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Note by the Executive Director

The attached document, which was prepared by H. Baccar for the International Union for Conservation of Nature and Natural Resources with support from the United Nations Environment Programme, is submitted to those participating in the Consultation for their information.

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INTERNATIONAL UNION FOR CONSERVATION OF NATURE AND NATURAL RESOURCES

A Survey of Existing and Potential Marine Parks and Reserves in the Mediterranean Region

by

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Presented as a background paper to the Expert Consultation on Mediterranean Marine Parks and Wetlands, Hammamet, Tunisia, 12-14 January 1977.

Foreword

The International Union for Conservation of Nature and Natural Resources initiated a survey of the Mediterranean region in January 1975 with financial support from the United Nations Environment Programme under Contract No. FP-0503-75-03. This survey has been carried out by Dr. Hédia Baccar, IUCN Consultant, 526bis Avenue Jean Jaurès, Tunis, Tunisia, with the cooperation of the governments of countries adjoining the Mediterranean Sea. The objects of the survey were:

- to establish an inventory of marine parks and natural marine reserves existing in the Mediterranean and on the Mediterranean coasts;

- to establish preliminary lists of zones which are protected or are on the verge of being classified as parks and marine reserves;

- to establish a list of coastal areas which require special protection in view of their ecological richness, their archaeological interest or special scientific value. The chosen areas will have to be ultimately subject to a more detailed study in order to get precise delimitations;

- to propose a future action plan for the protection of marine ecosystems in the Mediterranean area.

The results of the survey have been reported here by Dr. Baccar to serve as a background paper to the Expert Consultation on Mediterranean Marine Parks and Wetlands, Hammamet, Tunisia, 12-14 January 1977.

INTRODUCTION

1. Before going into the question of protection of the natural environment and marine parks, it is necessary to give some background on hydrographical and biogeographical aspects of the Mediterranean and to briefly review the biological resources, the state of pollution and the effects of pollutants on the Mediterranean marine ecosystems.

1.1. Hydrographical and biogeographical aspects of the Mediterranean:

1.1.1. Hydrographical aspects: The Mediterranean is a half-closed sea characterised by little tidal fluctuation; it is linked to the Atlantic Ocean through the Straits of Gibraltar and to the Red Sea through the Suez Canal. The Ridge of Sicily divides it into two basins: Oriental and Occidental. The Mediterranean is a narrow sea, (4,000 kms west-east and 800 kms north-south), and deep (from 2,500 to 5,000 meters) with a circumference of 10,600 kms, and a surface of 2.97 million km^2 and a volume of 4.24 million cubic meters.

The salinity of the Mediterranean is very high (from west to east 36-39‰) because of little inflow of fresh water (by the Rhône river and the Po, the inflow from the Nile being negligible since the construction of the Aswan Dam). The Atlantic current comes into the Mediterranean by the Straits of Gibraltar and follows the North African coast up to the Oriental basin. The water circulation route in the Mediterranean favours the concentration of pollutants on the surface which move out from the coast, and accumulate at certain points because of the almost total absence of tides (Lacombe and Tchernia).

1.1.2. Biogeographical aspects: The particular character of the Mediterranean which is, in fact, an ecoregion, is a homogeneity resulting from the origin of its fauna and flora, and the basic structure of its biocenose.

Considering its hydrographical characteristics and its diverse biogeography the Mediterranean can be subdivided into four biogeographical sub-units (Peres and Picard 1964): the Alboran Sea, the Occidental Mediterranean, the Oriental Mediterranean, and the Adriatic Sea. Within these sub-units one can distinguish various zones.

1.2. The biological resources of the Mediterranean: The biological resources of the Mediterranean are relatively weak. The rate and character of exploitation of the stock is badly known. The marine resources are over-exploited from Gibraltar to the Black Sea and along the European coast. The total fisheries of the Mediterranean, according to official statistics, stand at 1.1 million metric tons: the real statistics are believed to be 40% higher. This amounts to 1.7% of the fisheries of the world. The Oriental Mediterranean is poorer than the Occidental Mediterranean. The potential productivity of the

Mediterranean could be doubled by developing aquacultures. The problem which arises then is that of availability of protected sites and waters. The zones where human intervention is relatively small or even non-existant represent about 1 million hectares and are principally located on the African coast of the Mediterranean. These are, therefore, the zones where the fishing intensity is less high and which are less exposed to pollutants of terrestrial origin. The availability of these sites is in constant competition with the development of tourism, industrialisation, and the increase of human activities in the coastal zone.

1.3. The state of marine pollution in the Mediterranean: The description which follows is based on a report written by FAO/CGPM which in turn is based on information received from a questionnaire addressed to all countries touching the Mediterranean (CGPM 1972).

The ever-increasing level of pollution of the Mediterranean is basically concentrated in the coastal zone - in particular the north coast, the east coast of Spain, the Ligurian coasts of France and Italy, the north Adriatic and in the northern Oriental Mediterranean.

1.3.1. Domestic waste waters: Domestic waste waters from around the Mediterranean basin flow directly into the sea. There are some sewage works which very often do not operate, or are old-fashioned. The situation is particularly bad in the north west basin and in the north of the Adriatic. The total organic sediment coming through waste water is 1.195 tons of BOD5 a year, (except for Egypt and Lybia - map 1).

1.3.2. Industrial pollution: The big industrial centres of the Mediterranean are concentrated in the Occidental part of this sea. Big industries have recently been placed along the African coast. The zones which are most polluted are found around Barcelona in Spain, between the Rhône river and Marseillesin France, in the region of Genoa and Naples in Italy, the Occidental coasts of the Adriatic, the north Oriental region of the Levant Basin, the Aegean and Marmara Seas.

1.3.3. Hydrocarbon pollution: Pollution through hydrocarbons which has become more and more important in the Mediterranean is essentially due to transportation of petroleum, the operation of loading and off-loading of petroleum in terminals, off-shore exploitation and exploration, and the discharge of dirty ballast water from ships. The dumping of ballast water is authorised in two zones in the Mediterranean (map 2) and it is estimated at about 300,000 tons of petroleum a year. However, about 20,000 tons a year are discharged from the coasts either deliberately or accidentally. The quantities discharged in prohibited zones are not known. In the Occidental basin the beaches and ports are polluted by petroleum residues. Large quantities of crude oil are disseminated on the whole of the Mediterranean coast.

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1.3.4. Pollution by pesticides: Pollution through pesticides is not well-known in the Mediterranean. All agricultural Mediterranean countries use different pesticides in large quantities. The quantities used are much more important in the Occidental Mediterranean where one practices agriculture on a big scale, and smaller in the Oriental Mediterranean because of the topography and aridity of this region.

1.3.5. Other types of pollution: Other types of pollution such as thermal pollution, radio-nuclear, solid waste, and pathogenic agents are not alarming today in the Mediterranean. However, the rising demand for energy risks promoting an increasing number of nuclear stations and therefore an increase of radioactive discharge. One discovers around the Mediterranean coast important quantities of solid wastes and matter in suspension as well as an increase in the number of stations yielding thermal effluents.

1.4. Effect of the pollutants on the marine ecosystem in the Mediterranean: Hydrographical considerations, with a general circulation mostly in the coastal areas, makes pollution more serious in the Mediterranean - a half-closed sea characterised by very weak water exchange. Pollutants cannot be sufficiently absorbed or diluted in coastal zones, if they are not diluted and spread out into deep water. The effect of pollutants on the biological resources in the Mediterranean is very difficult to determine. Quite often the stated effect on the ecosystems is not to be attributable to pollutants only, but results from the synergistic action of several factors: even though some of them are not toxic, such as changes in temperature or salinity.

The effect of pollutants on marine communities and ecosystems in the Mediterranean must be included in a coordinated and continuing programme of research and surveillance, such as adopted by the participants at the Intergovernmental Meeting on Protection of the Mediterranean Against Pollution (Barcelona, February 1975) and specified during the experts meeting held in Rome (July 1975).

The envisaged research will be based on a long-term study in zones where one finds heavy pollution, and in similar communities in non-polluted areas such as marine parks and reserves.

INVENTORY OF MARINE PARKS AND NATURAL RESERVES IN THE MEDITERRANEAN

2. Taking into account what is mentioned above, the Mediterranean basin constitutes a fragile ecosystem which does not have a large tolerance against the variations brought to the environment by different human activities, either directly or indirectly. Moreover, the development of the coastal zone (i.e. the extensive industrialisation of the coast, the development of urbanisation and tourism) does not take into account the ecological aspects of the problem, the precarious situation of the marine environment in the Mediterranean and the protection of marine life.

This view of the whole situation "demands" the creation of a system of natural marine reserves in the Mediterranean. It is obvious that one has only recently realised the necessity of creating protected areas in the Mediterranean, and, for many coastal countries this resulted from the International Conference on Marine Parks held in Castellabate (South Italy) June 1973 (Appendix 1). At that time, existing marine reserves in the Mediterranean were very rare.

The mission initiated by IUCN is to establish an inventory of protected zones in the Mediterranean and to suggest a middle-term programme of creation of marine parks for the whole basin. It was based on a preliminary study of sites in order to take, as quickly as possible, measures of conservation regarding zones to be protected as well as to establish a system of natural reserves intended for some form of protection.

The following report includes, for each study area, an inventory of marine zones being legally protected (marine parks, natural marine reserves, military zones and others), and already described, and marked zones needing a better description, and a division into more precise zones. The marked zones have been chosen, after consultations and sessions of work with experts of different countries more or less concerned with the problems of protecting the marine environment. This preliminary study will have to be completed by a detailed study of all the parameters in the chosen zones. Certain areas will be greatly modified, perhaps excluded, in the light of the results obtained by detailed studies. (Appendix 2: recapitulatory table).

2.1. The Occidental Mediterranean: The biogeographic areas considered in the Occidental Mediterranean are the following:

2.1.1. South-west basin: This basin is characterised by the almost complete lack of some endemic Mediterranean forms in the south-west area of Alboran Sea and by the concentration of some Atlantic species which cannot be found elsewhere.

The Maghreb coast is characterised by the presence of most of the typical Mediterranean species (Peres 1964) and north Atlantic and Senegal species. At the moment, a presently low level of industrial activity is developing quickly. We shall consider separately the Moroccan coast, the Algerian coast and the Tunisian coast.

2.1.1.1. Moroccan coast: It now appears that the Moroccan coast seems among the better conserved of the whole Mediterranean. Human activities are relatively low. This coast is practically not polluted and uninhabited as access is quite difficult, the coast being precipitous. It is then easier to assure the protection of the natural beauty characterising the African littoral Mediterranean coast.

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The principal effects of human activities on the coastline are restricted to over-exploitation of fisheries in the trawling grounds in the Bay of El Hoceima and submarine fishing with electrogenic means and traps (great slaughter of Groupers in the region of Calla Iris).

The Moroccan coast is very steep, mountainous and jagged. One can reach Hoceima by only four points and on the whole coast from Cabo Negro by only six points. A project for a road linking Tetouan and El Hoceima is under study. This road project would assure the economic development (mainly tourism and urban) of the region.

The protection of important sections of this coast is of national and even international interest. The creation of marine parks could, therefore, be inserted into the development plans of the coast.

2.1.1.1.1. Protected zones: There do not exist any marine parks or nature reserves in Morocco, not even in project form.

2.1.1.1.2. Possible zones:

2.1.1.1.2.1. Punta Ceres and the Perekhill Isles: The only reserve foreseen is in the zone of the Straits of Gibraltar, a sheltered region of the ancient whale fisheries of Morocco. It is characterised by a distinctive marine population since terracing on the seaward side offers a great variety of biotopes. The very jagged coast is limited by sheer cliffs. The hinterland presents a great interest for the development of a terrestrial reserve.

In general, the Moroccan Mediterranean coast has not been studied in detail, it would be indispensable to make a systematic study of the hydrological, biological and ecological data before delimitating a zone to be protected. This is valid for all of the regions designated on the Moroccan coast.

2.1.1.1.2.2. The Jagersmith and Oued Inter Isles include: Roughly the reserve would be limited to three nautical miles. It is characterised by alternate sand banks, mud flats and rocky bars which also show at times both a moving substrate and hard strata, allowing for diversified biotopes supporting a very rich fauna. This region is known for the small scale fishing of 'chebeiks', of anchovies and sardines. The fishing of 'chebeiks' is very typical and picturesque and should also be protected.

The zones selected partly for the aesthetic values as well as touristic values are representative of the different landscape types of the region. On top of that they include a local skilled fishery. One finds there a unique, bi-valve, the mollusc, Pitaria chione. It is also very rich in small whales and dolphins.

The hinterland is very interesting from the view point of its flora one finds a stand of maritime pine which extends to the coast, an extremely rare phenomenon in Morocco - and its bird fauna.

2.1.1.1.2.3. Calla Iris: Enclosed coves in which lies an island with slight slopes towards land and sheer cliffs towards the sea. This zone is accessible by road and boat. It is indispensable to prohibit totally submarine fishing by divers because of the extensive killing of Groupers by amateur fishermen, and to develop scientific diving. Barracks for the lodging of research teams exist. The region is also very interesting from the faunistic point of view.

2.1.1.1.2.4. Mar Chica (Sebkhet Bou Areg): A lagoon region which in former times was oversalted; the Mar Chica (40 kms long and 7 kms wide) receives the overflow of the dam Mohammed V built in 1969 on the river Mellouia. This influx of fresh water has completely modified the environment of the lagoon and has changed the aquatic life. There is no fishing installation but there is a tourist complex in Nador, an interior port . This region is also remarkable for bird species (gulls, flamingoes, etc.). The interest of this lagoon zone could be encouraged through the development of aquaculture.

2.1.1.1.2.5. The Zafarines Isles: Situated in the sea of Cap de l'Eau, these islands are Spanish. The Zafarines are characterised by a coastline of steep cliffs and are totally uninhabited. They shelter a colony of nesting Audouin gulls and birds of prey (falcons, sparrow hawks and peregrines).

