MEDITERRANEAN ACTION PLAN
REGIONAL ACTIVITY CENTRE FOR SPECIALLY PROTECTED AREAS

UNITED NATIONS ENVIRONMENT PROGRAMME

INTERNATIONAL UNION FOR CONSERVATION OF NATURE AND NATURAL RESOURCES

DIRECTORY OF MARINE AND COASTAL PROTECTED AREAS IN THE MEDITERRANEAN REGION

PART I

SITES OF BIOLOGICAL AND ECOLOGICAL VALUE

MAP Technical Reports Series No. 26

UNEP
Athens, 1989

Note: The designations employed and the presentation of the material in this document do not imply the expression of any opinion whatsoever on the part of UNEP or IUCN concerning the legal status of any State, Territory, city or area, or of its authorities, or concerning the delimi ation of their frontiers or boundaries.

Note: Les appellations employées dans ce document et la présentation des données qui y figurent n'impliquent de la part du PNUE et de l'UICN aucune prise de position quant au statut juridique des pays, territoires, villes ou zones, ou de leurs autorités, ni quant au tracé de leurs frontières ou limites.

For bibliographic purposes this volume may be cited as:

UNEP/IUCN: Directory of Marine and Coastal Protected Areas in the Mediterranean Region. MAP Technical Reports Series No. 26. UNEP, Athens, 1989.

Pour des fins bibliographiques, citer le présent volume comme suit:

PNUE/UICN: Répertoire des aires marines et côtières protégées de la Méditerranée. MAP Technical Reports Series No. 26. UNEP, Athens, 1989.

This volume is the twenty-sixth issue of the Mediterranean Action Plan Technical Reports Series.

This series contains selected reports resulting from the various activities performed within the framework of the components of the Mediterranean Action Plan: Pollution Monitoring and Research Programme (MED POL), Blue Plan, Priority Actions Programme, Specially Protected Areas and Regional Oil Combating Centre.

TABLE OF CONTENTS

DIRECTORY

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 which entered into force on 23 March 1986. 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 Directory contains the information available in the database on established marine and coastal protected areas.* The information has been derived from three basic sources. The first source was information held by the World Conservation Monitoring Centre of the International Union for Conservation of Nature and Natural Resources in Cambridge, United Kingdom; the second was bibliographic research by the centre; the third source was answers to questionnaires sent to Mediterranean countries by the Mediterranean Co-ordinating Unit, Athens. The Directory includes only those areas designated by governments for inclusion in the Directory and for which sufficient information was provided.

Two groupings of information are contained in this Directory. For each country there is a section of general information or Country Data Sheet concerning marine and coastal conservation at the national level. After each Country Data Sheet there is a separate Area Data Sheet for each designated or established marine or coastal protected area.

The National Focal Points for Specially Protected Areas of the Mediterranean have been asked to review drafts of the information on marine and coastal protected areas held by the Centre during 1988. The Directory contains information received by 30 June 1988.

* This directory concerns the sites of biological and ecological value (SPA Protocol, Article 3, 2a).
A second directory is in preparation and will concern sites of particular importance because of their scientific, aesthetic, historical, archaeological, cultural or educational interest (SPA Protocol, Article 3, 2b).

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. Divjaka National Park (C)
2. Kune Nature Reserve (W)

ALBANIA

DIVJAKA

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

TYPE Coastal

ANNOTATED DESCRIPTION A 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 small 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 is allowed. Along the coast, the presence of fortresses prevents 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 commercial 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 .

LEGAL PROTECTION Total.

LAND TENURE

CLIMATE

PHYSICAL FEATURES The reserve is comprised of 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 has 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

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 a signatory to the Barcelona Convention and relative protocols (including the Specially Protected Areas Protocol), the Ramsar Convention, the World Heritage Convention, the CITES 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

Ministère 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. Gouraya National Park (C)
3. Reghaia Managed Nature Reserve (Centre d'Elevage Cynegetique) (W)
4. Taza National Park (C)

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

GOURAYA

MANAGEMENT CATEGORY National Park

TYPE Coastal

ANNOTATED DESCRIPTION The park covers the mountain at the north-west of Béjaia. This area includes natural, esthetical, historical and archeological features.

GEOGRAPHICAL LOCATION The Park is located in the North West of Béjaia, an covers 10,6km of coastline, from Carbon Cape to Bouak Cape. Geographical coordinates: N 36°46'- E 05°05'.

AREA 1,153.7 ha

DATE ESTABLISHED 1984

LAND TENURE Government owned

LEGAL PROTECTION Establishment Decree No 84-327, 3 November 1984, governed by the Decree 83 458 of 23 July 1983 on natural parks.

CLIMATE Mediterranean climate, with dry summer and rainy winter.

PHYSICAL FEATURES The area is mountainous.

VEGETATION The most typical species are Pancratium foetidum, Lithospermum rosmarinifolum, Convolirilus sabriatus ssp mauritanicus, Mathiola incana, Sinapsis pibescens ssp indurata, Mathiola sinuata, Euphorbia dendroides, Oryzopsis caerubescens, Pennisetum setaceum ssp asperifolium, Bupleurum plangineum and B. fructicosum.

FAUNA Several species are rare, and particularly the monkey Magot Macaca sylvana. It is usual to meet Genetta genetta, Hystrix crustata, and for the birds Gyps fulvus, Hieractus fasciatus, Circaetus gallicus, Bubo bubo.

CULTURAL/HISTORICAL FEATURES Some interesting ancient constructions or remains are in the area, like Gouraya harbour, Lalla Gouraya sepulture, Le Mercier Castle, Oriac Tower, Ruins Plate, Aygades area, and also recent like the lighthouse and the orientation table.

MANAGEMENT The area is managed by the Government. Hunting is prohibited. The exploitation of natural resources is controlled.

USES — Mainly tourism, in summer, for bathing.

PROBLEMS — Tourism pressure in the summer, and particularly illegal camping.

PRINCIPAL REFERENCE MATERIAL

CONTACT ADDRESS

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.

ALGERIA

REGHAIA

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

TYPE Wetland

ANNOTATED DESCRIPTION Permanent marshes behind the sand dunes at the mouth 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 east 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 ha of water). 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.

PRINCIPAL REFERENCE MATERIAL

- EEC 1985. Apercu des Zones de Grand Intérêt pour la Conservation des Espèces 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.

CONTACT ADDRESS

Direction du Centre Cynégétique de Reghaia,
Wilaya de Boumerdes,
Algeria.

ALGERIA

TAZA

MANAGEMENT CATEGORY National Park

TYPE Coastal

ANNOTATED DESCRIPTION The Main features of the park are: - the Marvelous Cave, with stalactites and stalagmites, - Oued Taza Canyon, about 500m long and 100m deep in some place, digged in calcareous rocks, with important population of monkeys, - Oued Bar el Oued Canyon and Guerrouch forest, constituated of Zeena trees, the most important of Algeria.

GEOGRAPHICAL LOCATION The Park is located in the East seashore of Algeria in the Béjaia Gulf. It is part of the Small Babor Kabilie. The Park is in the Jijel Wilaya at 30 km from Jijel and 59 km from Béjaia. It covers 9 km of bays, criques and beaches of the Jijelian Corniche. Geographical coordinates: N 36°41'- E 05°33'.

AREA 3,807 ha

DATE ESTABLISHED 1984

LAND TENURE Government owned for the main part (3,118.76 ha) and some private properties (668.24 ha).

LEGAL PROTECTION Establishment Decree No 84-328, 23 November 1984, governed by the Decree 83 458 of 23 July 1983 on natural parks and the law 83 63 of 5 February 1983 on the Protection of Environment. The effective activity in the park has begun on 1st January 1987. Inside the park, the Marvelous Cave is classified as natural site by the ordinance 62 282 of 20 December 1967.

CLIMATE The climate is typically mediterranean, with rainfall in winter months (November to February) and a long dry summer. Average annual temperature 15°C (winter 12, summer 25). Average annual precipitation 1200mm (winter months 180mm, summer momths 10mm). Principal winds North-East and North West.

PHYSICAL FEATURES It is a rough country, With a succession of antilinal and synclinal of calcareous, from Lias and Jurassic period, with locally sandstone and marl of Neocomian period covered by Quercus. Maximum altitude 1121 m.

VEGETATION The wet vegetation stage can be devided in four series: -(i) the Quercus Zeen serie, with Quercus afareas group, Q. faginea and Vinca difformis group, Q. faginea and Laurius nobilis group and Q. faginea and Agrimonia cupatoria group; -(ii) The Quercus suber

serie, mainly on the south exposed soil, with Q. suber and Cytisis trifloris group which present two facies (with Vibernum timis and Pteridium aquilinum), with Q. suber , Erica arboria, Arbustus unedo, Cistus monspeliensis and Pistacia lentiscus group and with a degradated facies with the presence of Ampelodesma mauritanica: -(iii) the "repissilve "serie along the river with Populus alba and on the boarder of the canyon with Alurus glutivosa, Prunus avium, Salix pedicellata, Fraxinus angustifolia; -(iv) along the seashore, the vegetation is dominated by Olea pistacietum with various facies.

FAUNA The fauna is very rich. Some species are threatened, like for the mammals Macaca sylvana (Barbary macaque), Felis libica (wild cat), Hystrix cristata (porcupine), Mustella nivalis (weasel), Crocuta crocuta (hyena) and Herpeste ichneumon (mongoose). The marine avifauna includes Phalacrocorax aristotelis, P. carbo carbo and Tadorna tadorna. Prey birds are frequent, as Hieraaetus fasciatus (Bonelli's eagle), H. pennatus (Booted eagle), Circaetus gallicus (Short-toed eagle), Gyps vulture (Griffon vulture), Falco peregrinus (Peregrine falcon), Strix aluco (Tawny owl), Tyto alba (Barn owl) and Bubo bubo (Eagle owl).

CULTURAL/HISTORICAL FEATURES Two archeological sites are part of the Taza National park: - Near Soutrouj, between Attis and taza Bay, corresponding to the Paleolithic and Neolithic periods. Each year, national and international archeological teams works here; - Near Oued taza, a natural cave, with ancient bones, is actually studied by National Centre for Historical Studies (CNEH).

MANAGEMENT The area is managed by the Government. Hunting is prohibited. The exploitation of natural resources is controlled. The Director and an Plannification Council are responsibles for the management. The staff is componed of 8 people (3 administrators, 2 wardens, 3 technicians). The annual budget is 300,000 Algerian Dinars provided by Government.

USES 3,000 residents live in the National Park and during the summer, about 100,000 tourists (national and foreigners) visit the park. Three camp sitesavailable for 300 people each are the only management for tourist. Due to this, illegal camping is very frequent. Touristic activities are mainly swimming, bathing and scuba diving. Research facilities include two field stations, one in the park, the other at the periphey. Education activities: a green school is organized once a week, and a botanic path is under preparation for 1988. Controlled human activities such as agriculture, fishing, forestry, hunting and grazing take place in the area.

PROBLEMS The principal environmental problems are the degradation of the forests due to fire, grazing and illegal camping in summer. Insufficent budget, technical equipment and vehicules, untrained personnel represent the main management problems.

REMARKS The management plan of Taza national Park recommand the protection of a marine area. This is waiting for study and evaluation of the most appropriate part (richness, diversity, accessibility).

PRINCIPAL REFERENCE MATERIAL

CONTACT ADDRESS

Ministère 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.

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

Department of fisheries,
Ministry of agriculture and natural resources
Tagmatarchou Pouciou 5-7,
Nicosia,
CYPRUS.

LIST OF ESTABLISHED M/C PROTECTED AREAS

1. Larnaka Lake Nature Reserve (W)
2. Limassol Lake Nature Reserve (W)

CYPRUS

LARNAKA LAKE

MANAGEMENT CATEGORY Permanent Game Reserve

TYPE Coastal Wetland

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

GEOGRAPHICAL LOCATION The reserve is situated on the south-eastern coast of Cyprus, extending from about 2 km 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 The area has a long dry period from June to the beginning of November, with temperatures ranging from 12° - 17°C minimum to 32° -37°C maximum. The rainy season in winter has an annual rainfall of 450 mm and temperatures ranging from 2° -10°C minimum and from to 20° -23°C maximum. There is a short spring with some rain from March to May.

PHYSICAL FEATURES The wetland consists of four lakes, the largest being Aliki with a surface area of 449 ha. The maximum depth of water is about 1m but 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 There is extensive halophytic vegetation in the area surrounding the lake, species such as *Salicornia fruticosa* and the Rushes (*Juncus* sp.) are common.

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. Dunaniella salina and the brine shrimp (Artemia salina) form the basic food source in the lake.

MANAGEMENT The shooting, pursuing or catching of any bird is forbidden. Some management of the water regime has been carried out by the Fisheries Department, in cooperation with the Department of Customs (which is involved in salt collection).

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 the towns of Larnaca and Nicosia, the lake attracts a large number of visitors, specially interested to see the flamingoes. The cysts of Artemia salina are collected in controlled quantities by the Fisheries Department. This is for use in marine aquaculture research and development projects.

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

The Ministry of Agriculture and
Natural resources,
Nicosia,
CYPRUS.

CYPRUS

LIMASSOL (AKROTIRI) LAKE

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

TYPE Coastal Wetland

ANNOTATED DESCRIPTION This is an important site for migrating waterfowl where several species overwinter or breed.

GEOGRAPHICAL LOCATION The reserve is 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 The area is about 2000 ha.

DATE ESTABLISHED 1974

LEGAL PROTECTION Established in 1963 under the Game and Wild Birds (Protection and Development) Law No 39 of 1974. The associated Phasouri Marshes are designated a temporary game reserve.

LAND TENURE Government property.

CLIMATE The area experiences a long dry period without any rain from June to the beginning of November, with temperatures ranging from 16°C to 33°C maximum. There is a short rainy season in the winter with average daily temperatures ranging from 7°C to 18°C and an average annual rainfall of 450mm. There is a 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 Rivers 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 the 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. The Phasouri Marshes are the main breeding ground in Cyprus of the frog Hyla arborea ssp. savignie (Xyla savignie). This is preyed upon by many species of birds and is itself an endangered species.

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 apart from bird observations and occasional bird counts by ornithologists.
There are also some grazing rights held by neighbouring villages in the area of the marshes.

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

SBA Akrotiri Administration,
Ministry of Agriculture and
Natural resources,
Nicosia,
CYPRUS.

EGYPT

AREA 1,000,250 km^2.

LENGTH OF MEDITERRANEAN COASTLINE 1000 km.

AREA OF TERRITORIAL SEA

POPULATION 52,000,000 (1988).

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 Peoples 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 contiguous zone outside the protected area. The protected area was established by the Ministerial Decree and its delimitation is to be drawn up by the Environment 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 Feb' 1984.

PROTECTED AREA ADMINISTRATION The Environment Affairs Agency (EEA), 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 EEA sets up branches in the Governorates where the protected areas are situated. Each protected area is to be administered by a board usually headed by the Govenor of the Governorate and formed of representatives from various ministeries and scientific organizations. Prime Minister's decrees Nos. 1429 of 1985 and 671 Of 1986 established nature reserves in North Sinai (Zaraniq and Bardawil Wetland and Woodland between El Arish and Rafah) and at Omayed on the North-western coast of the Mediterranean.

NATIONAL AUTHORITY ADDRESS

Egyptian Environment Affairs Agency,
Council of Ministers,
11, A Hassan Sabry Street,
Zamalek,
Cairo, Egypt.

LIST OF ESTABLISHED M/C PROTECTED AREAS

1. Bardaweel - El Arish Wetland Nature Reserve (W)
2. El Arish - Rafah Coastal woodland reserve (C)
3. Omayed Nature Reserve (C)
4. Ashtoun el Gamil - Tanees Island (M/C)

EGYPT

BARDAWEEL (Zaranick)

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 — 1985

LEGAL PROTECTION — Established as a Nature Reserve in 1985 based on law 102 concerning natural protectorates. Ministerial decree No. 1429 issued 5 October 1985 prohibits hunting of all birds and animals in the area.

LAND TENURE — No information. Presumably state owned.

CLIMATE — A typical mediterranean arid climate with winter temperatures between 7°C and 20°C and Summer temperatures between 18°C and 33°C. The annual rainfall averages 80-100 mm.

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) and 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 expansion of rainfed 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 Palearctic Wetlands. IUCN, Gland.

CONTACT ADDRESS

Egyptian Environment Affairs Agency,
Council of Ministers,
11, A Hassan Sabry Street,
Zamalek,
Cairo, Egypt.

EGYPT

EL ARISH-RAFAH

MANAGEMENT CATEGORY Nature reserve.

TYPE Coastal.

ANNOTATED DESCRIPTION This is a wooded coastal region stretching from El Arish to Rafah at the border with Israel. The site is an extension to the Bardaweel reserve. The shore consists of series of dunes supporting typical vegetation.

GEOGRAPHICAL LOCATION Situated between the town of El Arish and Rafah on the Israel border. E 34° 02', N 31° 13'.

AREA No information, approximately 40 km of coastline.

DATE ESTABLISHED 1985

LEGAL PROTECTION Established by Prime Ministers decree No. 1429 (1985).

LAND TENURE State owned.

CLIMATE A typical mediterranean arid climate with winter temperatures between 7°C and 20°C and summer temperatures between 18°C and 33°C. The annual rainfall averages 80-100 mm.

PHYSICAL FEATURES No information.

VEGETATION Fixed sand dune vegetation is represented by Ammophila arenaria, Pancratium maritimum and Crucianella maritima. The vegetation of the mobile dunes is largely of Sahara-Sindic origin and includes Euphorbia paralias, Cyperus conglomeralis, Cakile maritima and Silene succulenta.

FAUNA Mammals such as the dorcas gazelle (Gazella dorcas) have been recorded in the area. The Monk seal was last sighted in the marine areas of the park in 1940.

CULTURAL/HISTORICAL FEATURES El Arish, the administrative capital of Sinai, was founded by an Ethopian King of Egypt and was built on the ancient 'Route Maris' constructed 3,000 years ago.

MANAGEMENT The area is administered by the Executive council with representation from the ministries of tourism, agriculture, defence, interior, the ASRT, the EEAA and the Sinai development authority.

USES El Arish has a population of 30,000 (1973). Sand is extracted from the area.

PROBLEMS No information.

PRINCIPAL REFERENCE MATERIAL

- Brunn, B. (1986). Two new protected areas in Northern Sinai. Sinai Newsletter, 4.

CONTACT ADDRESS

Egyptian Environment Affairs Agency,
Council of Ministers,
11, A Hassan Sabry Street,
Zamalek,
Cairo, Egypt.

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. The area is of some geological interest.

GEOGRAPHICAL LOCATION The Reserve lies 7 km south of the village of Omayed, 80 km west of Alexandria and extends 21 km south from the Mediterranean seashore. N 30° 45'- E 28° 42'- 29° 23'.

AREA 7000 ha with a core area of 100 ha.

DATE ESTABLISHED Established as a Nature Reserve in 1986. Accepted as a Biosphere Reserve in October 1981. A prime ministerial decree for the area was issued in 1986.

LEGAL PROTECTION At present rented by the Remdene project (Regional Environmental Management of Mediterranean Ecosystems of Northern Egypt). The area is also now protected by primeministerial decree.

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 The area experiences a yearly average temperature of 20° C varying from an average of 15° C in January to 24° C in August. There is a mean annual precipitation of 130 mm the major part of this falling in the winter months. The prevalent wind is NW with an average speed of 25 km h^{-1}.

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 oolitic limenstone crusts. Altitude: 0-110 m, although less than 60m along the coast. The area can be divided into three physiographic regions; the coastal area, the ridges and depression system constituting the main part of the area and finally the inland plateau

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 The area is relatively rich in fauna considering the low rainfall. The gazelle (Gazella dorcas) can be found as well as the almost extinct desert fox, gerbils and the mole-rat. Ma.., species of birds are also resident common of which is the quail which is caught in large numbers. Other birds are generally predators. There are about 10 species of reptiles including, lizards, vipers and the rare tortoise. About 300 species of arthropods have been recorded. A rare species of protozoa has been discovered at Omayed.

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 23 of which about 10 are engaged in research, 3 are administrators, 4 are guards and 6 employed as labourers. Members of the local community assist in running the reserve and in monitoring research experiments. The area is administered by alocal board and research, training and monitoring activities are run in conjunction with Alexandria University. Several projects are intended for the reserve such as research into land management (introduction of animal and plant species and the rehabilitation of the area's ecology) and the use of the site as an educational centre for natural history and cultural activities. It is hoped that the reserve will become a model example for research and training into desert ecosystems and their management.

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 There is insufficient control or regulation of the reserve and a distinct lack of adequate equipment. Extensive desertification is an increasing problem in this region.

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).
- Ayyad, M. A. (1975-1983) Progress Reports on the Mediterranean desert ecosystems of Northern Egypt.

CONTACT ADDRESS

Egyptian Environment Affairs Agency,
Council of Ministers,
11, A Hassan Sabry Street,
Zamalek,
Cairo, Egypt.

EGYPT

ASHTOUN EL GAMIL - TANEES ISLAND

MANAGEMENT CATEGORY Nature Reserve

TYPE Coastal and Marine (C/M)

ANNOTATED DESCRIPTION The Lake Manzalah is in connection with the Mediterranean through Ashtoun El Gamil (10 km West of Port Saïd). In front of the mouth of the Lake is located Tanees Island. All the area is a very important place for birds.

GEOGRAPHICAL LOCATION Lake Manzalah lies between Damietta Nile Branch in West and Suez Canal in East. The mouth of the lake is located N 31° 18' and E 32° 11'.

