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MEDITERRANEAN ACTION PLAN

First Meeting of the National Focal Points for Specially Protected Areas in the Mediterranean

Athens 1-4 June 1987

D R A F T

DIRECTORY OF MARINE AND COASTAL PROTECTED AREAS IN THE MEDITERRANEAN

UNEP
Athens, 1987

INTRODUCTION

The Contracting Parties to the Convention for the Protection of the Mediterranean Sea against Pollution (Barcelona Convention) met in Geneva in April 1982 and adopted the Protocol Concerning Mediterranean Specially Protected Areas. The Protocol contains a number of Articles that specify the actions Mediterranean States are bound to undertake to identify, establish and manage marine and coastal areas requiring special protection. To aid them, the Regional Activity Centre for Specially Protected Areas was established in Salammbo, Tunisia in 1985.

One of the activities of the Centre is to maintain a computerized data-base containing information on the marine and coastal conservation activities of each Mediterranean country and on individual protected areas, either existing or planned.

This draft directory contains the information available in the database on established marine and coastal protected areas as of 28 February 1987. The information has been derived from three basic sources. The first source was information held by the Conservation Monitoring Centre of IUCN in Cambridge, United Kingdom; the second was bibliographic research by the centre; the third from answers to questionnaires sent to Mediterranean countries by the Mediterranean Co-ordinating Unit, Athens. The questionnaires were mailed on 9 December 1985. Not all countries have provided adequate replies. For an analysis of the status of information available in the data-base at the Centre the reader is referrred to UNEP/WG.163/4).

Two groupings of information are contained in this draft Directory. For each country there is a section of general information concerning marine and coastal conservation at the national level. After each Country Data Sheet there is a separate Area Data Sheet for each known, established marine or coastal protected area. These are accompanied by the respective map of the country which illustrates the location of the protected areas.

During the Meeting of Focal Points for Specially Protected Areas of the Mediterranean the information on marine and coastal protected areas held by the Centre will be critically reviewed. Focal points will be asked to make further information available and correct existing information.

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2. KUNE NATURE RESERVE (W)

ALBANIA

AREA 28,752 km^2

LENGTH OF MEDITERRANEAN COAST 400 km

AREA OF TERRITORIAL SEA

PROTECTED AREA LEGISLATION The legal basis for all National Parks in Albania is the Hunting Law No. 1351 of 1 November 1951 and the Forest Protection Law, No. 3349 of 3 October 1963.

PROTECTED AREA ADMINISTRATION Responsibility for protected area administration rests with the Ministry of Forests and Water Resources.

NATIONAL AUTHORITY ADDRESS
No information

ESTABLISHED M/C PROTECTED AREAS
1. Diviaka National Park (C)
2. Kune Nature Reserve (W)
3. Velipoje Nature Reserve (no information)
4. Fushë-Kuqë Negel Patok Nature Reserve (no information)
5. Rrushkull-Potull Nature Reserve (no information)
6. Ksamil Nature Reserve (no information)
7. Vain Managed Nature Reserve (no information)

ALBANIA

DIVIAKA

MANAGEMENT CATEGORY Managed Reserve (listed as National Park in the UN list of National Parks 1971)

TYPE Coastal

ANNOTATED DESCRIPTION An coastal lagoon important for migratory birds.

GEOGRAPHICAL LOCATION On the Adriatic coast. N 41° 00'- E 19° 27'.

AREA 1,000 ha

DATE ESTABLISHED 1956

LEGAL PROTECTION Total

LAND TENURE

CLIMATE

PHYSICAL FEATURES A long strip of low dunes on the shore of the Adriatic sea. The reserve is part of the wide coastal lagoon of Karavastase. Altitude: sea level to 10 m.

VEGETATION Pine forests (Pinus halepensis and P. pinea).

FAUNA A little colony of Pelicanus crispus was found in 1985 on the coastal lagoon of Karavastase (In Albania this species has been considered extinct since 1930). Hundreds of pairs of Sterna albifrons have been reported. The monkseal Monachus monachus occasionally occurs here.

CULTURAL/HISTORIC FEATURES

MANAGEMENT No hunting or grazing allowed. Along the coast, the presence of fortresses prevents the admittance. The staff is composed of an officer in charge and of two full-time guards. Special funds are available for re-afforestation (300 ha), other forest improvements, opening up of new paths and other civil construction work (forest lodge, rest camp, etc.). A forest lodge with 20 beds is available for tourists. Driveable routes in the Park are closed in winter.

USES Traditional activities, such as professional fishing, are allowed. The two neighbouring villages (Kulari and Divjaka) excercise a right to gather dead wood.

PROBLEMS No information.

PRINCIPAL REFERENCE MATERIAL

- IUCN, 1971. United Nations List of National Parks and Equivalent Reserves. IUCN, Morges.

CONTACT ADDRESS No information.

ALBANIA

KUNE

MANAGEMENT CATEGORY Strict Nature Reserve

TYPE Wetland

ANNOTATED DESCRIPTION A coastal lagoon of international importance to waterfowl.

GEOGRAPHICAL LOCATION At the mouth of river Drini. 41° 45'N-19° 28'E.

AREA Several hundred hectares.

DATE ESTABLISHED No information.

LEGAL PROTECTION Total.

LAND TENURE

CLIMATE

PHYSICAL FEATURES The reserve comprises the Kune lagoon, the river mouth and neighbouring land areas covering many square kilometres.

VEGETATION

FAUNA This wetland area is of international importance to waterfowl. Nesting species include grebes Podicipitidae, the cormorants Phalacrocorax carbo and P. pygmeus, Night Heron Nycticorax nycticorax, Squacco Heron Ardeola ralloides, Little Egret Egretta garzetta, Grey Heron Ardea cinerea, Spoonbill Platalea leucorodia, Glossy Ibis Plegadis falcinellus and many species of ducks, rails, waders and gulls. This site, that in the last ten years held a large herony, is still a very important ornithological area.

CULTURAL/HISTORIC FEATURES

MANAGEMENT No public access is allowed.

USES

PROBLEMS

PRINCIPAL REFERENCE MATERIAL
- Carp E., 1980. A Directory of Western Paleartic Wetlands. IUCN, Gland.

CONTACT ADDRESS No information.

ALGERIA

ALGERIA

AREA	2,381,741 km^2
LENGTH OF MEDITERRANEAN COAST	1,200 km^2
AREA OF TERRITORIAL SEA	80,000 km
HUMAN POPULATION	18,250,000 (in 1981)

PROTECTED AREAS LEGISLATION A new law for the protection of the environment (No.83-05) was approved on 5 February 1983 to protect and enhance the value of natural resources and to prevent and fight all forms of pollution. Protected areas (national and regional parks, nature reserves, cynegetic centers for the reproduction of local and exotic species of national value) are established under this law with the decree No. 83-458 of 23 July 1983. Out of five national parks listed in the UN list of National Parks 1985, only one is coastal and none are marine. Other laws relative to conservation of natural resources are the hunting law (No. 82-15 of 21 August 1982) and the ordinance (No 67-281 of 20 December 1967) on excavation and protection of historic and natural monuments.
Algeria is signatory to the Barcelona Convention and relative protocols (including the Specially Protected Areas Protocol), the Ramsar Convention, the World Heritage Convention, the CITIES Convention, the London Convention and the African Convention.

PROTECTED AREAS ADMINISTRATION The overall responsibility for protected areas administration and management rests with the Ministère de l'Hydraulique, de l'Environnement et des Forêts (H.E.F.) established in 1970. Under the Vice-Minister, responsible for environment and forests, there is the "Direction des parcs et de la protection de la faune" and hence the "Sous-Direction de parcs nationaux et des reserves naturelles", the latter divided in three Bureaux: "Parc Nationaux", "Reserves Naturelles" and "Faune et Flora en Disparition".
Each national park has its own budget. The Director is appointed directly by the H.E.F. Minister and has powers of independent action.

ADDRESS OF NATIONAL AUTHORITIES Ministere de l'Hydraulique, de l'Environnement et des Forêts. Direction des parcs et de la protection de la faune. Ex Grand Seminaire (Kouba) Alger, Algeria.

ESTABLISHED M/C PROTECTED AREAS

1. El Kala National Park (W)
2. Reghaia Managed Nature Reserve (Centre d'Elevage Cynegetique) (W)
3. Taza National Park (no information)
4. Gouraya National Park (no information).

ALGERIA

EL KALA

MANAGEMENT CATEGORY National Park

TYPE Coastal/Wetland

ANNOTATED DESCRIPTION The protected area covers a large wetland complex which has been recognised as the most important site for wintering birds in Algeria as well as a littoral Alep pine forest which is unique in the north east region of Algeria.

GEOGRAPHICAL LOCATION The park is located in the north-eastern part of Algeria, in the coastal plain along the Tunisian border around the small town of El Kala (Wilaya d'El Tarf district).
The park covers 40 km of coastline from Cap Rose to Cap Roux.
Geographical coordinates: N 36° 54'- E 08° 27'.

AREA 7233 ha

DATE ESTABLISHED 1983

LAND TENURE Government owned

LEGAL PROTECTION Total. Establishment decree No. 83.462, 23 July 1983 governed by the decree 83-458 of 23 July 1983 on national parks published in the Official Journal of 26 July 1983.
Lakes Tonga and Oubeira have been designated for the List of Wetlands of International Importance under the Ramsar Convention.

CLIMATE The climate is typically mediterranean with rainfall in winter months and a long dry summer. Average annual temperature 15° C, average annual precipitation 1300mm, principal winds north-west and north-east.

PHYSICAL FEATURES The principal components of the wetland complex are four lakes (Tonga, Oubeira, Mellah, Blue) and a marsh (Marais de Bour'dim). Geologically the area belongs to the Tellien Atlas, formed by an alternance of sandstones and clays of Tertiary and Quaternary eras. The topography is characterized by a low gentle relief with a maximum altitude of 100m. A well developed coastal dune system is present between the coast and the lakes. The lakes Oubeira (2974 ha) and Tonga (2392 ha) are closed freshwater basins (0.5-1m. average depth) with abundant vegetation and little open water; lake Mellah is a saltwater lagoon of 824 ha connected with the sea.

VEGETATION The wetland vegetation is mainly constituted of Phragmites, Scirpus and Typha. The submerged vegetation is dominated by Pondweed Potamogeton sp. in the eutrophic lake Oubeira, and by tassel pondweed Ruppia spiralis in the salty lake Mellah.
The inundated lands are dominated by Alnus glutinosa, but islands of Salix alba and Salix cinerea also occurr.
The coastal dune vegetation is composed of a thick Juniperus maquis, followed by an extensive cork oak forest (Quercus suber), maritime and Alep pine forests. The forest of Pinus halepensis, restricted to the drier sites of the ancient dune formation north of lake Mellah, is unique in the north east region of Algeria.

FAUNA The lakes are rich in fish and of great importance to wintering, migrating and breeding waterfowl, especially Anas penelope, Aythya ferina, A. fuligula, Fulica atra, Tachybaptus ruficollis and Podiceps cristatus. The Glossy Ibis Plegadis falcinellus is an occasional visitor.
Common mammals are: Wild Boar (Sus scrofa), Otter (Lutra lutra), hystrix, Mustela numidica, Herpeste ichneumon, Genetta genetta. Other rare mammals include Felis caracal and Cervus elaphus barbarus, the latter inhabiting the forests at the southern limit of lake Mellah.

CULTURAL/HISTORICAL FEATURES Several prehistoric and historic sites are found in the littoral zone such as neolitic remains, roman ruins of the ancient town of Tuniza (El Kala), and ruins of a XVI century French garrison (Vieille Calle).

MANAGEMENT The Park is managed by the Government, the exploitation of natural resources is controlled, hunting is prohibited. The staff is composed of 30 people (5 administrators, 20 wardens, 2 researchers, 3 technicians). The annual budget is 1,400.000 Algerian DA provided by the Government. A planning project study has been carried out in 1976. A management plan is in preparation at the University College London (UCL).

USES 100,000 residents live in the town of El Kala and in the village of El Tarf. 50,000 to 100,000 tourists visit the Park especially during the summer. One hotel and two camp sites are available for tourists. Education activities include nature trails and exhibits. Research studies are carried out on plants and animals, especially endangered species. Research facilities include a climatological station, a field station for researchers and various experimental sites (arboretum). Waterfowl counts have been carried out each year since 1971 by IWRB and the "Station Biologique de Tour du Valat", Camargue. Controlled human activities such as agriculture, aquaculture, fishing, forestry and grazing take place in the area.

PROBLEMS The principal environmental problems are the degradation of the forests due to grazing and fire, shooting pressure on the lakeshores, wetland drainage and dredging. Several attempts to drain the wetland area were unsuccessfully initiated in the past but high risks remain with the newly proposed water resources scheme in El Kala region. Insufficient equipment and untrained personnel represent the main management problems.

REMARKS The park does not include a marine part but the protection of the adjacent sea-waters has been repeatedly recommended because of the important ecological characteristics: rocky and sandy bottoms with rich mediterranean biocenosis, important coralligen formations of Corallium rubrum (heavily exploited in the past), large Posidonia oceanica meadows. The presence of monk seal has been occasionally reported possibly in connection with the small permanent colony of the nearby Galite islands (Tunisia).

PRINCIPAL REFERENCE MATERIAL

- Anonymous, 1985. El Kala National Park booklet. National Bureau for Forestry Studies, blida Algeria.
- Bougazelli M., Djender M., Thomas J.P., 1976. Projet de Parc National Marin Lacustre Terrestre de El Kala (Annaba) Algerie. Report presented to the UNEP Expert Consultation on Mediterranean Marine Parks and Wetlands, Tunis, 12-14 January 1977.
- Mezali M. 1985. Les Conditions Ecologique du Parcs National d'El Kala. International Symposium on Conservation of Natural Zones and Genetic Resources, UNESCO-MAB, July 85, Blagoevgrad.
- Skinner J., Smart M. 1984. The El Kala Wetlands of Algeria and Their Use by Waterfowl. Wildfowl 35: 106-118. .
- van Dijk G., 1983. La Valeur Ornithologique des Zones Humides de l'Est Algerien. Biological Conservation 26: 215-226. .

CONTACT ADDRESS Direction du Parc National d'El Kala, Route de la Pepinière, BP 73 El Kala wilaya d'El Tarf, Algerie.

ALGERIA

REGHAIA

MANAGEMENT CATEGORY Managed Nature Reserve (Centre d'Elevage Cynegetic).

TYPE Wetland

ANNOTATED DESCRIPTION Permanent marshes behind the sand dunes at the mounth of the Reghaia River. The area still holds small numbers of breeding, migrant and wintering waterfowl and is of major recreational and educational significance because of its proximity to the capital.

GEOGRAPHICAL LOCATION The area is located 30 Km west of Algiers, in the Wilaya de Boumerdes, daira Boudouaou. Geographical coordinates: N 36° 45'- E 03° 30'.

AREA 130 ha (80 ha on land and 50 on the sea). 2 km of coastline.

DATE ESTABLISHED 1983

LAND TENURE Government owned

LEGAL PROTECTION Partial. It was declared Centre d'Elevage Cynegetic by decree No 83/75 of 8 January 1983. It is also a protected landscape.

CLIMATE Hot dry summer and cool rainy winter. Average annual temperature 22° C. Average annual precipitation 625mm. Principal winds from North-West.

PHYSICAL FEATURES Calcareous mother rock with alternance of schist and clay soils, compact on the surface. Gentle relief forming a shallow depression surrounded by hills. Maximum altitude 30 m.

VEGETATION Typical association of marsh species with phragmites, sedges and reeds.

FAUNA Several species of western paleartic migratory birds. Passage of Ardeides (*Ixobrychus minutus*, *Nycticorax nycticorax*, *Ardea purpurea*), Anatides, Sternides (*Chlidonias niger*), aquatic sylviides (mainly *Acrocephalus schoenobaenus*). Wintering species are: *Phalocrocorax carbo*, *Circus aeruginosus*, *Luscinia svecica*.

MANAGEMENT The area is managed by the personnel of the Cynegetic Centre. Hunting is prohibited. The staff is composed of 30 people (5 administrative staff, 3 wardens, 1 researcher, 24 workers). The annual budget is 1,000,000 DA provided by the Government.

USES 40 families live in the area. 500,000 tourists visit the area exclusively in summer. Restaurants and bars are available in summer.
Research is carried out on plants, animals and pollution. Extensive grazing and fishing take place.

PROBLEMS Heavy tourism pressure in the summer, water pollution due to industrial discharges, illegal hunting. Untrained personnel.

CONTACT ADDRESS Direction du Centre Cynegetique de Reghaia, Wilaya de Boumerdes, Algeria.

PRINCIPAL REFERENCE MATERIAL

- EEC 1985. Apercu des Zones de Grand Interet pour la Conservation des Especes des Oiseaux Migrateurs de la Communaute en Afrique. EEC final report.
- Scott D. 1980. A Preliminary Inventory of Wetland of International Importance for Waterfowl in West Europe and Northwest Africa. IWRB Sp.Publ. No.2, Slimbridge, U.K.

CYPRUS

EXISTING M/C PROTECTED AREAS

1. LIMASSOL NATURE RESERVE (W)
2. LARNAKA NATURE RESERVE (W)

CYPRUS

AREA 9254 km^2

LENGTH OF MEDITERRANEAN COASTLINE 486 miles

AREA OF TERRITORIAL SEA

POPULATION 659,000

PROTECTED AREA LEGISLATION 1) Forest law, 2) Forest (protection against incendiarism) law, 3) Fruit trees protection law, 4) Game and wild birds protection law, 5) Goats law, 6) Sage leaves protection law, 7) Soil conservation law.

PROTECTED AREA ADMINISTRATION Ministry of Agriculture, Natural Resources and Energy, Department of Forests and Environmental Protection.

NATIONAL AUTHORITY ADDRESS

LIST OF ESTABLISHED M/C PROTECTED AREAS

1. Larnaka Lake Nature Reserve
2. Limassol Lake Nature Reserve

CYPRUS

LARNAKA LAKE

MANAGEMENT CATEGORY: Permanent Game Reserve

TYPE: Coastal wetland

ANNOTATED DESCRIPTION: Lake Larnaka is an important wintering area for waterfowl.

GEOGRAPHICAL LOCATION: On the south-eastern coast of Cyprus, exending from about 2km to about 7 km south of the town of Larnaca. 34°52'N, 33°33'E.

AREA: 668 ha.

DATE ESTABLISHED: 1974

LEGAL PROTECTION: Established in 1974 under the Game and Wildbirds (Protection and Development) Law, No. 39 of 1974.

LAND TENURE: State owned.

CLIMATE: Long dry period from June to beginning of November, with temperatures ranging from 12-17°C minimum to 32-37°C maximum. Rainy season in winter with annual rainfall 450 mm and temperatures ranging from 2-10°C minimum to 20-23°C maximum. Short spring with some rain from March to May.

PHYSICAL FEATURES: The wetland consists of four lakes, the largest being Larnaca with a surface area of 449 ha. The maximum depth of water is about 1m and the depth is probably less than 30cm over 60% of the lake. All water is evaporated during the summer. The lakes are surrounded by outcrops of sandy, shelly limestone and siltstone beds of Recent to Pleistocene age. These form the banks of the lakes. The lake bottom is covered by approximately a 6m thickness of limnic deposits. It is assumed that, in recent geological times, the lake depression was connected to the sea. Sea-water is probably still reaching the lake by underground flow, a theory which, if correct, would account for the present high salinity. Surface run-off contributes during the rainy season but some of this has been diverted to run directly into the sea in recent years. Altitude: -2m at the lake surface during peak flood-level period.

VEGETATION: The lake is completely devoid of any vegetation and there is no marsh vegetation, the lake margins being practically barren.

FAUNA This lake is an important wintering area for waterfowl, though fewer birds use this area than the nearby Limassol salt lake. Bird species which use the area in winter include Phoenicopterus ruber, Anas acuta, A. penelope, A. platyrhynchos, A. crecca, Tadorna tadorna, Plegadis falcinellus and Egretta garzetta.

MANAGEMENT Shooting, pursuing or catching of any bird are forbidden.

USES The government collects salt from the lake during the dry season, otherwise no rights exist for anyone to use the lake for any purpose. Due to the proximity of towns of Larnaca and Nicosia, the lake attracts a large number of visitors, specially interested to see the flamingoes.

PROBLEMS No information

PRINCIPAL REFERENCE MATERIAL

- Carp E., 1980. A Directory of Western Paleartic Wetlands. IUCN, Gland.
- Gryn-Ambroes P., 1980. Preliminary Annotated Lists of Existing and Potentially Mediterranean Protected Areas. UNEP/19.20/INF.5.
- Leontiades L., 1977. Report on Wetlands and Marine Parks in Cyprus. Prepared for the UNEP Expert Consultation on Mediterranean Marine Parks and Wetlands, Tunis, 12-14 January 1977.

CONTACT ADDRESS No information

CYPRUS

LIMASSOL (AKROTIRI) LAKE

MANAGEMENT CATEGORY About 1/4 of the area is a Permanent Game Reserve

TYPE Coastal wetland

ANNOTATED DESCRIPTION Important wetland for migrating waterfowl.

GEOGRAPHICAL LOCATION On the southern coast of Cyprus, on the peninsula which extends to the south-west of Limassol for a distance of approximately 14 km. 34° 30'N- 32° 57'E.

AREA Maximum area (in winter) is 940 ha

DATE ESTABLISHED 1974

LEGAL PROTECTION Established in 1963 under the Game and Wild Birds (Protection and Development) law No. 39 of 1974.

LAND TENURE Government property

CLIMATE Long dry period without any rain from June to beginning of November, with temperatures ranging from 12°C to 17°C maximum. Short rainy season in winter with average annual rainfall 450mm and temperatures ranging from 2°C to 10°C maximum. Short spring with some rain from March to May.

PHYSICAL FEATURES The lake is a natural depression and contains water from about the beginning of December until about the end of July, when it becomes nearly dry. The bottom of the lake is covered by a layer of recent sand and loams having a probable depth of 1.5 to 6.0 metres. The Limassol salt lake was formerly a gulf of the sea but as a consequence of long shore drift and the slight retreats of the sea, a pear of spits grew seawards from the mouths of the Kouris and Garyllis River towards the Akrotiri Island. These two spits eventually reached the island forming a tombolo and isolated a patch of sea water between them which is now the lake.
The lake is occasionally replenished by sea water (via the two low points along the shore) during storms. It is also replenished with fresh water from the marshes to the north and northwest of the lake.
At its maximum, the surface water level is 1.7 m below sea level. The maximum depth of water is about 1m. Even at peak level, some 50 % of the lake surface is covered by water which is less than 30 cm deep and this makes feeding conditions for wildfowl ideal.

VEGETATION To the north of the lake there is a belt of tree growth dominated by Eucalyptus spp., with rushes Juncus spp. and reeds. The marshy area outside the forest is covered with tamarisk-rushes, couch grass, reeds and brambles. The lake margin is bordered with Juncus spp., Salicornia fruticosa and Suaeda fruticosa. The high salinity of the lake leaves it devoid of any vegetation.

FAUNA There is a large concentration of birds during the migration seasons. Of particular note are Phoenicopterus ruber (2500 to 7000 individuals), Anas acuta (2000-4000 individuals), A. penelope, mallard A. platyrhyncos, A. crecca, Tadorna tadorna, Plegadis falcinellus, little egret Egretta garzetta, Ixoybruchus minutus and night heron Nycticorax nycticorax. Two important raptors, Falco peregrinus brookei and Eleonora's falcon Falco eleanorae, breed on rocks in the vicinity of the lake.

MANAGEMENT Apart for the forest, which is being managed by the Department of Forests of the Ministry of Agriculture and Natural Resources, no other part of the area is under any management.

USES A great number of visitors, both local and overseas, visit the area every year, especially during the wet period when the lake is alive with wildfowl. The area also attracts picnicers who mostly use the forest.
Research work on the physical environment and the wetland microfauna has being carried out by the Department of Fisheries. No other organized scientific research takes place a part from bird observations and occasional bird counts by ornithologists.

PROBLEMS Heavy tourist pressure. Some grazing occurs in the marshy area and along the lake margin during summer and autumn.

PRINCIPAL REFERENCE MATERIAL

- Carp, E. 1980. A Directory of Western PAleartic Wetlands. IUCN, Gland.
- Cyprus Ornithological Society Third Bird Report, 1972.
- Gryn Ambroes P., 1980. Preliminary Annoted List of Existing and Potentially Mediterranean Protected Areas. UNEP/19.20/INF.5.
- Leontiades L., 1977. Report on Wetlands and Marine Parks in Cyprus. Prepared for the UNEP Expert Consultation on Mediterranean Marine Parks and Wetlands, Tunis, 12-14 January 1977.

CONTACT ADDRESS SBAM Akrotin, Limassol, Cyprus.

EGYPT

EXISTING M/C PROTECTED AREAS

1. BARDAWEEL (ZARINICK) NATURE RESERVE (W)
2. OMAYED NATURE RESERVE (C)

EGYPT

AREA 1,000,250 km^2

LENGTH OF MEDITERRANEAN COAST 200 km

AREA OF TERRITORIAL SEA

POPULATION 42,000,000 (in 1980)

PROTECTED AREA LEGISLATION The Law Concerning Natural Protectorates (No 102) provided the legal framework for the establishment and management of nature reserves and national parks in Egypt. It was ratified by the People's Assembly and Shura Counsel on July 20 1983 and published in the Official Journal on August 4 1983. This law explicitly prohibits any action that would endanger living species or destroy landscapes within the protected area. It also prohibits economic activities and experiments in the contigous zone outside the protected area. The protected area is established by Ministerial Decree and its delimitation is to be drawn up by the Environmental Affairs Agency (EEA), directly affiliated to the Prime Minister's Office.
Egypt has one marine park established by special Prime Ministerial decrees 1067 and 1068 in 1983 at Ras Mohammed on the Red Sea coast.
Egypt ratified the World Heritage Convention on 7 February 1984.

PROTECTED AREA ADMINISTRATION The Environmental Affairs Agency (EAA), established by Republican Decree No 631 of 1982, is the competent body for the implementation of provisions of Law 102. It also coordinates activities with the various administrative offices in the regions. The EAA sets up branches in the governorates where the protected areas are situated. Each protected area is to be administred by a board usually headed by the Governor of the Governorate and formed of representatives from various ministeries and scientific organizations.

NATIONAL AUTHORITY ADDRESS
Egyptian Environment Agency, Cabinet of Ministers, 11 A Hassan Sabry Street, Zamalek, Cairo, Egypt.

ESTABLISHED M/C PROTECTED AREAS
1. Bardaweel-El Arich (Zarinick) Nature Reserve (W)
2. Omayed Nature Reserve (C)

EGYPT

BARDAWEEL (Zarinick)

MANAGEMENT CATEGORY Nature Reserve

TYPE Wetland

ANNOTATED DESCRIPTION Very important site for the passage of migratory birds.

GEOGRAPHICAL LOCATION The reserve covers the eastern end of the Bardaweel lagoon. This lagoon lies along the northern shore of the Sinai Peninsula, occupying more than half the length of its Mediterranean coastline. It is 95 km long and 25 km wide at maximum. N 31° 10'-E 33° 15'.

AREA 60,000 ha (lagoon)

DATE ESTABLISHED 1983

LEGAL PROTECTION Established as a Nature Reserve in 1983 based on law 102 concerning natural protectorates. Ministerial decree No. 472 issued 5 March 1980 prohibits hunting of all birds and animals in the area.

LAND TENURE No information. Presumably state owned.

PHYSICAL FEATURES A saline lagoon separated from the sea by a narrow strip of land forming a barrier 300-1000 m wide, its height varying from a few metres to over 60 m. Three man-made entrances permit free exchange of water from the sea. The lagoon is a vast area of shallow water with peninsulae and small islands, marshes and saltflats. Maximum water depth 3m, average water depth 1m.

VEGETATION Vegetation on foreshore and islands consists mainly of halophytes and is of varying density.

FAUNA The lagoon is a permanent habitat for about 1500 Flamingos Phoenicopterus ruber (a maximum of 8,000 being recorded in 1973). During the autumn, huge numbers of migrating birds pass along the length of the lagoon including Pelecanus onocrotalus (1460), Anas querquedula (203,000), Calidris minuta (15,500), Chlidonias leucopterus (8,800), Alcedo atthis (1,200), Coturnix coturnix.

MANAGEMENT Hunting is prohibited.

USES Some parts of the lagoons are used for sand extraction.

PROBLEMS Alteration of the habitat due to the construction of irrigation canals and the expansion of agriculture, severe hunting pressure. Eggs and fledglings of breeding waterbirds are gathered extensively by the local fishermen for food and probably sale. Excessive sand extraction.

PRINCIPAL REFERENCE MATERIAL

- Carp E., 1980. A Directory of Western Paleartic Wetlands. IUCN, Gland.

EGYPT

OMAYED

MANAGEMENT CATEGORY Nature Reserve, Biosphere Reserve.

TYPE Coastal

ANNOTATED DESCRIPTION The Reserve includes a coastal zone as well as part of the Egyptian northern desert. Extensive research studies have been carried out in the framework of UNESCO-MAB program.

GEOGRAPHICAL LOCATION The Reserve lies 7 km south of the village of Omayed, 80 km west of Alexandria and 20 km south of the Mediterranean seashore. N 30° 45'- E 29° 12'.

AREA 1000 ha of which a core area of 100 ha.

DATE ESTABLISHED Established as a Nature Reserve in 1986. Accepted as a Biosphere Reserve in October 1981.

LEGAL PROTECTION At present rented by the Ramdene project (Regional Environmental Management of Mediterranean Ecosystems of Northern Egypt).

LAND TENURE State owned. Forms part of a larger area which is state owned and allows the local population certain land use rights such as grazing.

CLIMATE Temperatures vary from an average of 12.7° C in January to 25.5° C in August. There is a mean annual precipitation of 150 mm.

PHYSICAL FEATURES The region is covered by sedimentary formations ranging in age from Miocene to Holocene. The latter formation is composed of beach deposits, sand dune accumulations, wadi fillings, loamy deposits, lagoonal deposits and limenstone crusts. Altitude: 0-110 m.