2.1.1.2. Algerian coast

2.1.1.2.1. Protected zones: There is one marine park in Algeria: the Marine and Land Park of Tipasa-Chenoua. The description and the data concerning this park are listed in Appendix 3. The marine park composes of three distinct sites which are well delimited, and a land park of 2 zones: terrestrial park and nature reserve. The chosen site apart from having different types of landscape (rocky cliffs and sand banks) is dominated by a high plain and is close to some interesting Roman ruins and offers an interesting underwater archaeology. Sea grasses make up a characteristic underwater landscape of outstanding beauty and indicate the presence of important sedimentary depots. One can distinguish a whole series of biotopes.

The site chosen is outside of the fishing grounds and small fishermen would benefit from the zone of restocking created by a park. It would also allow a better protection of the archaeological underwater sites. The region of Tipasa is still influenced, however, by degradation caused by human activities.

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2.1.1.2.2. Possible areas: A second site would merit particular attention: the area which takes in both sides of the Algerian-Tunisian border (the region of Calle-Tabarka), and which would form a regional marine park. A detailed study of this sector would permit the exact marking of the limits of the park. The region is of exceptional beauty characterised by a rocky, jagged coastline. This zone is practically uninhabited and sheltered from any form of pollution. One finds the endangered monk seal in various parts. The hinterland is very interesting: all human activity is very restricted. It is also protected by its border location.

2.1.1.3. The Tunisian coast

2.1.1.3.1. Protected areas: A decree by the Ministry of Agriculture officially established in 1973 the Zembra Marine Park and the Natural Nature Reserves of Zembra and Zembretta. The detailed description of the Marine Park is contained in Appendix 4 including a series of topographical and marine maps. The Island of Zembra presents a special interest due to its privileged situation in the Atlantic current. This current is very important for the quantitative and qualitative composition of the marine population around the island, such as the appearance of the monk seal (Monachus monachus) in Zembra which is becoming more and more rare in the Mediterranean.

2.1.1.3.2. Identified areas: A multidisciplinary study made in 1973 by the Tunisian Association for the Protection of Nature and the Environment, and the Directorate of Fisheries, permits us to make a list of sites to be protected all around the coast of Tunisia. These sites have not been submitted to a detailed study and are not governed by conservation legislation. However, there are middle-term programmes foreseen for the creation of protected biological zones on the Tunisian coastline. The important sectors would be situated on the east coast of Tunisia. This is the most important and unique of the Mediterranean and inhabited by a benthic subtropical fauna. Especially important are the Isles of Kerkennah that offer a series of unique biotopes. However, it will be extremely difficult to create a park on the Isles of Kerkennah and to defend it against the established rights of fishermen and the increase of tourism.

One should take note of an area already mentioned under a previous report concerning the Algerian coast: the region of Calle Tabarka, for the creation of a regional Tunisian/Algerian border park.

2.1.2. North-west basin: In the north-west basin we include the central and northern sectors of the Occidental Mediterranean and the west coast of the Adriatic which allows us to simplify the presentation of the present report to the countries concerned.

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This region (particularly the northern sector) is strongly polluted, heavily populated and the most industrialised of all the Mediterranean region. Moreover, the pleasantness and attraction of very big sectors of this coast result in rapid increases in the population in summer. This contributes to the spoilation of protected areas and impoverishment of the natural heritage through underwater fishing which is often badly regulated and irrational.

The population of this region is characterised in the central sector (Delta of the Ebro, Corsica, Sardinia, the Italian coasts of Piombino and the Gulf of Tarente) (Peres, 1964) by the presence of mostly endemic species and elements of Atlantic-Mediterranean species and a big percentage of subtropical species. The northern sector (Catalan Sea, Gulf of Lion, Provence and the Ligurian coast up to Piombino) is characterised by the presence of species of temperate to cold waters and a few sub-tropical species.

We consider in order:

- the Spanish coast (including the Balearic Isles)
- the French coast (including Corsica)
- the total Italian coast (including Sardinia, and Sicily).

2.1.2.1. Spain

2.1.2.1.1. Protected areas: Today there are no marine parks in Spain. The possibilities are being studied of creating a series of protected marine areas, trying to combine them with terrestrial national parks whenever possible. The National Institute for Conservation of Nature has established a plan for creating 2 marine parks, one around Cabrera Island (Balearics) and another around the Medas Islands (Costa Brava). Though these two sites are now being protected (the Medas Islands by the local authorities: the Cabrera Island by the military authorities), their official creation as marine parks is planned for the beginning of 1976.

2.1.2.1.1.1. The Medas Islands: Details and descriptions of the marine park reserve of the Medas Islands are included in Appendix 5. The Medas Islands constitute an archipelago including a series of islands situated along the Costa Brava (Gerona). Due to irrational exploitation, the natural beauty of the red coral reefs decorating the beautiful submarine grottos of the Medas Islands might disappear. They offer an aesthetic value which could be attractive to nature tourism. Moreover, the protected zone would allow for the recovery of an ecosystem, under known conditions and partly controlled, and thus reveal the possibility of stocking one delimited area. In addition to these scientific values, the economic values from such a zone of stocking, bringing back numerous fauna and flora, would be important.

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2.1.2.1.1.2. The Archipelago of Cabrera: The archipelago of Cabrera has a surface of 15.2 km^2 and extends to 4 miles from the south of Majorca (Balearic Islands). After the Cabrera Islands were expropriated by the Spanish Government, they were placed under military mandate.

The main activities on these islands are local fishing and cattle breeding. The northern half of Cabrera Islandsis covered by pine forests.

The marine fauna of the island area is quite poor (shells and turtles). Hunters have eliminated the monk seal (Monachus monachus), which was abundant until the middle of this century. Thanks to protection by the military, this seal has reappeared (two specimens were seen in January 1975). The banks of Cabrera give shelter to a small colony of Auduin gulls (very rare) and quite an abundant bird fauna on the cliffs.

The creation of a natural marine reserve on the Cabrera Islands will protect a flora and a unique and very interesting fauna. This could help to re-establish the monk seal (Monachus monachus) as well as other species that have disappeared. (Appendix 6).

2.1.2.1.2. Marked areas: After a preliminary study, 3 areas on the Spanish coast which could be protected have been counted. These areas are: one by Alboran Island, another in the Albufera of Valencia. The former is strictly marine and surrounds Alboran Island, the latter, the Albufera of Valencia is a lagoon communicating with the sea by natural channels, and is separated from the sea by an off-shore barrier. The third area is the Delta of the Ebro.

There exists a detailed survey on the Albufera of Valencia (Spanish contribution to the OECD Programme) and on the Delta of the Ebro, but there is nothing on the maritime area around the Alboran Island. The latter is under military control and is, therefore, protected. It would be the only protected zone in the Alboran Sea, a biogeographical unity in the Mediterranean, characterised by its own biological richness and faunistic diversity.

2.1.2.2. France: The French coast has one national park (Port-Cros), two natural reserves (Scandola in Corsica and Banyuls-Cerbère), one underwater park for experimental stocking (Beaulieu-sur-Mer) and the seaward regional park in Corsica covering 80 kms. However, one must note that a working group on the protection of the natural environment in the Mediterranean has been working on these problems for a year under the Direction of Protection of Nature (Ministère de la Qualité de la Vie et de l'Environnement). This working group has to determine, among other tasks, the Atlantic and Mediterranean areas to receive special protection. (See 2.1.2.2.2. Possible zones).

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2.1.2.2.1. Protected zones:

2.1.2.2.1.1. National Park of Port-Cros (VAR): The National Park of Port Cros includes Port-Cros and Bagnard Islands and the neighbouring islets of Rascars and La Gabinière. It includes the maritime zone surrounding the islands and islets as far as 600 m from the coasts. There exists a project for extending Port-Cros National Park to Porquerolles Islands and neighbouring islets. It will join together the two islands (Port-Cros and Porquerolles) into one establishment: "The National Park of the Islands of Hyères." It will cover 4600 ha of the surface of the protected maritime zone (1800 ha round Port-Cros and 2800 ha round Porquerolles).

See Appendix 8 for the description on Port-Cros National Park.

Because of its unique qualities, the marine flora of this park has a special place compared to other areas of the French Mediterranean coast. The Posidonian flora is important and forms at the surface a typical barrier-reef. One can find there an aquatic biocenoses which is relatively unpolluted and an epifauna which is extremely rich and varied (foraminiferans, hydroids, ascidians, sponges, bryozoans). Port-Cros Island, situated at about 10 nautical miles from the coast, escapes the intensive pollution of the coastal zone.

Port-Cros Underwater National Park gives protection to the marine environment but, above all, constitutes a natural laboratory for oceanographic research and a sample area of the Mediterranean coast, being the first marine park in Europe (the decree creating Port-Cros National Park is dated 14 December 1963).

After 10 years of research in the marine zone of the park, the results are definitely positive: there is an abundance of the bivalve Pinna nobilis, which is becoming more rare in the Mediterranean, of Groupers (Epinephelus), and of the ascidian Ascilia conchilega (very rare in the polluted area of Marseilles).

2.1.2.2.1.2. The Natural Marine Reserve of Cerbère-Banyuls-sur-Mer (Pyrénées-Orientales): The Natural Underwater Reserve of Cerbère-Banyuls-sur-Mer is entirely maritime; it was created on 5 March 1974; is situated opposite the communities of Cerbère and Banyuls and covers about 550 ha. It contributes to the preservation of sea-beds that have been badly damaged and constitutes a good natural environment for research of the Arago laboratory. The Roussillon coast has a very jagged coast, sheer cliffs with small sandy bays in between. There, the Posidonian flora shelters a rich and varied fauna. See Appendix 7 for detailed description.

2.1.2.2.1.3. Scandola Natural Reserve (Corsica): Situated at the Cape of Scandola, the reserve covers 1000 ha of land and the marine field

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covers 1000 ha of sea. The natural beauty of Scandola's peninsula makes it one of the most extraordinary of Corsica. Its role is double: first of all, it gives protection to an exceptional area, and secondly, it safeguards the natural heritage and the biological richness of the peninsula (a colony of monk seals Monachus monachus lived in Scandola but disappeared 7 or 8 years ago; the protection of the sector might help their reappearance). Disturbances brought by man have had bad effects on the area, showing, therefore, the fragility of the coastal ecosystems.

The avifauna needs particular protection. Scandola is one of the last shelters of the osprey. One can also find Audouin gulls and several pairs of birds of prey, which are disappearing throughout the world (Bearded vulture, Eleanora and Peregrine falcons, Cory's Shearwater and the Shag). See Appendix 9 for the summary description of Scandola's Reserve.

2.1.2.2.1.4. Submarine park for experimental restocking of Beaulieu-sur-Mer (Alpes Maritimes): Beaulieu-sur-Mer Park was established by the decree of 16 September 1968, in order to re-establish maritime fishing on the Alpes-Maritimes' coast. Its main aim is the creation of an area for experimenting and restocking the damaged sea-beds. The specific fauna and flora of the zone found between 0 and 20 m (bed of Posidonians) are in danger due to construction.

The attempts at restocking (paving stone put in the reserve in April 1972) and the planting of algae (Caulerpa disappeared 10 years ago between Antibes and Monaco) are aimed at recreating a biological environment. These installations have contaminated the numerous fauna and flora despite a little surveillance. See Appendix 10 for the description of Beaulieu-sur-Mer Marine Park.

2.1.2.2.2. Possible areas: The large areas on the Mediterranean coast, pointed out by the working group, are the following:

- the whole Roches Toreilles - Roches St. Laurent located further away from Barcarès,
- all of the zone from the Cap d'Agde to the Cape of Béauduc,
- all of the islands, islets and hauts-fonds of the Marseilles - Cassis' area,
- Brusc' zone,
- the whole island and rade of Hyères - Giens Peninsula,
- the sector going from Cap Caraya to Cap de St. Tropez,
- the Esterel falls,
- the Islands of Lerins and the zone of Cap d'Antibes,
- the coastal belt extending from Villefranche to Roque-Brune - Cap Martin.

A programme for creating marine reserves will definitively be proposed by this working group before the end of 1975.

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Besides the large above-mentioned areas and on the basis of observations and research on Beaulieu-sur-Mer Reserve, it would be advisable to establish other restocking areas and reserve small surfaces on the Alpes-Maritimes coast, taking into consideration touristic development and construction in this sector.

2.1.2.3. Italy: (Includes the Italian west coast concerning the Adriatic, Sardinia and Sicily).

2.1.2.3.1. Protected areas: The Italian coast luckily has a zone of biological protection of a maritime surface of 1 square mile, which was established by decree on 10 August 1971 in Portoferraio (Elba Island); a zone of biological protection in Santa Maria di Castellabate at 100 km south of Naples, established by decree on 25 August 1972 (official Gazette of the Italia Republic No. 253 of 27.September 1972); a marine park in Miramare (Trieste) created on 31 May 1973, and a zone of restocking around Ustica Island established on 4 July 1973.

Several projects for creating marine parks and natural reserves exist in Italy, whose description will be studied under the section on possible areas.

2.1.2.3.1.1. Zone of biological protection in Santa Maria di Castellabate: A detailed study of macrobenthos to a depth of 45 m and of colliform bacteria indicates that the Castellabate area is not polluted. On the basis of this survey, the area was declared a marine park.

An alternation of slimy and sedimentary substratums "Flysch" characterises the rocky coast which shelters a biocenose of medio-infra and ciculittoral bed. Of course, this would need protection, but one also has to keep in mind the interest in creating an experimental area which would be used for continuing surveillance in the Mediterranean, and for developing aquaculture. See Appendix 11 for the Castellabate marine park description.