AREA

DATE ESTABLISHED 1988 (April)

LEGAL PROTECTION The area is protected by Prime Ministerial Decree n 459/1988 issued April 21th, 1988.

LAND TENURE State owned.

CLIMATE A typical mediterranean climate with winter temperatures between 12°C and 20°C and summer temperatures between 18°C and 33°C. The annual rainfall averages 75-150 mm. The winds are mainly northern, north-eastern and western during summer and north eastern, northern, southeastern and western during winter, with a direct influence on the exchanges between the lake and the open sea. The water temperature in the lake varies from 13° in winter to more than 30° in summer.

PHYSICAL FEATURES The lake Manzalah covers approximatively 144,000 hectares, with very shallow waters (60-100cm), brackish receiving marine water in the north and nearly freshwater from drains in the south. The bottom of the lake is muddy or sandy, with local accumulation of Cardium.

VEGETATION Most of the shallower areas are densely planted mainly with rooted plants (Phragmites, Potamogeton, Ceratophyllum and Najas species.

FAUNA The area is an important wintering place for numerous birds, like Phalacrocorax carbo, Egretta alba, Ardea cinerea, Tadorna tadorna, Anas crecca, A. clypeata, Circus aeruginosus, Fulica atra, Recurvirostra avosetta, Charadrius alexandrinus, Calidris alba, C. minuta, C. alpina, Tringa totanus, Larus genei, Chlidonias hybridus, Alcedo atthis, Motacillidaes, Luscinia svecica.
Numerous fishes are caught in the lake and at the entrance, freswater fishes like Cichlidae (Tilapia), Siluridae, Cyprinidae and Serranidae, and euryhaline or haline fishes like Mugilidae, Anguillidae, Serranidae, Sparidae, Clupeidae and Pleuronectidae.

MANAGEMENT

USES The main activity on the lake are the fisheries.

PROBLEMS

PRINCIPAL REFERENCE MATERIAL

CONTACT ADDRESS

Egyptian Environment Affairs Agency,
Council of Ministers,
11, A Hassan Sabry Street,
Zamalek,
Cairo, Egypt.

FRANCE

AREA 543,965 km 2

LENGTH OF MEDITERRANEAN COAST about 1700 km

AREA OF TERRITORIAL SEA

POPULATION 55,282,000 (1986)

PROTECTED AREA LEGISLATION The two most important texts allowing for the protection of areas and particularly of coastal areas are the following:
- Act No 76.629 of 10 July 1976 on nature conservation (and its enforcement orders) which is chiefly concerned with the establishment of Nature Reserves.
- Act No 60.708 of 27 July 1960 which provides a general framework for the establishment of National Parks.

Specific legislations are applied for hunting reserves and particularly for marine fishing reserves, national ("domanial") biologic reserves, classified and listed areas, regional natural parks (modified enforcement of 24 October 1975).

Two others texts can be also used in order to protect some areas:
- the first one covering the acquisition made by the "Conservatoire de l'Espace Littoral et des Rivages Lacustres" which is an administrative public establishment created on the 10 July 1975 with the aim of forming political safeguards for natural coastal habitats;
- the second concerns the new rules established by the Act 86-2 of 3 January 1986 covering the development, the conservation and the evaluation of the coastal area.

France signed the World Heritage Convention on September 1985 and the Specially Protected Areas Protocol on 2 September 1986 (approval with reservation).

PROTECTED AREA ADMINISTRATION Administrative responsibility for nature, areas and landscapes conservation is by the Ministry of the Environment.
The responsibilities are divided amongst:
- The Directorate for the Protection of Nature, which acts for the conservation of fauna and flora, for the establishment and the management of natural reserves and national parks, and for the legislation of hunting and fishing;
- The Directorate for Architecture and Town Planning which acts for the protection of the landscape.
The management of some of the areas is under the responsibility of the State, as for the National Parks, or of others administrations (regional, departemental or municipal level) or associations for nature conservation or for hunting. It is important to implicate local responsibilities in the conservation and the evaluation of the natural heritage.

NATIONAL AUTHORITIES ADDRESS

Ministère de l'Environnement
Protection de la Nature,
14 Boulevard du Général Leclerc,
92521 Neully-sur-Seine,
Paris, France.

ESTABLISHED MARINE/COASTAL PROTECTED AREAS

1. Camargue National Reserve- Camargue Regional Natural Park (W)
2. Cerbere-Banyuls Marine Reserve (M)
3. Cerbicales Islands Nature Reserve (C)
4. Aquisitions of the 'Conservatoire de l'Espace Littoral et des Rivages Lacustres' C.E.L.R.L., (C).

4. 1 Pla de les Forques	4. 2 Mas Larrieu
4. 3 Le Lido	4. 4 La Ribère
4. 5 Mas de l'Isle	4. 6 Ile Sainte Lucie
4. 7 Ile de l'Aute	4. 8 Le Doul
4. 9 Le Grand Castelou	4.10 L'Oustalet
4.11 Les Orpellières	4.12 Les Aresquiers
4.13 Etang de Vic	4.14 Etang de Méjean
4.15 Le Petit Travers	4.16 Etang de l'Or
4.17 Tartuguières	4.18 Pointe de l'Espiguette
4.19 Chateau d'Avignon	4.20 Méjanes
4.21 La Palissade	4.22 Le Mazet
4.23 Ligagneau	4.24 La Côte Bleue
4.25 La Fontasse	4.26 Presqu'île de Port Miou-Ris
4.27 La Galère	4.28 Bois de Courbebaisse
4.29 Font Brun	4.30 Escampobariou
4.31 Vallon du Fenouillet	4.32 Casteu dou Souleu
4.33 Pointe du Dattier	4.34 Cap Mimosa
4.35 Cap Lardier	4.36 Briande
4.37 Cap Camarat	4.38 Etangs de Villepey
4.39 Bois de la Garoupe	4.40 Le Mont Vinaigrier
4.41 Le Cabanon Le Corbusier	4.42 Cap corse
4.43 Punta du Ceppo-Etang du Loto	4.44 Pointe de Curza
4.45 Les Agriates	4.46 Pointe de Spano
4.47 Pinia	4.48 Terrenzana
4.49 Mucchiatana	4.50 Caspiu
4.51 Bussaje	4.52 Capo Rosso
4.53 Pointe d'Omignia	4.54 Pointe de Cargèse
4.55 Spelunca	4.56 Pointe de Molendino
4.57 Pointe de Trio	4.58 Capo di Muro
4.59 Pointe de l'Uomo	4.60 Migini
4.61 Eccica	

5. Corsica Natural Regional Park (C)
6. Estagnol Nature Reserve (W)
7. Fango Biosphere Reserve (C)
8. Lavezzi Islands Nature Reserve (C/M)
9. Port Cros National Park (M/C)
10. Scandola Nature Reserve (M/C)

FRANCE

CAMARGUE NATIONAL RESERVE

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

TYPE Coastal Wetland

ANNOTATED DESCRIPTION The most important wetlands 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 and the Petit Rhône in the West and including a beach of fine sand.

GEOGRAPHICAL LOCATION The area is situated on the Rhône Delta, south of Arles, Bouches-du Rhône and near the townships of Arles and 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 The area has a typically Mediterranean climate with hot, dry summers and mild rainy winters. 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). The prevalent winds are from NW (50-100 km/h) and SE (30-70 km/h). Mean water temperature 15 o 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 50% 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 are present in the reserve.

MANAGEMENT The administration and management of the reserve are under the responsibility the Director of the Société Nationale 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, region).
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 1 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 150 ha 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 Diplôme Européen pour la Sauvegarde de la Nature. Réserve 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.

ALSO 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. Département Pyrénées-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 expérimental-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 (20-30 m) 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, 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 administrator, 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 specimens 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 The area is a major tourist resort and the reserve is subject to heavy pressure particularly in summer months. The inclusion of the coastal zone in the Reserve has been proposed 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. The lack of a Reserve center for visitor orientation activities, the limited number of patrolling personnel, and delays in receiving financial subsidies are also problems..

PRINCIPAL REFERENCE MATERIAL

- Binche J.L., 1984. Protection de la Mer. La Réserve Naturelle Marine de Cerbère-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 (CORSICA)

CERBICALES ISLANDS

MANAGEMENT CATEGORY Nature Reserve

TYPE Coastal

ANNOTATED DESCRIPTION The reserve of the Cerbicales archipelago includes four small islands and a group of islets: Forana (3 ha), Maestro Maria (3 ha), Piana (16 ha), Pietricaggiosa (13 ha), and Vacca. These are all covered in maquis vegetation and are host to 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. (N 41°33', E 09°23').

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 République 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 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. Average 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. Première Contribution à la Connaissance de la Géologie des Iles Cerbicales et Lavezzi. Parc Naturel Régional 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

Réserves des Iles Cerbicales et Lavezzi,
Parc Naturel Régional de Corse,
BP 417,
20184 Ajaccio Cedex,
France.

FRANCE

AQUISITIONS OF LE CONSERVATOIRE DE L'ESPACE LITTORAL ET DES RIVAGES LACUSTRES (CELRL).

MANAGEMENT CATEGORY: Managed nature reserves.

TYPE: Coastal.

ANNOTATED DESCRIPTION: The CELRL is an administrative public establishment created on the 10 July 1975 with the aim of forming political safeguards for natural coastal habitats. In effect, because of the limitation of the protection legislation, the state felt it necessary to assure protection of the coastal zones which are threatened by present and proposed urban and tourism expansion programmes. The lands of the CELRL are either bought (by compulsory purchase), in which case they cannot be subsequently put back on the buying market, or are received as gifts or legacies or else they are already in state posession.
The administrative council is composed of 34 members, half of whom are elected and half of whom are representatives of administration or specialists of groups responsible for environmental protection. It defines the policy of the CELRL and determines its buying policy after consultation with the Conseils des Rivages. These are composed of regional and general councillors. There are two Conseil des Rivages for the Mediterranean coast in France, one for Languedoc-Roussillon and Province-Alpes-Cote d'Azur and one for Corsica.

LOCATION: As at the 1 July 1985 there are 70 sites owned by the CELRL. There are 18 in the Languedoc-Roussillon region, 23 in the Provence-Alpes-Côte d'Azur region and 29 on Corsica. The following table gives a summary of the sites' location and their areas.

KEY

IND=	Number representing the region on the map.
NOM=	The name of the area.
VILLE=	The town or community to which the area is based.
DEP=	The managerial department: PO=Pyrénées Orientales, A=Aude, G=Gard, BR=Bouches du Rhône, V=Var, AM=Alpes Maritimes, HC=Haute Corse, CS=Corse du Sud.
REG=	Region concerned: LR=Languedoc-Roussillon, PACA=Provence-Alpes-Côte d'Azur, HC=Haute Corse, CS=Corse du Sud
SUP/ha=	Area in hectares.

IND	NOM	VILLE	DEP-REG	SUP/ha
1	PLA DE LES FORQUES	Collioure	PO-LR	12
2	MAS LARRIEU	Argelès	PO-LR	53
3	LE LIDO	Canet-St Nazaire	PO-LR	894
4	LA RIBERE	Torreilles	PO-LR	49
5	MAS DE L'ISLE	Le Barcarès	PO-LR	47
6	ILE SAINTE LUCIE	Port la Nouvelle	A-LR	227
7	ILE DE L'AUTE	Sigean	A-LR	40
8	LE DOUL	Peyriac sur Mer	A-LR	125
9	LE GRAND CASTELOU	Narbonne	A-LR	72
10	L'OUSTALET	Fleury d'aude	A-LR	383
11	LES ORPELLIERES	Sérignan-Valras	H-LR	128
12	LES ARESQUIERS	Frontignan-Vic la Gardiole	H-LR	127
13	ETANG DE VIC	Villeneuve les Maguelonne-Vic la Gardiole	H-LR	1338
14	ETANG DE MEJEAN	Lattes Palavas	H-LR	90
15	LE PETIT TRAVERS	Mauguio	H-LR	158
16	ETANG DE L'OR	Candilargues	H-LR	75
17	TARTUGUIERES	Lansargues	H-LR	158
18	POINTE DE L'ESPIGUETTE	Le Grau du Roi	G-LR	112
19	CHATEAU D'AVIGNON	Saintes Maries-Mer	BR-PACA	274
20	MEJANES	Saintes Maries-Mer	BR PACA	64
21	LA PALISSADE	Arles	BR PACA	702
22	LE MAZET	Port Saint Louis du Rhône	BR-PACA	95
23	LIGAGNEAU	Arles	BR PACA	449
24	LA COTE BLEUE	Ensuès la Redonne Le Rove	BR-PACA	3129
25	LA FONTASSE	Marseille Cassis	BR-PACA	243
26	PRESQU'ILE DE PORT MIOU PLAINE DU RIS	Cassis	BR-PACA	132
27	LA GALERE	Saint Cyr sur Mer	V-PACA	30
28	BOIS DE COURBEBAISSE	Le Pradet	V-PACA	5
29	FONT BRUN	Carqueiranne	V-PACA	17
30	ESCAMPOBARIOU	Hyères	V-PACA	41
31	VALLON DU FENOUILLET	Cavalaire	V-PACA	22
32	CASTEU DOU SOULEU	Cavalaire	V-PACA	15
33	POINTE DU DATTIER	Cavalaire	V-PACA	6
34	CAP MIMOSA	La Croix Valmer	V-PACA	114
35	CAP LARDIER	La Croix Valmer	V-PACA	103
36	BRIANDE	La Croix Valmer	V-PACA	11
37	CAP CAMARAT	Ramatuelle	V-PACA	52
38	ETANGS DE VILLEPEY	Fréjus	V-PACA	109
39	BOIS DE LA GAROUPE	Antibes	AM-PACA	9
40	LE MONT VINAIGRIER	Nice	AM-PACA	25

IND	NOM	VILLE	DEP/REG	SUP/ha	DATE
41	LE CABANON LE CORBUSIER	Roquebrune Cap Martin	AM-PACA	1	
42	CAP CORSE	Rogliano	HC-C	365	
43	PUNTA DU CEPPO-ETANG DU LOTO	Santo Pietro di Tenda-Saint Florent	HC-C	506	
44	POINTE DE CURZA	Santo Pietro di Tenda	HC-C	108	
45	LES AGRIATES	Palasca, San Gavino, Santo Pietro di Tenda	HC-C	3933	
46	POINTE DE SPANO	Lumio	HC-C	42	
47	PINIA	Ghisonaccio	HC-C	299	
48	TERRENZANA	Tallone	HC-C	127	
49	MUCCHIATANA	Venzolasca	CS-C	75	
50	CASPIU	Osani Partinello	CS-C	37	
51	BUSSAJA	Serreira	CS-C	11	
52	CAPO ROSSO	Piana	CS-C	64	
53	POINTE D'OMIGNIA	Cargèse	CS-C	61	
54	POINTE DE CARGESE	Cargèse	CS-C	20	
55	SPELUNCA	Cargèse	CS-C	9	
56	POINTE DE MOLENDINO	Cargèse	CS-C	20	
57	POINTE DE TRIO	Viso	CS-C	20	
58	CAPO DI MURO	Coti Chiavari	CS-C	202	
59	POINTE DE L'UOMO	Belvedere Campomoro	CS-C	24	
60	MIGINI	Belvedere Campomoro	CS-C	48	
61	ECCICA	Belvedere Campomoro	CS-C	535	

AREA The total area owned by the CELRL is 17,864 ha.

DATE OF PROTECTION 10 July 1975.

LEGAL PROTECTION As a result of the law of the 10 July 1975, all the sites are covered by special protection statutes.

TENURE The sites aquired by CELRL are untransferable and cannot be developed or resold. They are safeguarded for future generations.

MANAGEMENT The main problem for the CELRL is that it is only able to buy the sites, management of these protected areas has to be passed to local comminities, public establishments or appropriate societies. The budget in 1985 was 92 MF.

USES The areas are open to the public. Development of the sites is prohibited.

PROBLEMS

REFERENCES

CONTACT ADDRESS

Conservatoire de l'Espace Littoral et des Rivages Lacustres
78, avenue Marceau
75008 Paris - France

FRANCE

CORSICA NATURAL REGIONAL PARK

MANAGEMENT CATEGORY — Regional park.

TYPE — Coastal.

ANNOTATED DESCRIPTION — This is a large area which includes the Scandola reserve at its seaward extent and covers much of the inland of Corsica including all of the major peaks (Cinto, Rofondo, Monte d'Oro, Reuso and Incudine).

GEOGRAPHICAL LOCATION — Along the coast the park extends from Crovani bay (E 08° 41', N 42° 29') to Cap Rosso (E 08° 32', 42° 14'). It extends some 70 km inland and is a maximum of 110 km long, running down the spine of the island.

AREA — The park covers a total area of 220,000 ha, over 30% of the island, with a coastline approximately 75 km long.

DATE ESTABLISHED — 1972

LEGAL PROTECTION — The park was established by decree No. 72-397 on the 12th May 1972.

LAND TENURE — The park is owned partly by the state, partly by the communities and partly by private concerns.

PHYSICAL FEATURES — The area is mountainous reaching a maximum altitude of 2710 m.

VEGETATION — The coastal and lowland vegetation has been greatly modified by agriculture and tourism but maquis is still widespread to a height of 800 m, especially on the siliceous soils, where oaks (Quercus ilex, Q. suber) and pines (Pinus halepensis) are found. In the supra-mediterranean zone (800-1000 m) there is a mixed deciduous and evergreen woodland with Q. pubescens, P. nigra and Castanea sativa. In the mountain areas (1000-1700 m) the forests are mainly of beech and pine (P. nigra laricio), although in the north there is a sub-alpine zone (1600-2100 m) with white fir (Abies alba) and alder bushland. In the south, between 1800-2200 m there is a shrub belt with juniper, and an alpine region (above 2100 m) with species rich grasslands.

FAUNA — Wild sheep (Ovis orientalis) are found on the higher mountains and in the more humid regions wild boar (Sus scrofa) and deer (Cervidae) are common. Nesting bird include the Golden eagle (Aquila chrysaetus), lammergeier (Gypaetus barbatus) and the corsican nuthatch (Sitta whiteheadi). There are 13 endemic species of beetle.

CULTURAL/HISTORICAL FEATURES The park contains archeological sites from the neolithic to the Roman eras.

MANAGEMENT The park employs a total of 49 personnel; 25 guards, 7 technicians, 3 researchers and 7 seasonal workers. The present annual budget is 13,000,000 FF. There is also an Association of Friends of the Natural Park who are involved in its support and administration.

USES 800,000 tourists visit the area yearly. The main pastimes are walking, horse riding, skiing, pot holing, swimming and fishing and camping. Hunting, grazing and forestry also occur in the area along with traditional hill farming. The Park includes 58 villages and about 20,000 inhabitants. Farming of Chestnuts is also carried out in the area. The research teams have made inventories of the fauna and flora of the area as well as studies to protect rare species which are found in the park (alpine flora, wild sheep, the lammergeier and buzzards and trout). Prevention of fires is also a major concern for the administration.

PROBLEMS Fires are the major problem for the parks, along with the pressure caused by the large numbers of visitors to the area (mainly in the summer).

PRINCIPAL REFERENCE MATERIAL

- Conrad, M. (1973). Promenades en Corse parmi ses fleurs et ses forêts. Archives départementales, Ajaccio.
- Thibault, J.C. (1977) Les Oiseaux de la corse.
- Miniconi, R. et al. (1980). Poissons de corse et de Méditerranée. Découverte de la Nature No 21.

CONTACT ADDRESS

Parc Natural Régional de Corse,
BP 417,
20184 Ajaccio CEDEX,
CORSE.

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. It is an important area for nesting and migratory birds. Essentially it is 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. (N 43°30', E 03°50').

AREA 75 ha

DATE ESTABLISHED 1975

LEGAL PROTECTION Established by Ministerial Decree (Arrêté Ministériel de classement) of 19 November 1975 (Journal Officiel de La République Francais No 12967).

LAND TENURE Government owned (Office National de la Chasse)

CLIMATE The area has a typical mediterranean climate with periods of 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.), there are also 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 Général 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 permission is prohibited. Muddy pools 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 Réserves 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 (CORSICA)

FANGO BIOSPHERE RESERVE

MANAGEMENT CATEGORY: Biosphere Reserve

TYPE: Coastal.

ANNOTATED DESCRIPTION: The Biosphere Reserve includes mainly a forest of Quercus ilex which covers part of the Fango Valley.

GEOGRAPHICAL LOCATION: From an altitude of 1800m to 100m, with a project of extension until the coast (Galeria Bay), the Biosphere Reserve covers a large area (E 08° 42', N 42° 24'). The nearest town is Calvi.

AREA: The Fango Biosphere reserve (6,410 ha) is part of Corsica Natural Park, which covers a total area of 220,000 ha.

DATE ESTABLISHED: The Corsica Natural park has been created in 1972, the designation as Biosphere reserve has been made in 1977.

LEGAL PROTECTION: The park was established by decree No. 72-397 on the 12th May 1972.

LAND TENURE: The Reserve is a forest owned by government (Forêt Domaniale).

PHYSICAL FEATURES: The actual extension include the valley from about 100m to 1300m altitude. The reserve is part of the large volcanic-plutonic complex of Cinto massif and Fango valley.

VEGETATION: The vegetation is mainly constituted of Quercus ilex, adaptated to siliceous soils and of maquis.

FAUNA: The fauna is typical of the forest of Quercus ilex, with some endemic species (13 species of beetles) (lizzard). Ovis orientalis, Sus scrofa and deer (Cervidae) can be met in the Reserve. Numerous birds also nest in the valley.

CULTURAL/HISTORICAL FEATURES: No information.