VEGETATION The vegetation of the northern section of the western desert of Egypt belongs to the Thymelaeion hirsutae alliance with two associations: A) Thymelaea hirsutae-Noaea mucronata association with a wet variant dominated by Asphodelus microcarpus, and a dry variant dominated by Achillea santolina; B) Anabis articulata-Suaeda pruionosa association. The vegetation at Omayed is differentiated into groupings dominated by Asphodelus microcarpus, Echiochilon fruticosum, Plantago albicans, Anabasi articulata and Atractylis carduus. Other important species are: Thymelaea hirsutae, Gymnocarpus decandrum and Helianthemum lippii, which in some vegetation groups share dominance with one of the dominant species.

FAUNA Mammals include fox, hare, fat sandmouse, gerbil. Birds include kestrel, quail. Reptiles include lizard, horned viper. There are insects belonging to the families Terrebrionidae, Scarabaeidae, Carabidae and sandroach, harvester ant, etc.

MANAGEMENT The core area of 100 ha has been completely protected from grazing since 1974. Another 3 plots, each of 25 ha, have controlled grazing at a level of 25% and 50%. The rest of the area is under traditional land use, with free range grazing. A management plan will be drawn up in the future. The reserve has a total staff of 100 of which about 60 are engaged in research. Members of the local community assist in running the reserve and in monitoring research experiments.

USES The region has long been used for grazing and agriculture. The core area, which has not been grazed since 1974, shows evident regeneration of soil and vegetation and clearly indicates the differences between protected areas and overgrazed areas. Rain-fed fig farms are present within the reserve. There are some scattered human settlements, with partial nomadism.
This area is also one of the principal sites of research of SAMDENE (1974-1979) and REMDENE (1979-1984) projects. Studies are undertaken on soil, climate, flora, fauna, etc. Observations and monitoring activities are carried out on the following subjects: meteorology, soil physics, chemistry and biology, vegetation, fauna, behaviour of grazing animals. Research station, field station, climatic station, experimental plots and accommodation for scientists are available.

PROBLEMS No information

PRINCIPAL REFERENCE MATERIAL
- Biosphere Nomination submitted to UNESCO.
- An extensive bibliography is to be found in the five SAMDENE reports (1974-1979) and the two REMDENE reports (1980-1981).

CONTACT ADDRESS c/o REMDENE, PO Box 589, Alexandria, Egypt.

FRANCE

EXISTING M/C PROTECTED AREAS

1. CERBERE-BANYULS MARINE RESERVE (M)
2. ESTAGNOL NATURE RESERVE (W)
3. CAMARGUE NATURE RESERVE (W)
4. COTE BLEUE REGIONAL PARK (M)
5. PORT CROS NATIONAL PARK (M/C)

EXISTING M/C PROTECTED AREAS CORSICA

1. BASTIA FISHERY RESERVE (M)
2. SAINT FLORENCE FISHERY RESERVE (M)
3. ILE ROUSSE FISHERY RESERVE (M)
4. CALVI FISHERY RESERVE (M)
5. SCANDOLA NATURE RESERVE (M/C)
6. PIANA ET PORTO FISHERY RESERVE (M)
7. TUCCIA-SAGONE-CARGESE FISHERY RESERVE (M)
8. LAVEZZI ISLANDS NATURE RESERVE (M/C)
9. CERBICALES ISLANDS NATURE RESERVE (C)
10. PORTO VECCHIO FISHERY RESERVE (M)
11. PROPIANO FISHERY RESERVE (M)
12. VENTILEGNE FISHERY RESERVE (M)

FRANCE

AREA 543,965 km^2

LENGTH OF MEDITERRANEAN COAST

AREA OF TERRITORIAL SEA

POPULATION 54,540,000 (1984)

PROTECTED AREA LEGISLATION There are two relevant texts: Acts No 60.708 of 22 July 1960 and its enforcement order, No 61.1195 of 31 October 1961, which provides a general framework for the establishment of National Parks; and Act No 76.629 of July 1976 on nature coservation which is chiefly concerned with the establishment of Nature Reserves. National Parks and Nature Reserves are established by individual laws or ministerial decrees. Specific legislation governing marine reserves and parks does not exist. Marine environmental protection relies on a whole series of legal instruments governing the occupation and utilization of maritime public domain (for fishing, mining, sea transport, industrial pollutant discharge). Fishery Reserves (Cantonnement de Pêche) are governed by Ministerial Decree of 4 June 1963, and their establishment or abolition is decided by the Maritime Affairs Department, usually taking into account users opinions. These are sites of edible species conservation and for experimental restocking schemes. By definition they include no onshore territory.
France signed the World Heritage Convention on September 1985 and the Specially Protected Areas Protocol on 3 April 1982.

PROTECTED AREA ADMINISTRATION Administrative responsibility for nature conservation is by the Ministry of the Environment and the Quality of Life, in which the Department of State of the Environment has three Directorates advised by a National Nature Conservation Council and by the Ministry's General Secretariat of the Environment Committee, which has responsibility for long term studies and basic research. Of the three Directorates, the Directorate of the Quality of Life is responsible for Regional Natural Parks and rural development while the Department of Nature Conservation is further devided into three Departments: the Departments of Hunting, the Department of Fisheries and Hydrobiology, and the Departments of Parks and Reserves. The latter includes four offices responsible for 1. National Parks, 2. Nature Reserves, 3. Fauna and Flora, 4. Information and Education. The Department of Parks acts as a coordinating body for establishment and management of national parks and nature reserves. It is advised by the National Nature Conservation Council which meets four times a year at the request of the Directorate of Nature Conservation.

NATIONAL AUTHORITIES ADDRESS

Ministere de l'Environnement et de la Qualite de la Vie, Protection de la Nature, 14 Boulevard du General Leclerc, 92521 Neully-sur-Seine, Paris, France.

ESTABLISHED MARINE/COASTAL PROTECTED AREAS

1. Bastia Fishery Reserve (M)
2. Calvi Fishery Reserve (M)
3. Camargue National Reserve- Camargue Regional Natural Park (W)
4. Cerbere-Banyuls Marine Reserve (M)
5. Cerbicales Islands Nature Reserve (C)
6. Côte Bleue Regional Marine Park (M)
7. Estagnol Nature Reserve (W)
8. Ile Rousse Fishery Reserve (M)
9. Lavezzi Islands Nature Reserve (C/M)
10 Piana et Porto Fishery Reserve (M)
11. Porto-Vecchio Fishery Reserve (M)
12. Port Cros National Park (M/C)
13. Propiano Fishery Reserve (M)
14. Saint-Florent Fishery Reserve (M)
15. Scandola Nature Reserve- Corsica Regional Natural Park (M/C)
16. Tuccia-Sagone-Cargese Fishery Reserve (M)
17. Ventilegne Fishery Reserve (M)

FRANCE

BASTIA

MANAGEMENT CATEGORY Fishery Reserve

TYPE Marine

GEOGRAPHICAL LOCATION Corsica, Department of Haute Corse. Rectangle bounded on the seaboard side by the -20 isobath situated 350 m from the coast, seaward limits 3 km from the coast, at the northern end, opposite the Miomo tower and at the southern end opposite the new hotel Alivi. 42° 43'N- 9° 30'E.

AREA 791 ha.

DATE ESTABLISHED 29 July 1977

LEGAL PROTECTION Decree No 2086 P-3 of the "Secretaire d'Etat -Ministere de l'Equipement et de l'Amenagement du Territoire" (Transports) (Bulletin Officiel de la Marine Merchande p. 1194). Modified by decree No 1842 P-3 of June 1978 of the Ministry of Transports (B/O/M/M/ p. 1062).

LAND TENURE

CLIMATE

VEGETATION

FAUNA

MANAGEMENT Spearfishing, scuba diving, angling, commercial fishing are prohibited.

USES

PROBLEMS

PRINCIPAL REFERENCE MATERIAL

- Augier H. 1985. Mediterranean Marine Protected Areas. The Example of France: Appraisal and Prospects. Nature and Environment Series No. 31. Council of Europe, Strasbourg.
- Meinesz A., et al., 1983. Les Zones Marines Protégées des Côtes Françaises de Meditérranée. Bull. Ecol., t. 14, 1: 35-50.

CONTACT ADDRESS

FRANCE

CALVI

MANAGEMENT CATEGORY Fishery Reserve

TYPE Marine

GEOGRAPHICAL LOCATION Corsica, Department of Haute Corse. Extending onshore from Pointe Revelatta to Pointe Rossa, at sea as far as the -200m isobath, approximately 5 km from the coast. 42° 35'N- 08° 42'E.

AREA 1075 ha. Length of coastline 1.8 km.

DATE ESTABLISHED 1978

LEGAL PROTECTION Decree No 1842 P-3 of 20 June 1978 of Ministry of Transports (B.O.M.M. p. 1064).

LAND TENURE

CLIMATE

PHYSICAL FEATURES

VEGETATION

FAUNA

MANAGEMENT Spearfishing, scuba diving, commercial fishing are prohibited. Angling permitted from the shore only.

USES

PROBLEMS

PRINCIPAL REFERENCE MATERIAL

- Augier H. 1985. Mediterranean Marine Protected Areas. The Example of France: Appraisal and Prospects. Nature and Environment Series No. 31. Council of Europe, Strasbourg.
- Meinesz A., et al., 1983. Les Zones Marines Protégées des Côtes Françaises de Meditérranée. Bull. Ecol., t. 14, 1: 35-50.

CONTACT ADDRESS

FRANCE

CAMARGUE

MANAGEMENT CATEGORY Strict Nature Reserve and Biosphere Reserve. European Diploma Award 1966

TYPE Coastal Wetland

ANNOTATED DESCRIPTION The most important wetland site in the Mediterranean. The Reserve lies entirely within the Camargue Regional Natural Park of 85,000ha extending between the Grand Rhône in the east to Petit Rhône in the west and including a beach of fine sand.

GEOGRAPHICAL LOCATION On the Rhône Delta, south of Arles, Bouches-du Rhône. In the townships of Arles, Saintes-Maries. 43° 30'N, 04° 30'E.

AREA 13,117 ha of which 3,500 ha are terrestrial. 11 km of coastline

DATE ESTABLISHED 1975 as National Reserve, January 1977 as Biosphere Reserve.

LEGAL PROTECTION Protection of the area started in 1927 and resulted in the creation of the National Reserve in 1975 by ministerial decree (Ministry of Environment) of 24 April 1975. The Reserve is part of the Regional Natural Park of Camargue established in 1972.

LAND TENURE State property

CLIMATE Mediterranean climate with hot, dry summer and a mild rainy winter. Mean annual rainfall of around 571 mm (winter month average 150 mm., summer month average 110 mm). Mean annual temperature 14.5° C (winter average 7° C, summer average 22° C). Prevalent winds from NW (50-100 km/h) and SE (30-70 km/h). Mean water temperature 15° C, water salinity in winter 30 mg/l, in summer 30-60 mg/l.

PHYSICAL FEATURES The Reserve occupies the centre of the depression formed by the Rhône Delta and is a natural wetland of low-lying salt steppe and brackish, high concentration saltwater lagoons connected by shallow channels and dunes. Submerged land varies from 60% in summer to 95% in winter. The major water bodies or étangs are Vaccares (6,500ha) and the southern group of Fournelet, Monto, Malagroy, Impériaux, Dame and Lion. Salinity ranges from an average 7g per litre in the Vaccarès to 30g per litre in the "lesser" lakes and ponds. 10% of the area has sandy soil associated with fossil and recently formed dunes, and sub-soil consists of a layer of mud up to 50m thick. Altitude ranges between - 1.50m in the center of the lagoons to 4m in the sand dunes.

VEGETATION The main landscapes represented in the Reserve are: fresh or brackish marshes with Typhaceae, reed-beds and other fresh water or slightly brackish formations, lagoons with aquatic vegetation, temporary seaponds connecting with the sea, with saltbush vegetation; and littoral dunes with herbaceous formations of Psammophytes. The main saline-tolerant species are Salicornia spp. and Statice limonium with Tamarix gallica on less saline but still waterlogged soils. The drier, less saline soils are covered by tall, thick "maquis", dominated by a Phillyrea angustifolia association. The most saline flats support Arthrocnemum macrostachya and the dunes an Agropyron-Ammophila association, while the very old dunes (once sea-bank) have particularly good stands of climax Juniperus phoenicea.

FAUNA This is an important waterfowl breeding, resting and wintering place for large numbers of migratory birds, with some 323 different species being recorded. It is the only regular breeding place in France for several species, including Phoenicopterus ruber, Ardeola ralloides, cattel egret Bubulcus ibis, Sterna nilotica and Glareola pratincola. About 200,000 members of the family Anatidae live here during winter. Mammals include wild boar Sus scrofa, foxes Vulpes spp., coypu Myocastor coypus and many species of small mammals including shrew and weasels Mustela. The European beaver Castor fiber is found on the Rhône within the Natural Park zone. Nine of the 13 species of reptiles in the Rhône Delta, and all six species of batrachians, have been found in the Reserve.
Two different fish habitats can be distinguished often with overlapping geographical bounds: the saline lesser lakes and ponds, and the Vaccarès with freshwater fish able to tolerate the low salinity. The eel is abundant and widely fished in surrounding waters. The invertebrate distribution reflects the "mosaic" of environments, some noteworthy for their rarity are those dependent on Juniperus phoenicea.

CULTURAL/HISTORIC FEATURES
Archeological remains of the I century BC, and of IV and VI century AD.

MANAGEMENT The administration and management of the reserve are under the responsibility the Director of the Société National de Protection de la Nature, assisted by a management committee and a scientific committee. The personnel is composed of 7 people: 2 in the administrative service and 5 guards who are also acting as technicians. The annual budget in 1985 was 1,167,000 French francs provided by the State for running costs and 200,000 French francs for investments (from self-funding and from the regional administration).
Hunting, fishing, commercial activities are prohibited. Public access is permitted only on a 20 km trail and on the beach. Grazing is allowed in an area of approximately 1000 ha.
Tourist facilities are offered at Arles and Saintes Maries de la Mer. Educational facilities include a visitor orientation center at Salin de Badonan and an information center with permanent exhibition, audio-visual shows, nature trials at La Capelière. Training stages on ornithology, interpretation, drawing and other as well as guided tours are organized.

USES There are no permanent residents in the Reserve. Of one million persons visiting the Camargue, 150,000 visit the accessible sites of the Reserve between April and November for bird watching, bathing and cultural reasons. Permanent research programmes have been conducted since 1954 by the Station Biologique de la Tour du Valat, a privately run research station in cooperation with Centre Nationale de la Recherche Scientifique, and since 1970 by CNRS themselves. The present focus is on the gradual establishment of a permanent system for collecting data in research fields which have already been well-analysed, and on the study of new links in food chains. In addition, there has been an attempt to combine the efforts of many research workers in multidisciplinary programmes (Délégation Générale à la Recherche Scientifique et Technique, DGRST). These projects may be fundamental research (the productivity of saltbush flats, the behaviour of teal), and yet provide practical data such as on grazing activity or the effects of hunting. The diversity of research undertaken represents over 10 organizations working in the Camargue.

PROBLEMS The Reserve has only been slightly altered by human action including grazing and salt extraction from 150ha over a hundred years ago, however, the same is not true for the Delta as a whole. The geomorphological evolution of the Delta was arrested in 1860, when it was dyked and since then, man has harnessed the water to his use (pumping it or discharging it into the Rhône) and therefore has some influence over nature conservation in the centre of the Delta. Changes in rice-growing have had a special impact, with the introduction of large volumes of fresh water (1950-1960) and then the gradual abandonment (1960-1976) of this type of cultivation. Tourists and campers are causing increasing disturbance and sometimes invade the coastal part of the reserve. Air pollution from nearby industry is increasing, and there is an inflow of excess water from agricultural land, which has washed out part of the salt content from some of the ponds and introduced increasing amounts of toxic chemicals. Hunting close to the reserve threatens some game species.

PRINCIPAL REFERENCE MATERIAL

For over 50 years numerous scientific papers have been published on ornithology in the reserve, and more recently on botany, hydrobiology, hydrology, parasitology and general ecology. The best general view is in Actes de la Réserve de Camargue, appearing biannually in La Terre et La Vie.

- Biber O., 1975. Bibliographie de Camargue. 19th and 20th Comptes Rendus de la Station Biologique de la Tour du Valat. pp 16-53.
- Conseil de l'Europe. Octroi du Diplome Europeen pour la Sauvegarde de la Nature. Reserve Naturelle de Camargue, France. Strasbourg, 1966.
- Le Courrier de la Nature. Special Reserve de Camargue. No 35, January-February 1975.
- Biosphere Reserve nomination submitted to Unesco.

CONTACT ADDRESS

- Réserve Nationale de Camargue, La Capelière, 13200 Arles, France.
- Société Nationale de Protection de la Nature, 57 rue Cuvier, 75005 Paris, France.

FRANCE

CERBERE-BANYULS

MANAGEMENT CATEGORY Nature Reserve

TYPE Marine

ANNOTATED DESCRIPTION The marine reserve includes a general protection zone where fishing is allowed and a smaller strict protection zone where all fishing and diving activities are prohibited. Well developed coralligen formations support a rich marine fauna.

GEOGRAPHICAL LOCATION On the only rocky sector of the Languedoc-Roussillon coast, close to the Spanish border. From Cap Peyrefite (Cerbère) to Ile Grosse (Banyuls-sur-Mer), extending approximately 1.7 km out to sea. Department Pyrenees-Orientales. N 42° 28'-E 03° 10'.

AREA 650 ha including 65 ha of strict protection zone in front of Cap Rédéris. 6 kms of coastline

DATE ESTABLISHED 1974

LEGAL PROTECTION Created 26th February 1974 by Decree of the Ministry of the Environment (Journal Officiel of 5 March 1975 No 2505). The strict protection zone (Cantonnement à but experimental-scientifique) was established for a renewable three year period by Prefectorial decrees No 252 of 30 July 1985 and No 65/85 of 17 December 1985.

CLIMATE Annual average temperature 15.4° C (winter average 8.5° C, summer average 23.3° C). Annual average precipitation 530 mm (winter average 200 mm, summer average 60 mm). Principal winds from N-NW. Average water temperature 17° C (winter average 9.7° C, summer average 20° C). Water salinity 37.5 mg/l. Dominant current direction N-S.

PHYSICAL FEATURES The rocky coast is constituted of metamorphic schistes. Sea-bottoms are characterized by rugged rocky substrata of relatively small extension and not exceeding a depth of 45 m., and by extensive mobile sedimentary substrata. A fairly large underwater plateau (Sec de Rédéris) rising to within 6 m of the surface, is comprised in the strict protection zone. Several organic concretions are found on the under-water rocky extensions of the Capes. Coralligen formations are particularly well developed in front of Cap de La Belle.

VEGETATION The rocky littoral zone is mostly covered by extensive rims of Lythophyllum tortuosum, alternated with Cystoseira mediterranea. Precoralligen and coralligen formations constituted by several species of red calcareous algae are found on hard substrata at a depth of 30-40 m. Mobile substrata (20-30m in depth) are occupied by extensive meadows of Posidonia oceanica.

FAUNA An extremely rich marine fauna is found especially on the coralligen formations. More than 530 species of invertebrates have been recorded. All the fishes characteristics of the Mediterranean coasts occur here including numerous pelagic and coastal migratory species such as Sparidae, Clupeiformes and Thunnidae spp.

CULTURAL/HISTORIC FEATURES None

MANAGEMENT The Reserve is under the responsibility of the Prefect of Pyrenees Orientales, who is assisted by the reserve's management committee composed of departmental officials representing the university, the local authority, the fishermen's associations, etc. Research priorities are established by a Scientific Committee appointed in 1981. The Reserve's total budget is 433,210 French francs (50% from the Ministry of Environment and 50% from the Department of Pyrénées Orientales). The personnel is composed of one person responsible for administrative matters, interpretative and scientific programs, and one person in charge of patrolling and equipment maintainance. Research facilities as well as an office for the Reserve are provided by the Arago Laboratory at Banyuls. Collection of specimen and dumping are prohibited. Professional and sport fishing are allowed in the Reserve with the exception of a strict protection zone where all fishing and diving activities are forbidden.

USES The coast is heavily used by permanent residents (6,000 persons in Cerbère and Banyuls) and summer visitors (13,000) for fishing, shell collection, diving, boating, and camping.
Several research studies are carried out in the fields of marine ecology and biological production in collaboration with the Arago Laboratory of Banyuls-sur-Mer. Inventories of the marine flora and fauna, and impact studies of uses and pollution are regularly carried out since 1976. Artificial reefs, aquaculture and myticulture stations are being installed within the strict protection zone. Educational activities include underwater nature trails, exhibitions, audio-visual shows and ecology classes for school-children.

PROBLEMS Being located in an area where tourism is the major industry, the Reserve is subject to heavy human pressure particularly in summer months. The inclusion of the coastal zone in the Reserve has been envisaged to limit public access to the coast. Water pollution due to urban discharges (there are no sewage treatment plants in the area) constitutes another major problem.
Management problems are the lack of a Reserve center for visitor orientation activities, the limited number of patrolling personnel, and delays in receiving financial subsidies.

PRINCIPAL REFERENCE MATERIAL

- Binche J.L., 1984. Protection de la Mer. La Reserve Naturelle Marine de Cerbere-Banyuls. Bullettin A.C.A.M.
- Several studies on marine biology and ecology have been published on scientific journals by the Laboratoire d'Arago (Université Pierre et Marie Curie) and other French universities.

CONTACT ADDRESS Jean-Louis Binche, Administrateur-Gestionnaire, Réserve Naturelle Marine de Cerbère-Banyuls, 1 quai Racovitza, 666650 Banyuls-sur-mer, France. Tel. 68880911.

FRANCE

CERBICALES ISLANDS

MANAGEMENT CATEGORY Nature Reserve

TYPE Coastal

ANNOTATED DESCRIPTION The Cerbicales archipelago, composed of four small islands covered by law maquis, hosts important colonies of seabirds.

GEOGRAPHICAL LOCATION In the south-eastern part of Corsica, 9.6 km off Porto Vecchio. Department of South Corsica, Township of Portovecchio.

AREA 36 ha. 20 km of coastline

DATE ESTABLISHED 1981

LEGAL PROTECTION Established on 3th March 1981 by Decree No 81/205 of the Ministry of Environment (Journal Officiel de la Republique Francaise No 705).

LAND TENURE Government owned (Conservatoire du Littoral)

CLIMATE Climate characterized by long summer drought accentuated by strong winds. Average annual temperature 16° C (winter average 12° C; summer average 24° C). Annual average precipitation 450 mm (winter average 400 mm, summer average 50 mm). Principal wind directions N, NW and E-NE; wind speed can exceed 150 km/h; average of 270 windy days per year. Average annual water temperature 16° C (winter average 10° C; summer average 25° C). Winter current direction N-E (1-5 knots); summer current direction SW-NW (1-5 knots). Water salinity 38 mg/l in summer, 35 mg/l in winter.

PHYSICAL FEATURES The reserve includes four small islands and a group of islets: Forana (3 ha), Maestro Maria (3 ha), Piana (16 ha), Pietricaggiosa (13 ha), and Vacca. The Cerbicales islands, which were originally linked to the Corsican mainland (10,000 years ago), are mainly constituted by metamorphic rocks while the islet of Vacca is granitic. The bigger island of Piana reaches 36 m in height, the smaller ones do not exeed 20 m. in height. Average water water depth 40-45 m.

VEGETATION High number of endemic species. The islands of Forana, Piana and Pietricaggiosa are covered by a dense maquis dominated by Pistacia lentiscus and Olea europea. Where the maquis is more sparse a more diversified vegetation with Asphodelus aestivus, Carduus fasciculiflorus, Ferula communis and Pancratium spp. is found. Maestro Maria Island is covered by a very low vegetation with some Tamarix africana trees.

FAUNA The archipelago is rich in seabird colonies: Larus argentatus, Larus audouinii, Phalacrocorax aristotelis, Hydrobates pelagicus. Three sub-species of Thyrrenian lizards (Podarcis tilignerta) live on the islands. Mammals include the rabbit Oryctolagus cuniculus, Rattus rattus, Mus musculus and bats. The monk seal was present until 1960.

CULTURAL/HISTORIC FEATURES None

MANAGEMENT The Reserve together with Lavezzi Islands Reserve is administered by an Advisory Committee appointed by the Prefect who is also its chairman. The personnel is composed by one person in the administration and two guards. The annual total budget for Lavezzi and Cerbicales Reserves is 450,000 French francs provided by the Ministry of Environment (65%) and by local authorities (35%). Hunting, camping, species collection, and dumping are prohibited. Public access on the islands is forbidden from April 1st to August 31st and all the year around on the Vacca islet.

USES In the area there are no permanent residents and no touristic facilities. 2000-3000 persons per year frequent the surrounding marine zone (especially in July and August) for sea-related recreational activities. 10 research programs are under way in the fields of botany, zoology and archaeology.

PROBLEMS High tourist pressure in summer. Insufficient patrolling personnel and equipment. Inadequate funding.

PRINCIPAL REFERENCE MATERIAL

- Gauthier A., 1984. Premiere Contribution a la Connaissance de la Geologie des Iles Cerbicales and Lavezzi. Parc Naturel Regional de la Corse.
- Thibault J.C., et al. 1985. Oiseaux Marins Nicheurs du Midi et de la Corse. Annales du C.R.O.P. No 2, Aix-en-Provence.

CONTACT ADDRESS Reserves des Iles Cerbicales et Lavezzi. Parc Naturel Regional de Corse, BP 417, 20184 Ajaccio Cedex, France.

FRANCE

COTE BLEUE

MANAGEMENT CATEGORY Regional Marine Park

TYPE Marine

ANNOTATED DESCRIPTION A marine zone of 3,070 ha established by local municipalities for fishery's protection and development, and educational purposes.

GEOGRAPHICAL LOCATION The Regional Marine Park is located on the western side of the Gulf of Marseille, extending 1.6 km off the coast of Carry-le-Rouet municipality, between La Balise de l'Ane and Cap de Nantes. The peripheric zone includes also the municipalities of Ensues-la-Redonne, Le Rove, and Sausset-les-Pins. N 43° 19', E 5° 10'.

AREA 70 ha of marine reserve and 3,000 ha of peripheric zone. Length of coastline 17.5 km.

DATE ESTABLISHED 1982

LEGAL PROTECTION Established by local municipalities' concession of sea space for the protection and rehabilitation of the marine environment on 30 December 1982 for an initial period of three years. The concession has been renewed on 30 December 1985 for an other three years. Regulations are indicated by Prefectorial Decree No 17/84 of 18 June 1984 and Decree of 'Direction des Affaires Maritimes' No. 8 of 17 January 1983.

LAND TENURE State ownership.

CLIMATE Average annual water temperature 18° C (winter average 14° C; summer average 20° C). Water salinity 35 mg/l.

PHYSICAL FEATURES The rectangularly shaped core zone includes mainly rocky bottoms and sandy beds. Maximum water depth 73 m; average water depth 30 m.

VEGETATION Extensive grass beds of Posidonia oceanica.

FAUNA Typical Mediterranean marine benthos. The fish species Epinephelus guaza and Sciena umbra, which seemed to have disappeared from the area during the last twenty years, have been observed recently.

CULTURAL/HISTORIC FEATURES

MANAGEMENT The regional park is managed by the administration board of the 'Club de la Mer' association, which is composed of four local Municipalities' representatives. One person works permanently in the Park. The budget for 1984 was of 690,000 French Francs partly provided by the Region (65%) and partly by the 'Departement des Bouches de Rhone' (35%). In 1985, additional funds have been provided by the national government, the local municipalities and the Council of Europe (FEOGA). Fishing, diving and anchoring are forbidden within the 70ha core zone, whose boundaries are indicated by buoys. No specific regulations exists for the peripheric zone.

USES The coastal area has been inhabitated and exploited for its quarries since historic times. At present, 15,000 permanent residents and 15,00 summer temporary residents live on the coast. The peripheric marine area is used for boating, diving and swimming by summer visitors, and for fishing by 24 professional fishing boats. Experiments in myticulture and artificial reefs have been initiated. Educational activities include marine ecology and diving classes, exhibits and conferences. Research studies on grass-beds ecology and distribution, cartography, pollution, are carried out in cooperation with the 'Office Regional de la Mer', Marseille.

PROBLEMS Overexploitation of marine resources by professional and spear fishing and sea-urchin collection. Continuous incursions by fishing boats within the 3 miles (5.5 km) protection zone.

PRINCIPAL REFERENCE MATERIAL

- Parc Regional Marine de la Côte Bleue. Brochures.

CONTACT ADDRESS

Director, Parc Regional Marin de la Côte Bleue. Club de la Mer-Sausset. B.P. 37, 13960 Sausset Les Pins, France.

FRANCE

ESTAGNOL

MANAGEMENT CATEGORY Nature Reserve (listed as National Game Reserve in UN list of National Parks 1971).

TYPE Coastal wetland

ANNOTATED DESCRIPTION A fresh-water lagoon separated by the Mediterranean sea by a sea-bank. Important area for nesting and migratory birds. Essentially a strict nature reserve devoted to nature conservation and scientific research.

GEOGRAPHICAL LOCATION The Reserve is situated in a depression of the Languedoc littoral plain. In the department of Hérault, township of Villeneuve-les-Maguelonne, 10km to the southwest of Montpellier.

AREA 75 ha

DATE ESTABLISHED 1975

LEGAL PROTECTION Established by Ministerial Decree (Arrête Ministeriel de Classement) of 19 November 1975 (Journal Officiel de la Republique Francais No 12967).

LAND TENURE Government owned (Office National de la Chasse)

CLIMATE Mediterranean climate with grouped heavy showers and irregular winds. Average annual temperature 14.8° C (winter average 8° C; summer average 22° C). Average annual precipitation 753 mm (monthly winter average 80 mm; monthly summer average 40 mm). Principal winds from N and N-W with 4.3 m/s speed.

PHYSICAL FEATURES Ancient doline situated in the limestones of La Gardiole (pliocene alluvial deposits over cretaceous and upper jurassic substrata). Presumably it was an ancient gulf of the Etang de Vic from which it is now separated by a narrow low zone and salt marshes. To prevent floodings, the pool is surrounded by a collection channel 4 m wide which empties into the Etang de Vic. Altitude 0-2 m.

VEGETATION Reed-beds without great botanical interest (mainly Phragmites spp.) leave the central zone free of vegetation. Line edges of Populus alba, Ulmus campestris, Fraxinus excelsior border the pool.

FAUNA A very important area as a habitat for waterfowl and other migrants. The purple heron and a number of rails and crakes nest here (Rallus aquaticus, Porzana sp.). Many aquatic warblers. Most of the species of duck of Western Europe including the ferruginous duck Aythya syroca and the scaup Aythya marila.