2.1.2.3.1.2. Miramare Marine Park (Trieste): Miramare Marine Park is near Trieste, right at the north end of the Adriatic (most polluted part of this sea). However, the hydric exchanges, created by the currents coming down from the coast of Istria, protect the environment from pollution caused by waste waters from the city of Trieste. Trieste's Marine Park, created to strictly safeguard the marine environment, constitutes a natural laboratory for scientific research. Miramare's Park has been repopulated by marine species which had disappeared due to fishing over-exploitation. It also constitutes a sample area for the conservation of the sea for future generations. (See Appendix 12).

2.1.2.3.1.3. Area of biological protection in Portoferraio: The initial project was aimed at creating a complete natural reserve. The decree of 10 August 1971 established the creation of an area of biological protection.

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2.1.2.3.1.4. Restocking area of Ustica Island (Sicily): Please see Appendix 13 for detailed description of this protected area. In former times, Ustica was considered as the capital of the south. It contains, either on the island or in the sea, Phoenician, Greek, Roman and Arabian archaeological vestiges. Beside this archaeologic interest, there is protection of an international fishing zone, which is threatening to the coastal biocenoses.

Ustica belongs to a volcanic system which has formed abrupt beds which constitute a biotope-shelter for the Occidental Mediterranean as much as for the fauna, the benthic flora, and for most species of necton. The biogeographic interest of Astroides calycularis and the presence of Laminaria rodriguezii, constitute an extremely rare community which needs particular attention.

2.1.2.3.2. Marked areas: Thanks to the research of the coastal laboratories under the care of the National Council of Research, it appears that the areas pointed out in Italy are very important and are being studied and detailed. Particular attention is given by the Italian Government to the problems of protecting the Mediterranean marine environment. Four of these sectors are already classified (Castellabate, Portoferraio, Ustica and Miramare).

2.1.2.3.2.1. The Cape of Portofino: Situated several kilometers from Genoa, Portofino is one of the most beautiful sites of the Ligurian Riviera and gives the best example of fauna and flora in the Mediterranean. (Detailed description in Appendix 14). Some species, which have disappeared in the Mediterranean basin, live in the waters of the Cape (thanks to the geological structure, the topography of the sea-beds and the climatic conditions of Portofino). The irrational fishing, the depletion of marine fauna, and pollution are threatening the sector. The project foresees the creation of a reserve for the entire area.

2.1.2.3.2.2. Insular National Park on the Island of Pianosa (Tuscany): There is a detailed survey of the project regarding the creation of the marine park on Pianosa Island. (The resumé is in Appendix 15). Pianosa's Island is in a zone of currents, thereby causing exchanges of plankton and benthos, characterised by the presence of abundant and varied fauna and flora, archaeologic vestiges. It is also a penitentiary. Tourism and fishing over-exploitation are threatening the biocenose.

2.1.2.3.2.3. Meloria (Tuscany): The project concerns a military zone of 40 km^2 (limited by an isobar of 15 m) in Meloria (Livourno) to protect the rich sea-beds. There are Posidonian meadows with a large variety of biotopes in which live a varied fauna. The creation of a marine park would fulfil the scientific, touristic and educative needs. (See Appendix 16).

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2.1.2.3.2.4. Pilo-Sorso (Sardinia): An entire marine reserve is proposed between Pilo and Sorso in the province of Sassari in Sardinia, extending for 30 kilometers. The coast has rocky, chalky and sandy beds. One has to examine the biologic effects of marine pollution in the zone and to protect an area interesting enough for underwater archaeology (Appendix 17).

2.1.2.3.2.5. Capo Rizzuto (Calabria): The entire proposed reserve includes the maritime area of 20 ha, west of Capo Rizzuto (depths are between 3 and 5 m). The coast and the beds are rocky. One can see Posidonian meadows, a rare and very important resort of Cladocora caespitosa (Madréporian) and a rare parrot-fish (Euscarus cretensis. This interesting zone is threatened by underwater fishing and fishing with explosives. (Appendix 18).

2.1.2.3.2.6. Panarea: The creation of a natural submarine reserve and a restocking zone west of Panarea (Sicily) would protect the indicated sector from the unbalance of nature resulting from underwater and deep sea fishing. The project concerns an area of 13 km^2. Panarea is one of the most extraordinary insular sites of the Italian coast. (Appendix 19).

Appendices 14 to 19 contain detailed projects and resumés for the above-mentioned sectors. Other sectors must be pointed out:

1. Marine coast opposite Villa S. Giovanni
2. Entire marine reserve of Punta Pennata - Punta Campanella (characterised by an exceptional flora)
3. Zone of Santa Croce (Trieste)
4. Natural reserve on the coast of Cinque Terre
5. The coast of "Le Figarole - Monte Marcello - Punta Bianca"
6. Partial reserve in La Grotta delle Viole, Ile Tremiti - S. Domino (coralline surface)
7. Partial reserve in La Grotta dello Smeraldo (Amalfi)
8. Entire natural reserve associated with the future park of Gennartentu and situated in La Grotta del Bue Marino, Orosei (Presence of monk seal)
9. Coast of Lachea Island, Catania (coralline surface)
10. Coast opposite Ganzirri C. Messina
11. Entire natural reserve in Capo Zafferano (Palermo) having a quite interesting population of antozoairians
12. Deep waters of Elba Island
13. Deep waters of Lampedusa Island
14. S. Domino's coast (Tremiti Island)
15. The coast of Strombolicchio's islet (quite interesting population of antozoairians. Strict nature reserve)
16. Strict nature reserve aiming, among other things, to protect a colony of living monk seals in the maritime coastal zone of Tavolara Islands . Molara de Cap Coda, Cavala, (Sardinia).

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2.2. The Adriatic: All through its history, the Adriatic has been connected to the Mediterranean forming a subregion ecologically characterised by its own endemics. Half-encircled with only a few water exchanges with the Mediterranean; the Adriatic washes the east Italian coast (already seen in chapter 2.1.2.3.), Yugoslavia, Albania and part of Greece. The report concerning Greece will be included with those on the Oriental Mediterranean. Albania has not been studied.

2.2.1. Yugoslavia: Yugoslavia has a coastline of 6116 kms (including 4024 kms of insular coast) which extends for 620 kms only as the crow flies.

2.2.1.1. Protected areas :

2.2.1.1.1. The entire natural reserve of Strunian: It seems that only one marine reserve exists in Yugoslavia. Situated on the Strunian peninsula, the reserve covers a terrestrial field of 5 km^2 and a marine area of 200 ha with a briny salt-water lagoon used as an experimental basin to study the effects of pollution.

2.2.1.1.2. Mljet National Park: Mljet National Park, established in 1960, covers 3100 ha of the west area of Mljet's Island situated near Dubrovnic. Though it includes two marine lakes (Veliko and Malo) directly joined to the sea by a narrow canal, Mljet Park has a long surface opposite the Adriatic coast. However, the Park regulations essentially concern only the terrestrial area. The faunistic populations of both lakes are very interesting and rich, and the external coast shelters the rare monk seal Monachus monachus. A short description of the Park is in Appendix 20.

2.2.1.1.3. The islands of Prvic', Grgur, Jabuka, Bisevo, Lokrum, Plavnik, Prvic', Brusnik, Marjan, Krk', Scedo, Pakleni and the Channel of Limske: The above-mentioned are a series of isolated islands, and along with the Channel of Limske, are protected and regulated in regard to fishing activities. Underwater fishing is forbidden as well as the use of trawling nets. Rod fishing is authorised. Prvic's and Krka's islands shelter a nesting colony of Griffon vultures.

2.2.1.2. Marked areas

2.2.1.2.1. Kornati Islands: The archipelago of Kornati includes 125 islands, islets and majestic cliffs going straight down to deep water of up to 100 m and covering a surface of 300 km^2. They are characterised by the existence of well-developed biocenoses. The Kornati belong to the eumediterranean zone dominated by thermophilic elements.

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These islands are practically uninhabited: only a few families of fishermen, vinegrowers, and sheep-breeders have settled down on the beaches near the continent. Therefore, the Kornati "Pearl of the Adriatic", is protected from marine pollution caused by domestic and industrial waste. However, the modernising of fishing and the quick progress of tourism are a danger for the exceptional beauty and pure waters of one of the most marvellous sites of the Adriatic

A decree establishing the creation of the Kornati National Park must be issued during 1975.

2.2.1.2.2. The archipelago of Senj: Situated in the Gulf of Kvarner, the archipelago of Senj is being organized as a marine and insular national park. It includes various chalk sea-beds, and the depth of its basins in relation to the Adriatic result in a large biocenotic diversity and floristic variation. The archipelago of Senj belongs to the sub-Mediterranean zone and contains a maximum concentration of mesophilic elements with Atlantico-boreal affinities.

Other sectors opposite Split in the neighbourhood of Hvar Island to be taken into consideration are:

- Scredro Island
- Pakleni Island

2.3. Oriental Mediterranean: In the Oriental Mediterranean, direct or indirect human intervention, such as the building of the high dam of Aswan, oil transport which is becoming intensive, the building of pipelines and, quite recently, the reopening of the Suez Canal to maritime traffic, are quickly felt by the communities and marine ecosystems. An ecological, physio-chemical, oceanographic change and an increase of pollution in the Oriental Mediterranean results from these different human activities.

The bad effects of this technological development are deeply felt in the coastal zones, resulting in a change in their structure.

The biological Oriental Mediterranean can be sub-divided into three sectors:

a) the Meridional sector characterised by the presence of the largest part of migrating species from the Red Sea and Indo-Pacific through the Suez Canal;

b) the central sector characterised by the presence of its own Mediterranean endemics, tropical or sub-tropical;

c) the northern sector including populations which are comparable to the northern sector of the Occidental Mediterranean.

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2.3.1. Libya: At the moment, there are neither marine parks nor natural underwater reserves in Libya, the marine field having never been studied in detail. Moreover, there is very little oceanographic data relative to the Tripoli coast. However, the Secretariat of the State for Marine Resources, recently established (March 1975), gives high priority to the creation of protected sectors in the sea. But it is difficult to choose which sectors to safeguard as there is almost no data relative to this environment. On the basis of suggestions made by oceanographic research workers of the Centre of Marine Research, four areas have been chosen

- the Island of Thaouara;
- Leptis Magna (120 kms from east of Tripoli, archaeological underwater vestiges);
- Sabratha (75 kms from west of Tripoli, archaeological underwater vestiges);
- Shahaat (200 kms from east of Benghazi).

The Tripoli coast needs quick and effective protection in order to preserve some portions of the coast against potential touristic development, the increase of fishing activities, and above all against pollution due to the different petroleum activities. There are already 5 terminal ports for pipelines in Libya and an oil refinery is being built in Sirte.

Obviously, any definitive choice of marine sectors to be protected should be preceded by a detailed survey of biologic, physio-chemical, ecological and other elements of the considered sites.

2.3.2. Arab Republic of Egypt: There are no protected zones in Egypt. However, the Mediterranean coast of Egypt shows a variety of biotopes including habitats affected by erosion, lagoons, estuaries, lake-sea connections, sandy beaches, rocky hills, and so on. The physical particularities of the area are favourable to the establishment of a great variety of marine organisms. However, the changes of conditions of the environment (mainly caused by the building of the high dam of Aswan) have undoubtedly touched the physical, chemical and biological characteristics of areas directly affected by the Nile's waters.

The creation of marine parks and natural reserves in the area is very important for scientific research and as an ideal place for monitoring oceanographic, biological and environmental parameters in the basin of the Levant.

2.3.2.1. Protected areas: Although there are no marine parks or natural reserves in Egypt, some areas are protected for various reasons:

a) Area of lake-sea connection (Lake Edku) is a zone of restocking where fishing is prohibited

b) Ras El Hekma = (Ras El Kanayes) where sponge harvesting is regulated and fishing activities controlled.

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2.3.2.2. Possible zones: On the basis of details given in the Introduction, four sites have recently been censured on the Mediterranean coast of Egypt.

2.3.2.2.1. Ras El Hekma - Ras El Kanayes: An entire reserve of about 25 km2 is proposed. In depth studies will allow the exact delimitation of the reserve. The morphology of the coast varies from fine sand to a rough rocky coast. One must stress the richness of the fauna and marine flora where human intervention has not had direct effect on the environment.

The choice is justified for two main reasons: the former is scientific, to observe the development of the population and to educate the public; the latter is based on the development of a nature tourism which will offer marvellous marine sea-beds to divers. (See Appendix 21 for a summary description).

2.3.2.2.2. Lake-sea connection Boughaz El Gamil: Situated towards the west of Port Said and its immediate neighbourhood, the area shows an exceptional scientific interest and allows the observation of the development of the fauna of the Red Sea and the Indo-Pacific in the Mediterranean. In fact, in the surrounding area of Port Said one can count the maximum of living species in the Suez Canal which belong to the Red Sea (see Appendix 22 for a summary description). Moreover, the chosen site shows the changes in community structure and in marine ecosystems caused by increased pollution after the re-opening of the Suez Canal to international traffic.

2.3.2.2.3. The Nile Estuary - Rosetta: Since 1966, (construction of Edfina dam) the estuary of the Nile-Rosetta is much more interesting since the Nile's water discharge is now almost negligible. The Nile's water level is controlled by the Edfina dam (at about 15 to 17 kms south from the mouth of Rosetta). This impoverishes the area in fish of high commercial value. The figures are significant: the total fishing in the Bay of Abu Quir(situated at the Rosetta-Nile branch has gone from 4110 tons in 1964 down to 1086 tons in 1970; sardines from 948 tons in 1964 to 525 tons in 1970; shrimps from 1059 tons in 1964 to 834 tons in 1970 and crabs from 250 tons in 1964 to 20 tons in 1970. (See Appendix 23 for a summary description). The possibilities of aquaculture in this area makes the creation of a park within the chosen zone more interesting.