MANAGEMENT: The Reserve is managed by the Corsica Natural Park, with an Association of Friends of the Natural Park who are involved in its support and administration. The creation of a scientific committee fro the reserve is scheduled. A field study Centre can receive 30 people for scientific studies (actually on birds, bats, lizzards).

USES No important activities. Grazing, walking for tourists.

PROBLEMS

PRINCIPAL REFERENCE MATERIAL

- Conrad, M. (1973). Promenades en Corse parmi ses fleurs et ses forêts. Archives départementales, Ajaccio.
- Thibault, J.C. (1977) Les Oiseaux de la Corse.

CONTACT ADDRESS

Parc Natural Régional de Corse,
BP 417,
20184 Ajaccio CEDEX, CORSE FRANCE
Director: Mr Leenhardt.
Actual Contact: Mr Lenck

FRANCE (CORSICA)

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 The reserve is situated in the extremely southern part of Corsica, 11 km from Bonifacio. Département Corse du Sud, Commune de Bonifacio. (N 41°00', E 09°15').

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 The channel known as the Mouth of Bonifacio (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 (68 ha), 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 bigger island of Lavezzi is irregularly shaped with a relatively flat surface (average altitude 5 m) but there are 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 depth 75 m, average depth 35-40 m.

VEGETATION The islands are characterized by the rarity of arboreal species and by the presence of several endemics. They are mainly

covered by a low herbaceous vegetation dominated by Helichrysum italicum, with patches of the rare Silene velutina and Allium spp. In the sea, large meadows of Posidonia oceanica and Dilophus fasciola are present.

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 the Mouth of Bonifacio until 1960. Rich marine biocenoses and migrations of pelagic fishes occur.

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

MANAGEMENT The area 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. Première Contribution à la Connaissance de la Géologie des Iles Cerbicales and Lavezzi. Parc Naturel Régional 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 Réserves Naturelles des Iles Cerbicales et Lavezzi,
Parc Naturel Régional de Corse,
BP 417,
20184 Ajaccio Cedex,
France.

FRANCE

PORT CROS

MANAGEMENT CATEGORY National Park

TYPE Coastal/Marine

ANNOTATED DESCRIPTION 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 600 m wide zone around the islands of Port-Cros and Bagaud which constitutes the marine portion of the Park. Although there has been historically 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 (Ministère de l'Environnement 200 ha, Ministère de la Défense 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. Principal 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 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. Max altitude 196 m (Mt. Vinaigre); max depth 95 m, average depth 40 m.

VEGETATION The terrestrial flora is relatively limited but the woody vegetation dominated by Pinus pinea 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 Delphinus delphis, Tursiops truncatus. The monk seal was last sighted in the 1950's.

CULTURAL/HISTORIC FEATURES Several military fortresses built in the XVI century and later are being restored.

MANAGEMENT The Park is managed by an Administration Council of 27 members which receives the technical advice of a Scientific Committee. A total of 30 persons work in the park, 5 of which are patrolling guards. Auxiliary guards join the patrolling force during the summer months. The total annual budget is 11,000,000 French Francs.
Following the adoption of a five year management plan, 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 have been 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, traditional 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 degradating 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, Hyères. 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 (CORSICA)

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 extremely wealthy marine biocenoses. The Regional Natural Park of Corsica (220,000ha) 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 Régional 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 precipitations concentrated in fall and spring months. Average annual precipitation 750 mm; average annual temperature over 10°C. Dominant 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. Rough coast with steep cliffs of red porphyry and ryolyth, basaltic columns deeply eroded by the sea, several grottoes and rocky islets. Max altitude 560 m. (Capu Purcile); max depth 100 m.

VEGETATION The halophyle vegetation of the littoral zone is 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 steep areas 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 algae macrophytes including the rare Rhodophyceae are found on hard substrata.

FAUNA The rocky cliffs are inhabited by numerous couples of Larus argentatus (700-800), black cormorant (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 There are 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 shepards 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 Régional de Corse. La Réserve Naturelle de Scandola. Papecor, Ajaccio. Brochure of a selected bibliography of the scientific litterature.
- Ruggeri C., 1981. La Pression Humaine sur Scandola. Parc Naturel Régional de Corse, Ajaccio. A study on the monk seal is included.
- Boudouresque C.F., 1980. Phytocenoses Benthiques de la Réserve Naturelle de Scandola. Parc Natural Régional de Corse, Ajaccio.

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

GREECE

AREA	131,955 km^2
LENGTH OF MEDITERRANEAN COASTLINE	16,600 km
AREA OF TERRITORIAL SEA	105,000 km^2
POPULATION	9,740,417 (1981)

PROTECTED AREA LEGISLATION National Parks, Aesthetic Forests and Monuments of Nature are established by the Greek Forest Service under Presidential Decree No. 996 of 1971. Law No.998 of 1979 on forests and forest land protection additional to the above includes wetlands in the protected areas. A law for Physical Planning and the Protection of the Environment covered until recently environmental planning and the marine environment of the entire territory (Law No. 360, 18 June 1976). It provided institutional and procedural mechanisms for the preparation of national and regional plans. A new institutional law (L. 1650/Sept. 1986) is in force, which includes sections covering, inter alia, the protection of natural resources, landscapes, marine parks, environmental protection of planning and the establishment of responsible organizations. Prefectural and Ministerial decissions as well as Presidential Decrees have been issued for the protection of threatened species and their biotopes (Monachus monachus in North Sporades and Caretta caretta in Zakinthos).
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) and 3 inland (M. Prespa, Yolvi-Lagada Lakes, Kerkini Lake). Studies have been completed for each one of these sites and Presidential Decrees are under preparation to define individual boundaries and management plans.
The Specially Protected Areas Protocol of the Barcelona Convention has been ratified by Greece and is now enshrined in 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 the Environment, Physical Planning and Public Works.

NATIONAL AUTHORITY ADDRESSES

Ministry of Agriculture
Department for the Protection of Forests,
Ippocratous 3 - 5,
10164 Athens,
Greece.

ALSO

Ministry of the Environment,
Physical Planning and Public Works,
Department of Environment,
Section for the Conservation of Nature,
Pouliou 8,
11523 Athens,
Greece.

ESTABLISHED M/C PROTECTED AREAS

1. Nicopoli-Mytikas (Preveza Seashore) Aesthetic Forest (C)
2. Pefkias-Xylokastron Aesthetic Forest (C)
3. Piperi Island monument of Nature (Part of the Northern Sporades Marine Park) (C)
4. Samaria Gorge (Lefka Ori) National Park (C)
5. Sigri petrified forest (Lesvos Island) Monument of Nature (C)
6. Skiathos Island Aesthetic Forest (C)
7. Sounio National Park (C)
8. Vai Aesthetic Forest (C)

GREECE

NICOPOLI - MYTIKAS

MANAGEMENT CATEGORY: Managed Nature Reserve (Aesthetic Forest)

TYPE: Coastal

ANNOTATED DESCRIPTION: Artificial forest and extended sandy beaches close to an important archeological site.

GEOGRAPHICAL LOCATION: To the north of Preveza city, Preveza Prefecture, close to the entrance of Amvrakicos Gulf.

AREA: 66 ha.

DATE ESTABLISHED: 5 May 1977

LEGAL PROTECTION: Protected by Presidential Decree published on the 7 June.

LAND TENURE: .

PHYSICAL FEATURES: Altitude: sea level.

VEGETATION: The majority of the trees of the artificial forest are Pinus halepensis.

FAUNA: Small mammals and birds.

MANAGEMENT: The area is protected and the vegetation maintained and completed.

USES: The area is used for touristic reasons.

PROBLEMS

PRINCIPAL REFERENCE MATERIAL

CONTACT ADDRESS: Ministry of Agriculture,
Department for the Protection of Forests,
Ippocratous 3 - 5,
10164 Athens,
Greece.

ALSO Ministry of the Environment,
Physical Planning and Public Works,
Department of Environment,
Section for the Conservation of Nature,
Pouliou 8, 11523 Athens,
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 Xylokastron city, Korinth prefecture. 38° 04' N, 23° 38' E.

AREA 27.5 ha.

DATE ESTABLISHED 12 March 1974.

LEGAL PROTECTION Total protection, under Presidential Decree 198/18.3.1974.

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. The construction of a water supply network (3500m) has been completed in order to prevent fires. 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

Ministry of Agriculture,
Department for the Protection of Forests,
Ippocratous 3 - 5,
10164 Athens,
Greece.

GREECE

PIPERI ISLAND / NORTHERN SPORADES

MANAGEMENT CATEGORY Monument of Nature.

TYPE Coastal

ANNOTATED DESCRIPTION Piperi Island, as well as the adjacent islands of Yura, Skantzoura, Kyra Panagi, etc., are one of the most important biotopes (breeding areas) of the monk seal Monachus monachus.

GEOGRAPHICAL LOCATION Piperi Islands belongs to the Northern Sporades insular complex, Magnesia Prefecture.

AREA .

DATE ESTABLISHED 21 February 1980

LEGAL PROTECTION Designated for protection by a Decision of Natural Council for Public Plan and Environment (1980). A Presidential Decree has been signed and is expected to be officially published soon (1988), for the establishment of a Marine Park in the area and its protection.

LAND TENURE .

PHYSICAL FEATURES .

VEGETATION .

FAUNA The most important and endangered species in the area is Monachus monachus.

MANAGEMENT Specific management plan has been undertaken by the governement in co-operation with the E.E.C. Breeding station is under construction. Public awareness campaigns have been launched.

USES Ecological studies by Universities under the guidance of the Ministry of the Environment.

PROBLEMS Wrong information to fishermen, in some cases, concerning monk seal and their impact on fish catches. Disturbance of monk seal from tourists.

PRINCIPAL REFERENCE MATERIAL

CONTACT ADDRESS Ministry of the Environment,
Physical Planning and Public Works,
Department of Environment,
Section for the Conservation of Nature,
Pouliou 8, 11523 Athens, Greece.

GREECE

SAMARIA GORGE (LEFKA ORI)

MANAGEMENT CATEGORY: National Park and Biosphere Reserve
European Diploma Award 1979 and 1985.

TYPE: Coastal

GEOGRAPHICAL LOCATION: The area is located in the White Mountains (Lefka Ori) on the island of Crete, 45km south of Chania. 35° 14'-35° 20'N; 23° 49'-23° 54'E.

AREA: 4,850ha (core zone). Proposal to extend the Park by 4,000ha to the coast.

DATE ESTABLISHED: 6 November 1962

LEGAL PROTECTION (Greek Forest Service): Total protection under governmental jurisdiction Royal Decrees 781/20-11-62 and 74/15-2-64.

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. There are exceptional geological formations of limestone and silica schist. Altitude: sea level to 2,116m (Volacias peak). Total lenght: 18 km.

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), heather (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), and the rock rose (Cistus salvaefolius and C. creticus). There are 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 the bearded vulture or lammergeier Gypaëtus barbatus, griffon vulture Gyps fulvus and golden eagle Aquila chrysaetos.

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

USES There is a rapidly increasing tourist traffic ca. 150,000 per year. There is no accommodation in the Park but overnight accommodation is available in Aghia Roumeli, hotels in Chania 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 There is illegal hunting and grazing in the remote areas. Danger from forest fires caused by summer visitors is a constant threat.

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

Ministry of Agriculture,
Department for the Protection of Forests,
Ippocratous 3 - 5,
10164 Athens, Greece.
Ministry of the Environment,
Physical Planning and Public Works,
Department of Environment,
Section for the Conservation of Nature,
Pouliou 8,
11523 Athens, Greece

GREECE

SIGRI PETRIFIED FOREST

MANAGEMENT CATEGORY	Protected Monument of Nature
TYPE	Coastal
ANNOTATED DESCRIPTION	Unique remaining of petrified forest in Greece.
GEOGRAPHICAL LOCATION	Western end of Lesvos Island.
AREA	.
DATE ESTABLISHED	15 September 1977
LEGAL PROTECTION	Protected under P.D. 443 of 19 September 1985.
LAND TENURE	.
PHYSICAL FEATURES	.
VEGETATION	.
FAUNA	.
MANAGEMENT	.
USES	Tourism.

PROBLEMS

PRINCIPAL REFERENCE MATERIAL

CONTACT ADDRESS

- Ministry of Agriculture, Department for the Protection of Forests, Ippocratous 3 - 5, 10164 Athens, Greece.
- Ministry of the Environment, Physical Planning and Public Works, Department of Environment, Section for the Conservation of Nature, Pouliou 8, 11523 Athens, Greece.

GREECE

SKIATHOS ISLAND

MANAGEMENT CATEGORY: Managed Nature Reserve (Aesthetic Forest)

TYPE: Coastal

ANNOTATED DESCRIPTION: Seashore forest with picturesque beaches, small chapels, etc.

GEOGRAPHICAL LOCATION: Skiathos Island belongs to the Northern Sporades insular complex, Magnesia prefecture.

AREA: 3,000 ha.

DATE ESTABLISHED: 13 June 1977

LEGAL PROTECTION: Protected under Presidential Decree published on the 20 July 1977.

LAND TENURE: .

PHYSICAL FEATURES: .

VEGETATION: The 2/3 of the trees are Pinus halepensis. The famous "stone pine (Pinus pinea) forest of Skiathos" is included in the protected area.

FAUNA: Fox jackal, hare.

MANAGEMENT: .

USES: The area is used mainly for tourism.

PROBLEMS

PRINCIPAL REFERENCE MATERIAL

CONTACT ADDRESS

- Ministry of Agriculture, Department for the Protection of Forests, Ippocratous 3 - 5, 10164 Athens, Greece.
- Ministry of the Environment, Physical Planning and Public Works, Department of Environment, Section for the Conservation of Nature, Pouliou 8, 11523 Athens, Greece.

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. 37° 39' - 37° 47' N and 23° 47' - 23° 52' E.

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

DATE ESTABLISHED 1971

LEGAL PROTECTION Established by D. 966/1971 and boundaries defined by Presidential Decree No. 182/ 16-3-1974.

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 Kitsos cave 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

Ministry of Agriculture,
Department for the Protection of Forests,
Ippocratous 3 - 5,
10164 Athens,
Greece.

ALSO Ministry of the Environment,
Physical Planning and Public Works,
Department of Environment,
Office for the Conservation of Nature,
Pouliou 8,
11523 Athens,
Greece.

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. There is also the Monastery of Toplou, with frescos of the 16th century and ruins of the ancient city of Itanos.

GEOGRAPHICAL LOCATION On the island of Crete, Sitia (Lasithi prefecture). 35° 13'N, 26° 07'E.

AREA 20 ha.

DATE ESTABLISHED 1973

LEGAL PROTECTION Totally protected by P.D. 121/6-8-1973.

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, Pistaccia lentiscus, etc.

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. The main

actual problem is the over pumping of ground waters for irrigation of adjacent farms, leading to salinization.

PRINCIPAL REFERENCE MATERIAL

- Cassios C. Management plan.
- Greuter W., 1968. Le Dattier 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

Ministry of Agriculture,
Department for the Protection of Forests,
Ippocratous 3 - 5,
10164 Athens,
Greece.

ALSO

Ministry of the Environment,
Physical Planning and Public Works,
Department of Environment,
Section for the Conservation of Nature,
Pouliou 8,
11523 Athens,
Greece.

ISRAEL

AREA	21,501 km^2
LENGTH OF MEDITERRANEAN COASTLINE	190 km
AREA OF TERRITORIAL SEA	1824 km^2, (width 6 nautical miles)
POPULATION	4,355,800 (1987)

PROTECTED AREAS LEGISLATION Natural protected areas, coastal as well as marine, are established in Israel under the National Parks, Nature Reserves and National Sites Law, 1963 and its regulations and according to national masterplans under the Planning and Building Law, 1985. Other relevant legislation includes:
- Prevention of Sea-Water Pollution by Oil Ordinance (New Version), 1980;
- Prevention of Sea Pollution (Dumping of Waste) Law, 1983; - The Fisheries Ordinance, 1937 ; - The Forests Ordinance, 1926; - The Plant Protection Law, 1956; - The Public Health Ordinance, 1940; and - The Maintenance of Cleanliness Law, 1984; and their regulations.

PROTECTED AREA ADMINISTRATION There is a National Parks Authority (NPA) attached to the Prime Minister's Office and a Nature Reserves Authority (NRA) within the Ministry of Agriculture. There is also an Environmental Protection Service within the Ministry of the Interior, in charge of environmental issues. The designation 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 managed by the Nature Reserves Authority (established in 1964), which appoints wardens in each site. The legislation for the protection of Israeli Marine Parks empowers wardens to take measures necessary to prevent damage to marine resources.
Within some of the protected areas, field study centers are operated by the Society for the Protection of Nature in Israël (SPNI). These centers conduct research, conservation and education activities.

NATIONAL AUTHORITY ADRESSES
- National Parks Autority, Rehov Daled, Hakirya, Tel Aviv, Israel. Telephone: (03) 252-281
- Nature Reserves Authority, Yirmiyahu 78, Jerusalem 94467, Israel. Telephone : (02) 536-271
- Environmental Protection Service, Ministry of the Interior, P.O. Box 6158, Jerusalem 91061, Israel. Telephone: (02) 669-671
- Society for the Protection of Nature in Israel (SPNI), 4 Hashfela Street, 66183 Tel Aviv, Israel. Telephone (03) 375-063.

LIST OF ESTABLISHED M/C PROTECTED AREAS

1. Alexander River National Park (C)
2. Dor-Habonim Nature Reserve (M/C)
3. Ma'agan Michael Marine Nature Reserve (M/C)
4. Poleg River Nature Reserve (C)
5. Rosh Hanikra Marine Nature Reserve (M/C)
6. Sharon Cliff Shore National Park (C).
7. Taninim River Nature Reserve (W)

ISRAEL

ALEXANDER RIVER

MANAGEMENT CATEGORY — A National Park with the exception of the river and its banks which is a Nature Reserve.

TYPE — Coastal

ANNOTATED DESCRIPTION — The park has a variety of important coastal landscapes: mobile and stable sands, a calcarous sandstone (kurkar) ridge, a river and its banks, and seasonal pools. The Alexander River is one of the biggest rivers on the coast and has been heavily polluted by intensive agriculture along its banks as well as sewerage from nearby seettlements. A relatively big seasonal pool (30 ha.) is located in the reserve and is important as a refuge for flora and fauna associated with this once common habitat.

GEOGRAPHICAL LOCATION — Between Tel Aviv and Haifa, bordered on the south by a village called Kfar Vitkin, the north by a small town called Givat Olga, the west by the sea and the east by agricultural lands. (N 32°24', E 34°51').

AREA — 374.4 hectares

DATE ESTABLISHED — 1982

LEGAL PROTECTION — Established under the National Parks, Nature Reserves and National Sites Law, 1963.

LAND TENURE — State ownership.

PHYSICAL FEATURES — Most of the park is mobile or stabilized sands. The origin of the sands is believed to be suspended material transferred from the Delta Nile. The kurkar ridge, a formation unique to the Israeli coast is a Pleistocene formation made from hardened mobile sands. The Alexander River has a drainage basin of 600 km square, but only the last 6 km of river have a perennial stream flow. The seasonal pools are formed in depressions where rain water, run-off and/or groundwater collect during the winter season. The size and water quality of each pool differ according to the size of the drainage basin, and the substrate of the pool and drainage basin.

VEGETATION — The mobile sands have typical vegetation with the plant association Ammophila litoralis and accompanying plant species such as: Agropyrum junceum and Pancratium maritimum. Vegetation changes as the sand substrate becomes more stable to associations such as: Artemisia monosperma, Helianthemum stipulatum - Retama raetam, and Pistachia lentiscus - Lycium schweeinfurthii- Ephedra aphylla. Where the sand is completely stable, Certatonia siliqua is also found scattered in a "park-like" landscape.

In one part of the park there is a vestige of the former forests of Quercus ithaburensis that once covered all of the Sharon. The seasonal pools have unique community of hydrophilics such as Scirpus tuberosus, Butomus umbellatus, Ranunculus aquatilis and rare species such as Sparganium neglectum and Damasonium alisma. Because of pollution and disturbances along the river, many roadside weeds grow along the banks as well as more hardy hydrophilics such as: Phragmites australis, Cynanchum acutem and Limonium meyeri. The kurkar ridge is dominated by Pistacio lentiscus with other accompanying species such as Coridothymus capitatus.

FAUNA The mobile and semi-stable sands are home to many psammophiles common to the Israel coast. The river is the last habitat and nesting site of the endangered specie, Trionyx trionguis. The fish Anguilla anguilla are also found in the river.

CULTURAL/ARCHEOLOGICAL FEATURES Ruins from a seaside settlement dating back to the late Bronze Period were discovered at Tel Michmoret as well as a settlement dating back to the end of the First Temple Period. The oldest eucalyptus grove in the country is located in the park.

MANAGEMENT Management policies for the park have not yet been implemented and with exception to the river and its banks the park is presently neglected. There are plans to rehabilitate the park for use by the public.

USES Alexander River is presently a popular recreational spot for nearby residents.

PROBLEMS Alexander River is heavily polluted with sewerage and agricultural wastes.

PRINCIPAL REFERENCE MATERIAL

- 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.
- Paz, Uzi. Nature Reserve in Israel. Givataim : Masada Ltd. 1981 (in hebrew)
- Fishelson, L. , ed., "Marine Animals." Encyclopedia of Plants and Animals of the land of Israel. 1983. pp. 293-297.

CONTACT ADDRESS

National Parks Authority,
Rehov Daled, Ha-Kirya,
Tel Aviv,
Israel.

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', E 34°55').