MANAGEMENT The reserve is managed by the Office General de la Chasse assisted by an Advisory Committee appointed by the Prefect (Prefectoral Decree of 15 March 1984). The personnel is costituted of one person in the administration and one guard. The average annual budget for equipment and maintainance works is 60,000 French francs (own sources and Ministry of Environment's subsidies). Public access other than under special permissions is prohibited. Artificial ponds are created and maintained by the Reserve's personnel to increase the number of migratory and wintering birds.

USES The area is essentially an integral reserve devoted to nature conservation and scientific research. Ornithological research is carried out in collaboration with the Université des Sciences et Techniques du Languedoc (Montpellier).

PROBLEMS No information

PRINCIPAL REFERENCE MATERIAL

- An., 1975. Les Reserves de l'Estagnol et du Vagaran. Société de Protection
de la Nature du Languedoc-Roussillon, Montpellier.

CONTACT ADDRESS Office National de la Chasse, 165 Avenue Paul Rimbaud, 34000 Montpellier, France. Tel. 67635080.

FRANCE

ILE-ROUSSE

MANAGEMENT CATEGORY: Fishery Reserve

TYPE: Marine

GEOGRAPHICAL LOCATION: Corsica, Department of Haute Corse. Rectangle approximately 2 km wide on the landward side extending 4.4 km out to sea. 42°40'N- 08°55'E.

AREA: 890 ha, no protected coastline.

DATE ESTABLISHED: 29 July 1977

LEGAL PROTECTION: Decree No 2086 P-3 of the "Secretariat d'Etat-Ministere de l'equipemment et de l'Amenagement du Territoire" (Transports) (B.O.M.M. p. 1193). Modified by decree No 1842 p-3 of 20 June 1978 of the Ministry of Transports (B.O.M.M. p. 1061).

LAND TENURE

CLIMATE

PHYSICAL FEATURES

VEGETATION

FAUNA

MANAGEMENT: Spearfishing, scuba diving, commercial fishing, and angling are prohibited.

USES

PROBLEMS

PRINCIPAL REFERENCE MATERIAL

- Augier H. 1985. Mediterranean Marine Protected Areas. The Example of France: Appraisal and Prospects. Nature and Environment Series No. 31 Council of Europe, Strasbourg.
- Meinesz A., et al., 1983. Les Zones Marines Protégées des Côtes Françaises de Meditérranée. Bull. Ecol., t. 14, 1: 35-50.

CONTACT ADDRESS

FRANCE

LAVEZZI ISLANDS

MANAGEMENT CATEGORY Nature Reserve

TYPE Coastal/Marine

ANNOTATED DESCRIPTION The Reserve covers a terrestrial as well as a marine portion of the Lavezzi archipelago which contains underwater landscapes of unusual beauty, abundant fish and seabird populations.

GEOGRAPHICAL LOCATION In the extremely southern part of Corsica, 11 km from Bonifacio. Departement Corse du Sud, Commune de Bonifacio.

AREA 5080 ha of which 80 are terrestrial. 25 km of coastline.

DATE ESTABLISHED 1982

LEGAL PROTECTION Established on 6th January 1982 by Decree No 82-7 of the Ministry of Environment.

LAND TENURE The terrestrial section belongs to the Commune of Bonifacio. The marine section is Government's property.

CLIMATE Cool and humid winters, hot and dry summers. Annual average precipitation 500mm (winter average 370mm; summer average 125mm). Annual average temperature 16° C (winter average 12° C, summer average 24° C). Strong winds from NW and SW with speeds exceeding 200 Km/h (average windy days 330 per year). The islands are subject to the strong currents of Bonifacio's mouths (E-N direction in winter with a speed of 2-6 knots; NW-E in summer with a speed of 0-6 knots). Annual average water temperature 16° C (9-11° C in winter, 19-26° C in summer). Water salinity 35 mg/l in winter and 38 mg/l in summer.

PHYSICAL FEATURES The terrestrial part of the Reserve includes the bigger island of Lavezzi, four smaller islands (Piana, Ratino, Poraggia, Perduto), and numerous islets (more than 1000 just around Lavezzi). The marine section stretches out around the whole Lavezzi archipelago (including Cavallo island) up to the Corsican coast from Punta Capicciolo to Punta Sprono. The Lavezzi archipelago is formed by deeply eroded granitic rocks. The island of Lavezzi (68 ha) is irregularly shaped with a relatively flat surface (average altitude 5 m) but presents clumped granitic outcrops which can reach 40 m in height. The other islands are smaller than 10 ha and do not exceed 20 m in height. Maximum water depth 75 m, average water depth 35-40 m.

VEGETATION The islands are characterized by the rarity of arboreal species and by the presence of several endemics. The islands and islets are mainly covered by a low herbaceous vegetation dominated by Helichrysum italicum. Important stations of the rare Silene velutina and Allium spp. In the sea, large meadows of Posidonia oceanica on mobile bottoms and Dilophus fasciola on hard substrata.

FAUNA The islands host the most important colonies of Phalocrocorax aristotelis and Calonectris diomedea in Corsica. Important colonies of Larus argentatus and, in certain years, of Hydrobates pelagicus are also found. Reptiles include snakes, geckoes, lizards and Phyllodactylus europaeus. Mammals are represented by Rattus rattus, Mus musculus and bats. The monk seal frequented the close area of Bonifacio's mouths until 1960. Rich marine biocenoses and migrations of pelagic fishes occur.

CULTURAL/HISTORIC FEATURES The Reserve present interesting archeological sites such as the quarries of San Bainzo and Lavezzi, and the roman site of Piantarello.

MANAGEMENT Lavezzi Islands Reserve together with Cerbicales Islands Reserve is managed by an Advisory Committee appointed by the Prefect who is also its chairman. The personnel is composed of one person in the administration and two guards. The annual total budget for Lavezzi and Cerbicales Reserves is 450,000 French francs provided by the Ministry of Environment (65%) and by local authorities (35%). Public access is permitted only on Lavezzi island. Hunting, spear fishing, camping and dumping are prohibited. Mooring systems are in place.

USES Two lighthouse keepers are permanently stationed on Lavezzi island. About 20,000 international visitors frequent the area during the months of July and August mainly by boats. Some livestock grazing takes place on Lavezzi island. Professional and sport fishing are carried out in the reserve. About 20 research programs per year are carried out in the reserve mainly in the fields of oceanology, marine biology, botany and ornithology. Annual counts of seabird populations have been carried out since 1978. Guided tours for school-children are organized on Lavezzi island together with exhibitions and audio-visual shows.

PROBLEMS High touristic pressure in summer months. Difficult boat patrolling, lack of adequate equipment and economic funds.

PRINCIPAL REFERENCE MATERIAL

- Gauthier A., 1984. Premiere Contribution a la Connaissance de la Geologie des Iles Cerbicales and Lavezzi. Parc Naturel Regional de la Corse.
- Thibault J.C., et al. 1985. Oiseaux Marins Nicheurs du Midi et de la Corse. Annales du C.R.O.P. No 2, Aix-en-Provence.

CONTACT ADDRESS Reserves Naturelles des Iles Cerbicales et Lavezzi. Parc Naturel Regional de Corse, BP 417, 20184 Ajaccio Cedex, France.

FRANCE

PIANA ET PORTO

MANAGEMENT CATEGORY Fishery Reserve

TYPE Marine

GEOGRAPHICAL LOCATION Corsica, Department of Corse du Sud. This reserve, situated right inside Porto Bay, has complex geographical limits starting at the Pointe Bussagna in the north and ending at Tardo beach in the south; it juts out between these two points opposite the Bianca spur. 42° 15'N- 08° 42'E.

AREA 576 ha. Length of coastline 7.9 km

DATE ESTABLISHED 20 June 1978

LEGAL PROTECTION Decree No 1842 P-3 of the Ministry of Transport (B.O.M.M. p. 1064).

LAND TENURE

CLIMATE

PHYSICAL FEATURES

VEGETATION

FAUNA

MANAGEMENT Spearfishing, scuba diving, and commercial fishing are prohibited. Angling is permitted only from the shore.

USES

PROBLEMS

PRINCIPAL REFERENCE MATERIAL

- Augier H. 1985. Mediterranean Marine Protected Areas. The Example of France: Appraisal and Prospects. Nature and Environment Series No. 31. Council of Europe, Strasbourg.
- Meinesz A., et al., 1983. Les Zones Marines Protégées des Côtes Françaises de Meditérranée. Bull. Ecol., t. 14, 1: 35-50.

CONTACT ADDRESS

FRANCE

PORTO-VECCHIO

MANAGEMENT CATEGORY Fishery Reserve

TYPE Marine

GEOGRAPHICAL LOCATION Corsica, Department of Corse du Sud. A trapezium with the base facing the open sea. Western limit: coastline from Pointe de la Chiappa to Pointe Carattagio. Southern limit: line touching the northern tip of Ile Forana. Eastern limit: continuation of a line between the highest point of Ile de Toro and the buoy of Danger de la Vacca. Northern limit: line from Pointe de la Chiappa through the Pointe de l'Arena.

AREA 1,615 ha. Length of coastline 3.2 km.

DATE ESTABLISHED 20 June 1978.

LEGAL PROTECTION Decree No 1842 P-3 of the Ministry of Transport (B.O.M.M. p. 1063).

LAND TENURE

PHYSICAL FEATURES

VEGETATION

FAUNA

MANAGEMENT Spearfishing, scuba diving, and commercial fishing are prohibited. Angling is permitted only from the shore.

USES

PROBLEMS

PRINCIPAL REFERENCE MATERIAL

- Augier H. 1985. Mediterranean Marine Protected Areas. The Example of France: Appraisal and Prospects. Nature and Environment Series No. 31. Council of Europe, Strasbourg.
- Meinesz A., et al., 1983. Les Zones Marines Protégées des Côtes Françaises de Meditérranée. Bull. Ecol., t. 14, 1: 35-50.

CONTACT ADDRESS

FRANCE

PORT CROS

MANAGEMENT CATEGORY National Park

TYPE Coastal/Marine

ANNOTATED DESCRIPTION The Park includes the mountainous island of Port Cros with its adjacent islets as well as a surrounding marine zone of 600 m wide. Although there has historically been some human interference in the Park, the island of Port Cros still presents impressive natural resources such as an almost uniform woody vegetation cover and a rich marine flora and fauna.

GEOGRAPHICAL LOCATION Port Cros is the smaller island of the Hyeres archipelago located 15 km off the Mediterranean coast between Toulon and St. Tropez, in the region of Provence Côte-d'Azur, Département du Var. N 43°, E 6° 22'-25'.

AREA 2490 ha (690 ha terrestrial and 1800 ha marine). 22 km of coastline.

DATE ESTABLISHED 14 December 1963

LEGAL PROTECTION Established by Decree No 63- 1235 of 14 December 1963 based on the National Parks law of 22 July 1960 and its application decree of 31 October 1961.

LAND TENURE 270 ha are Governmental property (Ministere de l'Environnement 200 ha, Ministere de la Defense Nationale 70 ha); 420 ha are privately owned.

CLIMATE Typically mediterranean climate with mild and humid winters. Average annual temperature of 18.5°C (winter average 12.5°C; summer average 25.3°C). Average winter precipitation 103 mm, average summer precipitation 22.5 mm. Prevalent winds from E and N-W. Port.Cros island is subject to the geostrophic current "Liguro-provencal" running from the Genoa Gulf in the W-SW direction (average speed 0.15 m/s).

PHYSICAL FEATURES The Park includes the mountainous island of Port Cros (650 ha), the smaller island of Bagaud (40 ha), and the islets of Gabinière and Rascass together with a 600 m wide zone around the islands of Port-Cros and Bagaud which constitutes the marine portion of the Park. The islands are an extension of the Massif des Maures of the mainland, their soils being derived from metamorphic rock and therefore easily penetrated by water and plant roots. Steep cliffs bound the southern coast of all the islands and, in addition, Port Cros has five high ridges. Maximum altitude 196 m (Mt. Vinaigre); maximum water depth 95 m, average water depth 40 m.

VEGETATION The terrestrial flora is relatively limited but the woody vegetation dominated by Pinus pinaster and P. halepensis is of note. Four terrestrial zones have been identified: a littoral halophytic zone dominated by Senecio cinerea, rock samphire Crithmum maritimum and Euphorbia pinea; a zone just above this with pistachio Pistacia lentiscus, myrtle Myrtus communis and tree spurge Euphorbia dendroides; humid valleys with evergreen oak Quercus ilex; and at higher elevations a maquis of Arbutus unedo and tree heather Erica arborea and other scrubby plants, covering the largest area.
Four marine zones have also been identified: a supra-littoral zone with spray-tolerant flora; a medio-littoral zone with the red alga Rissoella verruculosa and Lithophyllum lichenoides rims; an infra-littoral zone dominated by great sheets of Posidonia oceanica, in which many pen shells Pinna nobilis are found, together with Zostera noltii and the brown seaweed Cystoseira stricta; lastly the circum-littoral zone beneath the rocks supports the calcareous alga Peyssonnelia and the red alga Vidalia volubilis

FAUNA The terrestrial fauna is poor in mammals - only rabbit Oryctolagus cuniculus, black rat Rattus rattus, and Apodemus sylvaticus. Many bird species pass through, especially during the spring migration, including Falco eleonorae. Nesting species include Puffinus puffinus, Falco peregrinus, shearwaters and gulls.
Reptiles are represented by snakes, lizards and geckos, and amphibians by tree-frogs and Discoglossus sardus. Some remarkable species of insects and spiders are present. The marine fauna is particularly rich and includes all the fishes characteristics of rocky Mediterranean coasts as well as the invertebrate fauna of the coastal zone. Common marine mammals are Stenella coeruleoalba and Grampus griseus. The monk seal was lastly sighted in the 1950's.

CULTURAL/HISTORIC FEATURES Several military fortresses built by Francis I in the XVI century and later are being restaured.

MANAGEMENT The Park is managed by an Administration Board of 27 members which receives the technical advice of a Scientific Committee. A total of 30 persons work in the park, 5 of whom are patrolling guards. Auxiliary guards join the patrolling force during the summer months. The total annual budget is 11,000,000 French Francs from the Ministry of Environment.
Following the adoption of a five year management plan (1980-1984), several management zones have been established. Terrestrial zoning is composed of "zones of biological interest" where public access is forbidden (i.e Bagaud island), "fire management zones" where partial cuts are carried out, "recreational zones" subject to high visitor pressure where restoration interventions are undertaken (i.e. public beaches). Marine zoning consists of "zones of strict protection" (i.e. Posidonia reefs of Port Cros bay), "zones of protection" where only bathing is allowed, "anchoring zones" supplied with a permanent mooring system. Fishing, other than with nets or spear-guns, is permitted in the Park. Research facilities include a laboratory, an equipped diving center, a meteorological station, and a guest house. Educational facilities include a visitor orientation center, guided terrestrial and marine nature trails, a glass-bottom boat, permanent and temporary exhibitions on the marine environment, conferences, audio-visual and information material.

USES On the island of Port Cros there is a small village of 40 permanent residents with some hotels, restaurants, and tourist shops. The island is linked to the mainland by a daily ferry boat service. Approximately 50,000 persons visit the park during the summer months mainly for bathing and recreation. 8000 pleasure boats were recorded in the main bay during the summer 1985.
Basic inventories of the terrestrial and marine biological resources have been carried out together with pleasure boat census. Major themes of present research projects are ecology and distribution of Posidonia beds, implantation of artificial reefs, implantation of artificial nests for small birds of prey, experimental commercial sponge production, artisanal fishing techniques and under-water archaeology. The reintroduction of monk seal is envisaged.

PROBLEMS The major problem is the excessive use by tourists and pleasure boats which result in vegetation degradation and subsequent soil erosion, and in the desertification of sea-bottoms due to anchor damage and water pollution. The vegetation of the islands is also subject to fire spreading and, in the littoral zone, to the damaging effects of polluted sea sprays. Management problems are represented by insufficient patrolling personnel and lack of adequate legislation concerning the protection and management of the marine environment. The decision-making power of the Park's administration in fact applys only to the terrestrial part, being only propositional for the the marine section which rests under the jurisdiction of the Navy.

PRINCIPAL REFERENCE MATERIAL

- Parc National de Port Cros, 1985. Un Parc, Deux Iles, 20 Ans de Découverte. Cahier anniversaire, Parc National de Port Cros, Hyeres. Brochure which includes a complete bibliography of the scientific and historical litterature of the Park.
- Birman L., 1983. Le Parc National de Port-Cros. Editions CREER, Nonette.

CONTACT ADDRESS Directeur du Parc National de Port-Cros, 50 Avenue Gambetta, 83400 Hyères, France. Tel. (94) 653298.

FRANCE

PROPRIANO

MANAGEMENT CATEGORY Fishery Reserve

TYPE Marine

GEOGRAPHICAL LOCATION Corsica, Department of Corse du Sud. Onshore limits: at Mason blanche de Portiglio with Ilot est de Portiglio to the east and the eastern end of Campo Moro beach to the west. Limits at sea: continuation of a line from the Propiano lighthouse to Cap Lauroso.

AREA 590 ha. 4.6 km of coastline

DATE ESTABLISHED 20 June 1978

LEGAL PROTECTION Decree No 1842 P-3 of the Ministry of Transport (B.O.M.M. p. 1063). Modified by decree of 14 June 1979 (B.O.M.M. p. 1213).

LAND TENURE

CLIMATE

PHYSICAL FEATURES

VEGETATION

FAUNA

MANAGEMENT Spearfishing, scuba diving, and commercial fishing are prohibited. Angling is permitted from the shore only.

USES

PROBLEMS

PRINCIPAL REFERENCE MATERIAL

- Augier H. 1985. Mediterranean Marine Protected Areas. The Example of France: Appraisal and Prospects. Nature and Environment Series No. 31. Council of Europe, Strasbourg.
- Meinesz A., et al., 1983. Les Zones Marines Protégées des Côtes Françaises de Meditérranée. Bull. Ecol., t. 14, 1: 35-50.

CONTACT ADDRESS

FRANCE

SAINT FLORENT

MANAGEMENT CATEGORY Fishery Reserve

TYPE Marine

GEOGRAPHICAL LOCATION Corsica, Department of Haute Corse. Limits: the Tour de Monza to the north, the Tour de Farinole to the south. It extends about 4 km out to sea from the shoreline. 42° 45'N- 09° 20'E.

AREA 2440 ha. 6 km of coastline

DATE ESTABLISHED 29 July 1977

LEGAL PROTECTION Decree No 2086 P-3 of the "Secretariat d'Etat-Ministere de 'Equipement et de l'Amenagement du Territoire" (Transports) (B.O.M.M. p. 1194). Modified by decree No 1842 P-3 of 20 June 1978 of the Ministry of Transport (B.O.M.M. p. 1062).

LAND TENURE

CLIMATE

PHYSICAL FEATURES

VEGETATION

FAUNA

MANAGEMENT Spearfishing, scuba diving, and commercial fishing are prohibited. Angling is permitted from the shore only.

USES

PROBLEMS

PRINCIPAL REFERENCE MATERIAL

- Augier H. 1985. Mediterranean Marine Protected Areas. The Example of France: Appraisal and Prospects. Nature and Environment Series No. 31. Council of Europe, Strasbourg.
- Meinesz A., et al., 1983. Les Zones Marines Protégées des Côtes Françaises de Meditérranée. Bull. Ecol., t. 14, 1: 35-50.

CONTACT ADDRESS

FRANCE

SCANDOLA

MANAGEMENT CATEGORY Nature Reserve, World Heritage Site

TYPE Coastal/Marine

ANNOTATED DESCRIPTION A mountainous peninsula with difficult terrestrial access and rugged coasts. On the coast there are spectacular geological formations, large populations of coastal birds and wealthy marine biocenoses. The Regional Natural Park of Corsica (200,000ha) serves as a buffer zone to the Nature Reserve.

GEOGRAPHICAL LOCATION On the north-western coast of Corsica, north of Ajaccio. Département Corse du Sud, Commune d'Osani. N 42°21', E 6°13'.

AREA 1919 ha of which 919 ha are terrestrial. There is a strict protection marine zone of 72 ha comprised between Punta Palazzo and Garganellu island. Length of coastline 17 km.

DATE ESTABLISHED 9 December 1975

LEGAL PROTECTION Established by Ministerial Decree No 75-1128 of 9 December 1979. The terrestrial part of the Reserve is part of the Parc Regional de Corse (150,000 ha) established by Decree on 12 May 1979. Scandola Nature Reserve, together with Cape Girolata and Cape Porto marine areas, was inscribed in the World Heritage Sites List in 1983.

LAND TENURE The area belongs to the Commune of Osani.

CLIMATE Mediterranean climate with abundant but irregular precipitation concentrated in autumn and spring months. Average annual precipitation 750 mm; average annual temperature over 10°C. Prevalent winds from SW, W, NW and NE with a speed up to 180 km/h.

PHYSICAL FEATURES The promontory is part of the large volcanic-plutonic complex of Cinto massif and Fango valley. The coast is rough with steep cliffs of red porphyry and ryolyth, basaltic columns deeply eroded by the sea, several grottoes and rocky islets. Maximum altitude 560 m. (Capu Purcile); maximum water depth 100 m.

VEGETATION The halophyle vegetation of the littoral zone is dominated by Crithmum maritimum and Statice articulata. The endemic Armeria soleirolii grows over the cliffs together with small arboreal species such as Juniperus phoenicea and Euphorbia dendroides. The less abrupt zones are covered by a dense degraded maquis dominated by Arbutus unedo and Erica arborea. In the sea, large meadows of Posidonia oceanica develop up to 50 m in depth owing to the high water transparency. Very developed rims of Lithophyllum tortuosum and Corallina elongata, and several macrophytes algae including the rare Rhodophyceae are found on hard substrata.

FAUNA The rocky cliffs are inhabited by numerous couples of Larus argentatus (700-800), black cormoran Phalocrocorax aristotelis (70-80), Pandion haliaëtus (3-4 couples). Birds of prey include Aquila chrysaetos and Falco peregrinus. The bearded vulture Gypaetus barbatus, Puffinus puffinus and Calonectris diomedea also occurr. Mammals include Vulpes vulpes, Mustela boccamela, Rattus rattus and the rare Tadarida terriotis. Reptiles are represented by snakes, lizards, geckos, amphybians by tree frogs and Discoglossus sardus. Marine fauna include all the fishes and invertebrate fauna characteristics of rocky Mediterranean coasts, as well as coral formations of Corallium rubrum and the rare Patella ferruginea. The monk seal was last observed in 1980.

CULTURAL/HISTORICAL FEATURES Three observatory towers from the Genoa mercantile republic (XII century a.d.). The Elbo tower has been restored to serve as a bird observatory. Characteristic shelters of Corsican shepherds are also present.

MANAGEMENT The Reserve is administred by the Regional Natural Park of Corsica. Research facilities (guest house, small laboratory, diving center, motor boats) and one marine warden are located in the village of Galeria, approximately 10 km outside the Reserve. The annual budget is 480,000 French francs. Hunting, spear-fishing and camping are prohibited in the Reserve. Boats are allowed to stay in the area only for a 24 h period. Professional fishing is allowed in the marine section with the exception of the strict protection zone.

USES Approximately 30,000 persons pass through the area with cruising ships during summer months. Some bathing and boating occurs in the marine zones. In the Reserve there are no permanent human settlements and no touristic facilities. Professional fishing and some forestry and grazing are carried out by locals. Research includes cartography of sea-bottoms, and inventories of terrestrial and marine flora and fauna.

PROBLEMS There is some concern about over-expansion of the tourist industry based on the natural attractions of the area. Some anchor damage on the Posidonia beds due to pleasure boats has been noted. The distance from the closest Regional Park station constitutes a problem for efficient patrolling.

PRINCIPAL REFERENCE MATERIAL

- Parc Naturel Regional de Corse. La Reserve Naturelle de Scandola. Papecor, Ajaccio. Brochure containing a selected bibliography of the scientific litterature.
- Ruggeri C., 1981. La Pression Humaine sur Scandola. Parc Naturel Regional de Corse, Ajaccio. A study on the monk seal is included.
- Boudouresque C.F., 1980. Phytocenoses Benthiques de la Reserve Naturelle de Scandola. Parc Natural Regional de Corse, Ajaccio.

CONTACT ADDRESS Parc Naturel Regional de Corse, BP 417, 20184 Ajaccio Cedex, France.

FRANCE

TUCCIA-SAGONE-CARGESE

MANAGEMENT CATEGORY: Fishery Reserve

TYPE: Marine

GEOGRAPHICAL LOCATION: Corsica, Department of Corse du Sud. Rectangle bounded to the north by the southern part of Monachi beach, to the east by Masion Guyon before Pointe Puntiglione, and extending approximately 66 km out to sea from the coast. 42° 05'N- 08° 37'E.

AREA: 1620 ha. Length of coastline 2.8 km

DATE ESTABLISHED: 20 June 1978

LEGAL PROTECTION: Decree No 1842 P-3 of the Ministry of Transport (B.O.M.M. p. 1064).

LAND TENURE

CLIMATE

PHYSICAL FEATURES

VEGETATION

FAUNA

MANAGEMENT: Spearfishing, scuba diving, and commercial fishing are prohibited. Angling is permitted from the shore only.

USES

PROBLEMS

PRINCIPAL REFERENCE MATERIAL

- Augier H. 1985. Mediterranean Marine Protected Areas. The Example of France: Appraisal and Prospects. Nature and Environment Series No. 31. Council of Europe, Strasbourg.
- Meinesz A., et al., 1983. Les Zones Marines Protégées des Côtes Françaises de Meditérranée. Bull. Ecol., t. 14, 1: 35-50.

CONTACT ADDRESS

FRANCE

VENTILEGNE

MANAGEMENT CATEGORY Fishery Reserve

TYPE Marine

GEOGRAPHICAL LOCATION Corsica, Department of Corse du Sud. Limits: Gulf of Ventilegne, between the Pointe de la Testa do Gatto rock to the north and the north-western tip of the Calle Grande to the south.

AREA 1,000 ha. Length of coastline 13.5 km.

DATE ESTABLISHED 29 July 1977.

LEGAL PROTECTION Decree No 2086 P-3 of the Secretaire d'Etat-Ministere du l'Equipement et de l'Amenagement du Territoire (Transports). Modified by decree of 20 June 1978 No 1842 P-3 of the Ministry of Transports (B.O.M.M. p. 1063).

LAND TENURE

CLIMATE

PHYSICAL FEATURES

VEGETATION

FAUNA

MANAGEMENT Scuba diving, spearfishing, and commercial fishing are prohibited.

USES

PROBLEMS

PRINCIPAL REFERENCE MATERIAL

- Augier H. 1985. Mediterranean Marine Protected Areas. The Example of France: Appraisal and Prospects. Nature and Environment Series No. 31. Council of Europe, Strasbourg.
- Meinesz A., et al., 1983. Les Zones Marines Protégées des Côtes Françaises de Meditérranée. Bull. Ecol., t. 14, 1: 35-50.

CONTACT ADDRESS

GREECE

EXISTING M/C PROTECTED AREAS

1. GORGE SAMARIA NATIONAL PARK (C)
2. PEFKIAS-XILOKASTRON AESTHETIC FOREST (C)
3. SOUNIO NATIONAL PARK (C)
4. VAI AESTHETIC FOREST

GREECE

AREA 131,955 km^2

LENGTH OF MEDITERRANEAN COASTLINE

AREA OF TERRITORIAL SEA

POPULATION 9,740,417 (1981)

PROTECTED AREA LEGISLATION National Parks, Aesthetic Forests and Natural Monuments are established by the Greek Forest Service under Presidential Decree No. 996 of 1971. Public Law No.998 of 1979 on forests and forest land protection additional to the above includes wetlands in the protected areas. At present there are no special laws on marine protected areas. A new law for the Protection of the Environment covers environmental planning and the marine environment of the entire territory (Law No. 360, 18 June 1976). It provides institutional and procedural mechanisms for the preparation of national and regional plans. A new institutional law is in preparation, which will include sections covering the protection of natural resources, landscapes, environmental protection of planning and the establishment of responsible organizations.
The World Heritage Convention was ratified on 17 July 1971. The Ramsar Convention on Wetlands of International Importance was acceded to on 21 August 1975 with 8 coastal sites (Nestos Delta, Amvrakikos Gulf, Mitrikou Lake, Vistonida Lake, Axios Delta, Evros Delta, Kotykhi Lagoon, Messolonghi Lagoon). The Specially Protected Areas Protocol of the Barcelona Convention has been ratified by Greece and consists now of a national law (No. 1634 of 18 July 1986).

PROTECTED AREA ADMINISTRATION The body responsible for the national parks and nature reserves is the Section of National Parks and Aesthetic Forests of the Greek Forest Service, Ministry of Agriculture. The coordinating body for all environment activities is the Ministry of Physical Planning, Public Works and Environment.

NATIONAL AUTHORITY ADDRESSES

- Ministry of Agriculture, Greek Forest Service, National Park Section, 3-5 Ippokratous Street, Athens, Greece.
- Ministry of Physical Planning, Public Works and Environment, Dept. of Environment, 8 Pouliou Str., 11523 Athens, Greece.

ESTABLISHED M/C PROTECTED AREAS

1. Gorge Samaria (Lefki Ori) National Park
2. Pefkias-Xylokastron Aesthetic Forest
3. Sounio National Park
4. Vai Aesthetic Forest
5. Nicopoli-Mytrakas (Preveza Seashore) Aesthetic Forest (no information)
6. Sigri petrified forest (Lesvos Island) Aesthetic Forest (no information)
7. Skiathos Island Aesthetic Forest (no information)

GREECE

GORGE SAMARIA (LEFKI ORI)

MANAGEMENT CATEGORY — National Park and Biosphere Reserve
European Diploma Award 1979

TYPE — Coastal

GEOGRAPHICAL LOCATION — In the White Mountains (Lefka Ori) of the island of Crete, 45km south of Chania. 35° 13'-35° 18'N, 23°-23° 58'E.

AREA — 4,850ha. Proposal to extend the Park by 4,000ha to the coast.

DATE ESTABLISHED — 6 November 1962

LEGAL PROTECTION — Total protection under governmental jurisdiction (Greek Forest Service) P.D. 742/8/11/1962 and 102/15.2.1964.

LAND TENURE — Government ownership 80%, local community ownership 20%.