2.3.2.2.4. The Bay of Abu Quir: The Bay of Abu Quir is situated towards the east of Lake Edku. It was considered as one of the most important reserves for endemic species of fish on Egypt's Mediterranean coast. However, plans for industrialising and developing the coast and the building of the high dam of Aswan influence the marine fauna and represent a danger to the life of marine organisms. The actual conditions ruling the south basin of the Oriental Mediterranean

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promote the immigration of organisms of the Red Sea and their subsequent establishment in the South Oriental area; 79% of the migrating species are found in the shallow waters of the Bay of Abu Quir (Appendix 24).

2.3.3. Lebanon: The Lebanese coast, 210 kms long, with a high density of population, is directly submitted to intensive pollution. Therefore, the protection of some of its zones would be a big advantage.

2.3.3.1. Protected areas:

2.3.3.1.1. The islets of Palmier, Sanani and Ramkine (Iles des Lapins): Now there is a project to create a marine and terrestrial park on the islands of Palmier, Sanani and Ramkine, 6 miles from El-Mina (Tripoli-Lebanon). These islets are relatively protected from coastal pollution and practically uninhabited. They are of exceptional interest for the protection of an endangered and typically Mediterranean avifauna, namely: a colony of Audouin's gulls as well as other pelagic or coastal species of gulls, terns and thrushes. These islets are a resting place for migrating birds.

Around these islets, the topography of the sea-beds shows a diversity of populations representative of the Oriental Mediterranean. One of these islands could be used to develop nature tourism; the other two could be used as a bird sanctuary and for marine restocking (especially for the most hunted non-migratory species such as the Seranides) and would help to reintroduce the Monk seal Monachus monachus (Appendix 25).

2.3.3.2. Marked areas:

2.3.3.2.1. Ras En Naqura - Ras El Abyad: This sector consists of 7 miles of coast situated towards the south extremity of the Lebanon, next to the border. The area is ideal because of the variety of its biotopes (rocks and sands).

The creation of marine reserves in the Lebanon causes a crucial social and political problem (fishing forbidden). This problem does not exist in South Lebanon as the fishermen cannot go there. The zone is well-controlled and surveillance made easy due to the presence of customs officers.

2.3.4. Syria: There are no oceanographic surveys on the Syrian coast. It is hardly exploited by fishermen. There is a well-advanced project to create a station of marine biology in North Latakia. Therefore, it would be advisable to consider, as soon as possible, the protection of some sectors of the coast, necessary for the smooth development of the territory. However, as the coast is not well-known, it is difficult to choose which sectors to protect. At least, a small study of the environment would be the first step.

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First of all, the maritime zone around the station of Latakia seems to show some reason for development as a reserve or a marine park. The biotopes are varied, show a large variety in species and are particularly rich in fish.

2.3.5. Turkey:

2.3.5.1. Protected areas: The Turkish Mediterranean coasts extend for 2800 kms. There are two projects to create terrestrial national parks, including a very important maritime area: the sea-shore national parks at Olympus and Halicarnassus.

2.3.5.1.1. Olympus: The regulations of Olympus National Park essentially concern the terrestrial environment on 138 kms of coast (including the insular coasts) and as far as 10 kms inland.

The overhanging coast, bordered by cliffs and mountainous peaks which dominate the turquoise water of an uncomparable limpidity, is of outstanding importance. It has a series of secluded sandy beaches and ancient towns which have not been touched by touristic development or modern architecture.

2.3.5.1.2. Halicarnassus (Bodrum): Halicarnassus National Park (Bodrum at present) has a maritime area covering 100 kms of the Aegean Sea in one of the most interesting areas of Asia Minor, because of the development of underwater archaeology around the peninsula. The most important natural resource of the Park is the marine environment. One has to stress the richness of the fauna, as much as for the quality as for the variety, which results from the morphological shape of the coast and the quality of the water. A small colony of monk seals Monachus monachus live in Bodrum's harbour, and in some isolated parts of the coast and the rocky islands.

The establishment of Bodrum and Olympus parks is planned for 1975.

2.3.5.2. Possible zones: The Turkish coast is unique and is being studied by the Ministry of Tourism with a view to developing the coastal zone without damaging the coastal heritage. This is why important sectors are being withheld from the development plans and their protection will be taken into consideration. The protected zones will be studied in detail by the Minister of Forests. All of the Turkish coast has been studied by a multidisciplinary team which is considering rational management of the natural resources.

2.3.5.2.1. From Iskandrum to Iskele (Iskandrum Bay): The feature of Iskandrum Bay is that its beaches are bordered by very high mountains, sometimes reaching up to 3000 m. Yumurtalik Bay is the sector needing immediate protection (in Turkish, "Yumurta" means "egg" , and "lik" means

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"area"). The most important surfaces where the marine turtles lay their eggs are situated in Yumurtalik Bay. The turtles come to lay their eggs in many areas on the fine sand. In Turkey, different species of marine turtles exist: Caretta caretta, Chelonia medas (only seen in Greece, but most probably existing in Turkey), Trionix triongurus (type of brackish soft water). Marine turtles are protected in Turkey. In Iskandrum sector, a particular type of local fishing is practised, dating from the 18th century, which should be protected from modernisation.

2.3.5.2.2. Köcegiz: The Köcegiz sector is in the Aegean Sea and presents a series of lakes, lagoons, sandy beaches, cliffs, underwater archaeology, thermal waters, areas where marine turtles lay their eggs, etc., with forests surrounding the park.

2.3.5.2.3. Delta Meriç/Evros: The project of a regional park between Greece and Turkey, discussed at the Council of Europe (Aegean Sea), concerns the protection of Delta Meriç, including the marine sector. The protection of Delta Meriç/Evros is of international importance. The intracoastal zone is interesting and, through its rich and varied fauna a very big colony of birds, mostly waders, is nourished. The sandy coast should be classified as a marine reserve, as it has not yet been damaged by pollution or irrational touristic development. Moreover, its situation, relative to the Dardanelles, is a good place for long-term monitoring studies on the effects of the pollution on the environment and marine ecosystems.

2.3.6. Greece: The Greek coast, (including the insular coasts of 3000 islands), extending for 15,000 kms is well-known for its natural beauty and the limpidity of its water, attracting every year a large number of tourists. The fauna and the marine flora are quantitatively and qualitatively varied, and characterised by the presence of endemics.

2.3.6.1. Protected areas: There are no areas really protected in Greece. However, one should note that a project exists for creating a marine park in a sector from Rhodes Island to Lindos. The realisation of this project (dating from 1972) has been delayed for various reasons but Lindos Marine Park will again be taken into consideration.

2.3.6.1.1. Lindos Marine Park: The park is situated near the small village of Lindos (Rhodes Island) in the Dodécanèse. The site has been chosen for various reasons of an archaeological, environmental and scientific order. The area is known for the presence of an Acropolis and old Greek, Roman and Byzantine ruins. The limpidity of water to a depth of 35 m, non-polluted coasts, varied underwater geomorphology: sands, rocks, vertical cliffs sometimes up to 150 m, offer a great variety of biotopes and diverse fauna. There are possibilities for many research facilities since there is a hydrobiological station and an aquarium. (A summary description in Appendix 26).

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2.3.6.2. Possible areas:

2.3.6.2.1. The Delta Evros/Meriç: This sector is described in the chapter covering the possible areas in Turkey (2.3.5.2.3.).

On the basis of a preliminary study made by a group of multidisciplinary researchers, several sectors with priority rights and protection needs, have been pointed out. These areas cover the different Greek eco-systems and include:

2.3.6.2.2. Sapienza Island: A small uninhabited island, situated on the west coast of the Peloponesus (Ionian Sea), where one finds a variety of biotopes and underwater grottos with a different and varied fauna and flora. The discovery of old sarcophagus in the depths is of high interest.

2.3.6.2.3. Paxi and Antipaxi Islands: These Islands belong to the complex of the Ionian Islands (Eptanisa) and would constitute an ideal marine reserve for the protection and the study of the marine environment. One finds varied biotopes (sand beaches, rocky cliffs and underwater grottos), and an abundant and interesting fauna, notably seals.

2.3.6.2.4. Gavdos Island: This Island is in an uninhabited zone towards the south of Greece, south-east of Crete Island. It was Calypso's island of Greek mythology, and is ideal for the establishment of a marine park (interesting and varied fauna and flora influenced by the Libyan Sea).

2.3.6.2.5. Lesvos Island (Mytilini): This needs special attention with priority to the protection and scientific study of an underwater and terrestrial fossil forest. Lesvos is one of the most beautiful islands of Greece and represents an invaluable natural heritage.

2.3.7. The Maltese Islands: The Maltese islands include Malta (250 km^2), Gozo,(64 km^2), Comino (2.5 km^2) and Filfla an uninhabited islet (at 8 kms towards the south-west of Malta). The coast is mainly rocky with several sandy bays.

There are no marine parks in Malta but a project to create a protected zone around Filfla islet is being strongly considered.

Conclusion

The above report only concerns Mediterranean areas which have been studied. For various reasons, some areas have not been covered during this mission.

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FUTURE PROGRAMME FOR THE PROTECTION OF THE MARINE ENVIRONMENT IN THE MEDITERRANEAN AND CONCLUSIONS.

3. This report states that there are only a few protected zones in the Mediterranean basin. Today, one can count 20 marine parks or natural reserves in the Mediterranean; but through the years to come, numerous projects will be realised concerning the protection of sea-beds of several Mediterranean countries. One should note that even in the sectors where regulations exist regarding the marine environment, they are often not applied nor obligatory.

This state of affairs could be excused by invoking the power of regeneration and self-purification of the sea and its biota. But this is not possible in the Mediterranean, which is a half enclosed basin characterised, as already seen, by small exchange of water with the ocean.

Fortunately there is a growing consciousness of these problems, and of the necessity for creating a system of protected marine areas.

However, ecological studies regarding the marine environment in the Mediterranean are quite recent. It is, therefore, necessary to approach carefully the questions of its protection. It would be advisable to first determine the biological data on these unknown areas before proposing an action plan. Moreover, one must take into account the fact that certain proposed areas are "in danger" due to the potential development of touristic and industrial projects. It is, therefore, becoming more and more urgent to have a programme for marine protection started in the Mediterranean.

A detailed study of possible areas and careful delimiting of sectors to be protected is needed. The data on which the choice of area is based is to be taken into account, as well as considerations of economic and social nature which affect the possible area, such as the long-term planning for development and management of the area. This could mean that one would later give up some sectors or redefine their geographical and legal framework.

One must also review the legislative and the legal provisions relating to existing reserves and, on the basis of the accumulated experience in the relatively old parks, (Port-Cros National Park in France for instance), to prepare new legal texts relative to parks to be created.

To conclude and to take into consideration what is mentioned above, the programme for protecting the marine environment in the Mediterranean can be summarised as follows:

1. The study of biological, ecological data and the environmental parameters of unknown areas.

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2. To propose an action plan for these areas (particularly the coasts of Libya and Syria).

3. To take immediate measures of conservation in the areas endangered by touristic and industrial development (as is the case for the proposed zones of the Moroccan, Syrian and Libyan coasts).

4. To study in detail the possible areas and precisely delimit them in view of plans for economic development, land use and management.

5. To define the prohibitions regarding the fishing, underwater hunting and diving, in the zones to be protected.

6. To collaborate with professional fishermen in making out laws ruling the reserves (for instance as does the Association for the Creation and Development of the Marine Biological Reserve of Cerbère-Banyuls, ARMCB).

7. To review the existing legislation in parks and natural reserves and, if necessary, to reform legislative texts and unadaptable regulations in light of previous experience.

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Appendix 1

The International Congress on Marine Parks was held in Punta Licosa from 19 to 21 June 1973; on the first day, the biological, legal, touristic, etc. aspects of the marine parks of Italy were examined, including those of Castellabate and Cilente.

On the second day, the marine parks in the Mediterranean and marine parks of the Indian, Pacific and Atlantic Oceans were discussed.

On the third day, several problems of a general order were discussed, such as: pollution, education, environmental laws, etc., and some general conclusions were reached:

1. The participants at the Congress thanked Dr. P. Dohrn for his efforts in organising this international meeting which marked a start for the marine parks of the world.

2. The participants were pleased to see that the Campania authorities favourably welcomed the establishment of Castellabate Marine Park as well as the holding of the Congress, and they were glad to be able to thank the authorities of Campania for their help, which is to be set down as an example.

3. The participants agreed that it is necessary to establish schools and courses in Castellabate and Campania, in order to help the fishermen on the coast of Cilento, on a short- and long-term basis.

4. The participants were pleased to hear that MAMBO has created a special prize to award the population and schools in the area of Castellabate for their effective contribution in the development of the Castellabate Marine Park.

5. The participants agreed to the creation of an international association of marine parks, an idea which could be put into form at the Tokyo meeting in 1975, through the election of a secretariat and an active president.

6. To safeguard the estuaries of the Danube, Elbe and the Rhône, the participants agreed to remind the interested nations that industries should not be built in or around the areas of the estuaries.

7. The participants will fight against any kind of pollution anywhere, and will help the international organisations concerned to safeguard the environment and to establish new natural, terrestrial or marine reserves.

8. The participants took note of the Charter of Beirut. It was obvious that this initiative will have very favourable effects on marine parks. Arrangements have been made so that each participant can give his utmost help to this Charter within his own country and organisation.

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9. During the meetings of the Congress, it was pointed out that it is absolutely necessary to include a school programme, beginning at the primary level on the environment and the dangers threatening it.

10. Regarding the proposal of the fishermen, the participants asked the authorities to find the best solution in order to satisfy their just claims.

11. The participants were pleased to hear that the conclusions of the Congress will soon be published with the help of eminent editors.