AREA 113 ha, with 5 km of coastline.

DATE ESTABLISHED 1980.

LEGAL PROTECTION Established under the National Park, Nature Reserves and National Monuments Law, (1963).

LAND TENURE State ownership.

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

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

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

CULTURAL/HISTORIC FEATURES An artificial mound and the remains of a temple, harbour and other buildings are found in Dor-Tantura Archeological site, established in 1964. Submerged buildings, wrecked vessels with cargo, anchors, pottery and metal objects are found in Dor Underwater Archeological site, established in 1984.

MANAGEMENT No urban development is permitted within a distance of 200 m 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 (only with special permission) for spear gun fishing.

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

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

The Nature Reserve Authority,
78, Yezmeyahu St.,
Jerusalem,
Israel.

ISRAEL

MA'AGAN MICHAEL ISLANDS

MANAGEMENT CATEGORY: Nature Reserve

TYPE: Coastal/Marine

ANNOTATED DESCRIPTION: Five relatively small islands off the shores of Ma'agan Michael and Dor. These islands are important as nesting grounds and resting points for migratory birds.

GEOGRAPHICAL LOCATION: Between Tel Aviv and Haifa, approximatively 150 meters offshore from Ma'agan Michael and Dor. (N 32°33', E 34°54').

AREA: 2.0 hectares (5 offshore islands)

DATE ESTABLISHED: 1964

LEGAL PROTECTION: Established under the National Parks, Nature Reserves and National Sites Law, 1963

LAND TENURE: State ownership

PHYSICAL FEATURES: The islands are on the alignment of the submerged Western Kurkar (calcarous sandstone) ridge. The islands are approximately 7 meters above sea level, each one approximately 100 meters in circumference.

VEGETATION: Diversity of species is low due to salt spray and strong winds. Salt tolerant plants such as Atriplex halimus, Halimione portulacoides, and Frankenia hirsuta grow here.

FAUNA: The islands are an important site for nesting colonies of Sterna hirundo, and a few pair of Larus argentatus and Columba livia. They are also an important resting point for migrating Charadriiformes.

MANAGEMENT: Visitation of islands is strictly prohibited during nesting period (May-September). Boat traffic limited to 100 meters from the islands.

USES : Scientific research an educational programmes conducted mainly by the local field study centre of SPNI in Ma'agan Michael.

PROBLEMS: The close proximity of a public beach is believed to be a disturbance for nesting terns on one island where the number of nests have decreased significantly. Columba livia population frequently disturb nesting terns.

PRINCIPAL REFERENCE MATERIAL

- Fischelson L., 1985. Littoral Marine Ecosystems and Marine Parks of Israel. In: Atti del Convegno Internazionale I Parchi Costieri Mediterraneim 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. Entre Provinciale per il Turismo di Salerno. pp. 539-545.
- Paz, Uzi. Nature Reserves in Israel. Givataim: Masada Ltd. 1981 (in hebrew).

CONTACT ADDRESS

Natures Reserve Authority,
78 Yermeyahu St,
Jerusalem 94467,
Israel.

ALSO Society for the Protection of Nature in Israel (SPNI), 4 Hashfela Street,
66183 Tel Aviv,
Israel.
Telephone (03) 375-063.

ISRAEL

POLEG RIVER

MANAGEMENT CATEGORY — Nature Reserve

TYPE — Coastal

ANNOTATED DESCRIPTION — The reserve has a diversity of important coastal landscapes: a rocky shore, beach cliff, calcareous sandstone (kurkar) ridge, mobile sands, the Poleg River and it's banks. Poleg is the shortest of all Sharon streams is nearly linear, and is believed to have been dug out by the Romans in order to drain the surrounding coastal swamps. The reserve includes the last kilometer of this river and it's surrounding landscapes as desribed above.

GEOGRAPHICAL LOCATION — Situated between Tel Aviv and Haifa, near the agricultural village of Udim and bordered on the east by the Tel Aviv Haifa road and the west by the sea. (N 32°16', E 34°49').

AREA — 48.5 hectares, 1200 meters coastline

DATE ESTABLISHED — 1971

LEGAL PROTECTION — Established under the National Parks, Nature Reserves and National Sites Law, 1963

LAND TENURE — State ownership

PHYSICAL FEATURES — The drainage basin of the Poleg River is coastal and 113 km square, relatively small compared to other Sharon streams whose drainage basin includes the Menashe Heights. The reserve includes a kurkar ridge, a Pleistocene formation made from hardened mobile sands. The kurkar ridge drops 30m to the shore where it is constantly exposed to the erosive forces of wave movement and sea spray. Where the river spills out into the sea, mobile sands have formed, the origin of the sand believed to be suspended material transferred northwards from the delta Nile.

VEGETATION — On the river banks the plant associations of Phragmites australis and Rubus sanctus are found. On the beach cliff, salt-tolerant plants are found such as Salsola kali, Pancratium maritimum and Oenothera drummondii. The mobile sands have typical vegetation such as Neurada procumbens, Echiochilon fruticosum and Ammophila litoralis. On the kurar ridge where there is little influence from the sea and particularly it's northern slope is a wide diversity of plant species and an important habitat for many endemic species such as Iris atropurpurea, Allium tel-avivense and Rumex rothschildianus.

FAUNA Typical Mediterranean fauna inhabit the kukar ridge such as the turtle, Testudo graeca terrestres, the mole rat, Spalax ehrenbergil leucodon and the birds, Alectoris chukar, and Merops apiaster. The mobile sands are home to many psammophiles, some of which are endangered due to the increasing urbanization threatening their habitat: Lytorhychus diadenia, Sphenops sepsoides and Acathodactylus schreiberi syriacaus.

MANAGEMENT Quarrying prohibited, prohibition of repelling from beach cliffs.

USES The reserve is a popular recreational spot for nearby residents, especially in the spring during flowering season. Walking trails are available. Water is diverted for use by a nearby settlement.

PROBLEMS Water is considerably polluted by sewerage from adjacent settlements.

PRINCIPAL REFERENCE MATERIAL

- 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
- Paz, Uzi. Nature Reserves in Israel. Givataim: Masada Ltd. 1981 (in hebrew).

CONTACT ADDRESS

Nature reserve Authority,
78 Yermeyahu St.,
Jerusalem 94467,
Israel

ISRAEL

ROSH HANIKRA.

MANAGEMENT CATEGORY Nature Reserve / National Park.

TYPE Marine/Coastal.

ANNOTATED DESCRIPTION The area comprises marine and coastal areas, and islands. The Nature Reserve includes a marine part with underwater caves, many islets which serve as breeding grounds for important species and a beach, partly rocky, partly sandy. The National Park is only coastal, including white cliffs and natural caves and cavernous tunnels.

GEOGRAPHICAL LOCATION The area is located in the most northern part of the Israel shore-line, extending from Akhziv to the Lebanese border (N 33°04', E 35°06').

AREA The Nature Reserve: 440 ha, extending 1,300 m seaward from the coast with about 5 km of coastline. The National Park: 22 ha, with 675m of coastline, 70m high.

DATE ESTABLISHED The Nature Reserve: 1965.
The National Park: 1972.

LEGAL PROTECTION Established under the National Park, Natural Reserves and National Monuments Law (1963).

LAND TENURE State ownership.

PHYSICAL FEATURES The coastline of the Nature Reserve is partly a "Kurkar" rock and partly sand dune. About 500 to 800 m seawards from the coast there is a belt of small islets, some of which protrude above sea level (Techeilet, Nachlieli and Shachaf Islands), others being only visible at low tide.
The National Park is in the most northern part. There are prominent calcareous rocks, forming a shoreline rich in cliffs which descend vertically to the sea, creating a steep, white chalk pillar mountain, 70 meters high. In the rocky cliffs, ther are natural caves and cavernous tunnels, the access to which is via a cable car.

VEGETATION Halophytic flora covers the islands permanently above sea level and the coastline. On the slopes of the cliffs, amongst Charob and Pistacia elasticxa, shaped by the wind into Bonsaï-like shrubs, blooms the Statice, endemic to this piece of land. There are also others colourful flowers such as sea-shore lilies, Narcisus and Squill.
The intertidal zone contains a wide diversity of algal species, and especially large areas coverd by biogenic constructions (vermetid algal rims).

FAUNA The bottoms and walls of the underwater caves are characterised by a very special fauna of hydroids, colourful sponges and bryozoa as well as soft corals and clinid fishes.
The fishes Apogon imerbis and Chromis chromis' as well as the triton shell (Charonia) are all found here. The sandy beaches serve as spawning grounds for the seaturtles (Chelonia mydas and Caretta caretta). The islands are nesting sites for several species of birds including Motacilla alba, Larus argentatus and Sterna hirundo, and in particular they have been visited (1968 for the last record) by the Monk seal (Monachus monachus).
Inside the grottoes, there are groups of bats. Swallows and rock pigeons are nesting in the rocks. There are also many Hydrax (Crocavia syriaca) in the cliffs. In the coastal area, there is evidence of the presence of jackal (Canis aureus) and foxes (Vulpes vulpes). Wolves (Canis lupus) which have been present in the past time, are now extincted.

CULTURAL/HISTORIC FEATURES Building remains and pottery from the Byzantine period are found on the islands of Shachaf and Nachlieli which were declared Archeological Sites in 1964. Throughout human history, Rosh Hanikra served as passage point for trade caravan and armies between northern and southern part of eastern Mediterranean.

MANAGEMENT For the marine part of the Nature Reserve, 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, and kurkar stone quarrying are all prohibited. Activities in the Nature Reserve are also carried out by the local field study centre of SPNI in Achziv. The National Park is managed for touristic purpose by a private initiater in co-operation with the National park Authority.

USES The National Park serves mainly as a tourist attraction, visited by more than 250,000 people a year. The coastline is used partly for bathing and recreation and partly like a reserve with a controlled access to the public, serving also research and scientific purposes.

PROBLEMS The area is endangered by sandstone quarrying, spearfishing, the collection of molluscs and turtle eggs. Some pollution exist, due to sewage outflows and garbage disposal on land and by sea currents. Mainly in the cliff area, there are severe erosion problems due to the influence of the sea on the local rocks..

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

The Nature Reserve Authority,
78, Yezmeyahu St.,
Jerusalem,
Israel.

ALSO

National Parks Autority,
Rehov Daled, Hakirya,
Tel Aviv,
Israel.
Telephone: (03) 252-281

OR

Society for the Protection of Nature in Israel
(SPNI), 4 Hashfela Street,
66183 Tel Aviv,
Israel.
Telephone (03) 375-063.

ISRAEL

SHARON CLIFFS

MANAGEMENT CATEGORY: National Park

TYPE: Coastal

ANNOTATED DESCRIPTION: A calcareous sandstone (kurkar) ridge adjacent to the seashore approximately 6 km long and 300 meter in width. The western slope of the ridge is a beach cliff dropping 30-40 meters to a narrow rochy shore below.

GEOGRAPHICAL LOCATION: Between Tel Aviv and Haifa, extending north from a settlement called Shefayim and reaching the southern border of Poleg River Nature Reserve. (N 32°13', E 34°48').

AREA: 125 hectares, 5050 m coastline

DATE ESTABLISHED: 1973

LEGAL PROTECTION: Established under the National Parks, Nature Reserves and National Sites Law, 1963

LAND TENURE: State ownership

PHYSICAL FEATURES: The kurkar ridge is a geological formation unique to the Israeli coast and is a Pleistocene formation of hardened mobile sands. The ridge also has some outcrops of Hamra, a rock also common to the coast. The kurkar and hamra bases are unevenly covered with a sand substrate that can become relatively deep. Where strong sea winds prevail, the sand substrate becomes thinner or disappears,leaving the kurkar and hamra bases exposed. Many small natural ravines cut through the ridge, draining run-off water into the sea.

VEGETATION: Where sand covers the kurkar and hamra base, there is approximately a covering of 75% of perennials, the most dominant being Artemisia monosperma, Retama raetam and Ononis natrix. Where kurkar or hamra is exposed, vegetation becomes more sparse and only 10% of all vegetation are perennials. These areas are typified by Limonium oleifolium and Coridothymus capitatus. Among the annuals there are several endemics, among them the rare Rumex rothschildianus. Where ravines cut through the ridge either Otanthus Maritimus or Limonium oleifolium are dominant and are accompanied by other species that are found on other parts of the ridge.

FAUNA: Typical Mediterranean fauna, dominated mainly by reptiles and small mammals.

MANAGEMENT No management policies have yet been implemented and the park is presently neglected. There are plans to rehabilite the park and make it accessible for the surrounding residents,

PROBLEMS The park is damaged due to past and present activities including dumping of garbage.

PRINCIPAL REFERENCE MATERIAL

- 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.
- Paz, Uzi. Nature Reserves in Israel. Givataim; Masada Ltd, 1981. (in hebrew)

CONTACT ADDRESS

The National Parks Authority,
Rehov Daled, Ha-Kirya,
Tel Aviv,
Israel.

ISRAEL

TANINIM RIVER

MANAGEMENT CATEGORY: Nature Reserve

TYPE: Coastal

ANNOTATED DESCRIPTION The lower three kilometers of a river fed mostly by springs with a relatively high salinity and temperature. One of the last streams on the Israeli coast with both unpolluted waters and a perennial flow making it an important refuge for flora and fauna associated with this once common habitat. The river is named after the Crocodylus niloticus that once inhabited this river (Taninim means crocodiles).

GEOGRAPHICAL LOCATION Between Tel Aviv and Haifa, near kibbutz Ma'agan Michael. Bordered on the east by the Tel Aviv-Haifa road and the west by the sea. (N 32°32', E 34°54').

AREA 5.5 hectares, 100 m. of shoreline

DATE ESTABLISHED 1972

LEGAL PROTECTION Established under the National Parks, Nature Reserves and National Sites Law, 1963

LAND TENURE State ownership

PHYSICAL FEATURES The source of the saline springs is the Yarkon-Tanninim aquifer from the Pleistocene Period. The salinity of the water fluctuates along the river with the influx of springs as well as a fresh water tributary that meets the river one kilometer before spilling into the sea (Ada River). The salinity rises significantly downstream from a dam built during the Roman Period, also about one kilometer east of the sea. The river is considered to be one of the last vestiges of the kabara swamps that once covered the entire area.

VEGETATION The main plant communities found in the river and on it's banks are as follows : Rubus sanctus-Lythrum salicaria, Tamarix sp., Nuphar luteum, Potamogeton nodusus, Ceratophyllum demersum, Phragmites australis, Polygonum sp., Sparganium neglectum, Juncus acutus, Inula crithmoides, Lemna sp..

FAUNA Fauna typical to freshwater sources is found in the river, with the snail, Melanopsis praemora, dominating the river bottom. The river estuary is a home for the fish, Anguilla anguilla and Mugil sp. and is one of the last habitats for the endangered turtle, Trionyx triunguis. Some mammals are also found near the banks such as the Felis chaus and Herpestes ichneumon.

CULTURAL/HISTORICAL FEATURES A dam was built on the river during the Roman period in order to utilize the fresh water resources found on the coast. A flour mill is found below the dam.

MANAGEMENT Fishing and swimming is prohibited.

USES The reserve is a popular recreational spot for nearby residents and several walking trails are available. Water is diverted to nearby fish ponds. Research and educational activities are conducted by the local field study centre of SPNI in Ma'agan Michael.

PROBLEMS Pollution from nearby settlements and sewerage and agricultural waste from the Ada River.

PRINCIPAL REFERENCE MATERIAL

- Por F.D., 1985. Nature Reserve Policy along the Mediterranean Shore of Israel. In Atti del Convegno Internazionale I Parchi Costieri Mediterranei, Saerno, Castellabate 18-22 June 1973. Ente Provinciale per il Turismo di Salerno. pp. 539-545.
- Paz, Uzi. Nature Reserves in Israel. Givataim: Masada Ltd. 1981. (in hebrew)

CONTACT ADDRESS

Nature Reserves Authority,
78 Yermeyahu St.,
Jerusalem 94467,
Israel.

ALSO Society for the Protection of Nature in Israel (SPNI), 4 Hashfela Street,
66183 Tel Aviv,
Israel.
Telephone (03) 375-063.

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. It is an 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°22'-24', E 11°23'-25'.

AREA about 410 ha.

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

LEGAL PROTECTION The area was declared a nature reserve by ministerial decree in 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 to 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 with 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 rich in fish.

CULTURAL/HISTORIC FEATURES The lake was originally an Etruscan harbour with a network of channels connected to the sea. An old Spanish tower is found in 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 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 the 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, the development of the surrounding area and fires caused by careless visitors in dry summers are major problems for the area. 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, protected as a military zone. There is 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. N 41°12', E 09°28'.

AREA 1,575 ha

DATE ESTABLISHED 1980

LEGAL PROTECTION The area was declared a Managed Nature Reserve by Ministerial Decree of 8 August 1980 published in the Official Gazette No. 232 of 25 August 1980. It was also 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 the 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 era. 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 replanted 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. There is a rich marine biocenosis. 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 The reserve is 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 There is a significant necropolis along the shore, an ancient Roman/Greek harbour in San Marco, underwater shipwreck findings (amphorae, pottery, anchors), Saracene coastal watch towers, the quarry for the Paestum Greek temples, the 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 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 has been 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. The significant Roman and Greek archeological resources (terrestrial and marine) are endangered from development activities. Posidonia oceanica is diminishing due to fishing pressures, trawling, and the results of land erosion.

PRINCIPAL REFERENCE MATERIAL

- Carrada G. 1970. Il Parco Marino di P.ta Tresino (S. Maria di Castellabate, Salerno). In: Tavola Rotonda sui Parchi Marini Informatore Botanico Italiano. Vol. 2, No. 3: 185-193.
- Regione Campania, Assessorato per il Turismo, 1985. I Parchi Costieri Mediterranei. Atti del Convegno Internazionale. Salerno, Castellabate. 18-22 Giugno 1973. Ente Provinciale per il Turismo, Salerno. (Several scientific papers on Castellabate Fishery Reserve).

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 It includes 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. N 41°13', E 13°04'.

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-W, 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, and 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 the 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 rich 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, and 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. Aquaculture, sport and commercial fishing take place in the lakes while the surrounding zones are grazed by semi-domestic buffaloes. Several zones are utilized for agriculture.
Research has been undertaken in the fields of climatology, botany, ornithology, and 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. In particular, 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.

PRINCIPAL REFERENCE MATERIAL

- Allavena S., 1978. Circeo National Park: Reclaiming a Rich Heritage. Parks 3 (3).
- Allavena S., 1977. Gli Uccelli del Parco Nazionale del Circeo. Collana Verde No 47, Ministero dell'Agricoltura e Foreste, Roma.
- Padula M., 1985. Aspetti della Vegetazione del Parco Nazionale del Circeo. Webbia 39 (1): 29-110.
- Several monographies on geology, paleontology, archeology, zoology and ecology of the Circeo National Park have been published by the Parco Nazionale del Circeo, Ministero dell'Agricoltura e Foreste, Sabaudia, under the series "Quaderni del Parco".

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 Tyrrenian 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. N 42°40', E 11°00'.

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 The annual mean precipitation of 700 mm is distributed essentially in autumn and winter. Average annual temperature 16°C (8°C in January; 25°C in July).

PHYSICAL FEATURES The regional park includes 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 and 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 was 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 or to enter from the sea.

USES The area is sparsely inhabited. The beach is frequented by local visitors in summer. Some agricultural and grazing (semi-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 populations 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. N 42°20', E 10°18'.

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 Official 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 interior.

VEGETATION The island is covered by a degradated mediterranean maquis dominated by Erica arborea with Erica scoparia, Rosmarinus officinalis, Cistus monspeliensis, and 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, and 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.

OR

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°25'-30'; E 11°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, with 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), and Toothcarp (Aphanius fasciatus).

CULTURAL/HISTORIC FEATURES No information.

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 have been established. 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

- Carp E., 1980. A Directory of Western Paleartic Wetlands. IUCN, Gland.
- Pratesi F., et al., 1972. In: Una Vita per la Natura (Pedrotti F. ed.). Associazione Italiana per il W.W.F., Roma.
- 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 Nazionale e Riserve Naturali,
Via Carducci 5,
Roma,
ITALY.

OR

Associazione Italiana-WWF,
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. The waters are notably clear with the uneven rocky sea bed supporting rich populations of several algal species. The area is also noted for its large underwater caverns, the largest being found on the small island of Scoglio del Medico which has many entrances at about 20-25 m below the sea surface.

GEOGRAPHICAL LOCATION Ustica island lies in the Tyrrenian sea, off the northern coast of Sicily, at a distance of 65 km from Palermo. The marine reserve is located on the western part of the island between Punta Spalmatore and Cala Sidoti (0.9 km of coastline). 13°10'E - 38°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. An agreement between the Ministry of the Environment, the commercial fishermen and the local community was signed on the 5 July, 1987.

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. Max. 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, and coralligen formations. The sandy bottoms are covered by dense stands of Posidonia oceanica. At about 60 m the uneven sea bed is covered by dense populations of Laminaria rodriguezzi.

FAUNA There is a varied fauna, a notable example being Astroides calycularis, of considerable biogeographic interest. The tuna fish Thunnus thynnus is also recorded, for which the area is a transit zone. In all only about 28 species have been recorded. Thalassoma, Coris, Chromis, Symphodus tinca Boops and Spicara are all present but not common. The caves are characterized by the presence of the scleratinid (Cladopsammia islandi) and of Petrobiona massalina. Astroides sp. has also been recorded. Three species of Gorgons can also be found (Paramuricea clavata' Eunicella cavolinii and E. singularis) along with a few corralinas.