CLIMATE — Mean annual temperature 18°C at 62m and mean annual precipitation 665mm.

PHYSICAL FEATURES — A mountainous limestone area with steep slopes and canyons up to 600m deep. The gorge is extremely narrow (minimum 2m wide) extending to the north in an almost straight line 6km long and contains an intermittent stream. Exceptional geological formations of limestone and silica schist. Altitude: sea level to 2,116m (Volacias peak).

VEGETATION — Pure stands of high altitude Mediterranean forest containing Pinus brutia, Cupressus sempervivens var. horizontalis, maple Acer sp. Maquis stands of holm oak Quercus coccifera, heath Erica arborea, juniper Juniperus oxydendrus, J. macrocarpa, Pistacia lentisus, carob Ceratonia siliqua, wild olive Olea sativa, O. oleaster, Ebenus creticus, plane tree Platanus orientalis, Cretan dittany Origanum dictamus, O. microphyllum, Paeonia clusii, Grecian sage Phlomis fruticosa, P. cretica, thyme Thymus capitatis, rock rose Cistus salvaefolius and C. creticus. 14 endemic species including Petromarula pinnata, Celsia arcturos, Linum arborum, Asperula incana, A. idaea and Verbascum spinosum. Forest and maquis cover 3,114ha and rocky and bare areas 791ha.

FAUNA — Mammals include Cretan wild cat Felis sylvestris cretensis, badger Meles meles arcalus, beech marten Martes foina bunites, weasel Mustela numidica galinthias, dormouse Glis glis argentes, fox Vulpes vulpes, jackal Canis aureus and endemic Cretan wild goat/ibex Capra aegagrus cretica. Birds of prey include bearded vulture or

lammergeier Gypaëtus barbatus, griffon vulture Gyps fulvus and golden eagle Aquila chrysaetos.

MANAGEMENT Access is from the town of Hania (42km) to Xyloskalon-Omalos at the Park entrance or from Chora-Sfakion to Agria Roumeli by boat only. Access within the Park is by foot on the main trail only and no camping is allowed. 5 firenests and underground water tanks have been built. Accommodation for scientists in Samaria village. A trail system for botanical studies has been developed.

USES Rapidly increasing tourist traffic ca. 150,000 per year. No accommodation in the Park but overnight accommodation available in Agria Roumeli, hotels in Hania and tourist pavilion and restaurants in Omalos. Samaria village in the Park, contains 2 restored churches and a restored guard's house with first aid facilities. Research includes wild goat study by Dr Schultze Westrum and biological study by G. Mavrommatis. Photographic work by P. Broussalis. Studies on plant and animal populations are carried out periodically by visiting scientists. Research could be carried out on the virgin stand of Cupressus sempervirens.

PROBLEMS Illegal hunting and grazing in the remote areas. Danger from forest fires caused by summer visitors.

PRINCIPAL REFERENCE MATERIAL

- Anon. Samaria Gorge Management Plan: A Landscape evaluation and information
  system development. SUNY - Univ. of New York School of Landscape Architecture off-campus programme supervised by Greek Forest Service.
- Cassios C. 1979. Park management plan and Park description. Council of Europe. (1979). Samaria Gorge booklet (European diploma).
- Mayromatis, G. (1976). Research on the Samaria's natural park ecosystem.
  Forest Research Institute Publications. pp. 77-106 (in Greek with English
  summary).
- Schultze-Vestrum, G. Th.n.d. The White Mountains National Park of Crete,
  Greece. A report on its conservation status. Assenhausen. 15pp.
- Biosphere Reserve nomination submitted to UNESCO.

CONTACT ADDRESS Forest Service, Hania, Crete, Greece.

GREECE

PEFKIAS-XYLOKASTRON

MANAGEMENT CATEGORY: Managed Nature Reserve (Aesthetic Forest)

TYPE: Coastal

ANNOTATED DESCRIPTION: One of the remaining Greek seashore pine forests, with great vegetational diversity.

GEOGRAPHICAL LOCATION: Xulokastron city, Korinth prefecture. 38° N, 23° E.

AREA: 27.5 ha.

DATE ESTABLISHED: 12 March 1974.

LEGAL PROTECTION: Total protection, under P.D. 198/12.3.1974.

LAND TENURE: Municipal ownership under Greek Forest Service supervision.

PHYSICAL FEATURES: Altitude: sea level.

VEGETATION: The majority of trees are paraclimax Pinus halepensis, with stone pine (P. pinea), Pistacia lentiscus and Phyllirea media.

FAUNA: No information

MANAGEMENT: The government maintains control of the area and certain activities are prohibited. Staff: one forest guard employed by the municipality. Budget: 500,000-600,000 drachmas annually.

USES: Ecological studies by the Forest Service.

PROBLEMS: Forest fire danger, overuse from summer tourists.

PRINCIPAL REFERENCE MATERIAL
- Forest Service management plan.

CONTACT ADDRESS: Xylokastron - Forest Service District Office.

GREECE

SOUNIO

MANAGEMENT CATEGORY National Park

TYPE Coastal

ANNOTATED DESCRIPTION A rocky promontory with outstanding scenic qualities and an important archeological site

GEOGRAPHICAL LOCATION In the southern east part of Attica Prefecture, 50 km south of the town of Athens, overlooking the Saronic Gulf in the Aegean Sea.

AREA 3,500 ha (750 ha core zone, 2,750 ha peripheric zone).

DATE ESTABLISHED 1974

LEGAL PROTECTION Established by Presidential Decree No. 182 of 1974.

LAND TENURE State ownership.

CLIMATE Mediterranean climate with strong winds.

PHYSICAL FEATURES Cape Sounio is a rocky promontory made up of limestone rocks. The whole area of the Park is of great geological, mineralogical and paleontological importance. There are about 100 kinds of minerals in the area; silver, zinc, iron and lead mining was in operation until recently. Fossils of the species Pinus nigra, Buxux sempervivens, Fraxinus and Colylus, which are not existing today in the area, and of the species Pinus maritima and Quercus suber, which are not native to Greece, were found in the cave Kitsos within the Park area.

VEGETATION Most of the area is covered by Pinus halepensis forests and by Mediterranean type species such as Quercus coccifera, Pistacia lentiscus, Arbutus, Vitex agnus castus, Thymus, Anthylis, Genista. The species Juniperus phoenicea can also be found in the Park. The groud flora is represented by many species of Labiatae, Papillonaceae, Graminaceae, Graminae and Compositae. A species of the last family, Centaurea laureotica, is endemic in the area.

FAUNA The fauna of the Park is limited. The most common mammals are fox, jackal, hare and hedgehog. Many smaller mammals and reptiles are also found in the Park. Until the end of the century wild boar was also present in the area. The birdlife includes hawks, owls, Corvidae and many Passeriformes.

CULTURAL/ARCHEOLOGICAL FEATURES Archeological remains include the Temple of Poiseidon (5th Cent. BC) near the edge of the Sounio Cape's cliff, the Temple of Athena, fortification walls, ship houses. There are also extensive remains of mines and ore processing laboratories from the historical period as well as remains of human habitations which cover the whole time spectrum from the palaeolithic to the prehistoric period. During the historical period there were also marble quarries in the area. The Temples of Poseidon and Athena were built with marble from the local quarries.

MANAGEMENT Plans to develop the region as holiday area with picnic places, nature trials, natural history museum.

USES At present, the area is heavily used by tourists for its archeological and aesthetic resources.

PROBLEMS Being one of the most accessible archeological sites from the town of Athens, the Park is subject to very heavy tourist pressure. In 1973/74, 350 ha of pine forest were destroyed by fire.

PRINCIPAL REFERENCE MATERIAL

- Cassios C. A., 1980. National Parks and Nature Reserves in Greece. Nature and National Parks. Vol. 67 (18): 9-10.
- Ministry of Agriculture. Brochure on Greek National Parks.

CONTACT ADDRESS No information.

GREECE

VAI

MANAGEMENT CATEGORY: Managed Nature Reserve (Aesthetic Forest)

TYPE: Coastal

ANNOTATED DESCRIPTION: A unique natural monument of the remaining ecological evidence of natural palm forest.

GEOGRAPHICAL LOCATION: On the island of Crete, Sitia (Lasithi prefecture). 35° 08'N, 26° 16'E.

AREA: 20 ha.

DATE ESTABLISHED: No information

LEGAL PROTECTION: Totally protected.

LAND TENURE: Owned by the monastery of Toplou.

PHYSICAL FEATURES: An outstanding sand beach. Altitude: sea level to 5 m.

VEGETATION: The area is composed of a natural small stand of the Cretan date palm (Phoenix theophrasti Greuter). The Phoenix is known from a few other scattered sites on the Cretan coast and the small site at Vai contains by far the greatest part of the population. The species occupies the bottom of a small valley, leading to a sandy and sheltered beach. The Phoenix, one of only two palms in Europe, is a Tertiary relic, and of great scientific interest, as well as being a major tourist attraction. It is potentially also of economic importance. Also found are oleander (Nerium oleander) and Juncus spp.

FAUNA: Probably none.

MANAGEMENT: The whole area is fenced and regulations are posted. Overnight staying is forbidden. Staff: one forest warden paid by the monastery and two seasonal firemen. Budget: 800,000 -1,000,000 drachmas annually.

USES: Scientific research include ecological study by Dr G. Mavrommatis, study of Phoenix theophrasti by Professor W. Greuter (Botanische Garten und Museum, Berlin), genetic studies by Professor Panetsos.

PROBLEMS: Fire hazard. The 'IUCN Plant Red Data Book', published in 1978, included the Cretan date palm as a 'vulnerable' species and reported that the population at Vai was threatened by tourists, by camping under the trees and by cars driven into the centre of the grove, all of which prevented regeneration. Fencing off the inner sector as a strict reserve inaccessible to tourists has considerably reduced the pressure.

PRINCIPAL REFERENCE MATERIAL

- Cassios C. Management plan.
- Greuter W., 1968. Le Dettier de Théophraste, spécialité crétoise. Mus. Geneve ser. 2, 81: 14-16.
- Lucas G. and Synge H., 1978. The IUCN Plant Red Data Book, pp. 417-8. IUCN, Switzerland.
- Mavrommatis G. Vai - An Ecological Study.

CONTACT ADDRESS - Forest Service District Office and Sitia - Forest Ranger's Office.

ISRAEL

EXISTING M/C PROTECTED AREAS

1. DOR-HABONIM NATURE RESERVE (M/C)
2. ROSH HANIKRA MARINE RESERVE (M/C)

ISRAEL

AREA 21,501 km^2

LENGTH OF MEDITERRANEAN COASTLINE 190 km.

AREA OF TERRITORIAL SEA 9.6 km (6 nautical miles)

POPULATION 4,200,000 (1984)

PROTECTED AREA LEGISLATION Relevant legislation includes the National Parks, Nature Reserves and National Monuments Act of 7 August 1963. This legislation does not specifically mention marine sites. It is indirectly indicated, however, that the purpose of a nature reserve may be to protect water against biological changes (article 1) and that the protective measures of nature reserves may concern shipping traffic (article 37), which implies that they may relate to the maritime environment. This Act, which has been amended repeatedly (Act of 28 July 1974, Act of 27 March 1968, Act of 23 December 1974, Act of 17 February 1975), has made it possible to establish several marine and coastal protected areas, each with its own regulations. The first Marine Natural Reserve (the Eliat Reserve) was established in 1963 in the Red Sea at the Gulf of Aqaba.

PROTECTED AREAS ADMINISTRATION There is a National Parks Authority (NPA) attached to the Prime Minister's Office and a Nature Reserve Authority (NRA) within the Ministry of Agriculture. There is also an Environmental Protection Service within the Ministry of Interior, in charge of environmenatl issues. The designations of protected areas is made after consultation with the National Council for Parks and Reserves, which is a broad collegiate body with advisory power. Marine Reserves are directed by the Nature Reserve Authority (established in 1964) which appoints supervisors with official directive powers in each site. The protective legislation of Israeli Marine Parks confers power of police officers to wardens of Natural Marine Reserves and Parks.

NATIONAL AUTHORITY ADDRESSES

- National Park Authority, Rehov Daled, Ha Kirya, Tel Aviv, Israel.
- Nature Reserve Authority, Yermeyahum 78, Jerusalem 94467, Israel.

LIST OF ESTABLISHED M/C PROTECTED AREAS

1. Rosh Hanikra Marine Nature Reserve (M/C)
2. Dor-Habonim Nature Reserve (M/C)

3. Taninim River Nature Reserve (W) (no information)
4. Ma' agan Michael Marine Nature Reserve (M/C) (no information)
5. Alexander River National Park (C) (no information)
6. Poleg River Nature Reserve (C) (no information)
7. Sharon Cliff Shore National Park (C) (no information).

ISRAEL

DOR - HABONIM

MANAGEMENT CATEGORY Nature Reserve

TYPE Marine/Coastal

ANNOTATED DESCRIPTION The reserve includes the most diversified stretch of coast in Israel with an extensive and well preserved 'kurkar' sandstone, several bays and underwater caves. It is considered a potential area for seal colonization.

GEOGRAPHICAL LOCATION The reserve is situated on the coast between Tel-Aviv and Haifa, about 3 km from HaBonim to Tel Dor (N 32°37', E34° 55').

AREA 113 ha, 5 km of coastline.

DATE ESTABLISHED 1980

LEGAL PROTECTION Established under the Israeli Marine Parks Law.

LAND TENURE State ownership.

PHYSICAL FEATURES The park includes a shore line composed of calcareous sandstone ridges (Kurkar). These Kurkar rocks form the supralittoral, intratidal and shallow subtidal formations, commencing seaward with more or less horizontal platforms. Within the platforms, holes and semi-caves are found. Below this, extends a sandy bottom partly covered with rocks and islets , becoming gradually deeper.

VEGETATION Scrub vegetation on the ridges includes: Pistacia lentiscus, Thymus capitatus, Thymelaea hirsuta, Atriplex halimus. Geophytes found and protected in the reserve include: Narcissus serotinus, Tulipa, Anemone, Ranunchulus.

FAUNA The animal communities are very rich in representatives from various classes, especially molluscs and echinoderms. Also found here are clingfishes Lepadogaster lepadogaster, as well as migrants from the Red Sea, such as Dasychone cingulata, Eurythoe comlanata (Plolychaeta) and the crab Atergatis roseus. The seaward fringes of the Kurkar rocks are formed by dense colonies of the vermitid Dendropoma petraeum. The rocky pools serve as a refuge for Palaemon elegans, as well as for schools of young Mugil spp. Blennius pavo and B. sanguinolentus are the most common fishes on the washed rocks. Below the tide range the most common fishes are the colourful Coris spp., several species of scorpion-fishes, schools of Chromis chromis, and large serranid fishes.

CULTURAL/HISTORIC FEATURES Artificial mound, remains of temple, harbour and other buildings are found in Dor-Tantura Archeological Site, declared in 1964. Submerged buildings, wrecked vessels with cargo, anchors, pottery and metal objects are found in Dor Underwater Archeological Site, declared in 1984.

MANAGEMENT No urban development is permitted within a distance of 200 metres from the Marine Park and consequently the regulations of Nature Protection also extend over the terrestrial flora and fauna of the dunes found here.

USES The Park is open to visitors, for swimming and (with special permission) for spear gun fishing.

PROBLEMS The area has to be protected against quarrying, littering and sewage pollution.

PRINCIPAL REFERENCE MATERIAL

- Fishelson L., 1985. Littoral Marine Ecosystems and Marine Parks of Israel. In: Atti del Convegno Internazionale I Parchi Costieri Mediterranei, Salerno- Castellabate 18-22 June 1973. Ente Provinciale per il Turismo di Salerno. pp. 453-467.
- Por F.D., 1985. Nature Reserve Policy along the Mediterranean Shore of Israel. In: Atti del Convegno Internazionale I Parchi Costieri Mediterranei, Salerno- Castellabate 18-22 June 1973. Ente Provinciale per il Turismo di Salerno. pp. 539-545.

CONTACT ADDRESS No information.

ISRAEL

ROSH HANIKRA

MANAGEMENT CATEGORY Marine Nature Reserve

TYPE Marine/Coastal

ANNOTATED DESCRIPTION The Marine Reserve includes high limestone cliffs, underwater caves and many islets which serve as breeding grounds for important species. The whole environment seems to be unique to all parts of the eastern Mediterranean.

GEOGRAPHICAL LOCATION The Reserve is located in the most northern part of the Israel shore-line, extending from a place called Akhziv to the border of Lebanon (N 33°04', E 35°36').

AREA 440 ha, extending 1,300 m seaward from the coast.
5 km of coastline.

DATE ESTABLISHED 1965

LEGAL PROTECTION Established under the protective legislation of Israeli Marine Parks.

LAND TENURE State ownership.

PHYSICAL FEATURES The supratidal zone is made up of "Kurkar" rocks and partly sand dunes. In its most northern part calcareous rocks are prominent, forming a shore line rich in cliffs discending vertically to the sea, cavities and undercuts. Seawards, about 500 to 800 metres from the shore line, a girdle of small islets is found, some of which protrude over the sea surface (Techailet, Nachlieli and Shachaf Islands), others being visible only during low water.

VEGETATION Halophytic vegetation covers the islets found permanently over the sea. The intertidal zone contains a wide diversity of algal species.

FAUNA The bottoms and walls of the the underwater caves are characterized by a very special fauna of hydroids, colourful sponges and bryozoa, as weel as soft corals and clinid fishes. The fishes Apogon imberbis and Chromis chromis, as well as the triton shell Charonia are found here. The sandy beaches serve as spawning grounds for the seaturtles Chelonia mydas and Caretta caretta. The islands are nesting places for several species of birds including Motacilla alba, Larus argentatus and Sterna hirundo, and are visited by the monk seal Monachus monachus.

CULTURAL/HISTORIC FEATURES Building remains and pottery from Byzantine period are found on the islands of Shachaf and Nachlieli, declared Archeological Sites in 1964.

MANAGEMENT Public access is strictly controlled. During the seaturtle breeding season, even climbing on the islets is strictly forbidden in order to prevent destruction of the brood. Underwater fishing, shellfish harvesting, kurkar stone quarrying are prohibited. Boat traffic is limited to 150 m from the islands.

USES Scientific research.

PROBLEMS Threats from sandstone quarrying, spearfishing, collection of molluscs and turtle eggs, sewage outflows.

PRINCIPAL REFERENCE MATERIAL

- Fishelson L., 1985. Littoral Marine Ecosystems and Marine Parks of Israel. In: Atti del Convegno Internazionale I Parchi Costieri Mediterranei, Salerno- Castellabate 18-22 June 1973. Ente Provinciale per il Turismo di Salerno. pp. 453-467.
- Por F.D., 1985. Nature Reserve Policy along the Mediterranean Shore of Israel. In: Atti del Convegno Internazionale I Parchi Costieri Mediterranei, Salerno- Castellabate 18-22 June 1973. Ente Provinciale per il Turismo di Salerno. pp. 539-545.

CONTACT ADDRESS No information.

ITALY

EXISTING M/C PROTECTED AREAS

1. PORTOFERRAIO FISHERY RESERVE (M)
2. MAREMMA REGIONAL PARK (C)
3. MONTECRISTO NATURE RESERVE (M/C)
4. ORBETELLO-FENIGLIA NATURE RESERVE (W)
5. BURANO NATURE RESERVE (W)
6. CIRCEO NATIONAL PARK (W)
7. CASTELLABATE FISHERY RESERVE (M)
8. USTICA MARINE RESERVE (M)
9. CAPRERA NATURE RESERVE (C)
10. MIRAMARE MARINE RESERVE (M)

ITALY

AREA 301,270 km^2

LENGTH OF MEDITERRANEAN COAST 8,800 km

AREA OF TERRRITORIAL SEA No information

POPULATION 56,557,000 (in 1981)

PROTECTED AREA LEGISLATION There are no basic laws covering nature conservation and the protection of fauna, flora and biotopes. However, a number of measures dealing with natural environment have been adopted. These include laws on fishing, hunting, protection of the soil. The 5 National Parks (of which only the Circeo National Park is coastal) were established by individual legislation (Royal or Presidential Decrees). Regional parks are established by regional governments. Four zones of marine biological protection have been established on the basis of the Fishery law No.963 of 14 July 1965 by the Ministry of Mercantile Marine. Two marine reserves have recently been established by presidential decree based on the law 979 of 31 February 1982 "Disposition for Defence of the Sea" which envisaged the establishment of marine reserves in 20 sites of national interest.
Italy ratified the World Heritage Convention in 1978, the Ramsar Convention in 1976 (with 25 coastal sites) and the Specially Protected Areas Protocol of the Barcelona Convention in July 1985.

PROTECTED AREA ADMINISTRATION The Ministry of Environment, in charge of nature conservation activities and pollution control measures, has been established in 8 July 1986 (Law No. 349). Technical responsibilities for national parks, nature and marine reserves rest now with the Ministry of Environment, Department of Nature Conservation, although the Ministry of Agriculture and Mercantile Marine will continue to be responsible for certain management operations (i.e. patrolling activities) in Nature Reserves and in Marine Reserves respectively. Management of Fishery Reserves rest with the Ministry of Mercantile Marine.

NATIONAL AUTHORITIES ADDRESSES

- Ministero dell' Ambiente, Piazza Venezia 11, Roma, Italy.
- Ministero della Marina Mercantile, Ispettorato per la Difesa del Mare, Viale dell'Arte, Roma (EUR), Italy.
- Ministero dell'Agricoltura, Via Carducci 5, Roma, Italy.

ESTABLISHED MARINE/COASTAL PROTECTED AREAS

1. Burano Nature Reserve (W)
2. Caprera Nature Reserve (C)
3. Castellabate Fishery Reserve (M)
4. Circeo National Park (C/W)
5. Maremma Regional Natural Park (C)
6. Miramare Marine Reserve (M)
7. Montecristo Nature Reserve and Fishery Reserve (M/C)
8. Orbetello and Feniglia Nature Reserve (C/W)
9. Portoferraio Fishery Reserve (M)
10. Ustica Marine Reserve (M)

ITALY

BURANO

MANAGEMENT CATEGORY Nature Reserve

TYPE Wetland

ANNOTATED DESCRIPTION A small saline lake separated from the sea by a strip of sand dunes. Important wintering station for migratory birds.

GEOGRAPHICAL LOCATION On the Tyrrhenian sea coast, 10 km east-south of Orbetello, in the Grosseto Province of Tuscany. N 42 o 22'-24', E 11 o 23'-25'.

AREA c. 410 ha.

DATE ESTABLISHED 1968 as WWF sanctuary and 1980 as Nature Reserve.

LEGAL PROTECTION The area was declared nature reserve by ministerial decree of 1980. It also has the status of a sanctuary, managed by the Italian Association of the World Wildlife Fund since 1968. The lake is included in the Ramsar Convention list since 1977.

LAND TENURE Private ownership; WWF rents the lake.

PHYSICAL FEATURES A saline lake, about 3 km long separated from the sea by a double line of sand dunes ('tombolo'). The lake (140 ha, max. depth 2.50 m.) is connected with the sea by a channel located near the Tower of Buranaccio. The 'tombolo', about 19 km long, is a recent Olocenic formation and is rich of iron sand.

VEGETATION Several plant associations typical of lagoons and marshes occur, dominated respectively by tassel pondweed Ruppia spiralis, reeds Phragmites communis, sea club-rush Scirpus maritimus and fen-sedge Cladium mariscus. A Mediterranean maquis has developed on the Tombolo di Capalbio, composed of cypress Cupressus macrocarpa, the juniper Juniperus phoenicea, olive Olea europea var. oleaster, myrtle Myrtus communis, mastic tree Pistacia lentiscus, holm oak Quercus ilex, etc. A herbaceous vegetation of spring sedge Carex caryophyllea, the clover Trifolium cherleri, Romulea columnae, mossy tillaea Tillaea muscosa (= Crassula tillaea) and other species, occur sporadically.

FAUNA The lake is an important resting and wintering place for waterfowl, especially Cormorant Phalacrocorax carbo, Grey Heron Ardea cinerea, Wigeon Anas penelope, Teal A. crecca, Pintail A. acuta, Pochard Aythya ferina and Coot Fulica atra. Several mammals such as Wildpig Sus scrofa, Porcupine Hystrix cristata, Fox Vulpes vulpes, Roe deer Caproleus caproleus, are found on the 'tombolo'. The rare Otter Lutra lutra is found in the lake. The lake is also reach in fish.

CULTURAL/HISTORIC FEATURES The lake was an Etruscan harbour with a network of channels connected to the sea. An old Spanish tower is found on the channel connecting the lake to the sea.

MANAGEMENT The reserve is managed by the Italian Association of World Wildlife Fund. The lake and the channels are periodically cleared of reeds and the water exchange with the sea is regulated. A guard is permanently stationed in the reserve. A meteorological station, a guest house, and guided nature trails are available for scientists and visitors. Public access is limited to certain days of the week.

USES Several tourists visit the area for bird-watching and recreation. Commercial fishing take place in the lake. Scientific research on ornithology, botany and lake's ecology is carried out by the WWF, the National Research Council and several universities.

PROBLEMS Pollution, and because the lake is a tourist attraction, development of surrounding area and fires caused by careless visitors in dry summers. Exploitation of sandpits in the vicinity can also have adverse effect.

PRINCIPAL REFERENCE MATERIAL

- Carp E., 1980. A Directory of Western Paleartic Wetlands. IUCN, Gland.
- Cognetti G., De Angelis C. M., Orlando E., 1979. Situazione Ecologica del Lago di Burano. WWF, Roma.
- Pratesi F., 1970. Paludi, Lagune e Stagni Costieri in Italia: Nuove Prospettive ed Indirizzi per la loro Conservazione. Quaderni di Italia Nostra No. 6. Roma. 62 pp.
- Regione Toscana, 1981. Il Sistema Regionale delle Aree Verdi. Giunta Regionale, Dipartimento Assetto del Territorio, Firenze. pp. 260-263.
- WWF, 1984. Le Oasi del WWF, Classificazione, Descrizione delle Aree Protette e Piano di Gestione. Associazione Italiana per il World Wildlife Fund, Roma.

CONTACT ADDRESS

- Associazione Italiana per il World Wildlife Fund. Via Salaria 290, Roma, Italy.

ITALY

CAPRERA

MANAGEMENT CATEGORY Managed Nature Reserve

TYPE Coastal

ANNOTATED DESCRIPTION A mountainous island with rough coasts, practically protected as a military zone. Considerable potential for the reintroduction of the monk seal.

GEOGRAPHICAL LOCATION Caprera island is part of the Maddalena archipelago situated off the north-eastern coast of Sardinia. Sassari Province.

AREA 1,575 ha

DATE ESTABLISHED 1980

LEGAL PROTECTION Declared Managed Nature Reserve by Ministerial Decree of 8 August 1980 published in the Ufficial Gazette No. 232 of 25 August 1980. It was declared a National Monument in 1980.

LAND TENURE Government owned. In 1892 the island, which had belonged to Garibaldi since 1864, was expropriated from his heirs by the Navy for its strategic military importance.

CLIMATE Low annual rainfall (600 mm) concentrated in winter months. Strong winds from N-W increase the dry conditions of the island.

PHYSICAL FEATURE The island is composed of hard granitic rocks of the Paleozoic. The topography is rough with steep bare reliefs eroded by the wind. Maximum altitude is 212 m. (Mount Teialone).

VEGETATION A mediterranean maquis, which grows in the more protected and humid zones, is alternated with totally bare zones. The maquis is composed of Erica arborea, Fillirea angustifolia, Juniperus Corbezzolo.
Artificial plantations of pines (Pinus pinea, Pinus alepensis) were introduced by Garibaldi and then reimplanted around the 1930s (300 ha). Plantations of olive tree and of the original climax oak forest (Quercus ilex) (8 ha)are also present.

FAUNA The wild rabbit is common together with some endemic species of lizards and snakes. Coastal birds include the Corsican gull Larus argentatus, Phalocrocorax carbo, Falco peregrinus. Rich marine biocenoses. The reintroduction of the monkseal Monachus monachus has been envisaged.

CULTURAL/HISTORIC FEATURES Caprera was home to the Italian national hero Giuseppe Garibaldi from 1856 to his death. His house, his tomb and the historic museum are visited by numerous people.

MANAGEMENT The Reserve is managed by the Ministry of Agriculture and Forests.

USES Several tourists visit the island for cultural reasons. The island is connected by a bridge to the bigger Maddalena island, which is in turn linked to the mainland by ferry. The access is free. On the island there is a sailing school and a holiday village of the Club Mediterranee. The Maddalena archipelago is a military base for NATO. Traditional agricultural activities are carried out. A proposal for the reintroduction of the monk seal on the island is under consideration at the Ministry of Agriculture.

PROBLEMS Heavy touristic pressure especially in summer. Depleting commercial and sport fishing.

PRINCIPAL REFERENCE MATERIAL

- La Riserva Naturale di Caprera. Leaflet of the Ministry of Agriculture and Forests.

CONTACT ADDRESS Ministero dell'Agricoltura e Foreste, Sezione Parchi e Riserve, Via Carducci 5, Roma, Italy.

ITALY

CASTELLABATE

MANAGEMENT CATEGORY Fishery Reserve (Zona di Tutela Biologica)

TYPE Marine

ANNOTATED DESCRIPTION A marine area rich in benthic biocenoses threatened by overfishing and presently protected as a reproductive zone for commercial fish species. There has been a proposal for its establishment as a marine reserve since 1972.

GEOGRAPHICAL LOCATION On the southern Tyrrhenian coast, in the province of Salerno, next to the town of S. Maria di Castellabate. The marine protected area extends between the bay of Sambuco and the Punta dell'Ogliastro within 4.8 km from the coast. 40°16'N- 14°56'E.

AREA About 4,400 ha.

DATE ESTABLISHED 1972

LEGAL PROTECTION Declared Fishery Reserve on 25 August 1972 by a Decree of the Minister of Merchant Navy based on Fishery Law No. 963 of 14 July 1965. The area will be added to the 20 proposed marine reserves listed in Law No. 979 of 31 December 1982.

LAND TENURE State owned (territorial waters)

PHYSICAL FEATURES Rocky sea-bottom with alternate layers of sandstone and marne forming extensive outcrops and deep cracks. Maximum water depth 48m, average water depth 3m.

VEGETATION Submarine vegetation dominated by Posidonia oceanica, an important species for invertebrate spawning.

FAUNA All the typical mediterranean biocenoses of mid-infra-circum littoral zones are represented. The benthos is particularly rich.

