispinus,* the Mediterranean slipper lobster *Scyllarides latus*, the pen shell *Pinna nobilis* and the limpet *Patella ferruginea* are protected;

- In the context of the International Union for Conservation of Nature (IUCN) Red List, the leatherback turtle *Demochelys coriacea*, observed only a few times in the past 50 years, is classified as critically endangered and four species, the fin whale *Balaenoptera physalus*, the loggerhead turtle *Caretta caretta*, the dusky grouper *Epinephelus marginatus* and the common seabream *Pagrus pagrus*, as endangered. Nine species are considered vulnerable, i.e. as facing a high risk of extinction in the wild. These include the gecko *Phyllodactus europaeus*, the long-fingered bat *Myotis capaccini* and certain threatened cartilaginous fish: the great white shark *Carcharodon carcharias*, the basking shark *Cetorhinus maximus*, the manta ray *Mobula mobular*, the liver-oil shark *Galeorhinus galeus*, and the angel shark *Squatina squatina*. Lastly, the status of 161 species is considered to be of concern (10 mammals, 143 birds, one amphibian, two reptiles and four fish);

- Seventy species feature in the red lists of the French Natural History Museum in Paris. The endangered species number 13 including the loggerhead turtle *Caretta caretta* and the Mediterranean slipper lobster *Scyllarides latus*. The following are considered to be vulnerable in France: the pen shell *Pinna nobilis,* the limpet *Patella ferruginea*, the brown meagre *Sciaena umbra* and the nursehound *Scyliorhinus stellaris*.

Among the floral taxons:

- Eight are included in annex I of the Berne Convention, including *Silene velutina* and *Posidonia oceanica*;

- Five algae are also included in SPAMI Annex III;

- Fifteen plant species are protected at national level, including 12 terrestrial species. The marine species include *Posidonia oceanica* and another marine phanerogam, namely the seagrass *Cymodocea nodosa*, which is also well represented in the Strait of Bonifacio;

- Four species are considered to be vulnerable by the IUCN: *Helicodiceros muscivorus, Drimia fugax, Nananthea perpusilla* and *Silene velutina*. They all enjoy protected status.

The diversity and complementarity found among the various littoral ecological compartments can be considered a major asset for this area. There are around fifty elementary habitats, with ecosystems ranging from coastal scrub to salt grass and from lagoons to the depths of the circalittoral zone.

The coastal, littoral and salty habitats, such as the mobile and fixed dunes of the Mediterranean shores where *Crucianella maritima* is found, and halophilous scrub, conceal all the floral taxons of major heritage importance.

At sea, the major "reefs" type of habitat brings together rocky habitats of the mediolitteral zone as well as all the fauna and flora of the intertidal zone. Biocoenoses of photophilous algae and coral are also integrated into this major type of habitat. All the types of gorgonia, cystoseira and the large bryozoans are also important elements of the area's rich heritage and require special protection against the impact of underwater activities and of global changes relating to rise in sea temperature.

2.1.6 Productivity

The large expanse of sea and strong currents, as well as the richness of the fish stocks, widely recognized by Mediterranean ichthyologists, give this protected marine area a major role in the dispersion of larvae throughout the western Mediterranean. That role is essential for the threatened species in a good state of preservation in the Strait of Bonifacio, such as the dusky grouper *Epinephelus marginatus*, but also for other species of importance in the heritage and fishing contexts.

2.1.7 Spawning or breeding grounds

The waters of the lagoon habitats (Pisciu Cane, Testarella and Ventilègne), rich in nutritive salts carried from the drainage basins across which they pass, stimulate the growth of lagoon phytoplankton. These lagoons nourish and shelter many marine species. The dense plant growth, adapted to the complementary influences of sea and land, is home to many aquatic and avian species. These biotopes provide ideal shelter for nesting and reproduction and are an important source of food. Yellow-legged gulls, grey herons, little egrets and even young ospreys are regularly observed there. The mosaic of vegetation and the presence of smooth stretches of standing water make it possible for certain wintering or migrating anatidae to come here on an irregular basis (mallard ducks, pintails, Northern shovellers, common teals and garganeys...), as well as migrating shorebirds (common snipes, jack snipes, sandpipers, black-tailed godwits, little stints). Mallards, moorhens and water rails occasionally nest on Testarella lake. As mentioned above, the Posidonia beds play a major role in the area's productivity and provide areas for breeding, spawning and the raising of young.

2.1.8 Fragility

Many habitats are important, in terms of heritage, by virtue of their representativity in the Mediterranean context and the direct and indirect threats they face.

For 15, 000 years man has been exerting his influence as an integral part of the ecological system of the Strait of Bonifacio. Man-induced factors (sample-captures, alteration or destruction of habitat, disturbances, introduction of species...), whether old or more recent, direct or indirect, are exerting an increasing impact as methods of navigation and sampling techniques evolve. Those factors are responsible for the disappearance of the monk seal (*Monachus monachus*) and the reduced populations of the limpet *Patella ferruginea*, a process which has been affecting that mollusc since prehistoric times, and the grouper *Epinephelus marginatus* for 30 years.