Appendix 2

List of marine parks and marine natural reserves in the Mediterranean

Countries	Protected areas		Potential areas
	Essentially marine (main part of the reserve occupied by the sea)	Coastal with maritime frontage (essentially terrestrial)	
Morocco			- Punta Ceres and Perekhill Islands M.P. - Calla Iris M.P. - Jagersmith Oued Imter Islets M.P. - Mar Chica N.R. - Zafarines Islands M.P.
Algeria	Tipasa-Chenoua M.P. (1975?)		- La Calle (border with Tunisia M.P.)
Tunisia	Zembra (1973) M.P.	Zembra and Zembretta N.R.	- La Calle (border with Algeria M.P.)
Spain	Medas Islands (1975) Archipelago of Cabrera (1975?)		- Island of Alboran M.P. - Albufera of Valencia N.R.
France	Banyuls-sur-Mer N.R. (1974) Scandola N.R. (1975) Beaulieu-sur-Mer (1968) S.A.	Port Cros (1963) (Hyères Islands)	- Roches Torcilles-Roches St. Laurent - Cap d'Adge to Pte Beauduc - Islands, islets of Marseille-Cassis - Brusc - Islands of Hyères and Peninsula of Giens - Cap Caraya to Cap Saint Topez - Slopes of l'Esterel - Islands of Lerins and Cap of Antibes - Villefranche to Roquebrune Cap Martin
Italy	Elbe Island (1971) M.P. S.M. Castellabate (1972) M.P. Miramare (1973) M.P. Ustica Island (1973) S.A.		- Portofino N.R. - Pianosa M.P. - Meloria M.P. - Pilo-Sorso N.R. - Capo Rizzuto N.R. - Panaréa N.R. and S.A. - Report p. 14 No. 1-16

Countries	Protected areas		Potential areas
Yugoslavia	Strunian N.R.	Mljet National Park Islands of Prvic', Grgur, Jabuka, Bisevo, Lokrum, Plavnik, Brusnik, Marjan, Krk, Scedo, Pakleni and Limske Channel	- Kornati Islands National Park - Pakleni Islands
Libya			- Tharouara Island - Leptis Magna - Sabratha - Shahaat
Egypt			- Ras El Hekma-Ras El Kayanes - Boughaz El Gamil - Nil-Rosetta - Abu Quir Bay
Lebanon	Islands of Palmier Sanani and Rankine M.P. (Iles des Lapins)		- Ras en Naqura-Ras El Abyad
Syria			- Lataquié M.P.
Turkey		Olympus National Park Halicarnassus (Bodrum) M.P.	- Iskandrun to Iskele M.P. - Köcegiz M.P. - Delta Meriç/Evros (regional with Greece) N.R.
Greece	Lindos		- Delta Evros/Meriç (regional with Turkey) - Sapienza Island - Paxi and Antipaxi Islands - Gavdos Island - Lesvos Island
Malta			- Filfla Island (Maltese Islands)

M.P. - marine park
N.R. - nature reserve
S.A. - restocking area
N.P. - national park

Map covering the whole area is attached at the end of this report.

Appendix 3

Terrestrial and Marine Park of Tipasa-Chenoua

1. Name: Terrestrial and Marine Park of Tipasa-Chenoua
2. Geographical situation: Algeria, Tipasa (70 km west of Algiers)
3. Latitude and longitude: the park is situated between the longitudes 2^{o} 15' east and 2^{o} 30' east

The park is made up of 3 marine sites:

Site 1 - longitude east 2^{o} 27' 5/10
latitude 36^{o} 36'

Site 2 - longitude east 2^{o} 24' 5/10
latitude 36^{o} 37'

Site 3 - Ras-El-Meskhouta Islets, east of Cap Blanc

4. Surface: the park surface is delimited by the contour of 50 m.
5. Type: coastal province - Mediterranean area south west - regional habitat - various biotopes - facies of cliffs, rocks and beaches of sand
6. Description:

6.1. Physical parameters:
6.1.1. Depth: Site 1 - 6 m - 15 m
Site 2 - 0 m - 16 m
Site 3 - no information

6.1.2. Limits: the 3 sites are delimited in size by the contour of 50 m
6.1.3. Hydrography: very little data exists
6.1.4. Sedimentology: there is a superficial underwater sedimentation favourable to the establishment of phanerogams

6.2. Dominant biotopes (ecology):

Site 1: Important meadow of Posidonia oceanica sheltering a very important and diverse fauna. Species seen: sponges (Chondrosia reniformis), Bryozoans (Retopora cellulosa, Myriczum truncatum), Hexacorallines (Astroides calycularis), Amelides (Eunice sp, spirographis spallanzani), Echinoderms (Sphacrichinus gramularis, Paracentrotus lividus), Molluscs (Peltodoris atromoculata, Purpura haemastoma), Crustacea (Palimerus vulgaris, Pagurus sp), Tunicates (Halocynthia papillosa), Fish (Seranullus cabrilla, Coris julis, Diplodus vulgaris, Labrides, Bleniides).

Site 2: Biocenosis with photophilous algae, main populations: Amphipoda, Isopoda, Bleniides (Chromis chromis, Scorpaena porcus, Diplodus vulgaris, Boops salpa), etc.

North point of Chenoua: remarkable by the presence of "Pouce-pied" (Pollicipes cornucopia) which is only rarely seen in North Africa. It is part of an abundant fauna. Abundance of the green mussel of Africa (Mytilus africanus).

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6.3. Value: Tipasa Bay has an exceptional value. Besides the protection of the terrestrial and marine environments, the Park aims at creating a restocking area for fish, and represents a protected area for scientific research. Moreover, it contributes to the development of tourism (nature tourism) in the region and protects an underwater archaeological site and the beauty of the site from urbanisation and inopportune utilisation.

7. Conservation status: natural character - importance and nature of the threats to the natural marine environment and present legislation. The chosen site has not yet been degraded by human activities. It shows varied and rich marine sea-beds, an abundant flora and fauna. It permits land-use planning of the region for the protection of the ecosystems. There is not yet any legislation regarding the Park.

8. Character and utilisation of the hinterland or the maritime sector, emphasising the need to create a buffer zone: the hinterland, the Chenoua mountain was classified as a terrestrial park to which a terrestrial nature reserve was added.

9. Proposed aim or present utilisation of the region, division in areas: old Roman port, III C. B.C., Tipasa is composed of a city of 16,000 inhabitants and of a touristic village bringing this figure up to 25,000 in the summer. In Chenoua, some peasants live in the vicinity of the mountain outside the classified areas. Fire and over-grazing by the goats endanger the mountain.

The fishing flotilla is made of 16 boats. Tourism is the main resource of the locality. The division of areas has not yet been exactly established. The Marine Park is made up of 3 sites.

10. Contacts:

M. Rachid Semroud - Director of the Oceanographic Institute of Algiers

M. Youssef Lalami (same address)

Mrs. Dalila Siblot, M. Salah Djebaili - National Committee for the Environment.

11. Bibliography:

University of Algiers (1973) - project for the creation of a terrestrial and marine park, Tipasa - Chenoua. Proceedings and papers on the International Marine Parks Conference. Castellabate, Italy - June 1973; 8 pp. (mimeogr.) being published.

Appendix 4

Zembra Marine Park

1. Name: Zembra Marine Park. Zembra and Zembretta Nature Reserves.
2. Geographical situation: Tunisia. Province of Nabeul, Sidi Daoud and Zembra.
3. Latitude and longitude:
4. Surface: one mile and a half around Zembra Island.
5. Type: habitat of special interest: monk seal colony; Atlantic current coming from Gibraltar.
6. Description:

   6.1. Physical parameters:
   6.1.1. Depth: 0 - 50 m.
   6.1.2. Limits: 1.5 miles around the island.
   6.1.3. Hydrography: the island is under the influence of the Atlantic current.
   6.1.4. Salinity: 37°/oo (at the surface).
   6.1.5. Temperature: 15°C in June (at the surface).

   6.2. Dominant biotopes: fauna rich and diverse; there are a few pairs of monk seals (Monachus monachus), great numbers of groupers (Epinephelus) (threatened by over fishing), sea-perch (Morone labrax), and many other species: Spariotes, Labroid, Cuidaires, Echinoderms, Mollusc, Crustacea, specially Cicada (Scyllarides latus). The flora is essentially composed of red algae; presence of Caulerpa prolifera.

   6.3. Value: Zembra Island presents a special interest because of the quality of its marine fauna and flora, its geographical situation which benefits from the Atlantic current coming through the Straits of Gibraltar. In addition, systematic comparative biological observations of the Egadi Islands and the Straits of Gibraltar would clarify the mechanism of distribution specific to the Mediterranean. Zembra Island is a perfect biological and ecological observatory.

7. Conservation status: threatened essentially by submarine over fishing, and fishing with explosives. The island is practically deserted and free from pollution. The biological protection of an area between the low tide line and the contour of 1.5 miles around the island, is assured by the Decree of 9 November 1973.

8. Character and utilisation of the hinterland or marine sector, emphasising the need to create a buffer zone: the hinterland, the Zembretta Island and the Egadi Islands are classified as terrestrial nature reserves.

9. Proposed or present use of the region, division in zones: Zembretta is totally uninhabited. A sailing club and a few fishermen cabins are on Zembra. Integral marine reserve around Zembra.

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10. Contacts:

Mme Hédia Baccar - ATPNE

M. Zakaria Ben Mustapha - ATPNE

11. Bibliography:

Zembra - Marine Park - Zembra and Zembretta - terrestrial nature reserves. Proceedings and papers of the International Marine Parks' Conference. Castellabate, Italy, June 1973. 11 pp. (mimeogr.) In print.

Appendix 5

Marine Reserve of the Medas Islands

1. Name: Marine Reserve of the Medas Islands.
2. Geographical situation: Spain - Costa Brava - Gerona. Medas Islands.
3. Latitude and longitude: 42° 3' and 3° 13'.
4. Surface: 5 ha.
5. Type: Rocky habitat with submarine caves and red coral making an impressive and magnificant landscape.
6. Description: Archipelago composed of two islands (Meda Gran and Meda Chica) and two islets (Magallot and Bernat Y Tascous).

   6.1. Physical parameters:
   6.1.1. Depth: 0 - 50 m.
   6.1.2. Limits: one mile around the island.
   6.1.3. Hydrography: superficial stream - upwelling of water at the south east coast.
   6.1.4. Temperature: min. 13° - atmospheric pressure: 762.9 mm (average)- relative humidity: 71% (average) - winds: transmontane (February, March, April, May, December) - climate: sunny and dry.

   6.2. Dominant biotopes: a submarine channel crosses the Meda Chica and shows a typical panorama and a biotope mainly composed of red coral, gorgonians (Eunicella verrucosa), fish (Chromis chromis), sea-urchins, Sphaerechinus, Granularis, Ascidies, Bryozoans, Sponges, fish of deep water, Mollusc, Crustacea, and many epibenthic organisms, specially hydroids.

   6.3. Value: scientific, economic, touristic, and recreational, thanks to: a) the creation of a restocking area and a refuge for adjacent populations;
   b) the creation of an equilibrium;
   c) the prohibition of human activities, but allowing for submarine diving.

7. Conservation status: the Decree establishing a marine nature reserve at Medas Islands will be published soon. But the archipelago is already protected by the local authorities by marine legislation forbidding fishing activities before the line of the 50 m. Integral reserve.

8. Aspect and utilisation of the hinterland or marine sector, emphasising the need to create a buffer zone: the region is seriously threatened with ecological unbalance because of fishing and underwater sport fishing. On the continent, the Estartit has a summer population of 8,000 instead of its usual 1,000, and the Estartit is located less than a mile from Medas Islands. The buffer zone does not involve the reserve itself, but extends to the marine zone of three miles.

9. Proposed or present use of the region, division in zones: during an initial phase, the reserve will be designated as a scientific, touristic and recreation area. The zone concerned will be delimited, and a mechanism of maintenance and control will be set up before the establishment of the reserve.

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10. Contact:

Dr. Antonio Ballester Nolla - Instituo de Investigaciones Pesqueras - Barcelona.

11. Bibliography:

Projecto para el establecimiento de un Parque-Reserva Submarino en las Ilas Medas (Costa Brava - Gerona). Inn. y cienca 3 (1) p. 7-33. December 1971.

Appendix 6

Integral Nature Reserve of the Cabrera Islands.

1. Name: Integral Nature Reserve of the archipelago of Cabrera.
2. Geographical situation: Spain, Balearic Islands. Cabrera archipelago.
3. Latitude and longitude: 39° 8' 6'' - 2° 54'
4. Surface: 15.2 sq. kms. (Cabrera), Coujera and some islets and reefs.
5. Type: habitat with a unique flora and fauna; protection of the monk seal (C.5 and E.3).
6. Description:

   6.1. Physical parameters:
   6.1.1. Depth: 0 - 100 m.
   6.1.2. Temperature: max. 27° - min. 12°
   6.1.3. Salinity: 37 to 38.2°/oo
   6.1.4. Transparency: with Sequi's disk: 20 - 35 mt.
   6.1.5. Streams: influence of the Atlantic - North African stream.

   6.2. Dominant biotopes: Cabrera Island presents an ideal biotope for a rich and diverse ichtyological fauna; all the species of fish of the Balearic Islands are there, specially two endemic species (Gobiides), Eleotrys privotis and Eleotrys balearica, and another very small pelagic goby Pseudaphia ferreri which is only present in the Balearic Islands and is commercially exploited. These goby are neotenic, pelagian and depigmented, and they form very dense swarms in winter. The monk seal appears again, changing its ethology (it seems that they breed no longer on deserted beaches, but inside submarine caves). The presence of Spondylus can be noted. Epiphenelus has disappeared. Underwater fishing.

   6.3. Value: protection of the representative marine areas of the Catalonia coast; public awareness; protection of threatened fauna monk seal and avifauna.

7. Conservation status: the archipelago which belonged to two farmers was expropriated by the Spanish Government after World War II, and has now a military status. If it were not occupied by the army, the island would be like all other Balearic Islands, overcrowded and exploited by tourism.

   It is essential to protect the archipelago of Cabrera because if the army were to leave, it would be completely lost for conservation.