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 is 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

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

AREA 1,759,530 km^2

LENGTH OF MEDITERRANEAN COAST 1,900 km

AREA OF TERRITORIAL SEA

POPULATION 3,770,000 (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)

LIBYA

EL KOUF

MANAGEMENT CATEGORY National Park

TYPE Coastal

ANNOTATED DESCRIPTION The park covers the northern 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 between the Gulf of Gabes in Tunisia and Hayfa Gulf.

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°35'-48'N, 21°21'-22°00'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, and 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, and Hystrix cristata.
In the sea Delphinus delphis and Tursiops truncatus have been recorded. Bird species include Phoenicopterus ruber and several bird of prey. Sea turtle Caretta caretta nest on the sandy beaches.

CULTURAL/HISTORIC FEATURES Several archeological remains, including Greek and Roman ruins linked to the ancient 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

Doctor ATIG EL-HUNI
Director of Biological Marine Research Centre
P.O. BOX 30830 TAJURA
TRIPOLI LIBYAN ARAB JAMAHIRIYA

MALTA

AREA: 315.6 km^2

LENGTH OF MEDITERRANEAN COASTLINE: 190 km

AREA OF TERRITORIAL SEA In a radius of 12 miles from the coast.

POPULATION: 345,418 (1985)

PROTECTED AREAS LEGISLATION The most important nature conservation legislation is the Bird Protection Act and Regulation No 68 (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 trapping and shooting are prohibited. The only nature reserve on the islands has been declared a National Nature Reserve established by Legal Notices No 126 Of 1978, the Protection of Birds (ammendment) Regulations. The Berthing regulation of 1975 was ammended in 1987 to prohibit all fishing, swimming and boating activities within a 1 mile radius of the Island of Filfla.

PROTECTED AREAS ADMINISTRATION The authority responsible for environmental conservation is the Environment section of the Ministry of Education. The Ghadira Wetland area is administered by this division.

NATIONAL AUTHORITY ADDRESS

The Ministry of Education,
Environment Division,
Beltissebh,
MALTA.
Tel. 230487, 235486, 229916.
Telex. 1100 MODMLT MT, 1115 MEE MT.

LIST OF ESTABLISHED M/C PROTECTED AREAS

1. Ghadira Nature Reserve.(W)
2. Filfla Island Nature reserve. (C/M)

MALTA

GHADIRA WETLAND RESERVE

MANAGEMENT CATEGORY Nature reserve

TYPE Wetland

ANNOTATED DESCRIPTION This is one of the remaining saline marshlands. A brakish water pool with fluctuating salinity. Typical Mediterranean saltmarsh vegetation is present with communities incorporating sand dunes and rare, endangered and endemic fauna and flora. The area is an attraction to avifauna, especially water-birds.

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. (N 35° 58', E 14° 21').

AREA 0.02 km^2. It is surrounded by a no-shooting buffer zone, an average of 500 m wide, making a total, partially protected area of about 1.12 km^2

DATE ESTABLISHED 1978

LEGAL PROTECTION The Wetland Reserve was established by Legal Notice No 126 of 1978, Protection of Birds (Ammendment) Regulations.

LAND TENURE State owned

CLIMATE Annual precipitation is about 600mm in total with 70% of this falling between September and March. Temperatures are of an average of 30°C in September down to 9.5°C in January. Winds are prevalently from the North-West. Water temperatures vary between means of 29.2°C in August to 12.5°C in January.

PHYSICAL FEATURES The wetland is a seaward part of a graben characteristic which is a water catchment area. The surface water, largely derived from winter rains, becomes steadily more saline during the hot summer months. Its altitude is from sea level to 5 m. Water depth varies from 1 to 15 cm in the wetlands and in a few deeper pools from between 60cm to nearly 4 m.

VEGETATION The area has been used for cultivation and saltpans in the past, but the pool is now surrounded by halophile scrub, with species such as seablite; Saueda maritima, glasswort (Salicornia europaea) and golden samphire (Inula crithmoides), and sandy patches supporting a rare species of arrow grass (Triglochin bulbosum). Bordering this in the south is a grove of tamarisk (Tamarisk gallica), with a variety of halophilous vegetation on the hill slopes and plantations of Acacia and Eucalyptus on the dune separating the eastern 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. The adjoining sand dune is one of two supporting the only European population of the Sand Broomrape (Orobanche densiflora form melitensis). Tassell weed (Ruppia drapensis) occurs only in this wetland area. It is both rare and threatened not only locally, but also on a European Scale (IUCN Threatened plants committee, European Threatened Plants List).

FAUNA The area is particularly noted for the great number of migrant species which are attracted to it to rest provided that water and insects are available. The 5 breeding birds in Gadhira are all small passerines, of which the fan-tailed warbler (Cisticloa juncidis) is characteristic. The area supports a very diverse entomofauna, some species of which are known only from this area, eg. tettigonid grasshoppers (Ddontura stenosciphe) and two species of possibly undescribed endemic wasps. Mammals recorded in the area include Mustela nivalis, Erinaceus algirus, Suncus etruscus, Rattus rattus and Rattus norvegicus. The reptiles Coluber virdiflavus carbonarius and Chameleo chameleon have also been recorded. The brackish water fish Aphianus fasciatus, which is in danger in other parts of the island is found at this reserve in a healthy population. A new species of brackish water snail has also been identified and is still being studied.

CULTURAL/HISTORICAL FEATURES This area is one of two ancient sites (the other being Salina bay) where salt extraction was carried out on the island.

MANAGEMENT The area has been fenced off with controlled access and is now managed by one full time warden supported by three night watchmen. In 1980 a comprehensive management plan had been prepared (WWF project No 1505) and approved by the Ministry then in charge. The pool was enlarged by dredging and surrounded by a perimeter ditch. Hides and educational facilities are also available for educational purposes.

USES The area has been kept under observation by ornitholigists for the last 25 years. There are plans to increase the educational impact of the site. There is no intended tourism facility appart from arrangement for regular visits by groups of students

PROBLEMS Disturbance, from traffic on the busy, eastern, boarder road. There is still some shooting on nearby hills.

PRINCIPAL REFERENCE MATERIAL

- 'Birds Eye View', (4) Feb' '81; (5) Feb' '82; (6) Feb' '83. MOS Publ.
- Carp, E. (1980). A Directory of Western Paleartic Wetlands. IUCN, Gland.
- Schembri, P.J. et al. (1975). Localities with Conservation Value in the Maltese Islands. pp 1-18.
- Sultana, J., Gauci, C., Beaman, M. (1975). A Guide to the Birds of Malta. MOS Publications.

CONTACT ADDRESS

Ministry of Education,
Environment Section,
Beltissebh, MALTA.
Present contact: A. E. Baldacchino,

MALTA

FILFLA ISLAND

MANAGEMENT CATEGORY Nature reserve.

TYPE Coastal.

ANNOTATED DESCRIPTION Filfla is a small rocky island, not easily accessible. The island is unhabitated and was used for target practice before the 70's. It is an important site for rare, endangered and endemic flora and fauna. It constitutes the largest breeding station in the Maltese Island for pelagic birds.

GEOGRAPHICAL LOCATION The island is about 5 km south of the Maltese mainland, about halfway along the southern coastline. E 14° 24'60, N 35° 47'37.

AREA The island has an area of about 20,234m^2 , 200 ?? or 59m above seal level, with a coastline of no more than 1 km. The island is surrounded by a no-shooting buffer zone of 1 kilometer.

DATE ESTABLISHED 1988.

LEGAL PROTECTION The island was created a nature reserve on 1st June 1988 by Act No XV of 1988 (An act to provide for the establishment of the Filfla Reserve). The other regulations which can be applied to the reserve are: -Berthing Regulations 1975; - Legal Notice 68 of 1980 (Protection of birds and wild rabbit Regulation); - Local notice to Mariners No 16 of 1987.

LAND TENURE State owned.

CLIMATE The area has a typical mediterranean climate with a mean annual temperature of 18.5°C (September 30°C, January 9.5°C) and a mean annual rainfall of around 530 mm falling mainly (70%) between September and march. Winds are prevalently from the North West. Water temperature vary between means of 29.2°C in August and 12.5°C in January.

PHYSICAL FEATURES A small, flat topped rocky outcrop of about 59 m high. Geology: the island is constituted of Upper coralline limestone plateau with underlying greensands and Blue clay, faulted down to its present level. Erosion and the effects of previous use as a target have resulted in steep cliffs with surrounding boulder screen.

VEGETATION The Island is covered by steppe and specialized cliffside flora maritime vegetation dominated by shrubs (Suaeda vera) and succulent herbs (Misembryanthemum nodiflorum). It harbours a large leek (Allium) of the Empeloprasum group which may be endemic to the island.

FAUNA The islet is particularly noted for the endemic species of lizard (Podarcis filfolensis filfolensis) known only from the island. Two very rare endemic land snails are also known only from Filfla: Trochoidea pyramidata despotti and Lampedusa gattoi. The island also supports an endemic tenebrionid beetle (Subterranea melitana). The island hosts one of the largest known mediterranean colonies of the Storm Petrel (Hydrobates pelagicus) and, on the flat topped plateau, the largest local colony of the Herring gull (Larus argentatus michahellis) along with a smaller colony of Cory's shearwater (Calonectris diomeda) which inhabits the rubble screes beneath the cliffs.

CULTURAL/HISTORICAL FEATURES The island was used by fishermen for shelter, it had once a small chapel built on its platean surface. the the island was used for target practice by the British Service till in the late sixties.

MANAGEMENT Under the oversee of the Minister of Education, Environment Section.

USES Access to the area is allowed only for scientific purposes, mainly for ornithological and natural history studies.. All types of hunting activity are prohibited and the island is surrounded by a no-shooting buffer zone of 1 kilometer.

PROBLEMS Loss of bird life through shooting from sea craft.

PRINCIPAL REFERENCE MATERIAL

-P. Schembri et al. 1987. Localities with conservation value in the Maltese Islands. Environment Division, Ministry of Education, Malta. pp 1-18.

CONTACT ADDRESS

Ministry of Education,
Environment section,
Beltissebh, MALTA.
Present contact: Alfred E. Baldacchino

MONACO

AREA	1,9km^2
LENGTH OF MEDITERRANEAN COASTLINE	approx 3 km
AREA OF TERRITORIAL SEA	4500 ha.
POPULATION	27,000

PROTECTED AREA LEGISLATION There is no special legislation for protected natural areas other than Royal decrees Nos. 6256 of 25 April 1978 and 8681 of 19 August 1986 which modified and completed the decree of the 2

NATIONAL AUTHORITY ADDRESS

LIST OF ESTABLISHED M/C PROTECTED AREAS

1. Monaco Underwater Reserve "Larvotto" (M)
2. Monaco Red Coral Reserve (M)

MONACO

MONACO - LARVOTTO

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. N 43°44', E 07°25'.

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 with small cliffs of red coral. Altitude 0 to -38 m.

VEGETATION Meadows of Posidonia oceanica, green and brown algae and as mentioned above small stands red coral (Coralium rubrum).

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

MANAGEMENT Public access is 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 Monégasque 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 Monégasque pour la Protection de la Nature: President - M. Eugène Debernardi,
7 rue de la Colle,
Principaute de Monaco.

ALSO

Centre Scientifique de Monaco
Monsieur Patrick Van Klaveren
16, Boulevard de Suisse
MC 98030 Monte Carlo Cedex
Principauté de Monaco

MONACO

MONACO - RED CORAL RESERVE

MANAGEMENT CATEGORY: Nature Reserve

TYPE: Marine

GEOGRAPHICAL LOCATION: The Monaco Red Coral Reserve is situated east of Condamine harbour, in front of Ficignana Cape. N 43°44', E 07°26'.

AREA: about 1 ha.

DATE ESTABLISHED: 1986 (18 August)

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. Ordinance of 18th August 1986.

LAND TENURE: Public Marine Domaine.

CLIMATE: Mediterranean climate.

PHYSICAL FEATURES: Rocky sea bottom. Cliff with red coral, Corallium rubrum, the last remains in Monaco waters. Altitude 0 to -35 -40m.

VEGETATION AND FAUNA: The cliff is covered by Coralligenous formations, typical association of fixed fauna and flora with several species of fishes typical of Mediterranean rocky coast: Diplodus sargus, Mulus surmuletus, Sparus auratus, Dicentrarchus larbrax, Labrus turdus, Socrpaena scrofa or S. porcus and the Lobster (Palinurus vulgaris).

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

USES / PROBLEMS

PRINCIPAL REFERENCE MATERIAL

- Comptes-rendus de l'Association Monégasque pour la Protection de la Nature (1986-1987).

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

ALSO: Centre Scientifique de Monaco
Monsieur Patrick Van Klaveren
16, Boulevard de Suisse
MC 98030 Monte Carlo Cedex
Principauté de Monaco

MOROCCO

AREA 710,850 km^2.

LENGTH OF MEDITERRANEAN COASTLINE 450 km.

AREA OF TERRITORIAL SEA

POPULATION 22,061,000 (1985).

PROTECTED AREA LEGISLATION National parks are established under the Royal decree of 11 Sep', 1934, which deals specifically with the establishment of protected areas. The Ministerial Order of 26 Sep', 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 Oct', 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.

LIST OF ESTABLISHED M/C PROTECTED AREAS There are none listed on the Mediterreanean coast.

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 In 17 December 1916 a General Law of National Parks was passed and was completed by Royal decree on 23 February 1917. In total five national parks were created under this act (none of which were on the Mediterranean coast). The 1957 Act defined Natural Sites of National Interest and Natural Monuments of National Interest. Natural Sites of National Interest are concerned with landscape protection and traditional landuse. In 1975 the National Areas Protection Law was passed (15 May with enabling Regulations on 4 March 1977) and the existing protected areas were reclassified and given legal status. Regulations introduced on 4 March 1977 provided for protection of 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.
The World Heritage Convention was acceeded 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 but has not yet been ratified.

PROTECTED AREAS ADMINISTRATION The body responsible for administration 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 peripherial 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 Fisheries and to a certain extent, also with the Ministry of Public Works and Urbanization, interministerial Commission on the Environment.

NATIONAL AUTHORITY ADDRESS

- 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 Park (W)
2. Albufera de el Grao (W)
3. Castello de Ampurias- Protected Landscape (W)
4. Ebro Delta Regional Natural Park (W)
5. Pals- Protected Landscape (W)
6. San Pedro Pescador- Protected Landscape (W)

SPAIN

ALBUFERA DE VALENCIA

MANAGEMENT CATEGORY — Regional National Park.

TYPE — Coastal.

ANNOTATED DESCRIPTION — A humid natural coastal zone with many small islands of exceptional scientific and recreational interest, as a result of which it is submitted to heavy human disturbance. It is a coastal lagoon of importance to migratory birds.

GEOGRAPHICAL LOCATION — Situated about 12 km to the south of Valencia. N 39°20, W 0°20'.

AREA — 3,200 ha., with a coastline of approximately 1.5 km.

DATA ESTABLISHED — 1986.

LEGAL PROTECTION — Established as a National Park on 7 August 1986 by a decree of the Valencian Inspectorate.

LAND TENURE — The Albufera is owned by the municipality of Valencia.

CLIMATE — The area has a Mediterranean climate, characterized by a very high humidity (80%) due to the heavy evaporation of the lake. The mean annual temperature is 25°C with a winter average of 6°C and summer averaqe of 33°C. The area has an annual rainfall of 500 mm.

PHYSICAL FEATURES — The geology of the area is of recent sedimentary rocks (Holocene and Pleisteocene) embeded with numerous fossils (eg. Cordium edule), evidece of the areas maine geological history. This is a coastal lagoon, separated from the sea by a strip of dunes, with fresh or slightly brakish water with a maximum depth of 2 m in places. There are some small islands and patches of reed in the lagoon. The adjoining rice fields are deliberately flooded in winter.

VEGETATION — The vegetation is dominated by the reeds, (Phragmites communis, Arundo donax, Potamogeton natans, Alisma plantago, Tipha angustifolia) and submerged or floating species such as Ranunculus confusus, Nitella hyalina, Chara ceratophylla, C. intermedia, C hispida and Myriophyllum verticillatum. The vegetation is seriously shores of the lagoon as a result of intense human activity and the effects of herbicides.

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 the Widgeon (Anas penelope), teal (A. crecca), Pintail (A. acuta), Shoveler (A. clypeata), red-crested Pochard (Netta rufina), and the Pochard (Aythya ferina). Breeding species include the Red-crested Pochard (200-400 pairs) and the Pochard and Ferruginous duck (Aythya nyroca) in small numbers. There were also several Areidae 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, M. labeo, Anguilla anguilla, Cyprinus carpio, Aphanius iberus, Dicentrarchus labrax, Carassius carassius, Barbus barbus and Valencia hispanica.

CULTURAL/HISTORIC FEATURES The main cultural feature of this area is the history of the areas distinguished ownership which mirrors the story of Spains colourful heritage. The first lord of this area was Jaime 1st of Aragon in 1288 who was instrumental in creating the lake. Since then ownership of the area has passed through the hands of the mother of the general Juan Bautrista Basset (she was bestowed the title of Marquise de Cullua and Lady of Albufera by the heir apparent to the Spanish crown, Archduke Carlos of Austria). With the succession of Felipe V to the throne, the lands passed to Cristobal de Moscoso, the Count of Torres and Lord of Albufera. In 1761 Carlos III inorporated the area into the crown property but it was transfered to Manuel Godoy, a butler of Carlos V, before being returned to the crown by Fernando VII. Napoleon transferred the region to Mariscal Suchet (The Duke of Albufera) during the Civil war when he had taken Valencia. The area was returned to the state by Isabel II and the land is now owned by the city of Valencia.

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 are provided with food to attract large numbers of water fowl, the shooting of which 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 Approximately 1,000,000 people visit the area each year, mainly for bird watcing and cultural reasons. Hunting, fishing, grazing and construction are also carried out in the area.

PROBLEMS There has been irreversible 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 Wetlends. 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. pp381-406
- Excelentisima Diputacion Provincial de Valencia. Campana de Defensa de la Naturaleza y Medio ambiente. Memoria 1973-1979.

CONTACT ADDRESS

Servicio Forestal de la Comunidad Autonoma
de Valencia,
C/ Amedeo de Saboya 2,
46020 Valencia,
SPAIN.

SPAIN

ALBUFERA DE EL GRAO

MANAGEMENT CATEGORY — Managed Natural reserve.

TYPE — Wetland.

ANNOTATED DESCRIPTION — Albufera de el Grao is on the Island of Minorca. It is cut off from the sea by a series of sand dunes and includes many small pools separated by hillocks. The area is an important site for avifauna and the topography of the area allows for the observation of the many species which come here.

GEOGRAPHICAL LOCATION — The site is on the eastern coast of the Island of Minorca, about 7 km north of the towm of Mahon. N 39°57', E 04°15'.

AREA — The reserve covers an area of 320 ha with a coastline of approximately 1 km.

DATE ESTABLISHED — 1986.

LEGAL PROTECTION — The site was declared a Natural Area of Special Interest on 7 May 1986.

LAND TENURE — Privately owned.

CLIMATE — The area has an average annual temperature of 16°C (20°C in the summer, 13°C in the winter), and an average rainfall of 637 mm the majority of which falls during the winter months.

VEGETATION — In the wetlands themselves the common species are Juncus (Scirpus sp. and Juncus acutus), Salicornia (Salicornia fruticosa), olive (Olea europaea), pistacchio (Pistacia lentiscus), the reed (Phragmitas australis) and tammarind (Tamarix gallica). On the beach and exposed dunes Medicago marina and Euphorbia paralias are recorded. In the perimeter of the area dense stands of Pinus halepensis and Quercus itex are present.

FAUNA — The area is important as a wintering ground for several species of waterfowl. The little grebe (Tachybaptus rufficollis (=Pocideps rufficollis)), the cormorant (Phalacrocorax carbo), the mallard (Anas platyrhynchos), the widgeon (Anas penelope), the shoveler (Anas clypeata) and the pochard (Aythya fefina) can all be found in the area. It is also an important summer nesting site for the coot (Fulica atra) and a stop off for migratory species such as the tufted duck (Aythya fuligula) and the redshank (Tringa totanus). Other species in the area include the snipe (Gallinago gallinago), the moorhen (Gallinula chloropus), the herring gull (Larus argentatus) and the kingfisher (Alcedo atthis). None aquatic species include the osprey

(Pandion halicetus), the red kite (Milvus milvus), the perregrine falcon (Falco peregrinus) the kestrel (Falco tinnunculus) and the blackbird (Turdus merula). The turtle (Emys orbicularis) is also present.

CULTURAL/HISTORIC FEATURES No information.

MANAGEMENT The area is managed by the Service for nature conservation of the C. A. of the Baleares.

USES The area welcomes about 1,000 visitors a year, mainly in the winter for bird watching and study of the geology of the area. Some hunting and fishing does still occur in the area.

PROBLEMS Expansion of urbanization around the perimeter is a serios threat to the ecology of the area.

PRINCIPAL REFERENCE MATERIAL

- Blas Aritio, L. (1976). Guia ecologica de Baleares. INCAFO, Madrid.
- Rodriguez and Joaquin, J. (1965-1968). Catalogo razonado de las plantas vasculares de Menorca. Tip. de Fabragues, Hermanos, Mahon.

CONTACT ADDRESS Servicio para la Conservacion de la Naturaleza de la C.A. de Baleares.

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 deposits near the Gulf of Reus and to the south west of the Cape of Creus. Ther area is badly damaged by human activity.

GEOGRAPHICAL LOCATION 42°14' N- 03°07' E. The area is situated in the Cataluna region, close to the Gulf of Reus and to the south west of Cabo de Creus.