CULTURAL/HISTORIC FEATURES Significant necropolis along the shore, ancient Roman/Greek harbour in San Marco, underwater shipwreck findings (amphorae, pottery, anchors), Saracene coastal watch towers, and the quarry for the Paestum Greek temples, S. Giovanni Monastery dating about 872 AD and ruins of the villas of the 1700s. On the Isle of Licosa a skeleton of a man has been found in a position that indicates burial at a probable date of 400 BC.

MANAGEMENT Fishing is totally prohibited in the sea-waters comprised between Punta Pagliarolo and Punta dell'Ogliastro. Research studies for the establishment of a marine reserve were initiated in 1972 by the Mediterranean Association of Marine Biologists and Oceanologists. A financial plan for management activities was prepared by World Wildlife Fund-Italy. Funding was provided by local authorities (Regione Campania).

USES Tourism in the summer and commercial fishing takes place in part of the area.

PROBLEMS Fishing restrictions are poorly enforced. Illegal spear-fishing together with sewage discharge from the town of Castellabate threaten marine life. Significant Roman and Greek archeological resources (terrestrial and marine) are endangered from developing activities. Posidonia oceanica is diminuishing due to fishing pressures, trawling, and the results of land erosion.

PRINCIPAL REFERENCE MATERIAL

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CONTACT ADDRESS Ministero della Marina Mercantile, Ispettorato per la Difesa del Mare, Viale dell'Arte 13, Roma (EUR), Italy.

ITALY

CIRCEO

MANAGEMENT CATEGORY National Park, Biosphere Reserve.
Because of the human activities carried out within the park's boundaries, this park is classified as a Protected Landscape in the UN List of National Parks and Protected Areas (1985).

TYPE Coastal/Wetland

ANNOTATED DESCRIPTION Although threatened by urban and industrial development, the Circeo National Park remains one of the most representative coastal protected areas in the Mediterranean for the diversity of its ecosystems including: the last remaining section of the ancient lowland Pontine forest, four coastal brackish lakes (Paola, Caprolace, Monaci, Fogliano) classified as wetlands of international importance in the Ramsar list, the rocky promontory of Circeo, the sand dunes along 30 Km of coast, and the island of Zannone located 30 Km offshore.

GEOGRAPHICAL LOCATION The National Park is located on the Tyrrhenian coast in the province of Latina, 100 km south of Rome and 150 km north of Naples. 41° 13'- 42° 3' N, 0° 23'- 0° 40' E.

AREA 8400 ha. The National Park includes 3260 ha of Biosphere Reserve (Foresta Demaniale del Circeo).

DATE ESTABLISHED 1934 as a National Park. January 1977 as a Biosphere Reserve.

LEGAL PROTECTION Established by Royal Decree No 285 of 25 January 1934. Application rules were issued on 7 March 1935 by Royal Decree No 1324. In recent years various modifications have been made. Four strict natural reserves (Rovine di Circe, Piscina della Gattuccia, Lestra della Coscia and Piscina delle Bagnature) and a nature reserve (Foresta Demaniale del Circeo) have been established within the Park boundary by Ministerial Decrees of 26 July 1971, 22 February 1975 and 15 December 1977. Three coastal lakes (Caprolace, Fogliano, Monaci) and the island of Zannone have been included in the Park by the Presidential Decrees of 2 July 1975 and 23 January 1979 respectively.

LAND TENURE 63% of the area is the property of the Government Agency for State Forestry, 4% belongs to the Commune of Sabaudia, 1,5% to the Regione Lazio, and 31,5% is privately owned.

CLIMATE The environment of the Park is characterized by a mild climate of the thermomediterranean attenuated type. Annual rainfall of 900 mm (750 mm in winter and 150 mm in summer). Average annual temperature of 16.5° C (10° C in winter and 22.5° C in summer). The atmospheric humidity is very high especially in the state forest. Principal winds are from N-E, S-O, and S-E.

PHYSICAL FEATURES The plain forest is situated on a series of continental dunes of reddish yellow sand. The soils which derive from it are loose on the surface but cemented below, these layers are therefore impermeable and make permanent flooded depressions (ponds), which are closed and vary in size from season to season. The soils are podzolic, very poor in nutritive elements, and much leached at surface levels. The coastal dune is formed of sand rich in calcium carbonate with alkaline soils.
The four lakes, situated behind the coastal dune, are connected by marshy areas. The soil of these wet areas is very rich in organic substances. The calcareous massif of mount Circeo reaches 541 m. Zannone is an island of volcanic origin (0,9 km^2, max altitude 200 m.) .

VEGETATION The vegetation of the plain forest varies according to the different microclimatic conditions in the area. Where no artificial plantations have been introduced, the vegetation consists of large deciduous oak species dominated by turkey oak Quercus cerris in association with Italian oak Q. farnetto, and European turkey oak Q. pedunculata. A vegetation transition towards the Mediterranean type - which has became more marked since the wholesale clearances of 1933 - includes Quercus ilex and Q. ruber, with an undergrowth of Erica arborea, Phyllerea latifolia, Pistacia lenticus, Crataegus monogyna, Rubus fruiticosus. The flooded depressions or ponds, where the vegetation is mostly Fraxinus oxycarpa, Salix cinerea and Alnus glutinosa, present a highly singular appearance recalling the landscape of the ancient Pontine marsh drained in the 1930's to fight malaria and to reclaim land for agriculture.
The coastal dune vegetation includes the Phoenician juniper Juniperus phoenicea, J. macrocarpa and sea daffodil Pancratium maritimum.
The vegetation of the wetland areas consists of extensive clumps of Phragmites australis in association with various species of Juncus, Scirpus, Cyperus and Carex.
The vegetation of Mount Circeo is typically mediterranean. The arid, rocky habitat of the southern slopes is covered by sclerophyllous vegetation including the protected dwarf fan palm Chamaerops humilis and Centaurea circae. The humid habitat of the northern slopes supports a luxuriant evergreen forest dominated by Quercus ilex with mixed deciduous trees. The vegetation of Zannone island presents floristic affinities with that of Mount Circeo.

FAUNA The remaining fauna of the ancient Pontine plain marshes includes the otter Lutra lutra, the crested porcupine Hystrix cristata, the wild boar Sus scrofa, the fox Vulpes vulpes, the badger Meles meles, Mustela putorius, M. nivalis. Roe deer Capreolus capreolus are being reared in enclosures for reintroduction into the Park. They became extinct in the area when the marshes were drained in the 1930's. 230 different species of birds live in the forest and in the lakes. Picus viridis and Dendrocopus major are of interest, they form a colony isolated from the rest of the Italian bird population. Important birds of prey are peregrine hawk Falcus peregrinus and black-winged stilt Himantopus himantopus. The brackish coastal lakes support abundant fish populations including eel Anguilla anguilla, grey mullet Mugil cephalus and thicklip grey mullet M. chelo.

CULTURAL/HISTORIC FEATURES The Park is reach in monuments and archeological remains including the roman villa of the emperor Domiziano, the roman harbour of Sabaudia lake, the Lucullo' baths, the Circe's acropolis and the towers built in the XIV century b.c. Important paleontological remains indicating the presence of Neanderthal men in the area are also found in several grottoes of Mount Circeo.

MANAGEMENT The National Park is administered by the Government Agency of State Forests. The personnel consists of 12 persons in the administrative service, 22 guards and 30 temporary workers. The annual budget is 470,000,000 Italian Lire.
In the strict nature reserves, in the coastal dunes and on Zannone island no human intervention is allowed. In the coastal plain human activities are subject to regulations. A fire control service is based in the Park. The service also operates outside the Park's boundaries. Research facilities include 3 metereological stations, several experimental plots, a collection of animal species, a library, a conference-room and a guest-house with 30 beds. Educational facilities include an eco-museum, audio-visual and information material, guided nature-trails.

USES In the park's territory there are 12,000 permanent residents (Sabaudia and San Felice Circeo) and up to 50,000 temporary residents during summer months. Each year 20,000 persons visit the Park for recreational and cultural reasons. Summers and winter-spring months are the peak seasons (the latter particularly for school-children). The overall number of yearly tourists in the coastal zone of the park and surrounding areas is estimated at 100,000,000. Several economic activities take place with permission. Forestry cuts are allowed in the Ecalyptus and Pinus pinea plantations which cover 12% of the forest area. Mushroom collecting is strictly regulated. Acquaculture, sport and commercial fishing take place in the lakes while the surrounding zones are grazed by half-domestic buffaloes. Several zones are utilized for agriculture.

Research has been undertaken in the fields of climatology, botany, ornithology, archeology. On-going research projects include studies on hydrology, small-mammal ecology and mushroom species.

PROBLEMS Because of its close proximity to Rome, the park is subject to considerable human pressure leading to degradation of the vegetation and subsequent soil erosion. Particularly the delicate coastal dunes are being degraded by summer visitors following the construction of an asphalt road along their length. Irrational speculative building and private land lots are also a problem. The coastal lakes are subject to eutrophy and water pollution due to urban sewage and agricultural activities.
Insufficient funds and the limited number of patrolling personnel constitute the major management problems.

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CONTACT ADDRESS Ispettore Generale Forestale, Parco Nazionale del Circeo, Via Carlo Alberto 107, 04016 Sabaudia (LT), Italy.

ITALY

MAREMMA

MANAGEMENT CATEGORY Regional Natural Park

TYPE Coastal

ANNOTATED DESCRIPTION A well preserved coastal dune system covered by thick Mediterranean maquis.

GEOGRAPHICAL LOCATION Along the Thyrrenian coast from Principina a Mare to Talamone (near the town of Livorno), delimitated at the east by the road Aurelia and at the south and south-west by the sea. Province of Grosseto.

AREA 9,000 ha

DATE ESTABLISHED 1975

LEGAL PROTECTION Declared a Regional Natural Park by the Region of Tuscany by Law No. 65 of the 5 June 1975.

LAND TENURE 4,000 ha are in public ownership.

CLIMATE Annual mean precipitation 700 mm distributed essentially in fall and winter. Average annual temperature 16°C (8°C in January; 25°C in July).

PHYSICAL FEATURES The regional park icludes high sandy beaches, the estuary of Ombrone river, a developed coastal dune system with a series of small coastal lagoons (partly temporary) "Paludi della Trappola". The inland mountains of Uccellina are partly calcareous and partly siliceous (maximum altitude 417 m.).

VEGETATION Mediterranean maquis dominated by Juniperus phoenicea and Pistacia lentiscus. High stands of Pinus pinea form the pinewood of Marina Alberese.

FAUNA Mammals include Wildboar Sus scrofa, Fallow-deer Dama dama, Roe-deer Capreolus capreolus, Porcupine Hystrix cristata, Badger Meles meles, Red fox Vulpes vulpes, Otter Lutra lutra, Wild cat Felis silvestris, Martes spp., Mustela nivalis, and several small mammals. The marshy areas also host a high number of migratory birds during the winter such as Anas acuta, Fulica atra, Gallinula chloropus, Capella gallinago, Himantopus himantopus, Ardea cinerea, Pandion haliaetus.

CULTURAL/HISTORIC RESOURCES
Various paleontological and archeological remains of the Etruscan and Roman civilizations are present. Several old observatory towers are found on the coast.

MANAGEMENT The Park is managed by the Consortium of the Maremma Regional Natural Park which includes representatives of the three townships involved and of the Province of Grosseto. The Consortium is assisted by a scientific committee. A management plan for the park has been approved by the Consortium on July 1977. Public visits are restricted to ferial days of the week. The public is not allowed to stay overnight, to leave guided trails and to enter from the sea.

USES The area is basically inhabited. The beach is frequented by local visitors in summer. Some agricultural and grazing (half-domesticated buffaloes) activities take place within the area. Nature oriented tourism and scientific research are carried out.

PROBLEMS No information.

PRINCIPAL REFERENCE MATERIAL

- Regione Toscana, 1981. Il Sistema Regionale delle Aree Verdi. Giunta Regionale, Dipartimento Assetto del Territorio, Firenze. pp. 238-142 (with bibliographic references).

CONTACT ADDRESS Consorzio del Parco Naturale della Maremma, Localita Pianacce, 58010 Alberese (GR), Italy.

ITALY

MIRAMARE

MANAGEMENT CATEGORY Marine Reserve and Biosphere Reserve

TYPE Marine

ANNOTATED DESCRIPTION A small marine reserve on the northern part of the Adriatic Sea with considerable importance for water pollution research studies, experimental species reintroductions and educational activities.

GEOGRAPHICAL LOCATION On the northern adriatic coast close to the Yugoslavian border, next to the town of Grignano in the gulf of Trieste. 45°42'N- 13°42'E.

AREA 30 ha (3.6 on land, 26.4 on sea)

DATE ESTABLISHED 1986

LEGAL PROTECTION The area has been declared a national marine reserve by Presidential Decree of June 1986. It was however privately established in 1973 by a local state concession renewed on 9 January 1981. Accepted as biosphere reserve in November 1979.

LAND TENURE State owned

PHYSICAL FEATURES Miramare is a rocky promontory of karst calcareous origin with coastal cliffs and shingle beaches. The eastern part of the coast is very steep abruptly reaching a depth of 18 m. (the whole Trieste Gulf has an average depth of only 21 m.).The sea bed is largely composed of muds and clays. Average water temperature is 14.6° C, pH of the sea varies from 7.7 to 8.3 with a salinity of 34.18 mg/l to 37.82 mg/l.

VEGETATION The terrestrial area has a typical Mediterranean sclerophyll vegetation. Extensive meadows of Cymadocea nodosa cover the sea-bottom. The transplantation of locally extint phanerogams such as Posidonia oceanica and Zostera marina have been initiated. The intertidal zone has a unique Mitylus galloprovincialis-Fucus virsoides association which is elsewhere endagered by hydrocarbon pollution and chemical pollutants. The brown sea-weed Fucus virsoides occurs only in this area of the North Adriatic Sea.

FAUNA The marine area has a rich fauna characteristic of a marine-estuarine environment. The area contains one of the last and the most northerly station of the rare mollusc Conus mediterraneus in the mediterranean basin. Mytilus galloprovincialis also occurs here. Several overexploited species have been reintroduced into the area, including Labrax lupus, Mugil sp., Crangon crangon and Maja squinado. The terrestrial area has a rich avifauna.

CULTURAL/HISTORIC FEATURES On the Miramare promontory is the old castle of Massimiliano d'Asburgo.

MANAGEMENT The area is managed by the local World Wildlife Fund association with the cooperation of the Marine Biology Laboratory of Arusina for scientific research and education activities. All forms of fishing and motor boat navigation are prohibited. A mooring system delimits the sea-water boundaries. Patrolling is carried out by the harbour-office of Trieste.

USES A number of research projects in the field of oceanography and pollution are carried out by various research institutes located in Trieste. These studies include: sea-bottom mapping, plankton studies, sea-water chemistry and experimental fish breeding. Artificial underwaters shelters have been installed for fish reproduction. Several education activities for school and university students are carried out.

PROBLEMS The marine life has suffered from biological and marine pollution originating from the town of Trieste and its hinterland. It is also endagered by overfishing, both private and commercial. There is a risk of disturbance from recreational activities. Boats carrying tourists to the port of Miramare are allowed to cross the area.

PRINCIPAL BIBLIOGRAPHIC REFERENCES

- Annals "Parco Marino di Miramare" 1973-1979.
- Biosphere Reserve nomination submitted to UNESCO 1979.
- Bussani M. 1974. L'istituzione del Parco Marino di Miramare nel Golfo di Trieste. WWF Bull. Vol.1, No. 1, Trieste.
- Pratesi F. 1984. Riserva Marina deniminata "Parco Marino di Miramare" nel Golfo di Trieste. Report for the Ministry of Merchant Navy, WWF-Italia, Rome.

CONTACT ADDRESS Parco Marino di Miramare. c/o Sezione WWF di Trieste, Via Felice Venezian 27, 34134 Trieste, Italy.

ITALY

MONTECRISTO

MANAGEMENT CATEGORY Fishery Reserve (Zona di Tutela Biologica) on sea and Nature Reserve on land.

TYPE Marine and Coastal

ANNOTATED DESCRIPTION A steep mountainous island devoted exclusively to scientific research. The island hosts a supposedly endemic species of wild goat which is overgrazing the local vegetation.

GEOGRAPHICAL LOCATION Montecristo island belongs to the Tuscan Archipelago located in the central part of the Tyrrhenian Sea. It is relatively isolated, being at a distance of about 46 km from Giglio island, 38 km from Elba and 51 km from Corsica.

AREA 1039 ha on land and 800 ha on sea. 16 km of coastline.

DATE ESTABLISHED 1981

LEGAL PROTECTION The sea waters around the island have been declared a Zone of Biological Protection for the Monk Seal with a Decree of the Merchant Navy Minister of 5 April 1979 based on the Fishery Law No. 963 of 14 July 1965. This was replaced by Ministerial Decree of 2 April 1981. The island itself has been declared a Managed Nature Reserve by Decree of Minister of Agriculture on March 1971 (published in the Ufficial Gazzette No. 137 of 1 June 1971).
The island is also a Biogenic Reserve established by Ministerial Decree of 12 December 1977 (UG No 7/9/78).

LAND TENURE State owned

PHYSICAL FEATURES A mountainous island of conic shape formed by granitic rocks (maximum altitude 645 m). Characteristic are large granitic outcrops that may form gigantic cliffs. The coast is steep and rough. Several fresh-water springs are found in the in the interior.

VEGETATION The island is covered by a degradated mediterranean maquis dominated by Erica arborea with Erica scoparia, Rosmarinus officinalis, Cistus monspeliensis, Teucrium marum. Large secular oaks (Quercus ilex), relic of the dense forest that once covered the island, also occur. Several esotic species are found: Eucalyptus globulus, E. lehmannii, Pinus pinea, P. halepensis, Cupressus sempervirens.

FAUNA About 350 individuals of wild goat (Capra aegagrus), presumably originating from a domestic population imported in ancient times, are found on the island.
The wild rabbit (Oryctolagus cuniculus) was also partly imported. The monk seal Monachus monachus, once common in the island, has not been observed since 1953. Delphinus delphis and Tursiops truncatus frequent the waters around the island. 62 species of birds have been recorded including Larus audouinii, L. argentatus, Phalacrocorax aristotelis, Falco eloeonorae, Falco peregrinus. The endemic snakes Vipera aspis and Coluber viridiflavus are common. Discoglossus sardus is the only amphibian found on the island.

CULTURAL/HISTORIC FEATURES The island was inhabited and partly cultivated since Roman times, mainly by monks. The remains of a large Benedictine monastery are still visible on a steep cliff overlooking Cala Maestra. In 1800 the island became a hunting reserve of the royal Savoia family. The old royal villa has been restored for the use of researchers and wardens.

MANAGEMENT The terrestrial area is managed by the Ministry of Agriculture and Forests (ex-ASFD) whereas the marine area is under the responsibility of the Ministry of Merchant Navy. Scientific research is carried out by the National Research Council (CNR). One warden is permanently stationed on the island. All fishing, bathing, navigation and public access are prohibited within 500 m from the seashore. Landing is difficult because of the lack of natural harbours and docking facilities.

USES The area is used for scientific research exclusively. Only the warden with his family live on the island.

PROBLEMS Uncontrolled increase of herbivores (goats, rabbits and rats) cause the degradation of maquis vegetation. The island is also infested with the imported plant species Ailanthus altissima.

PRINCIPAL REFERENCE MATERIAL

- Bruno S., Sauli G. 1976. Montecristo. Natura e Montagna No.1, March 1976.
- Fanfani A., Groppali R., Pavan M. 1977. La tutela Naturalistica Territoriale Sotto Potere Pubblico in Italia: Situazione e Proposte. Collana Verde 44, Ministero dell'Agricoltura e Foreste, Roma.

CONTACT ADDRESS

- Ministero della Marina Mercantile, Ispettorato per la Difesa del Mare, Viale dell'Arte, Roma (EUR), Italy.
- Ministero dell'Agricoltura e Foreste, Ex AFDS, Via Carducci 5, Roma, Italy.

ITALY

ORBETELLO AND FENIGLIA

MANAGEMENT CATEGORY Managed Nature Reserves

TYPE Wetland/Coastal

ANNOTATED DESCRIPTION A wetland system composed of two lagoons separated from the sea by two strips of lands and sand dunes. The northern lagoon and the southern strip of land are declared managed nature reserves. The area is also a wetland of international importance.

GEOGRAPHICAL LOCATION Surrounding the town of Orbetello at the base of the Monte Argentario peninsula and about 35 km south of Grosseto in south-western Tuscany. N 42 o 25'-30', E 11 o 10'-20'.

AREA 950 ha Orbetello Reserve and 474 ha Feniglia Dune Reserve.

DATE ESTABLISHED 1971

LEGAL PROTECTION The northern part of the Orbetello lagoon is a World Wildlife Fund oasis since 1971 and has been declared managed reserve by Ministerial Decree of 15 May 1981 (Ufficial Gazette No. 127, 11 May 1981). Feniglia Dune is a forestry oriented managed reserve established by Ministerial Decree of 26 July 1971 (Ufficial Gazette No. 239, 22 September 1971).

LAND TENURE Partly State and partly local government ownership.

CLIMATE

PHYSICAL FEATURES Orbetello is a typical lagoon separated from the sea by two long and narrow strips of dune ("tomboli") and divided in two by a third "tombolo" on which the town of Orbetello is built. The northern lagoon is triangularly shaped. Maximum depth: 2 m. Altitude: sea level.

VEGETATION The vegetation is typical of a brackish water habitat, shrubby glasswort Salicornia fruticosa and also some reedbeds predominating and particularly well developed in the northern lagoon. The tomboli themselves are covered with a Mediterranean-type maquis and on the southern Tombolo della Feniglia, there are stands of pines mixed with cork oak Quercus suber. The shallow parts of the lagoon have a submerged vegetation of algal and aquatic species belonging to such genera as Chaetomorpha, Valonia, Cistoseira, Cymodocea and Zostera.

FAUNA The submerged vegetation supports large numbers of small invertebrates such as Amphipoda (sand-hoppers) and Culicinae (mosquitoes) etc. Because of this, the lagoon is important to migrating and wintering ducks and waders, especially Wigeon Anas penelope, Teal A. crecca and Pintail A. acuta, and various species of Charadriiformes, and also quite a variety of other waterfowl, such as Great Crested Grebe Podiceps cristatus, Black-necked Grebe P. nigricollis, Cormorant Phalacrocorax carbo, Greater Flamingo Phoenicopterus ruber, etc. In the area there are also some notable mammals such as Fallow deer Dama dama (on the tombolo della Feniglia) and Wild Pig Sus scrofa. The lagoon has a good fishing stock including eels Anguilla anguilla, mullets Mugil spp., Bass Dicentrarchus labrax, Toothcarp Aphanius fasciatus.

CULTURAL/HISTORIC FEATURES

MANAGEMENT About 1,000 ha of Salicornia covered dunes of Orbetello lagoon are included in the World Wildlife Fund Reserve and therefore under conservation management. Several bird observation stations and guided nature trails are in place. A guard is permanently stationed in the reserve. Both the reserves are open to the public and shooting is prohibited.

USES Several visitors frequent the area all the year round for bird-watching and recreation. Commercial fishing continues in the lagoon. The Roman Section for the Observation and Protection of Birds has been carrying out studies on avifauna since 1965.

PROBLEMS Further tourist development in the area, especially on the tomboli bordering shores of the sea. These include the construction of a marina at Cala Galera, which has led to some erosion of the southern tombolo. The enlargement of Orbetello port and the organic pollution emanating from the town are having some adverse effects.

PRINCIPAL REFERENCE MATERIAL

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- Regione Toscana, 1981. Il Sistema Regionale delle Aree Verdi. Giunta Regionale, Dipartimento di Assetto del Territorio, Firenze. pp. 248-252 (with bibliographic references).

CONTACT ADDRESSES

- Ministero dell'Agricoltura e Foreste, Sezione Parchi Nazionali e Riserve Naturali, Via Carducci 5, Roma, Italy.
- Associazione Italiana-World Wildlife Fund, Via Salaria 290, Roma, Italy.

ITALY

PORTOFERRAIO

MANAGEMENT CATEGORY Fishery Reserve (Zona di Tutela Biologica)

TYPE Marine

GEOGRAPHICAL LOCATION On the north coast of the island of Elba, next to the town of Portoferraio, between Punta di Capo Bianco and Punta Falcone. 42°49'N- 10°20'E.

AREA About 160 ha

DATE ESTABLISHED 1971

LEGAL PROTECTION Established by Merchant Navy Ministerial Decree of 10 August 1971 on the basis of the Fishery Law No. 963 of 14 July 1965.

LAND TENURE State owned (territorial sea-waters)

PHYSICAL FEATURES Uniform gravelly sea-bottom. Maximum depth 50m.

VEGETATION Extensive meadows of Posidonia oceanica.

FAUNA Migration of sardines and anchovy. Rich benthos.

CULTURAL/HISTORIC FEATURES

MANAGEMENT Sport and commercial fishing are prohibited in the sea-waters.

USES

PROBLEMS

PRINCIPAL REFERENCE MATERIAL

CONTACT ADDRESS Ministero della Marina Mercantile, Ispettorato alla Difesa del Mare, Viale dell'Arte, Roma (EUR), Italy.

ITALY

USTICA

MANAGEMENT CATEGORY Marine Reserve

TYPE Marine

ANNOTATED DESCRIPTION A small marine reserve located on the coast of a volcanic island of significant touristic importance. Recently established to protect the area from overfishing.

GEOGRAPHICAL LOCATION Ustica island lies in the Tyrrhenian sea, off the northern coast of Sicily, at a distance of 36 km from Palermo. The marine reserve is located on the western part of the island between Punta Smalmatore and Cala Sidoti (0.9 km of coastline). $0^{o}43'E - 38^{o}42'N$.

AREA 76 ha

DATE ESTABLISHED 1986

LEGAL PROTECTION The marine reserve was established by presidential decree on June 1986. Fishing activities have been regulated since 1970 according to regional decree No. 960.

LAND TENURE 50% belong to the local community and 50% to the State (territorial waters).

CLIMATE Dry summers with dominant easterly winds, rainy winters with westerly winds.

PHYSICAL FEATURES An island of volcanic origin (309 ha, max alt. 248 m) with pillow shaped outcrops of lava emerging on the surface. The coast is rocky with some pebbly and sandy beaches. Several halfsubmerged grottos and underwater cliffs are present together with sandy bottoms. Maximum water depth is 75m at a distance of 350m from the seashore.

VEGETATION The coast is covered by mediterranean maquis with Mesembriantemacee and Capperidacee. Lichens (Verrucaria spp.) and blue algae cover the littoral zones.
Marine vegetation include superficial formations of Lithopyllum tortuosum, Cystoseiretum crinitae, a particularly rare community of Laminaria rodriguezii, and coralligen formations. Sandy bottoms are covered by Posidonia oceanica.

FAUNA Varied fauna, notable example being Astroides calycularis of considerable biogeographic interest, and the tuna fish Thunnus thynnus, for which the area is a transit zone.

CULTURAL/HISTORIC FEATURES Several archeological remains of Punic, Roman, Greek and Arab origin are found in the sea and on the island.

MANAGEMENT Navigation, fishing, hunting and collecting are prohibited. A technical committee formed by local, regional and national authorities provides management directions while the World Wildlife Fund-Italy will be responsible for management operations. An old building will be restored to serve as headquarters for the reserve; one warden will be permanently stationed on the island.

USES Tourism and sport fishing take place in summer months.

PROBLEMS The area has been heavily used by local and commercial fishermen.

PRINCIPAL REFERENCE MATERIAL

- Baccar H. 1977. A survey of Existing and Potential Marine Parks and Reserves in the Mediterranean Region. UNEP
- Pratesi F. 1985. Riserva Marina Denominata Isola di Ustica. Report prepared for the Ministry of Merchantile Marine. Italian Association of the World Wildlife Fund, Rome.
- Ufficio Tecnico Comunale di Palermo. Ustica, Progetto per la Realizzazione di una Riserva Naturale Marina.

CONTACT ADDRESS Ministero della Marine Mercantile, Ispettorato per la Difesa del Mare, Viale dell'Arte, Roma (EUR), Italy.

LEBANON

LEBANON

AREA 10,399 km^2

LENGTH OF MEDITERRANEAN COASTLINE

AREA OF TERRITORIAL SEA

POPULATION 3,056,000 (1977)

PROTECTED AREA LEGISLATION Only known legislation is the World Heritage Convention which was ratified on 3 February 1983. To date no natural sites have been inscribed.

PROTECTED AREA ADMINISTRATION

NATIONAL AUTHORITY ADDRESS

ESTABLISHED M/C PROTECTED AREAS

LIBYA

EXISTING M/C PROTECTED AREAS

1. EL KOUF NATIONAL PARK (C)

LIBYA

AREA 1,759,530 km^2

LENGTH OF MEDITERRANEAN COAST 1,900 km

AREA OF TERRITORIAL SEA

POPULATION 2,512,000 (1976)

PROTECTED AREA LEGISLATION No national legislation is known and Kouf National Park is governed by regulations based on an order of the Council of Ministers dealing with the establishment and organization of the Park. In 1977, the Secretariat of Agriculture and Land Reclamation signed an agreement with the Arab Centre for Studies of Arid Zones and Dry Lands (ACSAD) for the development of natural resources and protected areas. The creation of five more protected areas have been envisaged by a five years plan (1981-85) with 40,217 Libyan dinars allocated to these projects.
The World Heritage Convention was ratified on 13 October 1978 but to date no natural sites have been inscribed.

PROTECTED AREA ADMINISTRATION Almost nothing is known. In 1981 suggestions were made to establish a national park and wildlife section within the existing Agricultural Department and under the control of the Secretariat. The Kouf National Park was projected with the aid of the Arab Centre for the Studies of Arid zones and Dry lands (ACSAD). A Secretariat of the State for Marine Resources (established in 1975) gives high priority to the creation of protected sectors in the sea.

NATIONAL AUTHORITY ADDRESS
Secretariat of the Agrarian Reform and Land Occupation, Section of Forests and Rangelands, Tripoli, Libya.