8. Aspect and utilisation of the hinterland or marine sector, emphasising the need to create a buffer zone: Cabrera is one of the most undisturbed sites of the Mediterranean, and is protected by its military status.

9. Proposed or present use of the region, division in zones: the archipelago is used once a year for army manoeuvres. Naval artillery operates two or three times a year. The impact on the park is therefore, limited. Cabrera is inhabited by approximately 30 soldiers. The islet of Cabrera could be a nature reserve where only scientific activities on the avifauna would be allowed. The other islets would form an integral nature reserve.

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10. Contact:

Pere Maten Guillermo, Institut oceanographique des Baleares
Paseo Maritimo - Palma de Majorca.

11. Bibliography:

La Isla de Cabroa. De Buen F.

Primera Campana Biologica a bordo del Xauen en agnas de Mallorca (April 1933). Trabajos del Instituto Espagnol de Oceanografia. Madrid, 1934, Pgr. 31-38.

El Archipielago de Cabrera, Vicente Ma. Rossello Verger (1964).

Fauna and Flora of the Cabrera Archipelago.

Appendix 7

Cerbère - Banyuls-sur-Mer

1. Name: Marine Nature Reserve of Cerbère - Banyuls-sur-Mer (Pyrénées Orientales).
2. Geographical situation: France - Languedoc - Roussillon - Pyrénées Orientales - districts of Banyuls-sur-Mer and Cerbère.
3. Latitude and longitude: 42° 37' 30'' latitude north (limit north) 42° 28' 40'' latitude north (limit south)
4. Surface: 650 ha.
5. Type: zoogeographical area: Occidental Mediterranean. South west part. South west extremity of the Gulf of Lion. Habitat: coastal, exposed: the coast is cut up into many reefs and islets, with a succession of capes and small sandy beaches between steep cliffs.
6. Description:

   6.1. Physical parameters:
   6.1.1. Depth: 50 - 60 m. on a length of 6 kms.
   6.1.2. Temperature: 21°C in summer: 11°C in winter.
   6.1.3. Thermal stratification: in winter and in autumn (6 degrees difference between the surface and the bottom).
   6.1.4. Salinity: 38°/oo at the surface thanks to an important influx of freshwater from the Rhône and coastal rivers. Winter floods may cause high desalination at the surface (37 and even 36°/oo).
   6.1.5. Transparency: the water is not very transparent (less than 15 m of visibility) and consequently, bathymetric species go up to the surface of the reserve and can be more easily observed than in other regions where the water is more transparent.
   6.1.6. Streams: generally north-south and east-west. Strong winds (transmontane) blowing frequently from the north-west and causing superficial currents up to 80 cm/second when the wind is strong.
   6.1.7. Variation of level: 0 m - 80 max. because of atmospheric pressure. Maregraph 15 to 25 cm.
   6.1.8. Swell of sea: east-south-east, strong but rare, linked with a fall of the barometer; swell relatively small in the direction north-west.

   6.2. Dominant biotopes: important coral biotope; Lithotamnian and Posidonian sea beds (their protection is very important as they are receding from the north of the Mediterranean). Rocky facies, sometimes sheltered from the wind. Rock, sand or mud fish; pelagic fish.

   6.3. Value: scientific, touristic, cultural and economic values. The area concerned shows all types of representative marine habitats of the region.

7. Conservation status: the sector is threatened with impoverishment because of underwater fishing and because of its selectivity. (Groupers and "Corbes" have practically disappeared). The protection dated 2 May 1930, but the reserve was effectively established 26 February 1974.

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8. Aspect and utilisation of the hinterland or marine sector, emphasising the need to create a buffer zone: there is a buffer zone extending 3 miles, but not in the reserve itself.

9. Proposed or present use of the region, division in zones: one fifth of the reserve forms an integral reserve. Elsewhere, fishing is under strict regulations, and entirely controlled. There is a total protection of the benthos and the flora.

10. Contact:

    Dr. H. Boutiere, Laboratoire Arago, Banyuls-sur-Mer.

11. Bibliography:

    Réserve naturelle sous-marine de Banyuls-sur-Mer, Cerbère.

Appendix 8

Port-Cros National Park

1. Name: Port-Cros National Park
2. Geographical situation: France. Var. Hyères Islands. Port-Cros Island.
3. Latitude and longitude: 42° 59' and 43° 1' 3''
4. Surface: 1,800 ha. of marine surface and 694 ha. of terrestrial area.
5. Type:
6. Description:

   6.1. Physical parameters:
   6.1.1. Depth: 0 to 30 m.
   6.1.2. Wind: Mistral north-west and north-east.
   6.1.3. Temperature: of the air 15° 3'. Rain: less than 600 mm a year.

   6.2. Dominant biotopes: vast Posidonian sea bed with a rich fauna (specially fish), forming a barrier reef (one of the most beautiful of the Mediterranean). Bivalves (Pinna nobilis) occur there although they have become quite rare in the Mediterranean as there is a high demand on it for its decorative value. There is also the brown algae (Cystoceira stricta), various fish, as well as marine turtles Caretta caretta, and Dermochelys. The dolphin of the ancients and other Delphinides occur quite frequently. The monk seal used to live there but it has now disappeared.

   6.3. Value: 1) Port-Cros is relatively sheltered from acute pollution coming from ports.
   2) the topography of the island is varied and has a good diversity of species.
   3) protection of submarine meadows.
   4) reappearance of fish, crustaceans, molluscs, and monk seal.

7. Conservation status: now, Port-Cros is a "reference sample" compared to the rest of the Mediterranean shore which is being degraded. The site is remarkably preserved. This National Park was established by Decree of 14 December 1963; its regulation bears essentially on the terrestrial activities, and are not very strict concerning the protection of the marine environment. On the other hand, the proposed Hyères Islands National Park will benefit from strict protection. This Park will be established in 1976, and its marine area will cover 2,800 ha. at Porquerolles and 1,800 at Port-Cros.

8. Aspect and utilisation of the hinterland or marine sector, emphasising the need to create a buffer zone: about 20 persons live permanently at Port-Cros, deriving their resources from activities linked with the maintenance of the island and with summer tourism. There is a seasonal flow of tourists and over-population in summer.

9. Proposed or present use of the region, division in zones: Port-Cros National Park is a vast natural laboratory for scientific surveys. Under certain conditions, fishermen are allowed to continue their

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activities within the limits of the Park, but today this measure is unjustified. No division into zones.

10. Contact:

Dr. R. Ravetta, Director,
Port-Cros National Park

11. Bibliography:

See annex. 1

Appendix 9

Scandola

We have received little information about this Reserve which has just been established.

1. Name: Scandola Nature Reserve.
2. Geographical situation: France. Corsica. District of Osani and Scandola.
3. Latitude and longitude:
4. Surface: 1,012 ha.
5. Type: zoogeography; North west part of the Mediterranean. Tyrrhenian Sea. Rocky habitat.
6. Description:

   6.1. Physical parameters: no information

   6.2. Dominant biotopes: classical arrangement in tiers of marine biocenoses. Posidonian sea bed. Proliferation of spiny lobsters. Rich pelagic, sedentary or migrant fauna. The monk seal colony has disappeared. A rare species, Audouin's gull, occurs on the littoral with a few pairs of raptors threatened with extinction throughout the world: the bearded vulture, Eleonora's falcon, the peregrine, Cory'Shearwater, and the Shag. Scandola is one of the last sites for the osprey.

   6.3. Value: 1) Scandola is one of the finest sites of Corsica.
   2) great scientific interest.
   3) fragile ecological unity which has to be preserved from increasing degradation.

7. Conservation status: for several years, the impact of human activities has strongly affected Scandola. In summer, several tons of spiny lobsters are caught every day. There are 76 ships in the port of Girolata.

8. Aspect and utilisation of the hinterland or marine sector, emphasising the need to create a buffer zone: no information available.

9. Proposed or present use of the region, division in zones: no information. The map shows the division in zones. There is an integral reserve and a controlled reserve.

10. Contact:

    Mr. M. Leenhardt, Director, Regional Nature Park of Corsica
    Palais Lantiry, 20 000 Ajaccio, Corsica.

Appendix 10

Beaulieu-sur-Mer

1. Name: Experimental Marine Park of Beaulieu-sur-Mer.
2. Geographical situation: France - Maritime Alps - Beaulieu-sur-Mer.
3. Latitude and longitude: rectangular park:

   1) 43° 42' 34'' north
      7° 20' 23'' east

   2) 43° 42' 31'' north
      7° 20' 34'' east

   3) 43° 42' 24'' north
      7° 20' 16'' east

   4) 43° 42' 21'' north
      7° 20' 27'' east

4. Surface: 88,250 sq. kms.
5. Type: Restocking area.
6. Description:

   6.1. Physical parameters:
   6.1.1. Depth: the deepest point is at 14 m.

   6.2. Dominant biotopes: appearance of a specific fauna and flora. Posidonian sea beds. (Serranus), hog-fish (Scorpaena), "girelles" (Coris julis), "catagnoles" (Chromis chromis) "labre" (Labrus and Grenilabrus). Algae planting has been experimented to create a biological milieu of Caulerpa (disappeared for ten years between Antibes and Monaco) and of Zostera and Cymodocea.

7. Conservation status: the coastal zone between 0 and 20 m has the highest productivity in terms of flora and fauna, and it is also the most threatened by restructuration. This area is the most populated of all French coasts, and the discharge of waste water affects the biological balance. By Decree taken the 16 September 1968, a reserve has been established in the Bay of Beaulieu, entrusted to the laboratory of General Biology of Nice.

8. Aspect and utilisation of the hinterland or marine sector, emphasising the need to create a buffer zone: no information available.

9. Proposed or present use of the region, division in zones: sector essentially used as a restocking area; experimental park for scientific research.

10. Contact:

    M. A. Meinesz, Laboratoire de Biologie Générale
    28 Avenue de Valrose, 06034 Nice

11. Bibliography:

M. Lafaure and A. Meinesz, Création d'un parc sous-marin de repeuplement experimental. (Beaulieu-sur-Mer. Alpes-Maritimes. France). Rapp. Comm. Int. Mer Méditerranée, 22,6 pp. 103-105 (1974).

Appendix 11

Santa Maria di Castellabate

1. Name: area under biological supervision of Santa Maria di Castellabate.
2. Geographical situation: Italy - Campanie - Salerno - zone of Punta Tresino - Santa Maria di Castellabate.
3. Latitude and longitude: no information.
4. Surface: no information.
5. Type:
6. Description:

   6.1. Physical parameters:
   6.1.1. Depth: from 0 m to the isobath of 50 m.
   6.1.2. Bottoms mainly rocky, rocky coast and "Flysch".

   6.2. Dominant biotopes: all the biocenoses of the meso, infra and circulittoral are represented. The benthos is particularly rich and diverse. Presence of Chaetaster longipes.

   6.3. Value: the area is threatened by pollution and explosive fishing, but the region is not yet polluted and acts as a reference sample in the monitoring of pollution in the Mediterranean, and in comparative studies of polluted and non-polluted zones.

7. Conservation status: a zone of biological supervision has been established by the Decree of 25 August 1972 published in the Official Journal of the Italian Republic. The project is concerned only with the creation of a natural marine park. Specific threat to the region: erosion may result from construction work, and bring rocks into the sea, which would change the substrate and the biocenosis.

8. Aspect and utilisation of the hinterland or marine sector, emphasising the need to create a buffer zone:

9. Proposed or present use of the region, division in zones:

10. Contact:

Dr. Peter Dohrn
Secretary General of Mambo, Fondazione A. & R. Dohrn
B.P. 383
80 100 Napoli, Italy

11. Bibliography:

Dohrn P. (1973). Marine Parks of the Mediterranean Conference Castellabate - June 1973 - in print.

Sheppard C.R.C. & D.J. Bellamy: Pollution of the Mediterranean around Naples, Marine Pollution Bulletin, (1974) Vol. 5, No. 3.

Appendix 12

Miramare

1. Name: Miramare Marine Park (Trieste).
2. Geographical situation: Italy - Trieste - Miramare.
3. Latitude and longitude:
4. Surface: 30 ha.
5. Type: zoogeographical: Upper Adriatic.
6. Description:

   6.1. Physical parameters:
   6.1.1. Depth: 0 - 15 m.
   6.1.2. Temperature: max. 24° 5 - min. 9° 4
   6.1.3. Acidity: 7.7 to 8.3
   6.1.4. Salinity: 34,10°/oo to 37,32°/oo

   6.2. Dominant biotopes: submarine meadows with phanerogams: Zostera marina, Cymodocea nodosa, and Posidonia oceanica; there are some brown algae (Fucus virsoides) and a mollusc rare in the region: Conus mediterranucus; Fucus virsoides occurs only in this area of the northern Adriatic, and it forms with Mytilus galloprovincialis a special biocenosis.

   6.3. Value: safeguard of the sea; restocking area for some species whose disappearance was due to over fishing; monitoring station.

7. Conservation status: sector free from urban pollution because of streams descending the Istue coast; the rest of the coast is the most polluted area of the Adriatic. The Marine Park was established on 31 May 1973.

8. Aspect and utilisation of the hinterland or marine sector, emphasising the need to create a buffer zone:

9. Proposed or present use of the region, division in zones: in the division in zones, there is a first sector (240 m of coastline) where fishing is prohibited, and a zone under biological supervision up to one mile. Total protection to allow for restocking.