AREA 575 ha.

DATE ESTABLISHED 1983

LEGAL PROTECTION The area was declared a protected Lanscape (General Plan 1972) and then a Natural park of National Interest (Decree 1983).

LAND TENURE Private property

CLIMATE The area experiences a typical mediterranean climate with a mean annual temperature of 16°C (winter average 11°C; summer average 20°C). The mean annual precipitation is 650 mm (winter average 1000 mm; summer average 300 mm). The winds are dominantly easterly.

PHYSICAL FEATURES The base rock is of sedimentary formations of the Quaternary era. The terrain is flat with a maximum altitude of 7 m and with superficial, muddy waters.

VEGETATION The vegetation is dominated by Salicornietea and Juncetea spp. Populus albae is also present.

FAUNA The area is dominated by large numbers of Anas sp. and Scolopax rusticola. Birds of prey include Buteo buteo, Circus cyaneus and Falco tinnunculus.

CULTURAL/HISTORIC FEATURES Present in the area are the archeological ruins of the Greek colony Emporian (6 BC).

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

USES There are no permanent residents but the area welcomes a large number of visitors in the winter for bird watching and cultural reasons.

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

PRINCIPAL REFERENCE MATERIAL

- Arija Rivares, E. Geografia de Espana. Espasa Calpe S.A.
- Bover Argerich, J. (1966). Guia de Cataluna y sus comarcas. Fondo Cultural, Barcelona.
- Cardeval i Diars. (1932). Flora de Cataluna. Instituto Nacional d'estudis catalans, Barcelona.

CONTACT ADDRESS

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

SPAIN

EBRO DELTA

MANAGEMENT CATEGORY Regional Natural Park

TYPE Coastal wetland

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

GEOGRAPHICAL LOCATION 70 km south-west of Tarragona. 0°50' E-40°40' N

AREA 15,000 ha. with approximately 6.5 km of coastline

DATE ESTABLISHED 1983

LEGAL PROTECTION Natural park established by Decree of the Cataluna region, 4 August 1983.

LAND TENURE Private property

CLIMATE The average annual temperature is 20.5°C (winter average - 3.2°C; summer average 37.8°C), with an average annual precipitation of 500 mm. The wind direction is variable throughout the year.

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, Plato hola, Anfacada, Zancada, Enca izada) and the islands of Buda (1,300 ha) and San Antonio. The Ebro delta is one of the most important in the Mediterranean.

VEGETATION Relicts of white poplar wood Populus albae and Tamarix africana are present. In places, there are fairly extensive patches of dense reedbed, along with Gramineacea, Juncus, Nymphaceae and Potamogetonaceae.

FAUNA The delta is still very important for wintering coots Fulica atra and duck species, 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 Whiskered Tern (Chlidonias hybrida).

CULTURAL/HISTORICAL FEATURES The cultural features of the area are mainly influenced by the local fisheries. Exclusive fishing rights have been bestowed upon the fishermen of San Pedro de Tortosa and San Carlos de la Rapita since the reign of King Jaques I. The fishing methods which are emloyed are particular to the area and of some aesthetic value.

MANAGEMENT The area is managed by the General Directorate of Medio Rural de la C.A. de Cataluna. Shooting on the lagoons of La Enca izada and Zancada is under ICONA control.

USES Within the Regional Park area 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

- Anon., 1977. Els sistemes naturals del Delta de l'Ebre. Institucio Catalana, Barcellona (in Catalan).
- 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.
- Maluquer S., 1971. La Avifauna del Delta del Ebro. Ardeola Vol. Special: 191-319 (with numerous other references).

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

SPAIN

PALS (Marisma Costera)

MANAGEMENT CATEGORY Protected Landscape

TYPE Wetland

ANNOTATED DESCRIPTION Coastal wetland of high biological value for the abundant avifauna. This wetland is formed of Aigua Molls deposits and is very close to the Pals beach, south of Montgri in Ampurdan Bay.

GEOGRAPHICAL LOCATION Gerona province. 42°02'N- 03°11'E.

AREA 500 ha with a coastline of length 9 km.

DATE ESTABLISHED 1983

LEGAL PROTECTION Protected Landscape (General plan 1968). The area was designated a Natural Park of National Interest by Decree in 1983.

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). The area has a mean annual precipitation of 650mm (winter average 1000mm; summer average 300mm) with dominant easterly winds.

PHYSICAL FEATURES The area is formed of sedimentary formations of the Quaternary era of varying thickness. The terrain is flat and at sea level.

VEGETATION The vegetation is dominated by Salicornietae and Juncetea spp, along with species associated with Populus albae.

FAUNA Several species of migratory birds have been observed with the occasional appearence of the flamingo (Phoenicopterus ruber). Birds of prey include Buteo buteo, Circus cyaneus and Falco tinninculus.

CULTURAL/HISTORICAL FEATURES This area has high historical importance as it has witnessed the passage of numerous civilizations.

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

USES The area welcomes a considerable number of visitors during the winter months for bird wathing. Hunting and fishing also 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

- Arija Rivares, E. Geografia de Espana. Espasa Calpe S.A.
- Bover Argerich, J. (1966). Guia de Cataluna y sus comarcas. Fondo Cultural, Barcelona.
- Cardeval i Diars. (1932). Flora de Cataluna. Instituto Nacional d'estudis catalans, Barcelona.

CONTACT ADDRESS Medio Rural de la C.A. de Cataluna,
C/ Carcega 329,
08037 Barcelona,
SPAIN.
Present contact: Don Manuel Martin Arnaiz,

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. The land is very flat.

GEOGRAPHICAL LOCATION The area is situated at the mouth of the river Fluvia in the Gulf of Rosas. 42°12'N- 03°06'E

AREA 1450 ha, with 11 km of coastline.

DATE ESTABLISHED 1983

LEGAL PROTECTION The area was declared a Picturesque Landscape by the Ministry of Agriculture (General Plan approved on 1975). It was designated as a Natural Park of National Interest by Decree in 1983.

LAND TENURE 10 ha are owned by the state and 55 ha are common land. The remaining 1385 ha are privately owned..

CLIMATE The area has a Mediterranean climate characterized by rainy Autumns and Springs. The mean annual temperature is 16°C (Winter average 11°C; Summer average 20°C). The mean annual precipitation is 672 mm (Winter average 1000 mm; Summer average 300mm). The area experiences dominant 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 The area is dominated by large numbers of woodcock (Scolopax rusticola). There is also the occasional presence of the flamingo (Phoenicopterus ruber). Birds of prey include Buteo buteo, Circus cyaneus, Falco tinnunculus.

CULTURAL/HISTORICAL FEATURES Archeological remains of a Roman city. The area has seen the passage of Greek, Roman and Visigoth peoples.

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

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

PROBLEMS Fragile degraded ecosystem threatened by spreading urbanization.

PRINCIPAL REFERENCE MATERIAL

- Boada Altarriba, E. (1984). Espacios Naturales de la Provincia de Alicante. Alicante C/ Gerone 28.
- Direccion General del Medio Ambiente de Andalucia. Zonas humedas en Andalucia. Madrid.

CONTACT ADDRESS

Servicio del Medio Natural de la
Communidad Autonoma de Cataluna,
C/ Carcega 329- 5 Planta,
08037 Barcelona,
SPAIN.
Present contact: Don Juan del Peso Diaz.

SYRIA

AREA 185,179 km^2.

LENGTH OF MEDITERRANEAN COASTLINE 188 km.

AREA OF TERRITORIAL SEA 3950 km^2.

POPULATION 9,053,000 (1981).

PROTECTED AREAS LEGISLATION There is at present no legislation to protect specific areas. The World Heritage Convention (UNESCO) was accepted on 13 August, 1975.

PROTECTED AREAS ADMINISTRATION

NATIONAL AUTHORITY ADDRESS Department of the Countryside and Grazing,
Ministry of Agriculture and Agricultural reform,
Damas,
Syria.

LIST OF ESTABLISHED M/C PROTECTED AREAS There are no protected areas.

LIST OF PROPOSED M/C PROTECTED AREAS A steering committee is actually studying the possibilities of designating protected areas.

CONTACT ADDRESS Department of Zoology,
Faculty of Science,
University of Damas,
Damas,
SYRIA.
Dr. M. Al Nimeh.

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 are coastal) were established by Presidential Decree, the specitic 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 Directions of the Ministry of Agriculture: the Direction de l'Environnement (Cabinet of the Minister), in charge of the general co-ordination, and the Direction des Forêts (Sous-Direction de la Chasse et des Parcs Nationaux) which undertakes administrative tasks.

NATIONAL AUTHORITIES ADDRESSES

Direction de l'Environnement,
Ministère de l'Agriculture,
30 Rue Alain Savary,
Tunis,
Tunisia.

ALSO

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

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 colonies 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 elongated island of Galite (650 ha, max. alt. 391 m.). The Canis islands, 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, and 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, mainly in summer.

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

Direction de l'Environnement,
Ministère de l'Agriculture, 30 Rue Alain Savary,
Tunis, Tunisie.

ALSO Direction des Forêts, Sous-Direction de la Chasse et des Parcs Nationaux,
Ministère de l'Agriculture, 30 Rue Alain Savary,
Tunis, Tunisie.

ALSO Commissariat Général à la Pêche
Ministère de l'Agriculture, 30 Rue Alain Savary,
Tunis, Tunisie.

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 a Biosphere Reserve on March 77 and as a World Heritage Site in 1979. This area is also on the RAMSAR list. It si the only area in the world with these three citations.

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 (Anancus osiris, Elephas planifrons, Stylohipparion libycum, Libytherium maurusium, Testudo gigans, T. emys) of the Villafranchian (late Pleistocene) age ; 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 of 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, and 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 other 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 achieved 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 drainage 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 IBRS.

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 dessication 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 ADDRESS

Direction de l'Environnement,
Ministère de l'Agriculture, 30 Rue Alain Savary,
Tunis, Tunisie.

ALSO

Direction des Forêts, Sous-Direction de la Chasse et des Parcs Nationaux,
Ministère de l'Agriculture, 30 Rue Alain Savary,
Tunis, Tunisie.

OR

Chef du Parc National de l'Ichkeul,
Commissariat Regionale de Developpement
Agricole de Bizerte, Bizerte, Tunisie.

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 (MAB, UNESCO).

LEGAL PROTECTION The waters around Zembra (to a distance of 2.4 km) were declared a 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 blow 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 (Oryctolagus 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

Direction de l'Environnement,
Ministère de l'Agriculture, 30 Rue Alain Savary,
Tunis, Tunisie.

ALSO

Direction des Forêts, Sous-Direction de la Chasse et des Parcs Nationaux,
Ministère de l'Agriculture, 30 Rue Alain Savary,
Tunis, Tunisie.

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. The Hunting law (No 3167) was created in 1937 and does provide for the protection of endangered species. The national parks law (No 2873) was established in 1983 providing the legal framework for the establishment of such areas. Three other laws have also been brought into force which allow the protection of the environment from pollution (Environment law No 2872, 1983), the protection of natural and cultural sites and resources (Culture and natural resources protection law No 2863, 1983) and the protection of water resources by management and improvement (Water resources law, No 1380, 1971).

The country is also a signatory to a number of important conventions concerning the protection of wildlife and natural habitats. These are; The international convention for the protection of birds, The wildlife and habitat protection agreement for Europe (The Bern Convention), The convention for the protection of the worlds natural and cultural heritages (UNESCO), The Convention for the protection of the Mediterranean sea against pollution (The Barcelona convention) and the UNESCO MAB programmes.

PROTECTED AREA ADMINISTRATION National Parks and Reserves are established and managed by the General Directorate of National Parks and Wildlife of the Ministry of Agriculture and 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 YARIMADASI

MANAGEMENT CATEGORY National Park (II)

TYPE Coastal

ANNOTATED DESCRIPTION Dilek Yarimadasi National Park covers an area of 10,985 ha. of land surface which forms a peninsula of 20 km long and an average of 6 km wide. The altitude ranges from sea level to the peak of Dilek Tepe at 1237 m. The peninsula has an interesting geomorphological structure and scenic beauty which is enriched by topographical land forms, extensive beaches, numerous small bays, canyons, caves and various other interesting rock formations.
Apart from a few small patches of bare areas at higher altitudes, the peninsula is almost entirely covered by woods and maquis formations of Lauretum. The richness and diversity of these plant associations provide suitable habitats for various animal species. The Anatolian leopard (last seen in 1975) the Mediterranean monkseal and the Sea Turtle, all endangered, are recorded in this area. The park also has some endemic floral species. Despite the great fires that have ravaged certain parts of the park, the natural vegetation, especially on the northern slopes, is the most rare to be seen in the Mediterranean region. The area is ideal for the red and black pines and, even after the fires, the vegetation thrives. Bay trees, chestnuts, limes, and certain oak species are present which are peculiar only to the Northern Black sea coast.
The peninsula has been inhabited since the 10th-11th centuries B.C.(during all of the Archaic, Classical, Hellenistic, Roman, Byzantine, Selchuk and Ottoman periods).

GEOGRAPHICAL LOCATION The park is situated on the western coast of Turkey, in the South Aegean region, 28km from Kusadasi in Aydin province. N $37^{o}37'-37^{o}43$, E $27^{o}07'-27^{o}14'$.

AREA 12,185ha, with 10,985 ha being land surface and 1,200 ha of sea.

DATE ESTABLISHED 1966

LEGAL PROTECTION The titles and dates of legislation protecing the area are as follows: The Forest Law No. 6831 in force on 5 Sept' 1956, The National Parks Law No.2873, 11 Aug' 1983, and finally the Ministerial Approvement on Establishment of Biogenetic reserves on 14 Dec' 1977. The area itself was assigned as a biogenetic reserve in 1978.

LAND TENURE State ownership.

CLIMATE The area experiences a typical Mediterranean climate with hot dry summers and moderate rainy winters. The average annual temperature is 16.6°C (24.2°C in Summer and 9.6°C in Winter) and the average annual rainfall is 688.5 mm (380.2 mm falling in winter and 145.4 mm in Summer). Average relative humidity is 69.4%. and the winds are prevalently South-Easterly.
In the marine environment the average annual temperature is 20°C (26°C in Summer and 14°C in Winter), with an average summer salinity of 36.5% which drops by 1% in the winter.

PHYSICAL FEATURES 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.
The topography is rugged and highly undulating with an average altitude of 600 m, with Dilek Tepesi (1237m) rising in the centre. There are high peaks, steep slopes and deep canyons, plains, a large number of streams, and 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, between which there are great climatic differences.

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. There are 7 endemic and 27 threatened plant species within the park along with a total number of 333 species. 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 subsp.pallasiana) 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 the olive (Olea europea).
In the dunes the most common species are Ammophila arenaria (var. australis), Eryngium maritimum and Sporobolus arenarius.

FAUNA The park is known as one of the breeding grounds for the Anatolian Leopard and represents the western most point of its Asian distribution. Other 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 One of the most important archeological remains to be found in the park is that of the meeting chamber of the Panionian administrators, the Bouleterion. This is found near the village of Guzelcamli. The Panionian was a religious and political fusion of 12 Ionian cities representing the peak of the Ionian civilization in Greek culture. Excavations have been carried out by Prof. G. Kleiner (1957-58) which have unearthed an alter and the Bouleterion, with 11 steps on the Otomatik hill, as well as fragments of ceramic pottery and two stone tablets on which the records of the Panionian federation were written.

MANAGEMENT Dilek Yarimadasi has been designated as a national park in 1966 by the Minister of Forestry. The main management policy has been the preservation of the parks scientific value and wise use of the educational and recreational potential for the benefit of present and future generations. All deleterious activites in the area have been prohibited, although recreation activites have been permitted on some beaches which constitute only a small part of the area. Forest fire is one of the major dangers to the area and necessary measures such as fire observation towers with telephone links, roads and trails, have been developed. The park is administered by the Park Directorate, based in the town of Kusadasi in Aydin province, and employs 1 administrator, 6 guards and varying numbers of seasonal staff. The guards have police authority within the area of the park. Research teams also visit the area regularly to collect necessary data. The Government has assigned 40,500,000 TL to the Park since 1982.

USES The area welcomes 269,000 visitors a year to the area, the majority arriving in the summer. 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. The major pastimes in the area are skin diving, swimming, sunbathing, bird watching and visiting the archeological remains.

Research in the area has studied plant sociology, the general flora, fauna and marine environment. Training courses for local administrators of wildlife parks are organised along with the development of Nature trails. Limited and controlled ranching, grazing and recreational fishing are permitted in the park.

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. There is also a lack of trained technical staff.

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

Orman Genel Müdürlügü,
Milli Parklar Dairesi Baskanligi
11 no. lu bina Gazi,
Ankara,
TURKEY.
Present contact: Mr. M. Pamuk.

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. 40° 20'N- 26° 20'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. The remainder is mainly privately owned but subject to certain governmental control.

PHYSICAL FEATURES Consists 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

BEYDAGLARI (OLIMPOS)

MANAGEMENT CATEGORY National Park (II)

TYPE Coastal

ANNOTATED DESCRIPTION This district features all of the typical ecological features of the Mediterranean region. It has a rich vegitation with dwarf pines on the coast, Red pines to the 1000m level followed by cedars. The area has 5 vegetation types, 841 plant species and 21 endemic taxa. The richness and high endemism of the flora is one of the most important features of the area. It is also a habitat for the ndangered Mediterranean Monkseal. The area is also famous for its views from Antalya to the west which take in the brilliant blue waters of the Mediterranean (noted for their limpidity) to the mountains which climb, covered in green forest, from the sea.

The park also has some areas of geological interest in its sandy and pebbly beaches, wide and tiny coves, the gulfs and the valleys and peaks of the Kesme Bogazi Plateau, as well as Mount Tahtali (2366m). Natural gas, escaping from a crack between the calcareous and serpentine rock formations have been burning for hundreds of years.

Prehistoric remains (9000BC) in the Beldibi Cave and the greek colony of Phaselis, with its three harbours, and city of Olimpos and ports of Idryos and Adrasan are famous ancient sites giving evidence of the areas early settlements.

GEOGRAPHICAL LOCATION The park lies 12km southwest of Antalya City. ($30^{o}10'-30^{o}40'E$ - $36^{o}10'-36^{o}50'N$), although the site selected as a specially protected area, lies at the southern most tip of the park, 28km from Antalya.

AREA The National Park has an area of 69,800ha with 138km of coast, including the insular coasts, plus 10km inland. The specially protected site within the park near Adrasan has an area of 5,750 ha, 750 ha being made up of water. It has a coastline of 25 km.

DATE ESTABLISHED 1972

LEGAL PROTECTION Titles and dates of legislation and decrees protecting the area are as follows;
-The Forestry Law. Code no. 6831, 5 Sept' 1956.
-The National Parks Law. Code no. 2873, 11 Aug' 1983.
-Regulation on the implementation of the National Parks Law. 12 Dec' 1986.

LAND TENURE Mainly owned by the state with approximately 4,000 ha owned by private farm owners and local communities.

CLIMATE This region experiences a typical Mediterranean climate with hot, dry summers followed by moderate, rainy winters. The climatic data is taken from Antalya and Finike as no meteorological station is present in the park. The average annual temperature is 18.7°C, varying from 33.7°C in August to 6.2°C in January. Mean yearly precipitation is 1068.2 mm with an average of 703.7 mm falling in the winter and 14.8 mm in the summer. Wind is prevalently North-westerly with an average speed of 3.9 m s^{-2}

The mean sea water temperature is annually 21.6°C with a maximum in the summer of 27°C and a minimum in the winter of 16°C. Salinity is 39 mg l^{-2} in the summer which drops by 0.2 in the winter.

PHYSICAL FEATURES The park is bordered by the sea to the east and south and by the first of a series of mountain ranges to the west. The north is bordered by the western edge of the Antalya plain. This area is situated in the Western Taurus belt of young mountains. The geological formation is generally of calcareous and serpentine rocks. The oldest rocks in the vicinity are the permian carboniferous limestones of the late Mesozoic Era which form the coastal mountain ranges. Early in the Tertiary period the area was uplifted but later subsided with later deposition of sediments. Both extrusive and intrusive magnetic material is spread throughout the area dating from the early Cretaceous period. Large blocks of serpentine are representative of this material.

Altitude ranges from sea level to 2,366 m.

VEGETATION The areas flora can be categorised into five main vegetation types: Coastal dune vegetation, Frigana type vegetation, Maquies formations, Forest belt vegetation and Alpine belt vegetation. 841 plant species have been identified, the most noticeable of which are the red pine (Pinus resinosa), black pine (P. nigra), Sicilian fir (Abies cilicica), cedar of Lebanon (Cedrus lebani), juniper (Juniperus excelsa), cypress (Cupressus sempervirens), oak sp. (Quercus), poplar and plane.

FAUNA The presence of the Mediterranean monkseal is the most important marine animal to be recorded in this park along with turtles and fish species. Terrestrial species include the 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) and several bird species.

CULTURAL/HISTORIC FEATURES Prehistoric remains in the Beldibi cave show evidence of settlement in the region from as early as 9000 BC. Another feature of interest in the park is that the discovery of a sunken ship of the Bronze age period (2000 BC.) off the Gelidonya promontory and the fact that the forests of the Lycian peninsula, in antiquity, were ruled by the 'Sea people' both suggest that this park contains the sites of their settlements.