ESTABLISHED M/C PROTECTED AREAS
1. El Kouf National Park (C)

PROPOSED M/C PROTECTED AREAS
1. Naggaza (C)
2. Garabulli Wildlife Refuge (C)

LIBYA

EL KOUF

MANAGEMENT CATEGORY National Park

TYPE Coastal

ANNOTATED DESCRIPTION The park covers the north slopes and plateau of the Jebel Al Akhdar, with about 20 km of coastline bordering the Mediterranean. Jabel Al Akhdar is the only naturally forested mountain range of the entire North African coast

GEOGRAPHICAL LOCATION The Park is located on the north-west flank of the Jabel Al-Akhdar, near the town of Beidha in northeastern Libya. 32 o 30'-50'N, 22 o 00'-21 o 20'E.

AREA 32,000 ha. 20 km of coastline. The park is part of a larger conservation area of 100,000 ha which takes in the wider catchment of Wadi Al Kouf.

DATE ESTABLISHED 1978

LEGAL PROTECTION Final legislation for the Park was approved in 1978 by the General People's Committee (Council of Ministers). Two orders were issued, one in February 1978 and the other in June 1978, concerning the demarcation of the area, management methods and allocation of funds. Regulations for the application of these orders were issued by the Secretariat of Agriculture.

LAND TENURE State ownership.

CLIMATE Mild Mediterranean climate. Rainfall ranges from 300 to 600 mm per year. The rainy season starts in October and ends in May with most of the rainfall in winter months. Temperatures reach below zero during January and 35°C in July and August. Fog is a general feature during the winter months.

PHYSICAL FEATURES The rectangular shaped watershed of Wadi Al Kouf is a part of Jabel Al-Akhdar mountain which is made of deep layers of limestone rock with karstic caves and cracks (max altitude 860 m). Wadis Al Kouf with its tributaries Wadi Beit Saleh and Wadi Sudan make the main Jarjarumah wadi which empties its water into the Mediterranean sea during the rainy season. Wadis have made their paths through many rocky high and narrow valleys. Some valleys are about 200 m deep. Springs are limited to the coastal area and ground water can be obtained between 100 and 400 m. Beaches, sand dunes and seasonally inundated lagoons are found on the eastern edge of the coast; a rocky and low cliff formation characterize the western part of the frontage.

VEGETATION The land vegetation is maquis with Juniperus phoenicea, Pistacia lentiscus, Arbutus pavarii, Olea europaea, Myrtus communis, Quercus coccifera. In few protected localities good groves of Cupressus sempervivens can be seen.

FAUNA Fauna has been considerably reduced by hunting but includes Hyaena hyaena, Canis aureas, Vulpes vulpes, Genetta genetta, Felis libyca, Hystrix cristata, and in the sea Delphinus delphis and Tursiops truncatus. Bird species include Phoenicopterus ruber and several bird of prey. Sea turtle Caretta caretta is nesting on sandy beaches.

CULTURAL/HISTORIC FEATURES Several archeological remains, including Greek and Roman ruins linked to the antic cities of Apollonia and Cyrene located about 40 km east of the Park.

MANAGEMENT The Park is managed by the Forest Service. The staff is composed of one director, administrative personnel, 20 forest guards, 50 seasonal workers engaged in reafforestation activities. Budget: 1,200,000 LD for 1980. Park headquarters and tourist facilities have been constructed. Natural resources surveys and land use development plans have been carried out by the Arab Center for the Study of Arid Zones and Dry Lands (ACSAD) since 1979. Hunting is permitted for migratory birds but it is stricly forbidden for rare species such as gazelle.

USES In the park area there are 2500 inhabitants who live on agriculture and grazing. The area has long been used for picnics and recreation by people from neighbouring cities.

PROBLEMS Severe human pressure. The Jabel Al-Akhdar is the second most populated region in Libya. The cities of Beida, Shahat, Al Marj and many other small towns are adjacent to the area of the National Park. The cities of Benghazi and Derna are within 150 km of the Park and the main road connecting Libya and Egypt crosses the Park. Overgrazing by animals mainly goats and sheeps. Severe hunting pressure.

PRINCIPAL REFERENCE MATERIAL

- Hemsley J., 1981. Establishment of the Wadi Al Kouf National Park. Assignement report for UNESCO Biosphere Reserve network.
- Kettaneh M.S., 1980. Kouf National Park, Libya. Report prepared for IUCN 16th General Assembly.
- Several technical reports on natural resources and development plans for the Park have been prepared by ACSAD.

CONTACT ADDRESS No information.

MALTA

EXISTING M/C PROTECTED AREAS

1. GHADIRA NATURE RESERVE (W)

MALTA

AREA 316 km^2

LENGTH OF MEDITERRANEAN COAST 190 km

AREA OF TERRITORIAL SEA

POPULATION 382,000 (1985)

PROTECTED AREA LEGISLATION The most important nature conservation legislation is the Bird Protection Act and Regulation (1980) which gives protection to all breeding birds, all birds of prey and large numbers of migrants. There is a closed season (22 May to 31 August) and a list of bird sanctuaries where shooting and trapping are prohibited. The only nature reserve on the islands has been declared a National Nature Reserve established by Legal Notice No. 126 of 1978, Protection of Birds (Amendment) Regulations. The establishment of a marine protected area around the existing Bird Sanctuary at the Filfa Island has been proposed.

PROTECTED AREA ADMINISTRATION The authority responsible for nature conservation is the Environment Protection Centre, Department of Health, within the Environment Division of the Ministry of Health and Environment, and the only nature reserve is administered by this Centre. A WWF project (No. 1505) in 1981 granted $ 10,000 towards the establishment of the Ghadira wetland reserve for which a comprehensive management plan had been prepared and approved in principle by the Ministry.

NATIONAL AUTHORITY ADDRESS Environment Protection Centre, Department of Health, Bighi, Kalkara, Malta.

ESTABLISHED M/C PROTECTED AREAS

1. Ghadira Nature Reserve

MALTA

GHADIRA POOL

MANAGEMENT CATEGORY Nature Reserve

TYPE Wetland

ANNOTATED DESCRIPTION

GEOGRAPHICAL LOCATION Situated on an isthmus at the neck of the peninsula formed by the Marfa Ridge, north-western Malta. The isthmus runs west-east between Ic-Cumnija and Mellieha Bay, a distance of about 1,280 m.

AREA 1.8 ha, surrounded by a no-shooting buffer zone averaging 450 m wide, making a total partially protected area of about 112 ha.

DATE ESTABLISHED 1978

LEGAL PROTECTION National Nature Reserve established by Legal Notice No. 126 of 1978, Protection of Birds (Amendment) Regulations. Enacted under the auspices of the Ministry of Health and Environment.

LAND TENURE

CLIMATE

PHYSICAL FEATURES The wetland originated in a deep fault, where alluvial soil has accumulated as a result of erosion of steep Upper Coralline limestone hills and in particular of exposed sections of a Blue Clay Stratum. The pool itself is in a depression of impermeable clay, the surface water thus retained (largely derived from winter rains) getting steadily more saline until it dries out completely in summer (June-September). Altitude: sea level to 5 m. Water depth: 1 to 15 cm, in a few deeper pockets, 60 cm to nearly 1 metre.

VEGETATION The area has been used for cultivation and saltpans in the past, but the pool is now surrounded by halophile scrub of such species as seablite Saueda maritima, glasswort Salicornia europaea and golden sampshire Inula crithmoides, and sandy patches supporting a rare species of arrow-grass Triglochin bulbosum, bordering this is a grove of tamarisk Tamarisk gallica on the south, a variety of halophilous vegetation on the hill slopes and plantations of Acacia and Eucalyptus on the dune separating the seastern end of the reserve from the sea. The wetter patches also support stands of cane Arundo donax and common reed Phragmites, which together with a number of carob trees Ceratonia siliqua provide nest-sites for 5 out of Malta's 18 breeding birds.

FAUNA Faunistically the area is particularly noted for the great number of migrants of many scores of species which are attracted to it and will stay to rest and feed provided that water and hence insects are available. The five breeding birds in Gadhira pool are all small passerines, of which the fan-tailed warbler Cisticola juncidis is caracteristic.

CULTURAL/HISTORIC FEATURES

MANAGEMENT As yet limited, but a comprehensive plan has been prepared by an expert and approved in principle by the Ministry. The pool would be enlarged by dredging and made perennial by the construction of a perimeter ditch to carry water from a 0.6 ha, 2 m deep reservoir. The latter is to be constructed at the western end of the area to store rainwater topped up with 20,000 gallons weekly of treated waste from nearby Holiday camp. Hides and educational facilities are included in the plan as a second priority, and planting of more trees and shrubs, to give shelter and food to migrant birds, is also recommended.

USES The area has been kept under observation by ornithologists for at least 25 years. Future subjects for study are how best to diversify the habitat, attract more species, improve the landscape generally and increase the educational impact of the site. A Manager's house and reserve centre are planned together with the installation of two Heligoland traps for the capture and banding of migrants.

PROBLEMS Disturbance from traffic on the busy road along the eastern boundary, and especially by picnickers and holiday-makers, remains a problem. One licensee still has shooting rights, but exercises them with discrimination. There is some poaching, also year round shooting on nearby hills. Agriculture is tending to expand into the scrub-land and the numerous rats to be found on the edge of the cultivation suggest that rat control may become a high priority.

PRINCIPAL REFERENCE MATERIAL

- Carp E., 1980. A Directory of Western Paleartic Wetlands. IUCN, Gland.
- Sultana J., Gauci c., Beaman M., 1975. A Guide to the Birds of Malta. Malta Ornithological Society.

CONTACT ADDRESS No information.

MONACO

EXISTING M/C PROTECTED AREAS

1. MONACO MARINE RESERVE (M)

MONACO

AREA	1,9km^2
LENGTH OF MEDITERRANEAN COASTLINE	approx 2 km
AREA OF TERRITORIAL SEA	
POPULATION	25,000

PROTECTED AREA LEGISLATION

PROTECTED AREA ADMINISTRATION

NATIONAL AUTHORITY ADDRESS

LIST OF ESTABLISHED M/C PROTECTED AREAS

1. Monaco Underwater Reserve (M)

MONACO

MANAGEMENT CATEGORY Nature Reserve

TYPE Marine

GEOGRAPHICAL LOCATION The underwater reserve extends from the eastern border between France and Monaco up to a distance situated half way between this border and the entrance to the Port of Monaco (Larvotto Bay). The reserve extends 600 metres offshore.

AREA 45 ha.

DATE ESTABLISHED April 1976.

LEGAL PROTECTION Royal decree no. 6256 of 25 April 1978, modifying and completing the Decree of 2 July 1908 (Service de la Marine et de la Police Maritime). Regulations are set up in law No. 1018 of 29 December 1978.

LAND TENURE Public Marine Domaine.

CLIMATE Mediterranean climate.

PHYSICAL FEATURES Sea bottom covered by sea grass meadows, sand, silt and gravel. Altitude 0 to -38 m.

VEGETATION Meadows of Posidonia oceanica, green and brown algae.

FAUNA Several species of fishes typical of Mediterranean rocky coast: Diplodus sargus, Mulus surmuletus, Sparus auratus, Dicentrarchus larbrax, Labrus turdus, Socrpaena scrofa or S. porcus. Lobster Palinurus vulgaris.

MANAGEMENT Public access forbidden except for scientists and reserve personnel. All types of fishing and navigation are forbidden.

USES Two experiments have been tried in the reserve.
A) Management of artificial reefs: 8 artificial reefs have been installed on the sea bottom (3 reefs of 100 tons each on natural substrata; 2 reefs of 15 tons each on alveolar structures; reefs of 7 tons each built on reinforced concrete and alveolar structures; 1 reef of 5 tons of ceramic. The creation of an under-water village with 14 artificial reefs of 1 ton each built on reinforced concrete with alveolar stuctures has been envisaged.
B) Reintroduction of Pina nobilis by a biologist of the Aquarium du Musee Oceanographique de Monaco.

PROBLEMS The area has been subject to severe fishing pressure in the past, especially with drag nets that have damaged the sea bottom. Moreover, Larvotto bay has been used as a mooring site by many yachts whose anchors have completed the mechanical destructive action of drag nets.

PRINCIPAL REFERENCE MATERIAL

- Comptes-rendus de l'Association Monegasque pour la Protection de la Nature (1976-1977).
- Gryn-Ambroes P., 1980. Preliminary Annotated Lists of Existing and Potentially Mediterranean Protected Areas. UNEP/19.20/INF.5.

CONTACT ADDRESS Association Monígasque pour la Protection de la Nature: Secrétariat - M. Eugène Debernardi, Président, 7 rue de la Colle, Principauté de Monaco.

MOROCCO

MOROCCO

AREA 622,012 km^2

LENGTH OF MEDITERRANEAN COAST 450 km

AREA OF TERRITORIAL SEA

POPULATION 18,245,000 (1977)

PROTECTED AREA LEGISLATION National Parks are established under Royal Decree of 11 September 1934 which deals specifically with the establishment of protected areas. The Ministerial Order of 26 September 1934 lays out the procedures to be followed. Each park is thus created by Ministerial Order or Decree and regulations are laid out individually for each area. Any activities which are likely to have a damaging effect on the area need prior authorization from the Administration of Water and Forests.
The World Heritage Convention was ratified on 28 October 1975 with no natural sites inscribed. The Ramsar Convention on wetlands of international importance was signed without reservation as to ratification on 20 June 1980.

PROTECTED AREA ADMINISTRATION The responsible authority is the Division of Hunting, Fishery and Protection of Nature, within the Administration of Water and Forests and Soil Conservation within the Ministry of Agriculture and Agrarian Reform. There is also a National Parks Consultative Committee formed of representatives of various administrations and services. The Water and Forest Service has both local and regional offices.

NATIONAL AUTHORITY ADDRESS
Direction des Eaux et des Forets et de la Conservation de Sols, Ministere de l'Agriculture et de la Reforme Agraire, Rabat, Morocco.

ESTABLISHED M/C PROTECTED AREAS
None on the Mediterranean coast.

SPAIN

EXISTING M/C PROTECTED AREAS

1. CASTELLO DE AMPURIAS PROTECTED LANDSCAPE (W)
2. SAN PEDRO PESCATOR PROTECTED LANDSCAPE (W)
3. MEDES ISLAND FISHERY RESERVE (M)
4. PALS PROTECTED LANDSCAPE (W)
5. EBRO DELTA REGIONAL PARK (W)
6. ALBUFERA DE VALENCIA REGIONAL PARK (W)
7. TABARCA MARINE RESERVE (M)

SPAIN

AREA	504,750 km^2
LENGTH OF MEDITERRANEAN COAST	2093 km
AREA OF TERRITORIAL SEA	340,845 km^2
POPULATION	40,000,000 (1985)

PROTECTED AREA LEGISLATION

Five national parks (none of which are on the Mediterranean coast) were created under the General Law of National Parks (17 December 1916, completed by Royal decree of 23 February 1917). The 1957 Act defined Natural Sites of National Interest and Natural Monuments of National Interest. The existing protected areas were reclassified and given legal status in 1975 by the the National Areas Protection Law (15 May 1975 with enabling regulations of 4 March 1977). This law defined four categories of open space: National Parks, Reserves of Scientific Interest, Natural Sites of National Interest, and Natural Parks (the first three to be created by law, the last by the regions or private parties by decree). National Hunting Reserves are covered by the Hunting Reserves legislation (Act 371966, and Act 21973) as areas for utilization of wild fauna. The existing texts do not mention extension of protected areas to marine areas and marine reserves (at present only Tabarca) and fishery reserves are established under Ministerial Decrees of 4 April 1986 and 11 May 1982 respectively. Law No. 7 of 10 March 1980 also concerns coastal protection against pollution and construction threats.

The World Heritage Convention was acceeded to on 4 May 1982. The Ramsar Wetlands Convention accession was on 4 May 1982. The Protocol on Specially Protected Areas was signed on 3 April 1982.

PROTECTED AREAS ADMINISTRATION

The body responsible for the administration of protected areas is the National Institute for Conservation of Nature (ICONA). This body was set up in 1971 as an amendment to the Institutional Administration of the Ministry of Agriculture (Decree law 28 October 1971). The ICONA is comprised of a central service and provincial network. The central service comprises General Secretariat and four Divisions. Two of these are concerned with fire and ecology and administration and two with Nature Protection (National Forests) and Renewable Natural Resources. The latter is responsible for national parks, reserves, hunting grounds, fishing, protection of mountains, fauna, organization of natural areas, divided into two services: game, and parks and reserves. The peripheral services are undertaken by 11 Regional Inspectorates and 50 Provincial Services.

Responsibility for marine areas rests with the Fishery Division within the Ministry of Agriculture and Fishery and, to certain extent, also to the Ministry of Public Works and Urbanization, Interministerial Commission on the Environment.

NATIONAL AUTHORITY ADDRESSES

- Instituto Nacional para la Conservacion de la Naturaleza (ICONA), Subdiveccion General de Recursos Naturales Renovables, Gran Via de San Francisco 35, Madrid, Spain.
- Direccion General de Ordenacion Pesquera, Secretaria de Pesca, Ministerio de Agricultura y Pesca, Ortega y Gasset 57, Madrid, Spain.

ESTABLISHED M/C PROTECTED AREAS

1. Albufera de Valencia Regional Natural Park (W)
2. Castello de Ampurias- Protected Landscape (W)
3. Ebro Delta Regional Natural Park (W)
4. Medes Island Fishery Reserve (M)
5. Pals- Protected Landscape (W)
6. San Pedro Pescador- Protected Landscape (W)
7. Tabarca Island Marine Reserve (M)

SPAIN

ALBUFERA DE VALENCIA

MANAGEMENT CATEGORY: Regional Natural Park.

TYPE: Coastal

ANNOTATED DESCRIPTION: A coastal lagoon of importance to migratory birds.

GEOGRAPHICAL LOCATION: About 12 km south of Valencia. N 39°20'- W 0°22'.

AREA: 3,200 ha, 1.5 km of coastline.

DATE ESTABLISHED

LEGAL PROTECTION

LAND TENURE: The Albufera is owned by the Municipality of Valencia.

CLIMATE: Mediterranean climate characterized by a very high humidity (80%) due to the strong evaporation of the lake. Mean annual temperature 25°C (winter average 6°C, summer average 33°C). Annual average precipitation 500 mm.

PHYSICAL FEATURES: A coastal lagoon, separated from the sea by a strip of dunes, with fresh or slightly brackish water. There are some small islands and patches of reed in the lagoon. The adjoining ricefields are deliberately flooded in winter.

VEGETATION: The vegetation is dominated by reeds Phragmites communis, Arundo donax, Potamogeton natans, Alisma plantago, Tipha angustifolia and submerged or flooting species such as Rannunculus confusus, Nitella hyalina, Chara ceratophylla, C. intermedia, C. hispida, Myriophyllum verticillatum.

FAUNA: Until 1973 the wetland complex attracted large numbers of waterfowl, duck and coot, sometimes reaching a figure of 80,000. Most numerous of the duck were Wigeon Anas penelope, Teal A. crecca, Pintail A. acuta, Shoveler A. clypeata, Red-crested Pochard Netta rufina and Pochard Aythya ferina. Breeding species included Red-crested Pochard (200-400 pairs) and the Pochard and the Ferruginous duck Aythya nyroca (in small numbers), also several Ardeidae, such as the Night Heron Nycticorax nycticorax, Squacco Heron Ardeola ralloides, Cattle Egret Bubulcus ibis, Little Egret Egretta garzetta and Purple Heron Ardea purpurea. Most of the species are still found in the area although in reduced numbers. The ichtyofauna includes Mugil cephalus, M. ramada, Anguilla anguilla, Carassius carassius, Barbus barbus, Valencia hispanica, etc.

MANAGEMENT The Albufera is managed by the Forestry Service of the Autonomous Community of Valencia. The ricefields or "Vedados" are flooded each autumn and winter and provided with food to attract large numbers of waterfowl of which the shooting is strictly regulated. Hunting rights in the Vedados belong to the small neighbouring villages but those of the main Albufera are leased to the Valencia municipality.

USES 1,000,000 persons visit the Albufera each year for bird-watching and cultural reasons. Hunting, fishing, grazing and construction are carried out in the area.

PROBLEMS Deterioration of the natural ecosystem due to urbanization following an expanding tourist-industry, comprehensive drainage projects, massive use of pesticides in the rice-fields, and pollution by industrial and urban wastes.

PRINCIPAL REFERENCE MATERIAL

- Carp E., 1980. A Directory of Western Paleartic Wetlands. IUCN, Gland.
- Dafauce Ruiz C., 1975. La Albufera de Valencia, Uno Estudio Piloto. Monografia 4, Ministerio de Agricultura, Intituto Nacional para la Conservacion de la Naturaleza (ICONA), Madrid.
- Docavo Alberti I., 1985. La Albufera de Valencia y su Entorno. In: Regione Campania, Assessorato per il Turismo. Atti del Convegno Internazionale I Parchi Costieri Mediterranei. Salerno, Castellabate. 18-22 Giugno 1973. Ente Provinciale per il Turismo, Salerno. pp 381-406.

CONTACT ADDRESS Servicio Forestal de la Comunidad Autonoma de Valencia, C/ Amedeo de Saboya 2, 46020 Valencia, Spain.

SPAIN

CASTELLO DE AMPURIAS (AIGUA MOLLS)

MANAGEMENT CATEGORY Protected Landscape

TYPE Wetland

ANNOTATED DESCRIPTION Coastal wetland of high biological value for migratory birds. It is the northest wetland formed by the Aigüa Molls river.

GEOGRAPHICAL LOCATION In the northern part of the Spanish Mediterranean coast, Cataluna region, close to the Gulf of Reus and to the south west of Cabo de Creus. 42° 33' N- 02° 42' E.

AREA 575 ha.

DATE ESTABLISHED 1983

LEGAL PROTECTION Protected Lanscape (General Plan 1972)

LAND TENURE Private property

CLIMATE Mediterranean climate. Mean annual temperature 16° C (winter average 11° C; summer average 20° C). Mean annual precipitation 650 mm (winter average 1000 mm; summer average 300 mm). Dominant easterly winds.

PHYSICAL FEATURES Sedimentary formations of the Quaternary era. Flat terrain. Superficial muddy waters. Max altitude 7 m.

VEGETATION Vegetation dominated by Salicornietea and Juncetea spp. Presence of Populus albae.

FAUNA Large numbers of Anas sp. and Scolopax rusticola. Birds of prey include Buteo buteo, Circus cyaneus, Falco tinnunculus.

CULTURAL/HISTORIC FEATURES Archeological ruins of the Greek colony Emporian (VI BC).

MANAGEMENT The area is managed by the General Direction of the Medio Rural de la Comunidad Autonoma de Cataluna.

USES There are no permanent residents in the area. Large number of visitors in winter for bird watching and cultural reasons. Hunting and fishing are carried out.

PROBLEMS Deterioration of the site's natural value for migratory birds due to rapid and uncontrolled urbanization.

PRINCIPAL REFERENCE MATERIAL No information.

CONTACT ADDRESS Don Manuel Martin Arnaiz, Servicio del Medio Natural de la C.A. de Cataluna, C/ Carcega 329, 08037 Barcelona, Spain.

SPAIN

EBRO DELTA

MANAGEMENT CATEGORY Regional Natural Park

TYPE Coastal wetland

ANNOTATED DESCRIPTION The regional park covers the most valuable localities for waterfowl left of the wide Ebro delta area (64,000 ha) which is now under cultivation, mostly for the production of rice.

GEOGRAPHICAL LOCATION 70 km south-west of Tarragona. 0°30' E -41°09'N.

AREA 15,000 ha. 6.5 km of coastline

DATE ESTABLISHED No information

LEGAL PROTECTION Natural park established by Decree of the Cataluna region.

LAND TENURE Private property

CLIMATE Average annual temperature 20.5° C (winter average - 3.2° C; summer average 37.8° C). Average annual precipitation 500 mm.

PHYSICAL FEATURES The park includes the sandy or dune areas at the northern and southern tips of the delta (Punta del Fangar and Punta del Alfaques), several saline brackish lagoons (Goleta, Canal Vell, Platc hola, Anfacada, Zancada, Enca izada) and the islands of Buda (1,300 ha) and San Antonio.

VEGETATION Rests of white poplar wood Populus albae and Tamarix africana. In places, there are fairly extensive patches of dense reedbed.

FAUNA The delta is still very important for wintering coots Fulica atra and duck, especially Wigeon Anas penelope and Shoveler A. clypeata but also Mallard A. platyrhynchos, Teal A. crecca, Pochard Aythya ferina, in numbers up to 35,000. Flamingos Phoenicopterus ruber are often present in the saltpans on the south of the Los Alfaques peninsula, which also attracts waders, gulls and terns. Quite a number of species stay to breed, including Purple Heron Ardea purpurea, Mallard, Red-crested Pochard Netta rufina, Coot Fulica atra (c. 1000 pairs), Kentish Plover Charadrius alexandrinus, Herring Gull Larus argentatus, Common Tern Sterna hirundo and Whishered Tern Chlidonias hybrida.

MANAGEMENT Managed by the General Directorate of Medio Rural de la Comunidad Autonoma de Cataluna. Shooting on the lagoons La Enca izada and Zancada is under ICONA control.

USES Within the Regional Park there are 1500 permanent residents (villages of Amposta, Rosella, San Carlos de la Rapita, Tortosa) and 25,000 temporary residents. 250,000 persons visit the area each year for bird-watching and cultural reasons.
Fishing with traditional techniques is carried out in the lagoons.
The avifauna of the delta has been well studied by the Institucio Catalana in Barcelona.

PROBLEMS The area is threatened by urbanization and drainage projects, and the possibility of oil exploration within the delta. Heavy tourist pressure and massive use of pesticides for agriculture also constitute a problem.

PRINCIPAL REFERENCE MATERIAL

- Carp E., 1980. A Directory of Western Paleartic Wetlands. IUCN, Gland.
- Docavo Alberti I., 1985. El Delta del Ebro. In: Regione Campania, Assessorato per il Turismo. Atti del Convegno Internazionale I Parchi Costieri Mediterranei. Salerno, Castellabate. 18-22 Giugno 1973. Ente Provinciale per il Turismo, Salerno. pp. 406-415. (Extensive bibliography).
- Maluquer S., 1971. La Avifauna del Delta del Ebro. Ardeola Vol. Special: 191-319 (Extensive Bibliography).

CONTACT ADDRESS Don Juan del Peso Diaz, Servicio del Medio Natural de la Comunidad Autonoma de Cataluna, C/ Corcega 329, 5 Planta, 08037 Barcelona, Spain. Tel. (93) 2372991.

SPAIN

MEDES ISLANDS

MANAGEMENT CATEGORY: Fishery Reserve

TYPE: Marine

ANNOTATED DESCRIPTION: Rich marine area threatened by overfishing.

GEOGRAPHICAL LOCATION: Offshore the Costa Brava coast, Gerone Province. N 42°30', E 03°13'.

AREA: 5 ha

DATE ESTABLISHED: 1983

LEGAL PROTECTION: Legal decree of 27 September 1983 of the Agricultural and Fishing Department of Cataluna Region. Regulations are enacted by the Decree of 25 November 1983.

LAND TENURE: State ownership.

CLIMATE

PHYSICAL FEATURES: Rocky habitat with impressive underwater caves. Medes archipelago is composed of two islands (Meda Gran and Meda Chica) and two islets (Margallot and Bernat y Tascous). Meda Chica is crossed by an underwater channel.

VEGETATION

FAUNA: Rich marine biotopes including schools of Chromis cromis, red coral Corallium rubrum, Eunicella verrucosa, sea urchin Spaerechinus granularis, sponges, molluscs.

CULTURAL/HISTORIC FEATURES

MANAGEMENT: Fishing and extraction of marine resources in the waters surrounding Medes Islands are prohibited.

USES: Extensively used by tourists during the summer period. About 1,000 permanent residents and 8,000 summer residents live on the mainland coast.

PROBLEMS: Marine life is severely threatened by overfishing (commercial and spear fishing). Heavy tourist pressure during the summer.

PRINCIPAL REFERENCE MATERIAL

- Gryn Ambroes P., 1980. Preliminary Annoted List of Existing and Potentially Mediterranean Protected Areas. UNEP/IG.20/INF.5.

CONTACT ADDRESS

- Direccion General de Ordenacion Pesquera, Secretaria de Pesca, Ministerio de Agricultura y Pesca, Ortega y Gasset 57, Madrid, Spain.

SPAIN

PALS (Marisma costera)

MANAGEMENT CATEGORY: Protected Landscape

TYPE: Wetland

ANNOTATED DESCRIPTION: Coastal wetland of high biological value for the abundant avifauna.

GEOGRAPHICAL LOCATION: Gerona province. 42°09'N- 02°45'E.

AREA: 500 ha. Length of coastline 9 km.

DATE ESTABLISHED: 1983

LEGAL PROTECTION: Protected Landscape (General plan 1968).

LAND TENURE: Private property

CLIMATE: Mediterranean climate with rainy falls and springs. Mean annual temperature 16°C (winter average 11°C, summer average 20°C). Mean annual precipitation 650mm (winter average 1000mm, summer average 300mm). Prevalent easterly winds.

PHYSICAL FEATURES: Sedimentary formations of the Quaternary era. Flat terrain. Altitude 0m.

VEGETATION: Vegetation dominated by Salicornietae and Juncetea spp. Association of Populus albae.

FAUNA: Several species of migratory birds. Occasional presence of Phoenicopterus ruber. Birds of prey include Buteo buteo, Circus cyaneus, Falco tinninculus.

CULTURAL/HISTORICAL FEATURES: No information

MANAGEMENT: Managed by the General Direction of Medio Rural de la Comunidad Autonoma de Cataluna.

USES: Considerable number of visitors during winter months for bird wathing. Hunting and fishing take place in the area.

PROBLEMS: Deterioration of the natural value for migratory birds due to urbanization and industrialization of the area.

PRINCIPAL REFERENCE MATERIAL: No information

CONTACT ADDRESS: Don Manuel Martin Arnaiz, Medio Rural de la Comunidad Autonoma de Cataluna, C/ Carcega 329, 08037 Barcelona, Spain.

SPAIN

SAN PEDRO PESCATOR (Marisma costera)

MANAGEMENT CATEGORY Protected Landscape

TYPE Wetland

ANNOTATED DESCRIPTION Coastal wetland of high biological interest, being one of the few nesting areas for migratory birds on the Spanish Mediterranean coast.

GEOGRAPHICAL LOCATION In the Gulf of Rosas. 42 o 30'N- 02 o 42'E

AREA 1450 ha. Length of coastline 11 km.

DATE ESTABLISHED 1983

LEGAL PROTECTION Declared Picturesque Landscape by the Ministry of Agriculture (General Plan approved on 1975).