10. Contact:

Mme. Catalfano Elida
Parc Marin de Miramare, Station de contrôle
34 014 Triest, Italy

11. Bibliography:

Il Parco Marino di Miramare (Trieste)
Plaquette published by WWF

WWF. Annuaire 1973

M. Bussani - L'Istituzione del Parco Marino di Miramare nel Golfo di Trieste (1974) WWF. Vol. 1 No. 1 Trieste 1974.

Appendix 13

Ustica

1. Name: Ustica Restocking Area
2. Geographical situation: Italy - Sicily - Palermo - Ustica.
3. Latitude and longitude: 38° 42' 12'' north and 38° 42' 35'' north

4. Surface: 18 sq. kms. (between the shore and the isobath of 100 m.)
5. Type: zoogeographical: central part of the western Mediterranean. Belongs to the volcanic system. Habitat: typical biotope of the western part of the Mediterranean.
6. Description:

   6.1.1. Depth: 2 m - 200 m
   6.1.2. Tide: 30 cm.
   6.1.3. Sea bottoms: morphology typical of broken sea bottoms (volcanic system).

   6.2. Dominant biotopes: superficial formation of Lithopyllum tortuosum; Cystoseiretum crinitae; coralline facies; populations of Laminaria rodriguezii. Varied fauna: sponges, Antozoans, Bryozoans, fish; biogeographical value of the Astroide calycularis. Transit zone for tuna fish (Thunnus thynnus).

   6.3. Value: preservation of the natural heritage and protection of Phoenician, Greek, Roman, Arabic archaeological vestiges, on the island and in the sea.

7. Conservation status: once, Ustica was "the capital of the south". Irrational fishing and submarine fishing may have detrimental effects on coastal biocenoses. The restocking area is regulated by the Decree of 4 July 1973.

8. Aspect and utilisation of the hinterland or marine sector, emphasising the need to create a buffer zone: main activities: fishing around the island; tourism.

9. Proposed or present use of the region, division in zones: division in five sectors where fishing will be prohibited for a period of 3 consecutive years (see map) and on a rotation basis.

10. Contact:

Prof. Raimondo Sara
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Palermo, Sicily
Italy

11. Bibliography:

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Appendix 14

Portofino

1. Name: Marine Park of Portofino
2. Geographical situation: Italy - Genes - Camogli - Portofino.
3. Latitude and longitude: 44° 19' north and 3° 14' / 3° 18' west

4. Surface: no information.
5. Type: zoogeographical: farthest eastern limit of the north west part of the western Mediterranean.
6. Description:

   6.1. Physical parameters:
   6.1.1. Depth: more than 4 m to 100 m sea bottoms.
   6.1.2. Type of deeps: rocky, with several caves of various sizes; sand, waste, etc., high cliffs made of oligocene conglomerate.
   6.1.3. Temperature: 22° to 24° in summer at the surface
   12° to 13° in winter at the surface.
   6.1.4. Tide: 20 - 25 cm.
   6.1.5. Salinity: 38,7°/oo
   6.1.6. Acidity of the water: 7,9

   6.2. Dominant biotopes: one of the richest and most varied representative biotopes of the Mediterranean. The benthic communities are scattered on 4 zones: Supralittoral: populations of Littorina and Ligia; Mediolittoral: dense populations of Chtalamus (upper level) and of Lithophyllum (lower level); Infralittoral: many algae: Cystoseira, Dictyopteris, etc., few Posidonia; urchins, crabs, a few molluscs, Actinia; Sublittoral: this is the most interesting area. Development of corallene communities appearing in several places as "enclaves". Red coral (20 m). Several sponges, Bryozoans, Gorgons (Eunicella and Paramuricea) and a few Madrepores: Leptopsammia.

   6.3. Value: protection of the last wooded site of the Ligurian coast. Esthetic value (magnificent marine landscapes). Richness of the flora and fauna.

7. Conservation status: thanks to its geology and climate, Portofino is free from pollution affecting the Ligurian coast (absence of cities, factories; steep coast preventing the approaching of boats). Threats: irrational fishing; gathering of material, and pollution.

8. Aspect and utilisation of the hinterland or marine sector, emphasising the need to create a buffer zone: the hinterland has the status of national park.

9. Proposed or present use of the region, division in zones: this area is not classified, but local authorities are sensitised and ready to help in the realisation of the project for creation of a marine park.

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10. Contact:

Dr. Enrico Tortonese
Museum d'Histoire Naturelle
Via Brigata Liguria 9
Genes
Italy

11. Bibliography:

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Appendix 15

Pianosa (incomplete data)

1. Name: Insular National Park of the Pianosa Island.
2. Geographical situation: Italy - Toscana - Livorno - Campo nell'Elba - Pianosa.
3. Latitude and longitude: 27° 44' 30'' longitude north
   42° 35' 45'' latitude east
4. Surface: 1 sq. mile
5. Type: habitat: calcareous marine area. Very rich vegetation.
   Zoogeographical: Tyrrhenian Sea; western Mediterranean.
6. Description:

   6.1. Physical parameters:
   6.1.1. Depth: 0 - 50 m
   6.1.2. Type of marine area: calcareous.

   6.2. Dominant biotopes: flora: vast Posidonian meadow; Lithophyllum. Photophilous biocenose (facies with Cystoseira and Sciaphile). Marine flora: rich and diverse; many molluscs, Echinoderms, crustaceans, Tunicates, fish, Sparides, Serranides, Poma centrides and monk seal (Monachus monachus), Chromis chromis.

   6.3. Value: scientific for research and education. The island is a synthesis of the marine ecosystems in the Mediterranean.

7. Bibliography:

   See annex. 2

Appendix 16

Meloria

1. Name: Secche della Meloria
2. Geographical situation: Italy - Toscana - Livorno - Meloria
3. Latitude and longitude: 43° 30' and 43° 33' latitude north
   10° 04' and 10° 10' longitude east
4. Surface: the proposed National Park would cover 40 sq. kms. Island surface: 30 sq. kms.
5. Type: zoogeographical representative of the western part of the Mediterranean.
6. Description:

   6.1. Physical parameters:
   6.1.1. Depth: 0 - 15 m.
   6.1.2. Temperature: almost complete homothermy from the surface to the sea bottom.
   6.1.3. Acidity between 8.12 and 8.40
   6.1.4. Nutrients: relatively abundant in Meloria waters.

   6.2. Dominant biotopes: predominance of the Posidonia oceanica meadow resulting in a diverse ecology. Predominance of photophilous populations and many sciaphile populations. Incrustation of calcareous algae: Lithophyllum, Lithothamnion. There are great numbers of more or less sciaphile animal species: sponges (Petrosia, Agelas, Cliona, etc.), Cnidarians (Alcyonium, Eunicella), Echinoderms (Ophiothryx, Amphipholis, Ophidiaster), and Echiuroids, Opistobranchs, Tunicates, and Bryozoans.

   6.3. Value: scientific: fauna and flora rich and diverse. Economic: potential area for restocking. Archaeological: various vestiges from different eras.

7. Conservation status: sheltered from coastal pollution.

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Appendix 17

Pilo Sorso

1. Name: Coastal zone between Pilo and Marina di Sorso.
2. Geographical situation: Italy - Sardinia - Sassari - Porto Torres Sorso.
3. Latitude and longitude:
4. Surface: length of the coast: 30 kms.
5. Type: habitat: sheltered ; calcareous coast (miocene); sandy sediments originating from dunes.
6. Description:

   6.1. Physical parameters:
   6.1.1. Depth:
   6.1.2. Tide: 50 cm.

   6.2. Dominant biotopes: Labrides, Serranides, Sparides, Mugilides, Clupeides, Atherinides, Mullides.

   6.3. Value: esthetic value. Archaeological interest near Porto Torres.

7. Conservation status: the complex characteristics of the biotope and the biological balance are greatly modified by dumping from a petrochemical industry (Societa Italiana Resine S.I.R.) established for ten years in the immediate vicinity of Porto Torres. The area is threatened with an increasing degradation.

8. Aspect and utilisation of the hinterland or marine sector, emphasising the need to create a buffer zone:

9. Proposed or present use of the region, division in zones: stop the discharge of waste water from nearby industries, and prevent oil ships from discharging their waste water into the sea.

Appendix 18

Capo - Rizzuto

1. Name: Coastal zone west of Capo Rizzuto
2. Geographical situation: Italy - Calabre - Catanzaro - Ile de Capo Rizzuto.
3. Latitude and longitude:
4. Surface: 20 ha.
5. Type: rocky habitat.
6. Description:

   6.1. Physical parameters:
   6.1.1. Depth: 3 - 15 m.
   6.1.2. Deeps: rocky
   6.1.3. Coast: rocky

   6.2. Dominant biotopes: uncommon biotopes: flora: Posidonia, Dyctyopteris, Helimeda, Lithophyllum, Peyssonellia. Fauna: rare and important site for Cladocora caespitosa (Madrepore) and a rare fish Euscarus cretensis.

7. Conservation status: threatened by excessive underwater fishing, and fishing with explosives. Project for an integral nature reserve.

Appendix 19

Panarea

1. Name: Marine zone, east of Panarea.
2. Geographical situation: Italy - Sicily - Messina - Lipari - Panarea.
3. Latitude and longitude: 15° 03' 34'' longitude east
   38° 38' 14'' latitude north
4. Surface: 13 sq. kms.
5. Type: varied habitat: rocks, sand, stones, volcanic.
6. Description:

   6.1. Physical parameters:
   6.1.1. Depth: 0-100 m.
   6.1.2. Coast divided in a series of islets and reefs.
   6.1.3. Tide: 15 cm.

   6.2. Dominant biotopes: many Serranides, Carangides, Muraena, Sparides, Tunnides, Scombrides etc. Very rich sedentary and migratory fauna.

   6.3. Value: archaeological interest: Roman ruins (1700-1400 BC); touristic: the whole area has a great touristic interest as it is one of the most beautiful and interesting marine landscapes of the Italian coast.

7. Conservation status: Population constantly decreasing for 50 years due to emigration. There are only three hotels and 50 private dwellings at Panarea.

8. Aspect and utilisation of the hinterland or marine sector, emphasising the need to create a buffer zone:

9. Proposed or present use of the region, division in zones: little fishing activity. The project for the establishment of a reserve and restocking area is welcomed by the competent authorities of the Sicilian region, and by the local population (including fishermen).

Appendix 20

Mljet

1. Name: Mljet National Park.
2. Geographical situation: Yugoslavia - Croatia - Mljet archipelago.
3. Latitude and longitude: 17° 40' east
   43° 30' north
4. Surface: 3,100 ha. of island surface and marine front
5. Type: habitat: sand; rocky coastal area. Zoogeography: Adriatic.
6. Description:
   6.1. Physical parameters:
   6.1.1. Temperature: 15° or more all year round.
   6.1.2. Salinity: winter: off-shore - 30°/oo : summer: 38 to 39°/oo
   Two marine lakes linked to the sea by a narrow channel, represent one of the most characteristic features of the park: Lake Veliko and Lake Malojezero.

   6.2. Dominant biotopes: both lakes have a rich and diverse biotope. Fauna: Echinoderms, fish, (Dentex, Scorpaena, Corvina nigra, Zeus faber, etc.); Palinurus; Monachus albiventer. Flora: red and brown algae.

   6.3. Value: scientific: survey of the phenomenon of natural eutrophication of a marine lake (probably because of a bacteria). Protection of the monk seal. Esthetic value: protection of the natural beauty of the archipelago.

7. Conservation status: great clarity of unpolluted water around the island.

8. Aspect and utilisation of the hinterland or marine sector, emphasising the need to create a buffer zone: integral marine reserve and controlled reserve where local fishing is protected. At the present time, only the north of the island is protected Total protection is considered.

Appendix 21

Ras El Hekma

1. Name: Ras El Hekma - Ras El Kenayis.
2. Geographical situation: Egypt - Matrouh Ras El Hekma.
3. Latitude and longitude: 27° 58' longitude
   31° 10' latitude
4. Surface: approximately 25 sq. kms. Limited by isobath of 50 m.

5. Type: rocky habitat. Zoogeography: Western Mediterranean.
6. Description:

   6.1 Physical parameters:
   6.1.1. Depth: 0-50 m
   6.1.2. Type of marine area: green and brown algae (Caulerpa halimeda). Sponges, Echinoderms, and fish representative of rocky marine area are dominant.

   6.2. Value: rocky habitat undisturbed by human activities or by variations in the inflow of soft water. Scientific interest.

Appendix 22

Boughaz El Gamil

1. Name: "Lake-sea connection " - Boughaz El Gamil.
2. Geographical situation: Egypt - Port Said - Boughaz El Gamil.
3. Latitude and longitude: 32^{o} 6' - 32^{o} 17'
   31^{o} 16' - 31^{o} 19'
4. Surface: has yet to be determined.
5. Type: vast continental shelf. Habitat affected by the flow of water from Lake Manzallah. Zoogeography: migration of marine fauna to the Red Sea, through the Suez Canal.
6. Description:

   6.1. Physical parameters:
   6.1.1. Depth: 0 - 13 m (average 13 m.)
   6.1.2. Salinity: 36 - 38.5^{o}/oo. Brackish water from Lake Manzallah goes into the sea through Boughaz El Gamil and the El Abouti Channel.
   6.1.3. Coast: white fine sand; sea bottoms: mud.

   6.2. Value: scientific value: migration of the fauna of the Red Sea.

Appendix 23

Nile (Rosetta)

1. Name: Estuary of one branch of the Nile (Rosetta).
2. Geographical situation: Egypt - Behira.
3. Latitude and longitude: west of Lake Idku: 30° 19' - 30° 23'
   31° 22' - 30°

   Limited by the isobath of 18 m
4. Surface: has yet to be determined.
5. Type: habitat: mud and sand sediments around Nile-Rosetta; sandy marine area at the west.
6. Description:

   6.1. Physical parameters:

   6.1.1. Depth: very small

   6.1.2. Salinity: fluctuates with the regime of the Nile (between 25°/oo and 38°/oo, regulated by the Edfina dam, 17 kms south of the estuary. Since 1966 (Asswan dam) the inflow of fresh water has been unimportant.

   6.2. Dominant biotopes: the physical and chemical characteristics of the region support many marine animals. A rich and important food supply is in the sector due to the presence of a micro-fauna which develops on the organic matter available. Eighteen species of Bivalves (some with pearls), and 11 Gasteropods, Crustaceans, fish, etc.