The colony of Phaselis with its three harbours, and the city of Olimpos, which was famed for its minting of metal money are both to be found in the park along with other ancient sites such as the ports of Idryos and Adrasan near Kemer and Gagal to the west of the Celidonia promontory. In a mountaneous area, about 2 hours drive from the ancient city of Olimpos, there is a site where natural gas, escaping from a crack between the calcareous and serpentine formations has been burning for hundreds of years. This is probably the origin of the mythological Chimera monster which the hero Bellerophon is reputed to have slain whilst riding the winged Pegasos.

MANAGEMENT The Beydaglari area was set aside as a National Park in 1972 by the Minister of Forestry according to article 25 of the Turkish Forest Law. The aims were to preserve the area's outstanding natural and cultural resources, especially for its remarkably diverse flora and fauna and its brilliant blue waters and beautiful mountainous landscape. Since its establishment, the main management policy has been that of preserving the Parks scientific values linked with wise use of the educational and recreational potential for the benefit of the present and future generations. All activities which have a negative effect on the natural environment, such as hunting, trapping, commercial fishing, pollution and picking of flowers, have been prohibited according to the provisions of the National Parks Law.
There are some proposed camping and day-use areas within the site. At the moment picknicking and other recreational activities are permitted but with strict controls as forest fires are a serious threat to this area. As a result, a fire control project has been carried out by the National Parks Department. This project contains several components such as an effective warning and communication system, a network of fire control roads, a series of observation towers and a trained fire-control team.
The Park employs 2 administrative staff, 10 guards (more in the summer), and several seasonally employed labourers. A team of researchers also visit the area from time to time in order to collect data. Since 1982 66,000,000 TL has been allocated to the area (exclusive of salaries) through the governments National Park Investment Programme.

USES Tourism: The park welcomes 300,000 visitors a year taking part in various sports such as skin diving, sport fishing, bird watching along with conventional activities such as sightseeing, sunbathing and picnics. There are hotels, motels and marinas outside the site where bed capacity is at present 10,000 but due to rise to 60,000 in the near future (Touristic Development Project of South Antalya).

Research: The National Parks Master Plan has been prepared by a multidisciplinary team of experts. It assigns four main areas of interest: The significance of the area (Natural history, History and Archeology), the backround information (Geology , geography, climate and land use), the development and management of the area (Park objectives, resource protection, public access, development of facilities, staff organisation, and implementation of plans and management shedules) and the creation of catalogues of the flora and faune present in the park.

Research is being carried out on the Mediterranen Monkseal and its habitat in the Aegean region and on the park's flora. The establishment of a research station for this work is under consideration (there are at present no research facilites available although accomodation is available in Antalya).

Training courses are organised by the Generale Directorate of Forestry for technical and administrative staff. Subjects include; National parks, nature parks and reserves and wildlife.

Hunting and commercial fishing is prohibited in the park although ranching and grazing of livestock is permitted under certain circumstances and only in certain areas. Forestry activities are carried out according to the terms of the Forest Management Plan which was specially prepared for the National Park.

PROBLEMS The major environmental problem is that of forest fire and measures have been taken to alleviate this (see above).

There is a lack of trained technical staff for implementation of the management programme.

Some illegal grazing and construction is also a problem.

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

Orman Genel Müdürlügü,
Milli Parklar Dairesi Baskanligi,
11 No. lu Bina,
Cazi,
Antalya,
Turkey.
Present contact: Mr. M. Pamuk (Head of Department)
Mr. E. Karakurum (Forest Engineer).

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 The Republican Institute for the Protection of Nature,
Ilica 44/II,
Zagreb,
Yugoslavia.

ESTABLISHED M/C PROTECTED AREAS

1. Brioni Islands National Park (M/C)
2. Kornati Islands National Park (M/C)
3. Krka National Park (C)
4. Limski Zaljev Nature Reserve (Lim Bay) (M/C)
5. Lokrum Nature Reserve (C)
6. Malostonski Zaljev Nature Reserve (Malaston Bay) (M/C)
7. Mljet National Park (C)
8. Neretva Delta Nature Reserve (W)
9. Paklenica National Park (C)
10. Suma Dundo na Rabu Nature Reserve (Dundo forest - Rab Island) (C)

YUGOSLAVIA

BRIONI ISLANDS

MANAGEMENT CATEGORY National Park and Commemorative Site

TYPE Marine/Coastal

ANNOTATED DESCRIPTION A group of islands in the north Adriatic consisting of two larger islands (Veliki Brion and Mali Brion) along with 12 smaller islets and crags. 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 6.5 km to the northwest of Pula being separated from the Istrian mainland by the Fazane channel (about 1700 m wide). The area is located in the Commune of Pula, Socialist Republic of Croatia. 44°45'N- 13°45'E.

AREA 4000 ha (1000 ha terrestrial) with a coastline of 46.6 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 Communal ownership

CLIMATE Mediterranean climate giving a semi-arid environment with hot summers and moderate winters. The average annual temperature is 13.9°C (winter average 6.2°C, summer average 22°C). Average annual sea temperature is 16.1°C (22.5°C in summer, 10.5°C in winter). Annual average precipitation 812 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 being composed of stratified cretaceous limestones, flattened and without surface streams. The rocky coast is mainly low and easily accessible. The highest point is Straza (42 m) on Veliki Brion. The geological structure of Brioni is identical to the coastal region of Istria. There are no sandy coasts although the Fazane canal is silted. The marine area has an average depth of 20 m reaching a maximum of 50 m off Veliki Brion.

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 divided into two forms: equal proportions of holm oak with laurel (Orno-Quercetum 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-natives such as parasol pine, cedars and eucalyptus. Colonies of the Sea grass (Cymodocea nodosa) are found in the beds of silt in Fazane canal.

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 (3.4 ha) which is open to the public and some species such as wild sheep (Ovis aries), Fallow deer (Dama dama) and Roe deer (Capreolus capreolus) have been introduced to the islands.

CULTURAL/HISTORIC FEATURES The archipelago is rich in archeological excavations, dating from the neolithic age 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 Gradina hill on Veliki Brion is a 10 ha Illyrian site (about 1,700 BC), 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 under state ownership by the Organization of Works of Brioni. The property is financed with its own income, as well as by the Federal Republic of Croatia and the National Budget.
The site is open to the public although 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, the plan was due for completion in the second half of 1986. The management team employs a total of 263 people.

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 (171000 between spring and autumn). On the island of Veliki Brion there is a 4 ha flower garden and garden-nursery where decorative Mediterranean plants are cultivated.

PROBLEMS The major problem for the area is how to limit the number of visitors as the area is proving so popular that there is a danger that the areas natural capacity will be exceeded.

PRINCIPAL REFERENCE MATERIAL

- Mlakar, S. Muzejsko-konzervatorski radovi na otocju Brioni. Muzeji, 1956-1957, 11-12.
- Lenz, O. 1936. Vodic po Brionima, Vienna.
- 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 140 islands, islets and reefs lined in three parallel ranges. These are often 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 (E 15° 21', N 43° 48').

AREA 22375 ha (5068 terrestrial).

DATE ESTABLISHED 13 August 1980

LEGAL PROTECTION Total.

LAND TENURE Administratively the islands are under the jurisdiction of the local authority of Sibenik although the lands themselves are privately owned.

CLIMATE Mediterranean climate with cool rainy winters and sunny summers. Average annual temperature 16°C (January average 6.7°C; July average 27°C). Average annual rainfall 789 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 winter 10°C, in summer 25°C and a salinity of 38%.

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. On some islands the cliffs drop vertically to a depth of up to 98 m, particularly on the outer range of islands which face S-W. Between the other islands the shallow channels are covered with sands and silts.

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) with immportelle (Chelichrysum italicum) and Brachypodium ramosum. On vertical cliffs communities of Phagnalon rupestre and Centaurea ragusina have developed. A few isolated trees of wild olive (Olea oleaster) and oak (Quercus ilex) are left from the original evergreen forest. Within the various degradation stages of the 'garrigue' a Cisto-Ericetum community has developed with Cistus salviaefolius, Myrtus communis, Pistacia lentiscus, Olea oleaster, Ficus carica and Pyrus amygdaliformis being predominant. The cultivated area accounts for only 5% of the total area. On the underwater cliffs there are well developed photophillic algae and coralligen formations. and on the mobile substrata, large meadows of Posidonia oceanica occur. In caves, semi caves and at depths below 30 m the red coral (Corallium rubrum) is present.

FAUNA There is a poor terrestrial fauna including some lizards, ring-snakes, rodents, marten and rabbits. Sea gulls are common and 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 (eg. Murena helena, Dentex dentex and Palinurus vulgaris). The rare mollusc 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 can be found as well as the remains of some Roman salt works. There are the remains of a Venetian fort on the Islet of Panitula.

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. The area is administered by the Kornati National Park Management team which is comprised of 22 personnel. Funds are obtained partly from government sources and by entrance fees and guided tours.

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. The area receives 180000 visitors per year. Accomodation is provided in guest houses (600 beds), camping sites (2) and a marina (180 berths), there are no hotels within the park itself.

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 may endanger the exceptional and pristine beauty of the site. Tourist pressure may also become a problem resulting in the necessity of appointing more guards and the purchase of supervisory craft.

PRINCIPAL REFERENCE MATERIAL

- Bralic, I. 1970. Kornati - konverzatoska studija, Republicki zavod za zastitu prirode, Zagreb.
- Friganovic M., 1984. National Park: The Kornati Archipelago. Tourist Monographis No 3, Zagreb.

CONTACT ADDRESS

Uprava nacionalnog parka Kornati,
59243 Murter,
Yugoslavia.
Tel. 059 75 058.

YUGOSLAVIA

KRKA NATIONAL PARK

MANAGEMENT CATEGORY National park.

TYPE Coastal.

ANNOTATED DESCRIPTION The river is typically Karstic, flowing through canyons, waterfalls and forming lakes at wider parts. There are seven sets of waterfalls, the best known and largest of which are at Skradanski buk and Roski slap. The park also includes a tributary of the Krka, the river Cikola, both of which contain numbers of trout and possibly endemic species of Salmothymus obtusirostris. Part of the park is forested and some is pasture, although the largest part (45%) is of rocky soils. There is a large lake (Visovacko jezero) upstream of Skradinski buk. Within the limits of the park there are two sacred structures, a Franciscan monastery on an Islet in the lake, and a Greek Orthodox monastery upstream of this.

GEOGRAPHICAL LOCATION The park follows the course of the river Krka including its canyons, the waterfall area at Stradinski buk and the submerged part of the river to the sea. (E 15° 49'-16° 03', N 43° 46'-43° 59').

AREA The park covers a total area of 14200 ha.

DATE ESTABLISHED September 1985.

LEGAL PROTECTION The park is protected by the Law on Proclaiming the Krka National Park, Narodine novine No. 5, 12th February 1985.

LAND TENURE 70% of the park is owned by the communities of Sibenik, Drnis and Knin, the remainder is privately owned.

CLIMATE Seperate areas of the park differ in tneir cilimatic features. There are two main zones, the first is the area from the Sibenik bridge upstream to Skradinski buk. Here the influence of the sea is significant providing a mild climate with approximately 900 mm of rain. Upstream of this the park has a submediterranean climate with greater differences between summer and winter temperatures (Summer average 26.2°C, winter average -2.1°C) and an annual precipitation of around 1200 mm.

PHYSICAL FEATURES The upper part of the river bed is cut into conglomerates with limestones, as the river proceeds towards the sea, the rocks change from being predominantly conglomerate to carbonate rocks such as limestones and dolomites. The river canyon is cut into a plateau with a mild incline (N-S) from 243 m to 100m at the south. The river is deepest at Sibenic bridge (35 m), its temperature and salinity vary considerably during the seasons and at different depths.

VEGETATION The park has three main vegetation types. The first is of forests and thickets of Orneto-Quercetum ilicis and Carpinetum orietalis croatium communities. The second is of evergreen brushwood stands of Juniperus and the third is communities of Koelerieto-Bupleuretum associations found on the submediterranean rocky soils. A part of the park is also planted with stands of Black pine (Pinus nigra), particularly between Skradin and Skradinski buk. Swamp vegetation is present in some places on the lower courses of the river, particularly around the mouth of the tributary Guduca.

FAUNA Of the larger mammals, the roe deer (Capreolus capreolus), the boar (Sus scrofa), martens and the jackal (Canis aureus) are common. The otter (Lutra lutra) may be present around the mouth of the river Cikola. The area of Guduca is important for swamp birds such as the heron and the bittern (Botaurus stellaris). Birds of prey such as the golden eagle (Aquila chrysaetos), the peregrine (Falco peregrinus) and the Egyptian vulture (Neophron perenopterus) all nest in the park. Also in the park are found green frogs, the common toad (Bufo bufo), the green toad (Bufo viridis), green lizards (Lacerta viridis, Lacerta trilineata) and the leopard and four lined snakes (Elaphe situla and Elaphe quatorlineata). In the river itself research should confirm endemic species of Salmothymus. Towards the sea, marine organisms are found, such as dense colonies of the shells Pecten jacobeus and Arca noae. The most impoortant fish are members of the Mugilidae family.

CULTURAL/HISTORIC FEATURES At the northern edge of the park there are the remains of two middle-age fortifications (Necven and Trosenj). The greek orthodox monastery of St Archangel, built at the beginning of the 15th century, contains a disposing display of icons and books. The Franciscan monastery (also 15th C) on the island of Visovac also has a huge library. Both of these monasteries are still functional.

MANAGEMENT The Park is managed by the independant working organisation - Uprava nacionalnog parka 'Krka' in conformity with the Law on the Protection of Nature. The Group has 22 permanent emloyees along with an extra 10 guards and 40 labourers for the summer months. The park is financed from its own income by the sale of tickets and the organisation of excursions.

USES Approximately 2860 people actally live in the park area. During spring and summer the area is visited by 382000 people. Within the park there is a motel at Roski slap (15 beds) and a hotel (50 beds) and marina (180 berths) in Skradin. Oceanographic, icthyological, ornithological and limnological studies have been carried out in the area, although there is no special provision for these. There is a laboratory in Sibenik. The area is often visited by student groups. In waters downstream of Skradinski there are shell and fish farms.

PROBLEMS The major problem is one of pollution from settlemants upstream of the park area. There is also a shortage of sufficiently trained guards.

PRINCIPAL REFERENCE MATERIAL

- Matonickim, I. 1972. Zivot nasih rijeka, Skolska knijiga, Zagreb.
- Pavletic, Z. 1961. Bioloske karakteristike sedrenih slapova na nasim rijekama u krusu, Geografski gasnik, Vol 22, Zagreb.
- Pevalek, I., Roglik, J. et al 1953. Krka i problemi njezine zastitute, Konzervatorski zavod NR Hrvatske, Zagreb.

CONTACT ADDRESS

Uprava nacionalnog parka 'Krka',
A. Kovacica 9,
58000 sibenik,
Yugoslavia.
Tel. 059 27 720.

YUGOSLAVIA

LIMSKI ZALJEV

MANAGEMENT CATEGORY Nature reserve.

TYPE Coastal/Marine

ANNOTATED DESCRIPTION This bay cuts due east into the western coast of the Istrian peninsula, it is actually a submerged canyon valley in karst. It is about 10 km long with an average width of 600 m It is deepest at the mouth (33 m). The waters have a diminished salinity and a high planktonic production resuliting in lack of clarity of the waters. The waters are an important site for fish over-wintering or spawning. There is a natural oyster population along the western coast and commercially based shell fish farms in the inlet itself.

GEOGRAPHICAL LOCATION On the western coast of the Istrian Peninsula (E 13^{o} 37'-13^{o} 45', N 45^{o} 10'-45^{o} 11')

AREA 1473 ha in total (1140 ha terrestrial) with 20 km of coastline.

DATE ESTABLISHED 1979.

LEGAL PROTECTION The terrestrial part of the reserve is protected by Decision by the protected natural landscapes' registration commission within the institute for the protection of nature, dated 13th December 1963 in compliance with the Law on Protection of Nature. The marine area or the reserve is protected on the basis of the Decision proclaiming the sea and submarine space of the Inlet of Lim a Special Reservation, dated 1979.

LAND TENURE The reserve is both privately and communally owned.

CLIMATE The area has a mean annual temperature of $13.4^{o}C$ (winter mean $5.5^{o}C$, summer mean $20.6^{o}C$) and an annual precipitation of 925 mm (226 in winter and 227 in summer). Southern and northern winds alternate equally whereas eastern winds are 3 times more frequent than western. In the marine environment summer water temperatures range from $27^{o}C$ to $23^{o}C$ whilst winter temperatures may drop to $4^{o}C$. Salinity is generally around 15%.

PHYSICAL FEATURES The inlet of Lim is a submerged canyon valley in Jurassic limestones which extends into a dry canyon, Limska draga. The stoney beds of the bay fall at an angle of about 35^{o} to a depth of about 15-20 m and a sand silt bottom. The maximumn depth is 33 m.

VEGETATION The northern coast of Limski zaljev is covered by the community of evergreen oak (Orno-Quercetum ilicis), whilst the southern coast is mostly overgrown with the oriental hornbeam forest with holly (Carpinetum orientalis phyliretosum). On the rocky bed of the inlet, the following species can be found; Axinella, Cladocora cespitosa, Paracentrotus lividus, Arbacia lixula, Lithophaga lithophaga and Mytilus galloprovincialis. On the muddy bottoms one can fined Alcionium palmatum, Spirographis splanzani, Pennatula phosphorea and Cerianthus membranacus.

FAUNA The basic species of mammals are the roe deer (Capreolus capreolus) and the wild boar (Sus scrofa). In the marine area grey mullets (Mugillidae), bogue (Boops boops) and goldin (Salpa salpa) are common.

CULTURAL/HISTORIC FEATURES None.

MANAGEMENT The area has no separate administration. The terrestrial part is managed by Forest administrators in Porec and Rovinj. There are also measures to protect the sea and submarine areas.

USES Thearea is visited in the summer by some tens of thousands of people. Road access is possible and there is also a berth for access from the sea. There is one restaurant. Boats are not allowed to anchor in the area, and swimming is permitted in specified areas. The sea area is under constant monitoring by the Sea Exploration Center of the Ruder Boskovic Institute. There is an experimental oyster and mussel farm in the inlet. There are also fish spawn and rearing cages in the inlet.

PROBLEMS The major problems are of pollution from the land and of litter. Increased guard power would be an advantage.

PRINCIPAL REFERENCE MATERIAL
- Several papers in the periodical 'Thalassia Jugoslav'.

CONTACT ADDRESS
The Republican Institute for the Protection of Nature,
Ilica 44/II,
Zagreb,
Yugoslavia.

YUGOSLAVIA

LOKRUM

MANAGEMENT CATEGORY Nature Reserve

TYPE Coastal

ANNOTATED DESCRIPTION The island is 600 m from Dubrovnik and is overgrown with dense mediterranean vegetation covering an area of 59 ha. Part of the Island has been developed as a park with exotic plants planted in the middle of the 19th Century. There is a benedictine monastery (11th century).

GEOGRAPHICAL LOCATION 600m from the coast, near Dubrovnik. 42° 38'N, 18° 07'E.

AREA 72 ha with 4.8 km of coastline.

DATE ESTABLISHED 1967

LEGAL PROTECTION Established by Decree No. 221/48 on 27 February 1948. In 1963 the island was given further protection under the Law on Proclaiming Island of Lokrum a Managed Nature Reserve. In 1976 the island was protected in the category of a special reserve of forest vegetation by the Law on the Protection of Nature.

LAND TENURE Owned by the community of Dubrovnik.

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 25° C in summer, annual average precipitation being about 1300mm.

PHYSICAL FEATURES A calcareous islet of Nummulite limestones with a 4.8km long shoreline, the surrounding sea being 8-15m deep (maximum 55m). 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 The island is partly overgrown with the evergreen oak association (Orno-Quercetum ilicis) and 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. In the sea the sea grass (Posidonia oceanica) is present on the sandy bottoms.

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

CULTURAL/HISTORIC FEATURES The island was first mentioned in 1023 when the city of Dubrovnik donated it to the benedictine monks. The ancient Benedictine monastery, built in the 11th century, is the only major building on the islet. There is also however a 16th century lazaretto (quarantine) built for visitors to the city, and a remnant of the Napoleonic era- Fort Royal on the islands highest hill.

MANAGEMENT There is 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, 12 labourers and 4 guards. Budget: 4.5 million dinars a year mainly from its own income. 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 the number of visitors during the dry period of the year.

PRINCIPAL REFERENCE MATERIAL

- Arnold, Z. 1938. Slike iz vrtova Dalmacije, Parkovi na Lokrumu i Lopudu, 'Nas vrt', Zagreb.
- Gryn-Ambroes P., 1980. Preliminary Annotated Lists of Existing and Potentially Mediterranean Protected Areas. UNEP/19.20/INF.5.
- Horvatic, S. 1969. Osebujnost vegetacije otoka Lokruma, Prirode, Zagreb.
- Miljanic, M. 1986. Lokrum, Dubrovnik, Stvarnost, Zagreb.

CONTACT ADDRESS

Director, Reserve "Lokrum",
50000 Dubrovnik,
Izmadju polaca 16.
Yugoslavia.

YUGOSLAVIA

MALOSTONSKI ZALJEV

MANAGEMENT CATEGORY Nature Reserve

TYPE Marine/Coastal

ANNOTATED DESCRIPTION The bay of malostonski, or Malog Stona channel , as it is also called, is closed in by the mainland coast and that of the Peljesac peninsula. The seas receive fresh water from the Neretva river system which enable the development of bioces particular to this type of environment. The sides of the bay are steep, but are well covered with vegetation. The reserve has two protection zones and administration of the area is divided between Dubrovnik and Metkovic.

GEOGRAPHICAL LOCATION The bay is due North-west of Dubrovnik. N 42° 49'-42°59', E 17° 27'-17°47'.