LAND TENURE State property 10 ha, public domain 55 ha, private property 1385 ha.

CLIMATE Mediterranean climate characterized by rainy falls and springs. Mean annual temperature 16°C (Winter average 11°C, summer average 20°C). Mean annual precipitation 672 mm (winter average 1000 mm, summer average 300mm). Prevalent easterly winds.

PHYSICAL FEATURES Sedimentary formations of the Quaternary era. Flat terrain with muddy superficial waters. Max. Altitude 10 m.

VEGETATION Abundant vegetation of Salicornietea and Juncetea.

FAUNA Large numbers of Scolopax rusticola. Occasional presence of Phoenicopterus ruber. Birds of prey include Buteo buteo, Circus cyaneus, Falco tinnunculus.

CULTURAL/HISTORICAL FEATURES Archeological remains of a Roman city.

MANAGEMENT Management rests with the Service del Medio Natural de la Comunidad Autonoma de Cataluna.

USES 20,000 persons visit the site each winter for bird watching and cultural reasons. There are no permanent residents but agriculture, hunting and fishing are carried out in the area.

PROBLEMS Fragile degraded ecosystem threatened by spreading urbanization.

PRINCIPAL REFERENCE MATERIAL No information

CONTACT ADDRESS Don Juan del Peso Diaz, Servicio del Medio Natural de la Communidad Autonoma de Cataluna, C/ Carcega 329- 5 Planta, 08037 Barcelona, Spain.

SPAIN

TABARCA ISLAND

MANAGEMENT CATEGORY Marine Reserve

TYPE Marine

ANNOTATED DESCRIPTION A rectangularly shaped marine area around Tabarca island rich in marine biocenoses but threatened by overfishing.

GEOGRAPHICAL LOCATION Tabarca archipelago is located in front of the the cape of Santa Pola, 15 km off the town of Alicante. The marine reserve covers the surrounding waters comprised between 0 and 40 m in depth. N 38°09', W 00°27'.

AREA 1,463 ha, 6 km of coastline.

DATE ESTABLISHED 1986

LEGAL PROTECTION The marine reserve was established by decree No. 11543 of the Ministry of Agriculture, Fishing and Food on 4 April 1986, published in the official gazette (Boletin Oficial del Estado) No. 112 on 10 May 1986. The terrestrial section was declared an Historical-Artistic Unit by decree of 27 August 1964.

LAND TENURE 55 % is Government owned, 45% belongs to the Regional Council.

CLIMATE Mean annual temperature is 17.4°C (12,1°C in winter and 29.1°C in summer). Mean annual precipitation is 302.4 mm (65.1 mm in winter and 32.0 mm in summer). Prevalent easterly winds with mean speed of 20.6 km/h. Mean water temperature is 19.8°C (14.5°C in winter and 26.3°C in summer). Water salinity is 38.0 mg/l in winter and 36.9 mg/l in summer. Prevalent northeasterly current with maximum speeds of 24.7 cm/sec in summer and 17.0 cm/sec in winter.

PHYSICAL FEATURES The small Tabarca archipelago is composed of the island Plana or Nueva Tabarca of elongated shape in the direction NW-SE (57 ha, 1,800 m long and 400 m wide), three islets (Nao, Galera and Cantera) and numerous emerged rocks. The archipelago is formed by basaltic and carbonatic rocks. The coast is irregular with numerous rocky bays, capes and one sandy beach. The sea bottom is mainly rocky with emergent rocky reefs (La Nao and La Llosa islets). Maximum altitude 14 m. Maximum water depth 45 m, average water depth 20 m.

VEGETATION The flora of Tabarca island is composed of approximately 100 species, many of which have nitrofil characteristics. The main vegetation association on Nueva Tabarca is: Rudero-Secalietea, Thero-Brachypodietea and Crithmo-Limonirtea. The higher part of the island is dominated by Asparagus albus, Whitania frutescens and Lycium intricatum. Extensive meadows of Posidonia oceanica are found in the sea.

FAUNA The rat Rattus rattus, Mus musculus and the bat Pipistrellus pipistrellus are the only mammals living on the island. Reptiles include the endangered Chalcides bedriagai, the snake Malpolon monspessulanus and the salamanders Hemidactylus turcicus and Tarentola mauritanica. Coastal birds are represented by gulls Larus argentatus and L. ridibundus, Sterna albifrons, Chlidonis niger. The sea turtle Caretta caretta, lobsters (Palynurus and Scyllarides) and the endangered fishes Epinephelus guaza and E. alexandrinus are found in the sea. The monk seal Monachus monachus was last sighted in 1974 (one couple).

CULTURAL/HISTORIC FEATURES The island was very likely a Greek and Roman site as testified by the numerous archeological remains. On the higher part of the island there are also three military constructions of the XVIII century.

MANAGEMENT Three management zones have been defined: a strict protection zone with restricted access and no exploitation activities allowed; an area with controlled access and regulated fishing activities; and a free access area where sport and commercial fishing are carried out. The personnel is composed of 14 people (5 in the administration, 7 researchers, 1 guard and 1 worker). An additional marine guard patrols the island waters by boat. The 1986 budget is 2.500.000 pesetas provided by the municipal council.

USES 40 permanent residents (in San Pedro y San Pablo village) and up to 1000 summer residents live on the island. 150.000 tourists visit the area each year, mainly in the summer period for marine recreational activities. On the island there is a small port and 10 houses are available for rent; camping is free. Research is carried out in the fields of oceanology, botany, zoology, archeology and pollution. The conversion of the ancient lighthouse to a field station for researchers has been envisaged. Marine and terrestrial nature trails are in preparation.

PROBLEMS At present, the major problem is the overexploitation of fishing resources, particularly lobsters. Excessive disturbance from recreation can be foreseen in the near future. Operational budget and control measures are presently insufficient.

PRINCIPAL REFERENCE MATERIAL

- Ramos A. (ed), 1986. La Reserva Marina de la Isla Piana o Nueva Tabarca (Alicante). Ayuntamiento de Alicante, Universidad de Alicante.
- Ramos A., 1980. Informe preliminar del medio marino y comunidades bent nicas de la Isla de Tabarca. Propuesta de Reserva Marina. In: Plan Especial de Ordenaci n de la Isla de Tabarca (Alicante). Ayuntamiento de Alicante, informe No. 16.
- Seva E., Escarre D., 1976. El Esliz n Iberico (Chalcides bedriagai) en el Medio Insular de Tabarca (Alicante). Mediterranea, 1: 61-115.

CONTACT ADDRESS Alfonso A. Ramos, Coordinator, Instituto Maritimo-Pesquero del Mediterraneo, Muelle Pesquero s/n, 03001 Alicante, Spain.

SYRIA

SYRIA

AREA 185,179 km^2

LENGTH OF MEDITERRANEAN COAST 188 km

AREA OF TERRITORIAL SEA

POPULATION 8,103,000 (1978)

PROTECTED AREA LEGISLATION There are no protected areas in Syria. Only known legislation is the World Heritage Convention which was accepted 13 August 1975. To date no natural sites have been inscribed.

PROTECTED AREA ADMINISTRATION

NATIONAL AUTHORITY ADDRESS
Direction de la Campagne et des Paturages, Ministere de l'Agriculture et de la Reforme Agraire, Damas.

ESTABLISHED M/C PROTECTED AREAS

TUNISIA

EXISTING M/C PROTECTED AREAS

1. GALITON MARINE RESERVE (M)
2. ICHKEUL NATIONAL PARK (W)
3. ZEMBRA NATIONAL PARK (M/C)

TUNISIA

AREA	164,148 km^2
LENGTH OF MEDITERRANEAN COASTLINE	1,250 km
AREA OF TERRITORIAL SEA	30,000 km^2
POPULATION	6,975,000 (in 1984)

PROTECTED AREAS LEGISLATION Legal provision for National Parks was originally given by the Forestry Code with the law No. 66-60 of 4 July 1966. Four National Parks (two of which coastal) were established by Presidential Decree, the specific regulations for each Park being indicated in the Ministerial Decree of 6 July 1980 (Ministry of Agriculture). Tunisia has also one Marine Reserve and one marine zone of biological protection, established by Ministerial Decree on the basis of the fishery legislation "Police de la Peche Maritime" (26 July 1951, Article 6)). The monk seal is fully protected by law (No. 68-4 of 8 March 1978).
Tunisia is signatory to the World Heritage Convention (March 75), Ramsar Convention (November 1980), African Convention (November 1976), Washington Convention (May 1974), Barcelona Convention (May 1977). The Specially Protected Areas Protocol was ratified on 26 May 83.

PROTECTED AREAS ADMINISTRATION Protected areas are under the technical and administrative responsibility of two Sous-Directions of the Ministry of Agriculture: the Sous-Direction de l'Environnement Agricole (Cabinet of the Minister), in charge of the general co-ordination, and the Sous-Direction de la Chasse et des Parcs Nationaux (Direction des Forets) which undertakes administrative tasks.

NATIONAL AUTHORITIES ADDRESSES
- Direction des Forêts, Sous-Direction de la Chasse et des Parcs Nationaux, Ministere de l'Agriculture, 30 Rue Alain Savary, Tunis, Tunisia
- Sous-Direction de l'Environnement Agricole, Minister de l'Agriculture, 30 Rue Alain Savary, Tunis, Tunisia.

LIST OF ESTABLISHED M/C PROTECTED AREAS
1. Galiton Marine Reserve (M)
2. Ichkeul National Park (W)
3. Zembra and Zembretta National Park (M/C)

TUNISIA

GALITON

MANAGEMENT CATEGORY Marine Reserve

TYPE Marine

ANNOTATED DESCRIPTION The Galiton islot, whose waters are protected up to a distance of 0.8 km, is part of the Galite Archipelago where one of the last colony of monk seal in the western mediterranean is found.

GEOGRAPHICAL LOCATION The Galite Archipelago is situated in front of Cap Negro on the northern Tunisian coast, 72 km away from the town of Bizerta and 57.6 km Tabarka. The Galiton islot is located 2.4 km south west of the Galite island. 37°30'N- 08°52'E.

AREA About 450 ha

DATE ESTABLISHED 1980

LEGAL PROTECTION The Strict Marine Reserve covers the waters around Galiton islot up to a distance of 0.8 km which includes the islot of La Fouchelle. It was established on 4 July 1980 by Decree of the Ministry of Agriculture.

LAND TENURE State property

PHYSICAL FEATURES The Galite Archipelago is the only granitic formation in Tunisia, the mainland being made of sedimentary rocks. The principal island of the archipelago is the Galite (650 ha, max. alt. 391 m.) of elongated shape. The islands Canis, located 0.8 km north, are three islots no bigger than 9 ha with max. altitude 119 m. The islots of Galiton (27 ha) and La Fouchelle (14 ha), located 2.4 km south-west of Galite, are separated by a distance of about 50 m. Sea bottoms are mainly rocky.

VEGETATION The Galiton and La Fouchelle are covered by a low herbaceous vegetation with some arboreous shrubs of Pistacia lentiscus no higher than 50 cm from the ground. The north-west part of La Fouchelle is covered by a branchy Graminacea locally known as "Diss", which is common on the other islands.

FAUNA The monk seal (Monachus monachus) frequents the caves of the Galiton and other islands of the archipelago. A small colony of 6 individuals was studied in 1978. Delphis delphis and the seaturtle Caretta caretta are common. The wild rabbit (Oryctolagus cuniculus) and the black rat (Rattus norvegicus) are extremely abundant on the islands. Sea birds include: Larus audouinii, Larus argentatus (500 couples), Puffinus kuhlii, Phalacrocorax aristotelis. Falco peregrinus and Falco eleonorae (60 couples on the Iles de Chiens) are also present.

MANAGEMENT The island of Galite is a military base managed by the "Marine Nationale" (about 15 people worked on the island in 1983). The Marine Reserve is under the responsibility of the Ministry of Agriculture and patrolling activities are carried out by two persons of the "Guarde National".

USES All fishing is prohibited in the marine reserve but takes place in the waters of the Archipelago, together with spiny lobster and coral collection. A lighthouse keeper lives permanently on Galiton islot and about 150 persons live on the Galite island. The area is frequented by local and foreign tourist boats.

PROBLEMS Insufficient patrolling personnel. Illegal fishing (including spear-fishing by tourists), sea turtles and monk seal killing take place. Overgrazing by rabbits and excessive egg collection by rats also occur on the islands.

PRINCIPAL REFERENCE MATERIAL

- Gaultier T. 1978. L'Ile de la Galite et ses Ilots. Institut National de Recherches Scientifiques et Techniques, Tunis. 19.pp.
- Rosser. A. et al. 1978. Status of Mediterranean Monk Seal (Monachus monachus) in Tunisia. Environmental Conservation No.5 (4): 298.

CONTACT ADDRESS Sous Direction de la Chasse et Parcs Nationaux, Ministere de l'Agriculture, 30 Rue Alain Savary, Tunis, Tunisia.

TUNISIA

ICHKEUL

MANAGEMENT CATEGORY National Park, Biosphere Reserve, World Heritage Site.

TYPE Wetland

ANNOTATED DESCRIPTION Ichkeul lake is almost the only remaining example of a number of large, shallow lakes which once occurred in North Africa. It is also one of the principal sites in the entire Mediterranean region for the wintering of waterfowl.

GEOGRAPHICAL LOCATION The Park is situated on the Mateur plain in the Gouvernorat of Bizerte, northern Tunisia. It lies 20 km south-west of Bizerta and 60 km north-west of Tunis. 37°10'N- 09°40'E.

AREA 12,600 ha

DATE ESTABLISHED 1980

LEGAL PROTECTION The National Park was established on 18 December 1980 by Presidential Decree No. 80-1608. It was accepted as Biosphere Reserve on March 77 and as World Heritage Site in 1979.

LAND TENURE Government owned

CLIMATE Average annual temperature is 18° C (11.3° C in winter, 25.2° in summer). Average annual rainfall is 625 mm (103mm in winter, 30 mm in summer). About 300 million cubic metres of rainwater pour into the lake each year. The dominant winds are from north and west.

PHYSICAL FEATURES The Park consists of an isolated, wooded massif or Djebel (511m), probably a lake island at one time, located on an alluvial plain, and a permanent lake, lake Ichkeul (8,700 ha in summer), connected to the sea via Lake Bizerta and the Tindja Canal. Lake Ichkeul (some 1.5m below sea level) is fed by four fresh water rivers which dry up in summer, causing the level of the lake to fall and salt water from Bizerta lake to flow in. The following geological elements can be distinguished: the Djebel Ichkeul composed of Triassic and Jurassic formations (matamorphosed limestones with pseudo-Dolomitic aspects - marbles); the northern fringe, with its late Tertiary and Quaternary outcrops, which contain a valuable paleontological fauna of Villafranchian age (late Pleistocene)(Anancus osiris, Elephas planifrons, Stylohipparion libycum, Libytherium maurusium, Testudo gigans, T. emys); the endorheic basin of the lake and the marshes composed of Quaternary alluvia.

VEGETATION The vegetation of the Park is representative of the thermo-mediterranean belt with north-african affinities. The Djebel is covered with a grouping of Olea europaea, Pistacia lentiscus and Smilax aspera. It forms an ecosystem varying from fairly dense pure olive groves, to associations in which other species co-dominate, especially Euphorbia dendroides on the south-east versant and Juniperus phoenicea on the northern versant. The Djebel has a rich variety of northern Tunisian plant species including Teucrium shoenenbergeri (a species endemic to Tunisia), Notholena velleae, Ceratonia siliqua and Tetraclinis articulata. The marsh vegetation is dominated by Scirpus maritimus, S. lacustris, S. litoralis, Typha angustifolia, and Tamarix africana. Lake vegetation is mainly composed by Potamogeton pectinatus, Phragmites communis and Ruppia ssp.

FAUNA The Ichkeul wetland plays an essential role in the Paleoarctic waterfowl cycle hosting about 200-300,000 birds. The most numerous species are Anas penelope, Aythya ferina and Fulica atra. Ichkeul is the most important wintering station in the Maghreb for Aythya ferina (100,000) and Anser anser (7,000). More than 185 different bird species are found in Ichkeul including Casmerodius albus, Plegadis falcinellus, Ciconia nigra, Phoenicopterus ruber, Hieraaetus pennatus, H. fasciatus, Falco peregrinus, Neophron pernopterus, Plyonoprogne rupestris. The otter Lutra lutra is rather rare on the shore of the lake, whereas porcupine Hystrix cristata, mongoose Ichneumon herpestes, Genetta genetta and wild cat Felis sylvestris lybica are commonly found on the Djebel. The Ichkeul water buffalo, Bubalis bubalis, is being reintroduced into the marshes. No buffalos exist in Tunisia at the present time. The principal fish species are Anguilla anguilla, Mugil cephalus, M. ramada, Dicentrarchus labrax, Barbus barbus, Solea solea and Alosa fallas.

MANAGEMENT Hunting is prohibited, fishing and grazing are controlled. There is a locally based park director and two wardens. Patrolling activities are carried out by the National and Regional Brigades. A museum is under construction and exhibits are in preparation. The Park has no budget at present but financial support for conservation activities has been provided by international organizations and bilateral cooperation programs. A management plan was produced by the University College London and a conservation program was approved by a Co-ordinating Committee formed by various Tunisian authorities. The principal management objectives are to control water-level and water salinity of the lake in order to maintain and develop areas of Potomogeton and Scirpus vegetation which is the major food source for migrating birds. This is to be obtained through the construction of a sluice on the Tindja Canal to exclude sea water from the lake and retain winter flood water and the filling of the dreinage canal across the Djoumine marshes.

USES About one hundred families live in the Park area and some controlled grazing is allowed. Aquaculture is carried out by the Office National de la Pêche. Several warm water springs around the foots of the Djebel are much visited during the spring. Some bird watching and recreation by local and foreign tourists take place especially in the winter. Studies on the biological environment of Lake Ichkeul and its hydrology have been carried out by the Ministry of Agriculture, the Salammbo Oceanographic Institute and University College London. Waterfowl counting is undertaken by the "Station Biologique de Tour du Valat", Camargue, and the University College of London.

PROBLEMS

The construction of dams in the rivers which feed the lake with freshwater is endagering the Ichkeul ecosystem. Major habitat loss as a wintering, feeding and roosting place for waterfowl would eventually result from the salinization of the lake and dissecation of the marsh vegetation. Some reclamation of land for agriculture and overgrazing by domestic stock also coming from the surrounding areas occur in the marshes. The death of 18 of the water buffaloes reintroduced in 1980 has been ascribed to malnutrition caused by overgrazing by domestic stock on the marshes. The massive use of fertilisers and herbicides in the cultivated lands around the marshes might cause eutrophication and disrupt the benthic food-chains. Open-cast stone quarries are found on the southern versant of Djebel Ichkeul.

PRINCIPAL REFERENCE MATERIAL

- Hollis G.E. 1983. A Faisability Study for Sluice on the Oued Tindja in the Ichkeul National Park, Tunisia. A Report on Aspects of Hydrology, Sedimentology and Ecology of the Project. Prepared for the Commission of European Communities.
- The Conservation Course, 1977. A Management Plan for the Proposed Parc National de l'Ichkeul, Tunisia. Report Series No. 10. University College London, London. 240 pp.
- University College London's. About 40 reports on Ichkeul's hydrology, hydrometeorology, biogeography, vegetation dynamics and distribution, ornithology together with feasibility studies for sluice construction. Produced between 1982 and 1986 for the Commission of the European Communities.
- Zaouali J. 1975. Contribution a l'Etude Ecologique du Lac Ichkeul (Tunisie septentrionale). Bull. Inst. Natl. Sci. Tech. Oceanogr. Pêche, Salammbô. No. 4 (10: 115-124.

CONTACT ADDRESSES

- Chef du Parc National de l'Ichkeul, Commissariat Regionale de Developpement Agricole de Bizerte, Bizerte, Tunisia.
- Sous-Direction de la Chasse et Parcs Nationaux, 30 Rue Alain Savary, Tunis, Tunisia.

TUNISIA

ZEMBRA AND ZEMBRETTA

MANAGEMENT CATEGORY: National Park, Zone of Biological Protection, Biosphere Reserve

TYPE: Marine/Coastal

ANNOTATED DESCRIPTION: A mountainous island with rough coasts and cliffs, uninhabited and practically protected as a military zone. Considerable potential for scientific research.

GEOGRAPHICAL LOCATION: Zembra and Zembretta islands are situated in the Gulf of Tunis, the nearest point of the mainland being Ras el Ahmar, in the Cap Bon Peninsula, which is 10 km away. The Gammarth and Carthage Capes are some 50 km away. The islands are in the Gouvernorat of Nabeul. 37° 06'N- 10° 48'E.

AREA: Approximately 5000 ha (330 ha terrestrial and 4,700 marine)

DATE ESTABLISHED: 1973 as Zone of Biological Protection, 1977 as National Park and Biosphere Reserve

LEGAL PROTECTION: The waters around Zembra (to a distance of 2.4 km) have been declared Zone of Biological Protection on 9 November 1973 by Decree of the Ministry of Agriculture. The National Park of Zembra and Zembretta was established on 1 April 1977 by Presidential Decree No. 77-340; regulations for the park were issued on 6 July 1984 by Ministerial Decree published in Official Journal No 44, 24-27 July 1984. It was accepted as a Biosphere Reserve on January 1977.

LAND TENURE: State Property

CLIMATE: The islands are characterized by a sub-humid Mediterranean climate with long dry summers and mild temperate winters. The average annual temperature is 18° C. (average max. 31.9° C, average min. 8.3° C). Average annual precipitation 625 mm. Strong north-western winds blown on the island. The islands are under the influence of Atlantic waters and Tunis Gulf's currents. Water salinity is 37 mg/l; summer water temperature is 25° C.

PHYSICAL FEATURES: Zembra island (389 ha) consists of an alternation of limestones and clays, the common oligocene facies found in the north of Tunisia. Triangular in shape, Zembra rises to 435 m above the stepped cliffs of the east coast. The topography is fairly rugged. A temporary river flows in the only valley to the south coast. The sea-bottom is rocky with steep cliffs (max. depth 120m). Zembretta (2 ha) is a trapezoidal sandstone rock about 400m long and 50m wide.

VEGETATION The vegetation of Zembra island consists of species found in Sicily, the Tunisian mainland, Khroumirie, the Oran region. Species or varieties from Greece and the East have also been found. Some 230 have been recorded. The maquis consists of Pistacia lentiscus, Olea europaea, Erica arborea and Calycotome villosa, with plants of rare species: Iberis semperflorens, Dianthus hermaensis, Brassica cretica atlantica, Poterium spinosum. The marine flora presents affinities to the "cold " one of north-western Mediterranean (Gulf of Lion).

FAUNA The wild rabbit Oryctlolagus cuniculus, which is not found on the African mainland, occurs on Zembra and Zembretta islands. The Corse mouflon (Ovis masimon) is present with a population of 30 individuals. Large numbers of Puffin kuhli nest there (8000), and Falco peregrinus is also found (10 pairs). The waters near the coast are often frequented by Delphinus delphis. The monk seal (Monachus monachus) was last sighted in 1975.
Fish populations are characterized by the abundance of Chromis chromis at all depths, Sparidae ssp. (particularly Diplodus vulgaris), Serranus scriba, Epinephelus guaza, Sciaena nigra. The benthos includes Astroides calycularis which is particularly abundant on the underwater cliffs, the triton Charonia nodifera, Cyprea ssp. and Patella ferruginea now threatened by overcropping in the Mediterranean.

CULTURAL/HISTORIC FEATURES Some Roman ruins, Punic tombs and old under-water wrecks are present.

MANAGEMENT Hunting, fishing and other uses are prohibited. One warden is permanently stationed on the island. Restoration of infrastructures (dock, field station, water pipes) and boat patrolling are carried out by four persons of the "Marine National". Basic inventories of flora and ornithological fauna, and studies in the field of marine biology have been made.

USES Until 1977, when the islands became a military base, tourism and educational activities such as under-water photography courses took place on the island. Today there is no public access and only researchers are allowed to visit the place with permission. A bungalow-style hotel is now used as a field station for army personnel and researchers.

PROBLEMS The degenerate maquis is the result of past deforestation activities (cutting, intense grazing and fire). At present, illegal fishing presents the main problem. Boat patrolling in winter months is difficult because of rough seas.

PRINCIPAL REFERENCE MATERIAL

- Anon. 1953. Contribution a l'exploration scientifique des Iles Aegimures (Zembra et Zembretta). Soc. Nat. de Tunisie, Memoire No. 2.
- Ben Mustafa Z., Baccar H., 1985. Zembra Parc Marin, Zembra et Zembretta Parcs Naturels. Regione Campania, Assessorato per il Turismo. In: Atti del Convegno Internazionale I Parchi Costieri Mediterranei. Salerno, Castellabate. 18-22 Giugno 1973. Ente Provinciale per il Turismo, Salerno. pp. 423-428.
- Biosphere Reserve submitted to UNESCO, 1977

CONTACT ADDRESS Sous-Direction de la Chasse et Parcs Nationaux, Direction des Forêts, Ministere de l'Agriculture, 30 Rue Alain Savary, Tunis, Tunisia.

TURKEY

1. DILEK NATIONAL PARK (C)
2. GELIBOLU NATIONAL PARK (C)
3. OLYMPOS SEASHORE NATIONAL PARK (C)

TURKEY

AREA 778,000 km^2

LENGTH OF MEDITERRANEAN COAST

AREA OF TERRITORIAL SEA

POPULATION 45,000,000 (1975)

PROTECTED AREA LEGISLATION Legal basis for the establishment of National Parks was provided in 1956 by the Forest Law No. 6831. It gives the Ministry of Forestry the authority to designate areas as national parks, national forests, forest recreation areas and wildlife protection areas.

PROTECTED AREA ADMINISTRATION National Parks and Reserves are established and managed by the General Directorate of National Parks and Wildlife of the Ministry of Forestry, which was established in 1976. It consists of 8 district offices. The Ministry of Education, Tourism and Information and State Planning Organisation are given some responsibilities concerned with the management of national parks.

NATIONAL AUTHORITY ADDRESS

ESTABLISHED M/C PROTECTED AREAS

1. Dilek Peninsula National Park (C)
2. Gelibolu Peninsula National Park (C)
3. Olympos Beydaglari National Park (C)

TURKEY

DILEK PENINSULA

MANAGEMENT CATEGORY National Park

TYPE Coastal

GEOGRAPHICAL LOCATION On the western coast of Turkey, in the Aegean region, 28km from Kusadasi in Aydin province.

AREA 10,985ha

DATE ESTABLISHED 1966

LEGAL PROTECTION Total

LAND TENURE State ownership

CLIMATE Climate inclines to drought in summer but winter rains are plentiful.

PHYSICAL FEATURES The Dilek Peninsula is formed by the Aydin mountain range located between the Greater and Lesser Menderes, and is part of the Menderes Massif. Geologically it is composed of palaeozoic schists, mesozoic limestones and marbles, and masses of neozoic sediment of a sand and marl conglomerate. Marly limestones are also encountered. The whole region is a highly sensitive earthquake area. Topography is rugged and highly undulating with Dilek Tepesi (1237m) rising in the centre. There are high peaks, steep slopes and deep canyons, plains, a large number of streams, gravelly coasts with historical ruins and sandy beaches. Oluk Gorge is the most spetacular canyon, and the walls display the complete geological stratification of the Peninsula. The ridge of Samsun Dagi divides the peninsula into north and south slopes. There are great climatic differences between the north and south slopes. Altitude ranges from 0-1,237m.

VEGETATION The southern slopes have only a few scattered groves of pines, but the north slopes have a rich variety of pine forests, together with maquis. Practically all the species of Lauretum and Castaneatum in the Mediterranean region can be found in the park. Cluster pine Pinus brutia is the most important conifer. Richly developed forests of black pine P. nigra are found up to about 700m, together with small scattered groves of Phoenician juniper Juniperus phoenicea, various oaks Quercus coccifera, Q. frainetto, Q. ilex, Q. infectoria and Q. aegilops, elm Ulmus campestris, maple Acer sempervirens and ash Fraxinus ornus.

The Bal Deresi basin along the eastern border of the park is remarkable for its variety of trees, shrubs and herbaceous plants. Chestnut Castanea sativa and lime Tilia platyphyllos are found here, together with the service tree Sorbus torminalis, Lathyrus grandiflorus and Viburnum tinus. The Erbaslik and Ayituregi areas contain a wealth of fruit and nut trees, both indigenous and introduced, including almond Amygdalus communis, carob Ceratonia siliqua, wild pear Pyrus eleagrifolia and Olea europea.

FAUNA Mammals include fox Vulpes sp., jackal Canis aureus, wolf C. lupus, lynx Lynx lynx, caracal L. caracal, wild cat Felis sylvestris, wild boar Sus scrofa, bear Ursus arctos, badger Meles meles, pine marten Martes martes, hare Lepus sp., hedgehog Erinaceus europaeus and squirrel. Monk seals Monachus monachus still occur in the marine area bordering the park and conservation measures are under consideration. Birds include wild dove, rock dove Columba livia, rock partridge Alectoris graeca, grey partridge Perdix perdix, quail Coturnix coturnix, woodcock Scolopax rusticola, blackbird Turdus merula, fieldfare T. pilaris, bustard, golden oriole Oriolus oriolus, bee-eaters, eagles, vultures, raven Corvus corax, magpie Pica pica, starling, hawks, falcons and ducks. Reptiles include snakes and turtles. The surrounding seas contain grey mullet, bream, sea bass, dentex, needlefish and tunny fish.

CULTURAL/HISTORIC FEATURES There are several archeological ruins.

MANAGEMENT Staff: one ranger, five wardens, four guards.

USES Visitor facilities such as toilets, water taps and picnic tables are provided along the shore. There are a large number of hotels, motels and holiday camps at Kusadasi and various others places along the shore, but no accommodation within the park itself.

PROBLEMS Forest fires (started deliberately or accidentally) have greatly altered the vegetation. In 1943 the whole forest between Karina and Dip Point was completely destroyed, and other major fires have taken place in 1963, 1964, 1972, 1974, 1976, 1977 and 1979. Cluster pine has completely disappeared from the western region. Grazing by domestic animals, although it has now stopped, has also had great effect. Illicit fishing with drag-nets is ruining the marine environment and causing the extinction of various species.