   6.3. Value: scientific value: survey of the physico-chemical, ecological, geological, due to the construction of the dam, as the region is under the direct influence of the Nile.

7. Contact:

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Appendix 24

Abu Qir

1. Name: Bay of Abu Qir.
2. Geographical situation: Egypt - Behira - Abu Qir.
3. Latitude and Longitude: east of "Lake Sea Connection" Lake Idku:
   30° 12' - 30° 18'
   31° 15' - 31° 21'
4. Surface: to be determined.
5. Type: protected habitat (bay). Three types of bottom: sandy, mainly sandy and muddy. Zoogeography: eastern Mediterranean.
6. Description:

   6.1. Physical parameters:
   6.1.1. Depth: limited: 0 - 18 m.
   6.1.2. Salinity: varies between 20 and 27°/oo; off the bay, between 36 and 39.4°/oo. Two sources of fresh water: the Nile-Rosetta and Lake Edku, through El Maddia Channel.

   6.2. Dominant biotopes: one of the most important areas for fishing in the Egyptian sector of the Mediterranean. Considered until recently as a reproduction area for endemic fish species. Besides most Mediterranean and Atlantic species, there are a few migratory species from the Red Sea: Modiaulo barbatus, Lima lima, Lophas stentina, etc.

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Appendix 25

Rabbit Islands

1. Name: Rabbit Islands
2. Geographical situation: Lebanon, Tripoli, Rabbit Islands off El Mina.
3. Surface: remains to be determined.
4. Type: zoogeography: east region. Habitat: diverse, rocks and sand. Representative biotope for the whole Lebanese coast.
5. Description:

   5.1. Physical parameters:
   5.1.1. Depth: 15 - 500 m around the Islands.
   5.1.2. Marine area: all the Islands are sandy on their northern side and rocky on the south side.
   5.1.3. Temperature: very high.
   5.1.4. Salinity: very salty water.
   5.1.5. Strong stream in the direction south-north.

   5.2. Dominant biotopes: ideal refuge for migratory birds (gulls, terns). The avifauna deserves special attention. Interesting marine biotopes, varied fauna and flora; presence of the monk seal.

   5.3. Value: touristic (unique transparency of the water); scientific: protection of the avifauna (Larus audouini) and of the monk seal (Monachus monachus); public awareness.

6. Conservation status: these Islands belong to the maritime domain. The transport department is the only one authorised to give them a legal status.

7. Aspect and utilisation of the hinterland or marine sector, emphasising the need to create a buffer zone: the central island could form an integral reserve and the two others controlled reserves.

8. Contact:

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Appendix 26

Lindos

1. Name: Lindos Marine Park
2. Geographical situation: Greece - Dodecanese - Rhodes Island - Lindos
3. Latitude and longitude:
4. Surface:
5. Type: zoogeographical: western Mediterranean Aegean Sea.
6. Description:

   6.1. Physical parameters:
   6.1.1. Depth: 0 - 30 m
   6.1.2. Submarine area: rocky. Sandy beaches; steep cliffs.
   6.1.3. Transparency: down to 35 m.

   6.2. Dominant biotopes: important population of Echinoderms, Holothurids, urchins, sponges, vertebrates, decapods, etc. Flora: Cystoseira, Padina, Laurencia, Hypnea.

   6.3. Value: archaeological: presence of various vestiges. Environmental: no pollution; transparent down to 35 m; varied marine landscape.

7. Contact:

   Dr. C. Vamvakas
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   Grèce

8. Bibliography:

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Annex 1

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   Convegno per la protezione della natura all'Isola di Pianosa, - Portoferraio, 22 Maggio 1971, organizzato dagli Istituti di Botanica, Zoologia, Geologia-Paleontologia dell'Università di Firenze. G.R.S.T.S., Firenze, Maggio 1971, 14 pp.

3. Ultimo, in ordine di tempo, il Convegno promosso dalla Regione Toscana dal 7 al 9 Novembre 1974: "Politica Regionale dell'Ambiente".

4. "La Commissione di studio per la conservazione della natura e delle sue risorse del CNR, preso atto delle comunicazioni ricevute in merito alla possibilità di istituire una riserva naturale nell'isola di Pianosa e nelle acque circostanti, ritiene di estremo interesse tale iniziativa e delibera di approfondire i problemi tramite contatti con esperti e con le autorità competenti. Riconosciuta inoltre sia l'opportunità di considerare tale iniziativa nel contesto di una protezione coordinata delle risorse naturali dell'Arcipelago Toscano ed in generale delle isole e scogliere del medio e alto Tirreno, sia la necessità urgente di assicurare la tutela dei biotopi terrestri e marini di Pianosa mediante la rigorosa applicazione delle norme di tutela e di sicurezza vigenti, fa appello a tutte le autorità centrali e locali competenti per materia e territorio affinchè si valgano nel modo più rigoroso delle disposizioni vigenti al fine di assicurare l'immediata e completa protezione dei biotopi interessati." Settembre, 1970.

5. Programma interdisciplinare degli Istituti di Zoologia, Botanica e Geologia dell'Università di Firenze per approfondire le conoscenze scientifiche sull'isola di Pianosa e sui fondali adiacenti. Il Laboratorio di Geologia Marina del CNR di Bologna ha redatto una carta geologica e stratigrafica dell'isola.

6. V. Giacomini, - Evoluzione e attualità del concetto di Parco Nazionale, - s.d. e luogo, p. 4

7. G. Bacci, - Problemi dei Parchi e delle Riserve Marine in Libro bianco sulla natura in Italia, - Roma, CNR, 1971. p. 307, "criteri di valutazione per i Parchi e le Riserve Marine".

8. G. Bacci, op. cit.

9. Pianosa dista 12 miglia da Marina di Campo (Isola d'Elba) ed è collegata anche con Piombino da un servizio bisettimanale di piroscafi della "Navigazione Toscana". Sull'isola esiste anche un campo di atterraggio per piccoli aerei. Tutta l'isola è di proprietà demaniale.

10. Un accurato studio in merito è stato recentemente oggetto di una tesi di laurea discussa alla Facoltà di Architettura dell'Università di Firenze dai Dott. M. Canzonieri e R. Cornacchia (Proposta per una stazione biologica a Pianosa), relatore il Prof. D. Santi, correlatori i Dott. S. Bolaffio e C. Lenzi Grillini.

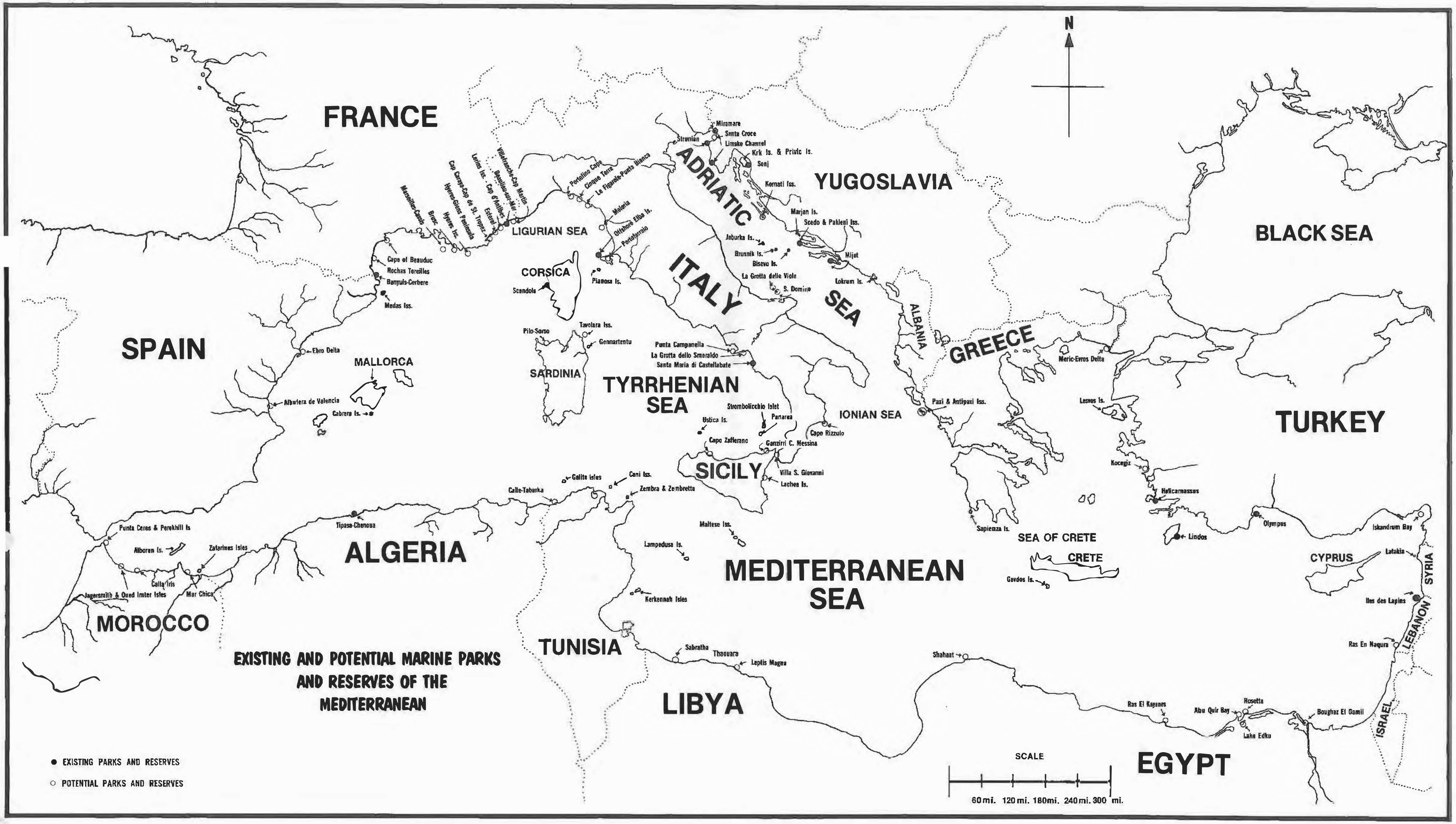
11. G. Bacci, op. cit., p. 306.

12. V. Giacomini, op. cit., p. 16.

13. Disposizione del Regolamento Particolare del Compartimento Marittimo di Portoferraio (Ordinanza n°12/1966) che vieta a qualsiasi natante di accostarsi a meno di un miglio dalla costa dell'isola di Pianosa lasciando la facoltà di accesso al porto solo in casi di forza maggiore. Nella fascia da 0 a 300 metri dalla costa l'accesso è comunque interdetto; da 300 metri a 1 miglio possono navigare le imbarcazioni munite di apposito permesso da rilasciarsi in seguito a domanda in carta da bollo corredata dai certificati penali dei componenti l'equipaggio.

14. Al Convegno per la protezione della natura all'isola di Pianosa parteciparono rappresentanti dei Ministeri di Grazia e Giustizia, Marina Mercantile, Agricoltura e Foreste; delle Università, del CNR, della Regione Toscana, della Soprintendenza alle Antichità d'Etruria, della Società Toscana di Scienze Naturali; il Comandante del Compartimento Marittimo di Portoferraio, il Sindaco di Marina di Campo, il Direttore della Colonia Penale di Pianosa, il Direttore dello Stabilimento Penale di Porto Azzurro; gli assessori della Provincia di Livorno, del Comune di Marina di Campo e dell'Ente Valorizzazione Elba; alcuni membri del G.R.S.T.S.

15. G. Schmiedt, Il livello antico del Mar Tirreno - Testimonianze dei resti archeologici, - Firenze, Leo S. Olschki, 1972, pp. 38-47.


FRANCE
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LEBANON
ISRAEL
MEDITERRANEAN SEA
ALGERIA
MOROCCO
TUNISIA
LIBYA
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Cape of Beauduc
Rochas Tercilles
Banyuls-Cerbere
Medas Iss.
Ebro Delta
Albufera de Valencia
Cabrera Is.
Scandola
Pianosa Is.
Portofino Cape
Cinque Terre
Meloria
Offshore Elba Is.
Portoferraio
Pilo-Sorso
Tavolara Iss.
Gennartentu
Punta Campanella
La Grotta dello Smeraldo
Santa Maria di Castellabate
Stromboliccbio Islet
Panarea
Ustica Is.
Capo Zafferano
Ganzirri C. Messina
Villa S. Giovanni
Lachea Is.
Capo Rizzulo
Miramare
Santa Croce
Limske Channel
Krk Is. & Privic Is.
Senj
Kornati Iss.
Marjan Is.
Scedo & Pakleni Iss.
Jaburka Is.
Brusnik Is.
Bisevo Is.
La Grotta delle Viole
S. Domino
Mljet
Lokrum Is.
Paxi & Antipaxi Iss.
Meric-Evros Delta
Lesvos Is.
Kocegiz
Halicarnassus
Lindos
Olympus
Iskandrum Bay
Latakia
Iles des Lapins
Ras En Naqura
Sapienza Is.
Gavdos Is.
Punta Ceres & Perekhill Is
Alboran Is.
Zafarines Isles
Calla Iris
Jagersmith & Oued Inter Isles
Mar Chica
Tipasa-Chenoua
Galite Isles
Calle-Taburka
Cani Iss.
Zembra & Zembretta
Maltese Iss.
Lampedusa Is.
Kerkennah Isles
Sabratha
Thaouara
Leptis Magna
Shahaat
Ras El Kayanes
Abu Quir Bay
Rosetta
Lake Edku
Boughaz El Gamil
EXISTING AND POTENTIAL MARINE PARKS AND RESERVES OF THE MEDITERRANEAN
● EXISTING PARKS AND RESERVES
○ POTENTIAL PARKS AND RESERVES
SCALE
60 mi. 120 mi. 180 mi. 240 mi. 300 mi.