It is also quite clear that climate change, especially the increases in air and sea temperatures, as well as fishing activities across the Mediterranean, is exerting an ever increasing influence on the overall functioning of the Strait of Bonifacio.

Increase in seawater temperature triggers significant changes in the ways that pelagic communities (tropicalization of plankton production) or benthic communities function in the north-west Mediterranean. It benefits tropical species, such as the yellowmouth barracuda *Sphyraena viridensis,* to the detriment of certain Mediterranean species that cannot support the rise in temperature. In this regard, the spectacular rise in mortality rates since 1998 among gorgonias is cause for concern.

Man-induced activities also generate cascade effects. Such occurrences may be confined to the territory of a protected marine area or affect its periphery. Thus, the destabilization of *Posidonia oceanica* owing to increased numbers of unregulated anchorages or sediment erosion is leading to a reduction in the populations of species associated with this habitat, in particular the pen shell *Pinna nobilis*. Failure to manage household waste and the existence of open-air public landfill sites for over 30 years have brought about an increase in the population of yellow-legged gulls (*Larus cachinnans*) and a serious deterioration in the micro-insular systems of southern Corsica (destabilization of vegetation by the action of nitro-phosphates on floristic corteges, and inter-species competition between the very rare Audouin's gull (*Larus audouinii*) and the yellow-legged gull, to the latter's advantage).

Waste from purification plants undergoing repair is also likely to affect the existing habitats. Large-scale recreational use of the location also produces effluent and larger waste

products, particularly plastic bags, which become mixed in with schools of jellyfish and are then consumed by loggerhead turtles and bottlenose dolphins, causing obstruction of their digestive systems.

The habitat known as "silty sands in sheltered areas (Mediterranean) biocoenosis" in the large creeks and shallow bays of Lavezzi, Cavallu, Ventilegne, Santa Manza, Porto Novo and Rondinara remain under the influence of the nutrients and pollutants which arrive from the drainage basins, bringing the risk of hypoxia or anoxia owing to the low water renewal rate. This habitat can also prove to be a good indicator of anthropization level in the drainage basins themselves.

The habitats of submerged or semi-submerged sea caves are extremely sensitive to the impact of man. The Sdragonato cave and undersea caves used in diving are areas of particular sensitivity.

In France, the belts of *Lithophyllum lichenoides* have receded in polluted areas. The situation of the algal limestone belts, like that of L. Lichenoides at the mediolittoral level, and their porous structure, makes these formations highly vulnerable to surface pollution by effluents, oily film on the water and other agents. The loss of even a little salinity in the water prevents them from forming. There could also be a threat from phosphate ions and detergents (LABOREL, unpublished, in Boudouresque *et al*., 1990). A belt appears to take an exceptionally long time to build up (several centuries) and it is imperative to protect the existing ones (Boudouresque *et al*., 1990).

2.2 Scientific and educational criteria

2.2.1 Baseline for monitoring studies

In considering the importance of preserving the habitats and meta-populations mentioned above, their vulnerability must be assessed with caution. Long-term observation of reliable scientific indicators will help distinguish between natural cycles and genuine man-induced disturbances.

This area can also play a role in the transfer of ecological engineering in relation to sustainable resource management. The length of time that protection measures have been in place in southern Corsica, differences in regulations and hence in the pressures from fishing activities inside this protected area in Corsica and in Sardinia, the conservation of reference areas (areas of strict protection) and finally the long-standing acquisition of reliable scientific data are factors which can be used in establishing sustainable development models for Mediterranean coastal areas.

3 Vulnerability of the area to damage by international shipping activities

3.1 Natural factors

3.1.1 Hydrographical

The hydrographical conditions in the Strait of Bonifacio are strongly influenced by the region's landscape and climate. In particular, there are frequent very strong currents (3-4 knots) largely determined by the winds. These strong currents have already, on two occasions, caused the South Lavezzi signalling buoy to shift. They derive from cyclonic and anti-cyclonic conditions and are responsible for surface changes among the Tyrrhenian and Algero-Provencal water masses. Movements originating in the Atlantic and Tyrrhenian systems, being less subject to the vagaries of the weather where water masses of permanent density are concerned, also affect the bathymetric layer between 50 and 100 m.

This situation explains (Romano, 2004), at least for surface waters, the existence of strong currents, especially as the strait between Corsica and Sardinia is characterized by a rise in depths.

The tides are semidiurnal with diurnal inequality, with a tidal range of less than 0.5 m.