PRINCIPAL REFERENCES MATERIAL

- Aktar O., 1983. Dilek Peninsula. Ilgi No 35, January 1983. pp 2-7.
- Gryn Ambroes P., 1980. Preliminary Annoted List of Existing and Potential Mediterranean Protected Areas. UNEP.
- IUCN, 1971. UN List of National Parks. IUCN.

CONTACT ADDRESS

Dilek Yarimadasi Milli Park Müdürlügü, Kusadasi, Aydin, Turkey.

TURKEY

GELIBOLU PENINSULA

MANAGEMENT CATEGORY National Park

TYPE Coastal

GEOGRAPHICAL LOCATION In the south of what is also known as the Gallipoli Peninsula, bordering the Cannakale Bogazi or Dardenelles at the entrance to the Sea of Marmara. Marmara region, Canakkale province forming a peninsula on the Dardenelle Straits. 41° 20'N- 26° 15'E

AREA 33,000ha

DATE ESTABLISHED 1973

LEGAL PROTECTION Total

LAND TENURE About two thirds of the area is occupied by State-owned forest, controlled by the Ministry of Forests. Remainder mainly privately owned but subject to certain governmental control.

PHYSICAL FEATURES Consist of Gelibolu Peninsula, which forms the Dardanelle Straits. Rather flat calcareous series of terraces, rising in steps to fairly mountainous terrain in the north. Shore varies from sandy beaches and bays to steep rocks and cliffs particularly in the vicinity of Saroz bay. Anafarta (Suvla) Bay on the northwest, between the Small and Great Kemikli promontories, is one of the best natural bays along the Thracian sector of the Aegean Sea. Altitude ranges from 0-340m.

VEGETATION Wooded areas are dominated by Scots pine Pinus sylvestirs, stone pine P. pinea, Mediterranean cypress Cupressus sempervivens and the oriental plane Platanus orientalis. Also red pine Pinus resinosa, oak, cypress and magui.

FAUNA The wolf Canis lupus is still thought to occur but the most common mammals are rabbit Oryctolagus cuniculus, fox Vulpes vulpes, beech or stone marten Martes foina, and wild boar Sus scrofa. The avifauna is typical of dry eastern Mediterranean coasts, comprising such species as rock partridge Alectoris graeca, blue rock thrush Monticola solitarius, wheatears Oenanthe spp. and rock nuthatch Sitta neumayer.

CULTURAL/HISTORIC FEATURES There are at least 8 archaeological sites as well as cemetaries and other memorials of the great battles of the First World War.

MANAGEMENT Staff: one ranger, 5 wardens. Budget: equivalent of US $14,500; TL 3,800,000

USES Mainly approached by main road from Istanbul (c.350km), the park is also accessible by ferry from Cannakale (where there is an airport) and from Lapseki. Lodgings may be found in villages within the Park boundary and there are also camping facilities. Hotel accomodation exists or is planned at Cannakale, Gelibolu and Saroz Bay. Most research in the area has been of a historical nature.

PROBLEMS Cultivation and grazing, exploitation of forest products, excessive hunting and touristic or recreational pressures are among the problems of the park.

PRINCIPAL REFERENCES MATERIAL

- IUCN, 1977. UN List of National Parks and Protected Areas. IUCN.

CONTACT ADDRESS Gelibolu Yarimadasi Tarihi Milli Parkim Sefligi, Eceabat-Cannakale (Ace Abad-Cannakale) Turkey.

TURKEY

OLIMPOS SEASHORE (BEYDAGLARI)

MANAGEMENT CATEGORY National Park

TYPE Coastal

ANNOTATED DESCRIPTION Well forested mountains dipping steeply to precipitous sea cliffs or long narrow beaches. The coast is of outstanding scenic beauty.

GEOGRAPHICAL LOCATION 12km southwest of Antalya City. 30°01'E-36°30'N

AREA 69,800ha (138km of coast, including the insular coasts, plus 10km inland)

DATE ESTABLISHED 1970

LEGAL PROTECTION No information

LAND TENURE Mainly state with 4,000 ha private.

PHYSICAL FEATURES Bordered by the sea to the east and south, the first of a series of mountain ranges to the west and the western edge of the Antalaya plain to the north. Western Taurus young mountains, calcareous, rocky mountains and a coastline formed by precipitous cliffs or long, narrow sandy beaches. The overhanging coast, with turquoise water of incomparable limpidity is of outstanding scenic quality. Altitude ranges from 0-2,366m.

VEGETATION The vegetation includes red pine Pinus resinosa, black pine P. nigra, Sicilian fir Abies cilicica, cedar of Lebanon Cedrus lebani, juniper, cypress, oak, poplar and plane.

FAUNA Bear Ursus arctos, wolf Canis lupus, jackal C. aureus, wild boar Sus scrofa, fox Vulpes sp., lynx Lynx lynx, martens Martes spp., wild goat Capra aegagrus, rabbit Oryctolagus cuniculus, birds, turtles and fish. Monk seal Monachus monachus has been reported.

CULTURAL/HISTORIC FEATURES There are several archaeological sites.

MANAGEMENT The Park area is divided into a protection zone, a buffer zone, and development zones. Staff: one manager, one ranger, nine wardens, two guards. Budget: TL4,800,000

USES Tourism: facilities for visitors include hotels, motels and camp sites.

PROBLEMS Some illegal grazing and construction.

PRINCIPAL REFERENCE MATERIAL

- Mursaloglu B., 1984. Monk seal Conservation in Turkey, Project No. 1118.

WWF Monthly Report, May 1984.
- National Park Master Plan. HC Development Plan.

CONTACT ADDRESS Milli Park Müdürlügü, Kemer, Antalya, Turkey.

YUGOSLAVIA

EXISTING M/C PROTECTED AREAS

1. BRIONI NATIONAL PARK (M/C)
2. KORNATI NATIONAL PARK (M/C)
3. NERETVA DELTA NATURE RESERVE (W)
4. MLJET NATIONAL PARK (M/C)
5. LOKRUM NATURE RESERCE (C)
6. KOTOR WORLD HERITAGE SITE (C)

YUGOSLAVIA

AREA 255,803 km^2

LENGTH OF MEDITERRANEAN COAST 6116 km (including 4024 km of island coastline)

AREA OF TERRITORIAL SEA

POPULATION 22,480,000 (1981)

PROTECTED AREA LEGISLATION In Yugoslavia, the national park is the most stringently protected type of conservation site, usually consisting of an inner strictly protected zone and an outer, less strictly protected zone. National parks can only be declared by the Republic's Assembly, the highest authority on land. There are also regional parks (or territories of special natural beauty) and nature reserves. In Montenegro republic, protected areas are created within the framework of a law enacted on 6 August 1952 whilst in Croatia each park is created under its own special law. There are no special laws on the creation of marine protected areas, however general texts on conservation may allow for the establishment of such sites.

PROTECTED AREA ADMINISTRATION The administration for nature conservation is organized on a republic level, with an Institute for nature protection in each of the six Autonomous Republics. The parks are managed by public administrative bodies, the actual authority varying from republic to republic. The parks may be managed by experimental farms under the Ministry of Agriculture, or by local self-administered committees or bodies under the Ministry of National Education or under a nature conservancy institute.

NATIONAL AUTHORITY ADDRESS

ESTABLISHED M/C PROTECTED AREAS

1. Brioni Islands National Park (M/C)
2. Kornati Islands National Park (M/C)
3. Kotor World Heritage Site (C)
4. Lokrum Nature Reserve (C)
5. Mljet National Park (C)
6. Neretva Delta Nature Reserve (W)

YUGOSLAVIA

BRIONI ISLANDS

MANAGEMENT CATEGORY National Park and Commemorative Site

TYPE Coastal

ANNOTATED DESCRIPTION A group of islands in the north Adriatic. Since the end of World War II the archipelago has been the late President Tito's private residence and as a consequence the site has had strict protection and restoration work carried out on it.

GEOGRAPHICAL LOCATION The islands are situated to the northwest of Pula about 3 km from the Istrian mainland. Fazane channel. Located in the Commune of Pula, Socialist Republic of Croatia. 44°55'N- 13°45'E.

AREA 860 ha with a coastline of 50 km.

DATE ESTABLISHED 1983

LEGAL PROTECTION Article 27, Paragraph 1 of the Law of Nature Protection (Narodne novine No. 53 76) proclaimed the Brioni archipelago a national park by enacting a law on the Creation of Brioni National Park and Commemorative Site (Narodne novine 46/83) which was passed by the National Assembly of the Socialist Republic of Croatia.

LAND TENURE State ownership

CLIMATE Mediterranean climate. Average annual temperature is 13.9°C (winter average 5.6°C, summer average 22.7°C). Average annual sea temperature is 16.1°C (22.5°C in summer, 10.5°C in winter). Annual average precipitation 817 mm. Moderate winds from south-east and north-west.

PHYSICAL FEATURES The two major islands, Veliki Brion and Mali Brion cover 690 ha and 170 ha respectively. There are 12 smaller islets (Gaz, Sveti Marko, Okrugljak, Supin, Supinic, Galisja, Grunj, Vanga, Madona, Visar, Jerolim, and Kozada) and two reefs (Kabula and Stine). The island relief is undulating, the rocky coast is mainly low and easily accessible. The highest point is Straza (54 m) on Veliki Brion. The geological structure of Brioni is identical to the coastal region of Istria. The basic sub-stratum consists of limestone sediments laid in the Cretaceous age.

VEGETATION The islands are covered in luxuriant Mediterranean type vegetation with holm oak forest (Orno-Quercetum ilicus) covering over 50 ha, being the best example in Yugoslavia and possibly in the Mediterranean basin. The holm oak is devided into two forms: equal proportions of holm oak with laurel (Orno-Quesrcetum ilicis laurosum) and holm oak with buckthorn (Orno-Quercetum ilicis rhamnosum). A native maquis of a distinctive clustered type, persists on Vanga, Madona and Mali Brion islands. There are records for 900 plant species including 250 described as meadows and hedgerow species and 650 as marsh species. There is a marsh area in the bay of Saline. Veliki Brion is layed out as a landscape park with non-native such as parasol pine, cedars and eucalyptus.

FAUNA The islands hold a good number of breeding bird species and is on a major migration route for passerines, marsh birds and large numbers of raptors. The coast is very well conserved and abounds in fish species. Large exotic game species are kept in a safari park open to the public.

CULTURAL/HISTORIC FEATURES The archipelago is rich in archeological excavations, dating from the neolithic and covering 150 ha of the islands. Gromace is an agglomeration of hut foundations which were known as an example of the "culture of Brioni". On the hill Gradina on Veliki Brion is a 10 ha Illyrian site, the best preserved in Yugoslavia. A number of other architecturally important remains are present such as a country mansion house with terraces (54 ha), a Roman emperors villa (architecturally unique in the world), a Byzantine camp "Castrum" (covering 11,480 m^2), the only example in Yugoslavia, and a VI century Byzantine basilica (the only other two examples being in Morocco and Syria).

MANAGEMENT The islands are managed in state ownership by the Organization of Works of Brioni. The property is financed with its own income, as well as those of the Federal Republic of Croatia and the National Budget.
The site is open to the public. The sea area around the islands has a prohibition on underwater fishing. All the archeological sites on Brioni have been investigated, conserved and maintained. For the last 40 years all work has been strictly controlled and directed by experts from the Republic Institute for Nature Conservation, Zagreb and the Regional Institute for Cultural Monuments Conservation. Preservation activities have included the clearing and management of the forests.
A republic level management plan for Croatia deals with Brioni National Park. The future elaboration of a management plan for the national park is confirmed in Narodne Novine 49/83 p.j.7 and the plan is due for completion in the second half of 1986.

USES The islands have been inhabited since 500 BC but towards the end of the nineteenth century they became deserted. The site has had some tourism and recreation pressure for nearly 100 years but has remained largely undamaged. Today on Veliki Brioni there are 3 hotels, 6 villas and buildings for State visits. Permanent exhibitions on archaeology, ethnography and natural sciences, and organized excursions are offered to visitors. On the island of Veliki Brion there is a 4ha flower garden and garden-nursery where decorative Mediterranean plants are cultivated.

PROBLEMS In 1883 the islands were purchased by an Austrian industrialist who constructed roads, cleared the forests, maintained the meadows and lawns and constructed a lodge. In 1918 the island was occupied by Italy and the cultivated areas and gardens were destroyed. This destruction lasted till the end of World War II when the archipelago became the late President Tito's residence. There are introduced non-native examples of flora (cedar, eucalyptus and parasol pine) and fauna (mouflon and fallow deer).

PRINCIPAL REFERENCE MATERIAL

- Radisic F., 1985. Brioni. Tourist Monographs No 8. Niro Privredni Vjesnik, Zagreb.
- Nomination proposed by the Government of Yugoslavia, for inclusion in World Heritage (1986).

CONTACT ADDRESS

National Park and Commemorative Site, 52214 Brioni, Croatia, Yugoslavia.

YUGOSLAVIA

KORNATI ISLANDS

MANAGEMENT CATEGORY National Park

TYPE Coastal/Marine

ANNOTATED DESCRIPTION The National Park covers 109 islands and islets bordered with steep barren cliffs falling straight into the sea which may reach 100 m in depth. The archipelago abounds in scenic natural bays and extremely rich marine biocenoses.

GEOGRAPHICAL LOCATION The Park embraces a part of the Kornati archipelago (the Kornati and the external string of islands) and a part of Dugi otok island. The Kornati archipelago is in the heart of the North-Dalmatian island area in the center of the Yugoslavian Adriatic coast.

AREA 302 km^2 of which 69 km^2 is terrestrial.

DATE ESTABLISHED 16 August 1980

LEGAL PROTECTION Total.

LAND TENURE Administratively the islands are under the jurisdiction of the local authority of Sibenik.

CLIMATE Mediterranean climate with cool rainy winters and sunny summers. Average annual temperature 16°C (January average 6.7°C, July average 24°C). Average annual rainfall 850 mm (winter average 340mm; summer average 120mm). Irregular and stormy winds from N-E and SE in winter, strong and steady winds from NW in summer. Water temperatures in winter14°C, in summer 22.8°C.

PHYSICAL FEATURES The Kornati islands are made of limestone and dolomites from the Mesozoic and Cenozoic age. These carbonate rocks have evolved into various karst forms such as caves, cliffs, fissures and sink-holes. Impressive isolated cliffs and massive vertical limestone layers are present on the coast. The two island ranges (Kornat and Piskera) extend in parallel in a SE-NW direction. The island of Kornati is the biggest (32,53km^2), the longest (25,2 km) and the highest (max alt. 296 m) in the whole Kornati archipelago. The average area of the other islands is 0,42km^2.

VEGETATION The islands are floristically poor, with only 150 plant species recorded on them. They have a barren rocky appearance, covered only with a sparse grass vegetation and low bushes dominated by sage *Salvietum officinalis*. Few isolated trees of wild olive *Olea oleaster* and oak *Quercus ilex* are left from the original evergreen forest. The cultivated area accounts for only 5% of the total area. On the underwater cliffs there are well developed photophil algae and coralligen formations. On mobile substrata, large meadows of *Posidonia oceanica* occur.

FAUNA Poor terrestrial fauna including some lizards, ring-snakes, rodents, marten, rabbits. Sea gulls are common, sea swallows and falcons can also be seen. Marine biocenoses are much more developed than terrestrial ones including a rich invertebrate fauna (particularly corals and sponges) and numerous species of pelagic fishes. The rare Pinna nobilis lives in the Kornati and is protected by law because of overfishing.

CULTURAL/HISTORIC FEATURES Several archeological remains of Illyrian settlements and roman villas.

MANAGEMENT Different degrees of protection have been afforded to various zones. A strict protection zone consists of all the islands of the open sea chain (Piskera) including the costal sea zone 200 m from Purara in the south east to Obrucan in the north west. A general protection zone consists of the island of Kornat with its satellite islets including a marine belt of one nautical mile from the coast to the open sea. Strict limitations of economical and sporting activities are imposed on the first zone. Dumping is forbidden; commercial and sport fishing, and camping are allowed in specific areas.

USES These islands are mostly uninhabitated: only a few families of fishermen, vine-growers or sheep-raisers are settled along the beaches facing the mainland.

PROBLEMS The Kornati are sheltered from marine pollution caused by urban and industrial sewage. However, the modernization of fishing equipment and the rapid progress of tourism endanger the exceptional and pristine beauty of the site.

PRINCIPAL REFERENCE MATERIAL

- Friganovic M., 1984. National Park: The Kornati Archipelago. Tourist Monographis No 3, Zagreb.

CONTACT ADDRESS No information.

YUGOSLAVIA

KOTOR

MANAGEMENT CATEGORY World Heritage Site

TYPE Coastal/Marine

ANNOTATED DESCRIPTION The natural and cultural-historic area of Kotor with its environment represents a unique harmonious symbiosis of the natural phenomena and the architectural heritage of Yugoslavia.

GEOGRAPHICAL LOCATION Southwest part of Crnoghorsko primorje (Montenegro coastal region); 42°77'-42°31'N, 18°37'-18°39'E.

AREA 12,000 ha in total (2600 ha marine, 9400 ha terrestrial).

DATE ESTABLISHED 14 June 1979.

LEGAL PROTECTION The area is well protected by three acts, Decision of the Republic Institute for Protection of Nature of SR Montenegro, No/7/1968, No. 116/1 of 23 December 1949, and the Decree of the Town Assembly of Kotor which proclaims Kotor and its environment for the natural cultural and historic inheritance of special character (14 June 1979).

LAND TENURE Associated ownership: partly public property and partly owned by corporate bodies and individuals.

CLIMATE The climate is Mediterranean with a considerable continental influence due to northern winds and the proximity of the Lovcen and Orjen mountains. The maximum air temperature, registered in the period from 1943 to 1962, rose over 40°C in July, while in January it fell to -5°C. The minimum rainfall is in August and the maximum in December, the average varying from 964mm to 8063mm.

PHYSICAL FEATURES The Kotor-Risan Bay is part of the Boko Kotorska bay, and represents the most indented portion of this part of the Yugoslav coast. The narrowest region (340m) and the furthest inland point (33km) of Boka Kotorska Bay are included in the area. The bay is formed from a sunken river bed by tectonic subsidence, and is morphologically unique in the Mediterranean. The geological structure of the terrain shows Carboniferous rock masses of the Orjen and Lovcen slopes originating from the Mesozoic period (trias and iura), then a clastic zone of "paleogen flysch" along the coast and also the upper cretaceous limestones and dolomites. The Mesozoic limestones are strongly karstified and show numerous geomorphological forms, such as caves, precipices, pits and temporary karst wells.

The hydrographic complex is represented by the sea surface of the 2600 ha Kotor-Risan Bay, joined by a narrow passage with the remaining part of the Boka Kotorska Bay, and/or the open sea. The typical formations of karst hydrography are represented by karst wells at the sea level (Skurda, Gurdic, Ljuta), underground rivers above sea level (Sopot near Risan) and springs at the bottom of the sea (Drazin Vrt, Perast and Sopot). Due to the geological structure of the soil in the basin of Boke Kotorska and the specific features of the karst relief with groundwater run-off, groundwater appears at the sea level or below sea level, thus causing a shortage of good potable water. The only permanent water flow is Morinjska Rijeka, while the other water sources are found in the form of sea bottom springs, or as very short and temporary waterflows (Skurda and Gurdic near Kotor, Ljuta near Orahovac and Spila in Risan). Altitude: 52 to 1385m

VEGETATION In the protected area of Kotor-Risan Bay a large number of the Mediterranean plant species are found that are in general typical of the coastal region of Yugoslavia, including laurel Laurus nobilis, oleander Nerium oleander and Pinus leucodermis. The flora also includes plants such as Rhamnus orbiculata, Galium procurens, Seseli globiferum, Petteria ramentacea, Moltkea petraea, Prunus webbii, Castanea sativa, and winter and early spring flowering geophytes such as Crocus dalmaticus, C.tommanisianus, Romulea bulbocadium and Galanthus nivalis.

FAUNA The basic species of mammals are hare Lepus europaeus and fox Vulpes vulpes. The wild cat Felis silvestris is rare, as are jackal Canis aureus and wolf Canis lupus. Beech marten Martes foina also occurs in the area. The dominant bird species are the rock partridge Alectoris graeca and pigeons Columba sp., while among migratory species is the woodcock Scolapax rusticola. The bay is the most fertile spawning place in the Adriatic, and represents a separate biotope. Two species of mollusc, Mitra zonata and Tiasira orahoviciana, which were formerly not considered to inhabit the south Adriatic have been found in the bay. Among the endemic species of fauna, the most typical is a type of snail Clausilia catherensis which lives on the wall surfaces of Kotor.

CULTURAL/HISTORIC FEATURES The richness of the cultural and historic inheritance of Kotor, Perast and Risan make this part of Boka kotorska extremely attractive for the development and promotion of tourism. Unfortunately, many monuments and tourist buildings were demolished by earthquakes in 1979. Intensive building and restoration of such structures are now underway.

MANAGEMENT The complexity and variety of tasks concerning protection of the Kotor rarities demand a special organization to be established, i.e. personnel that will make efforts to implement the existing plans and programmes. The budget proposals are in preparation.

USES The World Heritage Site includes several towns and villages. In Kotor there are two institutes carrying out natural research operations in Bokakotorska Bay. Other institutions and museums also carry out research work and studies on the culture and history of the area.

PROBLEMS Kotor Bay has been endangered by industrial waste water and other water used by numerous villages, tourist facilities and floating vessels. The results are visible and are particularly reflected in the impoverishment of fish caught for economic reasons.

PRINCIPAL REFERENCE MATERIAL

- Gryn-Ambroes P., 1980. Preliminary Annotated Lists of Existing and Potentially Mediterranean Protected Areas. UNEP/19.20/INF.5. The above report includes a list of five other references (in Yugoslavian) on this area.
- The UNESCO nomination form includes a list of references in Serbo-Croatian.

CONTACT ADDRESS President of Town Assembly of Kotor, 81330 Kotor.

YUGOSLAVIA

LOKRUM

MANAGEMENT CATEGORY: Nature Reserve

TYPE: Coastal

GEOGRAPHICAL LOCATION: 700m from the coast, near Dubrovnik. 42° 38'N, 18° 07'E.

AREA: 72.3 ha

DATE ESTABLISHED: 1948

LEGAL PROTECTION: Established by Decree No. 221/48 on 27 February 1948.

LAND TENURE: Public ownership.

CLIMATE: The climate is humid eumediterranean, characterized by hot, dry summers and mild, humid winters. The annual average temperatures are 9° C in winter and 26° C in summer, annual average precipitation being about 1300mm.

PHYSICAL FEATURES: A calcareous islet with a 4.8km long shoreline, the surrounding sea being 8-15m deep. In the south of the islet there is a small brackish lake called Metvo more (Dead Sea), which has a depth of 10m. Altitude: 15 to 91m.

VEGETATION: Well developed maquis with the following elements: strawberry tree Arbutus unedo, crack phyllirea Phyllirea latifolia, laurestine Viburnum thymus, myrtle Myrtus communis, laurel Laurus nobilis and sporadically evergreen oak Quercus ilex. The southeast portion is covered by woods of Aleppo pine Pinus halepensis. A botanical garden of 2.19 ha is situated in the centre of the islet. It contains 567 introduced exotic species, the most interesting of which are palms, agaves, eucalyptus and camphor trees.

FAUNA: Common Mediterranean birds can be seen at Lokrum, though it has no special faunistic value.

CULTURAL/HISTORIC FEATURES: An ancient Benedictine monastery, built in the 11th century, is the only building on the islet.

MANAGEMENT: Complete protection of the islet, with a ban on building. Some felling of trees is permitted in order to improve the forest structure. Staff: 1 professional, 8 mid-level, 7 labourers and 2 guards. Budget: 4.5 million dinars a year. There is a department in the Biological Institute of Dubrovnik with a permanent zoological exposition and with a botanical section taking care of the botanical garden and a collection of cacti.

USES About 200,000 people visit Lokrum every year, most of them during the summer. The visitors have to leave the island at evening, as no one is allowed to spend the night there. There are no possibilities for accommodation, but two small restaurants are open during the day.
Ornithological and botanical researches are carried out by the Biological Institute of Dubrovnik.

PROBLEMS Forest fire is the biggest threat, due to a number of visitors during the dry period of the year.

PRINCIPAL REFERENCE MATERIAL

- Gryn-Ambroes P., 1980. Preliminary Annotated Lists of Existing and Potentially Mediterranean Protected Areas. UNEP/19.20/INF.5.

CONTACT ADDRESS Director, Reserve "Lokrum", 50000 Dubrovnik, Izmadju polaca 16.

YUGOSLAVIA

MLJET

MANAGEMENT CATEGORY National Park

TYPE Coastal/Marine

GEOGRAPHICAL LOCATION The northwest part of Mljet island, Mljet Archipelago, near Dubrovnik; 42° 47'N, 17° 22'E.

AREA 3,100 ha

DATE ESTABLISHED 7 December 1960.

LEGAL PROTECTION Law no. 49/60 proclaiming the northwest part of the island Mljet as a National Park "Narodne novine".

LAND TENURE Part private and part public ownership.

CLIMATE Mediterranean climate characterized by hot, dry summers and mild, humid winters. The average summer temperature is about 24° C, average winter temperature about 9° C and average yearly precipitation is about 1200mm. Two dominant winds interchange during the winter season - the southeast wind locally called "silok" and the strong, biting north wind called "bura", while during the summer a mild northwest "maestral" wind prevails. Offshore salinity is 30 mg/l in winter and 38-39 mg/l in summer.

PHYSICAL FEATURES Mljet is one of the south Adriatic islands, similar in origin as well as in structure, to the other areas of Dinaric orogensis karst. It consists of cretaceous limestone hills and dolomite depressions covered with "terra rossa" and sand. The most characteristic features of the park are the Great and Little "lakes", Veliko and Malo Jezero - two very enclosed sea coves connected with the open sea by a narrow passage. There are no permanent watercourses on the island but a few springs with variable output are present. Altitude: 46 to 389m.

VEGETATION The entire area is covered with evergreen vegetation, with woods of Aleppo pine Pinus halepensis especially outstanding as the best-preserved of their species in the Mediterranean, and there are also woods of evergreen oak. Maquis vegetation is very well developed, with the main floristic elements being strawberry tree Arbutus unedo, crack phylliera Phyllirea variabilis, white heather Erica arborea, carbo Ceratonia siliqua, myrtle Myrtus communis, laurestine Viburnum thymus, lentiscus Pistacia lentiscus, laurel Laurus nobilis and oxycedar juniper Juniperus oxycedrus.

FAUNA The fauna of Mljet island is interesting and rich. The most notable representative is the monk seal Monachus monachus, which has become extremely rare. The outer shorelines provide shelter for the remaining animals. The herpetofauna is much reduced by the mongoose Herpestes auropunctatus, imported to the island at the beginning of the century. Nevertheless, the Turkish gecko Hemidactylus turcicus, sharp-snouted lizard Lacerta oxycephala and Dahl's whip snake Coluber najadum survive there.
In 1958 a few pairs of fallow deer Dama dama were introduced onto the island and today this animal is quite common. During winter there are many migratory birds, especially songbirds.
Veliko and Malo Jazero are renowned for their mussels and fishes. The marine fauna includes the rock lobster Palinurus and fishes such as Dentex, Scorpaena, Coveria nigra and Zeus faber.

MANAGEMENT Staff: 1 professional, 2 mid-level, 10 labourers and 5 guards. Budget: 3,250,000 dinars a year.
There is an integral marine reserve and a controlled reserve where local fishing is protected. Total protection of all living things and landscape, intervention allowed only by the permission of the nature protection management.

USES The national park attracts about 25,000 visitors a year, the majority of them in the summer season. There are two hotels and a camping site, and alltogether the park has a total accommodation capacity of 800 persons. Two asphalted roads cross the park.
Research has been made into the vegetation, hydrography and benthic organisms of the lakes, including a survey of the phenomenon of natural eutrophication of a marine lake.

PROBLEMS The main environmental problem is the permanent danger of forest fire, especially during the summer tourist season. There is also some local fishing in the controlled area.

PRINCIPAL REFERENCE MATERIAL

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- Gryn-Ambroes P., 1980. Preliminary Annotated Lists of Existing and Potentially Mediterranean Protected Areas. UNEP/19.20/INF.5.

CONTACT ADDRESS Director, OUR nacionalni park "Mljet", 50226 Govedjari.

YUGOSLAVIA

NERETVA DELTA

MANAGEMENT CATEGORY Nature Reserve

TYPE Wetland

ANNOTATED DESCRIPTION A delta area with coastal salt marshes, saline lagoons, sandbanks and wet meadows. Although threatened by development, the delta region remains one of the most important sites for waterfowl in the Adriatic coastlands.

GEOGRAPHICAL LOCATION The delta borders the Adriatic sea for a distance of about 25 km south-eastwards from the town of Ploce at the southern extremity of the Dalmatian region, Republic of Croatia.; it extends inland for 20 km before the boundary of Bosnia Hercegovina and the lower end of the Neretva valley are reached. N 43°02', E 17°27'.

AREA 1,200 ha and 700 ha.

DATE ESTABLISHED

LEGAL PROTECTION The two areas are protected nature reserves.

LAND TENURE State ownership.

CLIMATE

PHYSICAL FEATURES A network of small karstic lakes, some permanent, others only temporary. The whole delta area (500,000 ha) has a very complex hydrographic system with some waters being ologotrophic and others brackish.

VEGETATION Typical vegetation of marshes and wet meadows.

FAUNA A very important passage and wintering area for migrant waterfowl, and a breeding area for Pigmy cormoran Phalacrocorax pygmeus, several species of herons Ardeidae and egrets, Mallard Anas platyrhynchos, Garganey A. querquedula and Ferruginous duck Aythya nyroca, and rails Rallidae.

CULTURAL/HISTORIC FEATURES

MANAGEMENT Freshwaters in the area are used for fishing and hunting, both being controlled. Water management includes flood prevention measures and some use of springs for water supply purposes.

USES Hydrographic studies and other investigations by the Institute of Biology in Belgrade and Sarajevo.

PROBLEMS Severe hunting pressure; intensive development associated with the town of Ploce; hydrographic control and regulation in the sector between the town of Opuzen (half way to Metkovic) and the river-mouth. These have all contributed to a decline in the migrant waterfowl frequenting the delta.

PRINCIPAL REFERENCE MATERIAL

- Carp E., 1980. A Directory of Western Paleartic Wetlands. IUCN, Gland.

CONTACT ADDRESS No information.