3.1.2 Meteorological

Having a sub-humid Mediterranean climate, with temperate winters, the Strait of Bonifacio region is also particularly windy. Data recorded by the Pertusato semaphore station on the Bonifacio plateau show that the wind blows on 328 days per year (171 days of wind >16 m/s or 57.6 km/h). There is high frequency of winds of a speed faster than 8 m/s, almost exclusively from two directions: west (280°) and east (80°).

Given the hydrographical, topographical and meteorological conditions (shoals, strong winds and currents), the major risk to the Strait of Bonifacio area relates to accidental pollution from all forms of navigation in the Strait itself (several merchant ships have sunk in the past 30 years), and also on its periphery. The risk of collision with a bottlenose dolphin is also a threat identified by the Pelagos sanctuary for Mediterranean marine mammals.

3.2 Traffic characteristics

In 2009, Bonifacio Trafic (the Franco-Italian service) received 2,984 mandatory ship reports. Among them were 180 abnormalities (breaches of IMO Assembly resolution A.766(18)) of which 108 were for transport of dangerous goods, amounting to 147,013 tonnes (141,867 tonnes in 2008). The offences included 55 cases of sending a mandatory report after entering the system, 19 relating to ships found to be following a route that was not recommended (down by 33% on 2008) and 108 relating to ships carrying dangerous goods (+9 %).

In 2009 a total of 157 ships carrying dangerous goods passed through the Strait of Bonifacio:

- 70 container ships;
- 61 ro-ro ships;
- 13 bulk carriers;
- five chemical carriers;
- three oil tankers;
- three gas tankers;
- two ferries.

The 2,984 vessels which navigated in the Strait of Bonifacio in 2009 were distributed as follows:

<u>European Union</u>

Italy 831; France 371; Malta 251; Netherlands 152; Portugal 78; United Kingdom 67; Cyprus 50.

<u>Non-EU</u>

Turkey 100; Antigua 183; Bahamas 165; Panama 143.

The status that the Strait of Bonifacio enjoys as an international strait and the provisions of IMO resolution A.766(18) contribute to making it, although it is apart from the major shipping routes (3, 000 ships per year) and its dangerousness is well known, an area in which the coastal authorities are confined to the role of spectator, waiting for a maritime accident to happen.

This situation of constant danger is no longer tolerable given the ecological and heritage significance of the Strait of Bonifacio, which is now in the process of being officially recognized, particularly in the context of the application to have it declared a Unesco world heritage site.

Considering the recent disasters that have affected European coasts, it seems essential that IMO adopt protective measures additional to those for which resolution A.766(18) provides. France and Italy therefore request that the Strait of Bonifacio be designated a particularly sensitive sea area (PSSA).

II APPROPRIATE ASSOCIATED PROTECTIVE MEASURES AND THEIR APPROVAL OR ADOPTION BY IMO

France and Italy propose that the following area, comprising a quadrilateral bounded by the following lines, should be declared a PSSA:

- To the north: a line linking point 41° 45' 00" N – 008° 01' 48" E to point 41° 45' 00" N – 009° 48' 30" E passing the French coast (Cap Muro to the west and Anse de Tarcu to the east);
- On the western side: a line linking points 41° 45' 00" N – 008° 01' 48" E; 41° 06' 36" N – 008° 01' 48" E and 40° 58' 00" N – 008° 12' 00" E on the Italian coast;
- On the eastern side, a line linking points 41° 45' 00" N – 009° 48' 30" E; 40° 41' 08" N – 009° 48' 30" E and 40° 45' 56" N – 009° 41' 42" E on the Italian coast to the south.

France and Italy propose the adoption of the following as associated protective measures for the Strait of Bonifacio PSSA:

.1 Adoption by IMO of a mandatory traffic separation scheme (TSS) to replace the current recommended routes. SOLAS regulation V/10 provides for the adoption of such measures for purposes of protecting the marine environment;

.2 Promulgation of areas to avoid close to reefs that present particular danger to navigation, such as those of Lavezzi or Perduto. France and Italy will notify IMO of the measures establishing these areas where their territorial waters are concerned;

.3 Establishment of a vessel traffic system (VTS) pursuant to the provisions of the SOLAS Convention. Regulation 8-2 of chapter V (Safety of navigation), which establishes when a VTS may be brought into operation, states that VTS contribute to safety of life at sea, safety and efficiency of navigation and protection of the marine environment, adjacent coastal areas, work sites and offshore installations from possible adverse effects of maritime traffic. Governments may establish a VTS when, in their opinion, volume of traffic or the degree of risk justifies such services. Bonifacio Trafic is already an embryonic VTS;

.4 Establishment of a mandatory pilotage system for ships following the Strait of Bonifacio and whose transit of the area resolution A.766(18) recommends flag States to prevent. The pilots of the French department of Corse Sud have already been active in this regard, with several large ships every year making use of their services.

ADDITIONAL INFORMATION: CHART OF THE AREA