AREA 10389 ha in total with 4821 being terrestrial. There is 76 km of coastline.

DATE ESTABLISHED 1983

LEGAL PROTECTION Established by Decree No. 4 on 13 May 1983 in Dubrovnik and No. 3 of 21st April in Metkovik on Proclaiming the Malostonski Zaljev a Special Marine Reserve.

LAND TENURE Owned by the community of Dubrovnik and Metkovik and partly privately.

CLIMATE The climate is humid eumediterranean, characterized by hot, dry summers and mild, humid winters. The annual average temperatures are 8° C in winter and 24° C in summer. The seas average temperatures are 14°C in winter and 22°C in the summer, salinity varies from 39%-19%.

PHYSICAL FEATURES The area is predominantly made up of jurassic and cretaceous limestones and has considerable permeability so that the undersurface circulation of water is significant. Vepar is the highest point on the island (398 m). The bay is rocky with sands and silt on the bottom to a maximum depth of 28 m.

VEGETATION The island is partly overgrown with the evergreen oak association (Orno-Quercetum ilicis) and maquis being under the strong influence of man and livestock. The 'garrigue' exists in several associations - Genisto-ericetum verticilatae, Erico-Calycotometum infeste, Cisto-Ericetum arboreae and Paliuretum adriaticum. On coastal reefs there is well developed halophyllic vegetation. In the sea, 244 taxons of algae have been determined and Cymodocea nodosa sea grass beds are present.

FAUNA The sea area is rich in species such as the striped mullet (Mullus barbetus) and pandora (Pagellus erythrinus). The area is important for juvenile and immature fish.

CULTURAL/HISTORIC FEATURES There are no significant structures on the island apart from 14th-15th century walls which link Mali ston to Ston, these were built by the Ragusa republic.

MANAGEMENT The area is not administered by a specific management group. The marine part of the reserve is divided into two parts. The first comprises the area to the south east of a line stretching from Nedjelja promontory due north-east perpendicular to the coast. Within this zone fishing is totally forbidden. The second area (ie. the rest of the reserve) permits general fishing except spear fishing.

USES The first zone mentioned above is not assigned for any human activity, in the second area recreational activities except skiing are permitted. Studies into the marine ecology have been performed and shell farming is permitted in the area.

PROBLEMS The main problem is one of pollution by sewage from the mainland. A scheme to remove polluted waters from this area is in preparation.

PRINCIPAL REFERENCE MATERIAL

- Jugoslavenska akademija znanosti i umjetnosti, Znanstveni savjet za zastitu prirode: Savjetovanje Malostonski zaljev-prirodna podloga i drustveno valoriziranje, Dubrovnik, 12-14 November 1981.

CONTACT ADDRESS

The Republican Institute for the Protection of Nature,
Ilica 44/II,
Zagreb,
Yugoslavia.

YUGOSLAVIA

MLJET

MANAGEMENT CATEGORY National Park.

TYPE Coastal/Marine

ANNOTATED DESCRIPTION The park is in the north-west part of the island and has a rich vegetation cover. The area also has two deep sea bays connected by a very narrow channel, these are called Veliko i Malo jezero (the great and small lake). In velico there is a small islet (Sv Marija with a middle ages benedictine monastery (today a hotel).

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

AREA 4,619 ha, 3100 ha of which are terrestrial. There are 72 km of coastline.

DATE ESTABLISHED 30th May 1961.

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 27° C, average winter temperature about 8° C and average yearly precipitation is about 1100mm. 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. The coasts fall to the sea at a relatively steep angle of 45° to depths of 40-60 m (Maximum 88m).

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.

CULTURAL/HISTROIC FEATURES The area was settled in Roman times and in the village of Polace there are the remains of a palace from 4th-5th century. The island has also been populated by Illyrians (remains of a settlement in Gevedari). The benedictines built their first monastery on the Ilset of Sv. Marija in Veliko lake.

MANAGEMENT The area is administered by a management team with staff of 2 professional, 2 mid-level, 10 labourers and 8 guards. Budget: 3,250,000 dinars a year, 60% of which is self earned, the rest from government sources.
There is an integral marine reserve and a controlled reserve where local fishing is protected. There is also 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 40,000 visitors a year, the majority of them in the summer season. There are two hotels and a camping site, and all together the park has a total accommodation capacity for 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

- Acta Adriatica, vol. VI, No. 1-12, Institute za oceanografiju i ribarstvo, Split.
- Baccar H., 1977. A survey of Existing and Potential Marine Parks and Reserves in the Mediterranean Region. IUCN Report.
- 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.
Tel. 050 89 022.

YUGOSLAVIA

NERETVA DELTA

MANAGEMENT CATEGORY Nature Reserve

TYPE Wetland

ANNOTATED DESCRIPTION A delta area stretching from Hutovo blato to the estuary (20km) with coastal salt marshes, saline lagoons, sandbanks and wet meadows. The whole area is surrounded by Karstic hills, overgrown with degraded forest. Although threatened by development, the delta region remains one of the most important sites for waterfowl in the Adriatic coastlands. Within this reserve there are 6 lesser localities which are also afforded special protection.

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 7430 ha 4100 of which is terrestrial. There is 8 km of coastline.

DATE ESTABLISHED 1954 and 1974.

LEGAL PROTECTION Hutovo blato was protected by decree of the Republican Institute of Cultural Monuments and Natural Rarities in Sarajevo. Other localitites in SR Croatia have been protected by decree of the Metkovic community in 1974.

LAND TENURE Ownership is mainly communal with some private owners.

CLIMATE The mean annual temperature is 16°C (Winter 8°C, Summer 24°C) with an annual precipitation of 1312 mm (Winter 160 mm, summer 45 mm). Winds are generally from the east, occasionally from the west. Winters are moist and mild with hot, dry summers.

PHYSICAL FEATURES The flanks of the Neretva valley are made of Mesozoic karst limestone, while the bed itself is covered by younger alluvial deposits. There is in the valley 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 The evergreen forest on the valley sides also contains deciduous species such as Quercus pubescens. Around Hutovo blato the vegetation is represented by white hornbeam (Carpinus ortientalis) along with forests of pubescent oak (Quercus pubescens) and plantations of Aleppo pine. In the watery areas communities of Myriophyllo-Nupharetum and Potameto-Najadetum associations are common. Associations of Alopecuro-Ranunculetum marginati are found in the flood plains and in the saline environment of the estuary the Juncetum maritimo-acuti association is found. On elevated positions vines, citrus and vegetables are cultured.

FAUNA A very important passage and wintering area for migrant waterfowl, and a breeding area for the Pigmy cormorant (Phalacrocorax pygmeus), several species of herons (Ardeidae) and egrets. The Mallard (Anas platyrhynchos), Garganey (A. querquedula), Ferruginous duck (Aythya nyroca), and rails (Rallidae) are also present. In total 299 species have been recorded of which 92 nest in the area.

CULTURAL/HISTORIC FEATURES In the immediate vicinity there are the remains of the ancient town of Narona, near the modern village of Vid.

MANAGEMENT The Hutovo blato site is administered by APRO-Hercegovina from Mostar while the sites in SR Croatia are administered by authorities from Metkovic. Water management includes flood prevention measures and some use of springs for water supply purposes.

USES Freshwaters in the area are used for fishing and hunting, both being controlled. The reserves are not open to tourists other than ornithologists and research teams. 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. There is also the absence of a unified working organisation which would help to coordinate protection of the area.

PRINCIPAL REFERENCE MATERIAL

- Carp E., 1980. A Directory of Western Paleartic Wetlands. IUCN, Gland.
- Horvatic, S. 1963. Biljnogeorafski polozaj i rasclanjenje naseg primorja u svjetlu suvremenih fitocenoloskih istra-zivznja. Acta Botanica Croatica, Vol. XXII, Zagreb.
- Rucner, D. 1954. Ptice doline Neretve, Larus VI-VII, Zagreb.

CONTACT ADDRESS

Zavod za zastitu spomenika kulture i prirodnih rijetkosti i znamenitosti SR BIH,
27 jula lla,
71000 Sarajevo,
Yugoslavia.

YUGOSLAVIA

PAKLENICA

MANAGEMENT CATEGORY National Park.

TYPE Coastal.

ANNOTATED DESCRIPTION The park is situated on the southern slopes of the Velebit massive, including the drainage areas of the rivers Velika and Mala Paklenica. The Park includes bare mountain peaks and ridges as well as forested valleys. The forests are well preserved due to their past inaccessibility. The gorge of Velika paklenica is about 7.5 km long. Anica lake is positioned beneath one of the highest 'kuks' (Peaks) Anika kuk (712 m). There are a few caves within the park, the largest of which is Manita pec.

GEOGRAPHICAL LOCATION The park is situated 45 km north of Zadar. The southern most part almost reaches the Adriatic coast. E 15° 27'-16° 03', N 44° 17'-44° 25'.

AREA The total area of the park is 3617 ha.

DATE ESTABLISHED 19th October 1954.

LEGAL PROTECTION Law proclaiming Paklenica a national park was made valid on 19th October 1949, 'Narodne novine' No. 84/1949. The Management team was established in 1954.

LAND TENURE Almost the whole of the area is communally owned, private ownership constitutes only 0.21%.

CLIMATE The area experiences cold wet winters and warm dry summers. Temperatures range from a summer maximum of 35°C to a winter minimum of -30°C. Annual rainfall ranges from 1300 mm to 2500 mm in the mountains where snow can last for longer than 5 months. Winds tend to blow from the East.

PHYSICAL FEATURES The area has a heterogenous geology with rocks from paleozoic to kenozoic ages. The oldest rocks are of permian dolomites found in the upper courses of the two river valleys. The highest peaks are made up of jurassic sediments of limestone and dolomite often creating karstic features. The maximum altitude is the 1617 m peak of Rapavac mountain.

VEGETATION Almost half of the park is under forest, mainly beech (Fagetum croatium seslerietum). In the north-western part acidophyllic beech forest (Fagetum montanum silicocolum) is found. At heights of over 1200 m Fagetum croaticum subalpinum occurs. The upper boundary of the forest is occupied by Juniper (Mugho pine) and pine

(Pinetum mughi croaticum). Natural stands of black pine (Pinus nigra) can be found on southern slopes above 1000 m. Oriental hornbeam (Carpinetum orientalis croaticum) is found in lower areas.

FAUNA Wolves (Canis lupus), foxes (Vulpes vulpes) bears (Ursus arctos), wild cats (Felis silvestris) and roe deer (Capreolus capreolus) are common mammals in the area. Important birds in the park include the griffon vulture (Gyps fulvus) and the golden eagle (Aquila chrisaetos) which both nest in the park. The eagle owl (Bubo bubo) is also present along with the rock nuthatch (Sitta neumayer), the black-eared wheatear (Oenanthe hispanica) and the blue rock thrush (Monticola solitarius).

CULTURAL/HISTORICAL FEATURES There are no structures of significance in the park apart from some small mills in the canyon of Velika paklenica and the rural hamlets of Parici and Ramici.

MANAGEMENT The area is managed by the National park management group in accordance with the stipulations of the Law on the Protection of Nature and an Internal Order Decree. In 1984 a regional plan was prepared which is legally binding. The team comprises a total of 11 people (3 administrative, 6 guards and 2 labourers). Finances come from the parks own income and from SR Croatia.

USES The area is popular for mountain climbers and tourists. In Starigrad Paklenika there is a hotel and campsite. The area is also commercially forested and studies into this, the botany and ornithology have been carried out.

PROBLEMS The increasing number of tourists results in problems of litter and pollution. The number of management personnel should be increased.

PRINCIPAL REFERENCE MATERIAL

- Bozicevic, S. 1965. Pecine Paklenica u juznom Velebitu, Acta geologica, br. 5, Zagreb.
- Rados, D. 1972. Paklenika - Nacionalni park - vodic, Starigrad Paklenica.
- Savic, D. 1978. Tektonsko-litoloska i hidrogeoloska ekspertiza Nacionalnog parka Paklenica, Geoloski zavod JAZU, Zagreb.

CONTACT ADDRESS

Uprava Nacionalnog parka Paklenica,
57 244 Starigrad - Paklenica,
Yugoslavia.
Tel. 057 79 002.

YUGOSLAVIA

SUMA DUNDO NA RABU

MANAGEMENT CATEGORY Nature reserve.

TYPE Coastal.

ANNOTATED DESCRIPTION This is a forested area which stretches N-S. From Dundo hill it falls to the sea at Kristofor cove. Much of the Forest of evergreen oak was cut down during the second war, but the forest is now redeveloping with a few individual old trees remaining.

GEOGRAPHICAL LOCATION The reserve is on the North western coast of the Island of Rab. E 14° 42', N 44° 45'.

AREA The total area is 106.5 ha with 1 km of coastline

DATE ESTABLISHED 25th February 1949.

LEGAL PROTECTION The Forest of Dundo was proclaimed a national rarity in 1949 by the Republican Institute for the Protection of Natural Rarities. In 1963 the assembly of PR Croatia enacted the Law on Proclaiming the Dundo Forest a Managed Natural Reserve.

LAND TENURE The Land is communally owned.

CLIMATE The area experiences warm dry summers and moist mild winters, with a mean temperature of 18°C (Summer 24°C, winter 4°C). Annual precipitation is 1250 mm and winds predominate from the N and the N-E.

PHYSICAL FEATURES The greater part of the forest lies on upper cretaceous sediments with some areas being of quaternary age. There is also a narrow coastal belt of rudaceous limestones (Upper cretaceous).

VEGETATION The forest is made up of two communities, the Orno-Quercetum ilicis typicum and the Orno-Quercetum ilicis ericetosum.

FAUNA The site is not significant as far as fauna is concerned.

CULTURAL/HISTORIC FEATURES None.

MANAGEMENT The reserve is managed by the Forest administration of Rab which is part of the Forest Economy Management of Senj. The group employs 8 people.

USES The site is visited by tourists. Investigations into the forest were begun in 1934 and is continued by students and naturalist groups.

PROBLEMS The major problem is one of fire during the summer months.

PRINCIPAL REFERENCE MATERIAL

- Horvatic, S. 1937. Istrazivanje vegetacije otoka Raba i Krka u god, 1935-36. Ljetopis Jugosl. Akad, 49.
- Petracic, A. 1938. Zimzelene sume otoka Raba. Glasnik za sumarske pokuse, 6.

CONTACT ADDRESS

Sumarija Rab,
51280 Rab,
Yugoslavia.
Tel. 051 771 102.

PUBLICATIONS IN THE MAP TECHNICAL REPORTS SERIES

No. 1 UNEP/IOC/WMO: Baseline studies and monitoring of oil and petroleum hydrocarbons in marine waters (MED POL I). MAP Technical Reports Series No. 1. UNEP, Athens 1986 (96 pages) (parts in English, French or Spanish only).

No. 2 UNEP/FAO: Baseline studies and monitoring of metals, particularly mercury and cadmium, in marine organisms (MED POL II). MAP Technical Reports Series No. 2. UNEP, Athens 1986 (220 pages) (parts in English, French or Spanish only).

No. 3 UNEP/FAO: Baseline studies and monitoring of DDT, PCBs and other chlorinated hydrocarbons in marine organisms (MED POL III). MAP Technical Reports Series No. 3. UNEP, Athens 1986 (128 pages) (parts in English, French or Spanish only).

No. 4 UNEP/FAO: Research on the effects of pollutants on marine organisms and their populations (MED POL IV). MAP Technical Reports Series No. 4. UNEP, Athens 1986 (118 pages) (parts in English, French or Spanish only).

No. 5 UNEP/FAO: Research on the effects of pollutants on marine communities and ecosystems (MED POL V). MAP Technical Reports Series No. 5. UNEP, Athens 1986 (146 pages) (parts in English or French only).

No. 6 UNEP/IOC: Problems of coastal transport of pollutants (MED POL VI). MAP Technical Reports Series No. 6. UNEP, Athens 1986 (100 pages) (English only).

No. 7 UNEP/WHO: Coastal water quality control (MED POL VII). MAP Technical Reports Series No. 7. UNEP, Athens 1986 (426 pages) (Parts in English or French only).

No. 8 UNEP/IAEA/IOC: Biogeochemical studies of selected pollutants in the open waters of the Mediterranean (MED POL VIII). MAP Technical Reports Series No. 8. UNEP, Athens 1986 (42 pages) (parts in English or French only).

No. 8 Add. UNEP: Biogeochemical studies of selected pollutants in the open waters of the Mediterranean (MED POL VIII). Addendum, Greek Oceanographic Cruise 1980. MAP Technical Reports Series No. 8, Addendum. UNEP, Athens 1986 (66 pages) (English only).

No. 9 UNEP: Co-ordinated mediterranean pollution monitoring and research programme (MED POL - PHASE I). Final report. 1975 - 1980. MAP Technical Reports Series No. 9. UNEP, Athens, 1986 (276 pages) (English only).

No.10 UNEP: Research on the toxicity, persistence, bioaccumulation, carcinogenicity and mutagenicity of selected substances (Activity G). Final reports on projects dealing with toxicity (1983-85). MAP Technical Reports Series No. 10. UNEP, Athens, 1987 (118 pages) (English only).

No.11 UNEP: Rehabilitation and reconstruction of Mediterranean historic settlements. Documents produced in the first stage of the Priority Action (1984-1985). MAP Technical Reports Series No. 11. UNEP, Priority Actions Programme, Regional Activity Centre, Split, 1986 (158 pages) (parts in English or French only).

No.12 UNEP: Water resources development of small Mediterranean islands and isolated coastal areas. Documents produced in the first stage of the Priority Action (1984-1985). MAP Technical Reports Series No. 12. UNEP, Priority Actions Programme, Regional Activity Centre, Split, 1987 (162 pages) (parts in English or French only).

No.13 UNEP: Specific topics related to water resources development of large Mediterranean islands. Documents produced in the second phase of the Priority Action (1985-1986). MAP Technical Reports Series No. 13. UNEP, Priority Actions Programme, Regional Activity Centre, Split, 1987 (162 pages) (parts in English or French only).

No.14 UNEP: Experience of Mediterranean historic towns in the integrated process of rehabilitation of urban and architectural heritage. Documents produced in the second phase of the Priority Action (1986). MAP Technical Reports Series No. 14. UNEP, Priority Actions Programme, Regional Activity Centre, Split, 1987 (500 pages) (parts in English or French only).

No.15 UNEP: Environmental aspects of aquaculture development in the Mediterranean region. Documents produced in the period 1985-1987. MAP Technical Reports Series No. 15. UNEP, Priority Actions Programme, Regional Activity Centre, Split, 1987 (101 pages) (English only).

No.16 UNEP: Promotion of soil protection as an essential component of evironmental protection in Mediterranean coastal zones. Selected documents (1985-1987). MAP Technical Reports Series No. 16. UNEP, Priority Actions Programme, Regional Activity Centre, Split, 1987 (424 pages) (parts in English or French only).

No.17 UNEP: Seismic risk reduction in the Mediterranean region. Selected studies and documents (1985-1987). MAP Technical Reports Series No. 17. UNEP, Priority Actions Programme, Regional Activity Centre, Split, 1987 (247 pages) (parts in English or French only).

No.18 UNEP/FAO/WHO: Assessment of the state of pollution of the Mediterranean Sea by mercury and mercury compounds. MAP Technical Reports Series No. 18. UNEP, Athens, 1987 (354 pages) (English and French).

No.19 UNEP/ICC: Assessment of the state of pollution of the Mediterranean Sea by petroleum hydrocarbons. MAP Technical Reports Series No. 19, UNEP, Athens, 1988 (130 pages) (English and French).

No.20 UNEP/WHO: Epidemiological studies related to Environmental Quality Criteria for bathing waters, shellfish-growing waters and edible marine organisms (Activity D). Final report on project on relationship between microbial quality of coastal seawater and health effects (1983-86). MAP Technical Reports Series No. 20. UNEP, Athens, 1988 (156 pages) (English only).

No.21 UNEP/UNESCO/FAO: Eutrophication in the Mediterranean Sea: Receiving Capacity and Monitoring of Long term Effects. MAP Technical Reports Series No. 21. UNEP, Athens, 1988 (200 pages) (parts in English or French only).

No.22 UNEP/FAO: Study of ecosystem modifications in areas influenced by pollutants (Activity I). MAP Technical Reports Series No. 22. UNEP, Athens, 1988 (146 pages) (parts in English or French only).

No.23 UNEP: National Monitoring Programme of Yugoslavia, Report for 1983-1986. MAP Technical Reports Series No. 23. UNEP, Athens, 1988 (223 pages) (English only).

No.24 UNEP/FAO: Toxicity, persistence and bioaccumulation of selected substances to marine organisms (Activity G). MAP Technical Reports Series No. 24. UNEP, Athens, 1988 (122 pages) (parts in English or French only).

No.25 UNEP: The Mediterranean Action Plan in a Functional Perspective: A Quest for Law and Policy. MAP Technical Reports Series, No. 25. UNEP, Athens, 1988 (105 pages) (English only).

PUBLICATIONS "MAP TECHNICAL REPORTS SERIES"

No. 1 PNUE/COI/OMM: Etudes de base et surveillance continue du pétrole et des hydrocarbures contenus dans les eaux de la mer (MED POL I). MAP Technical Reports Series No. 1. UNEP, Athens 1986 (96 pages) (parties en anglais, français ou espagnol seulement).

No. 2 PNUE/FAO: Etudes de base et surveillance continue des métaux, notamment du mercure et du cadmium, dans les organismes marins (MED POL II). MAP Technical Reports Series No. 2. UNEP, Athens 1986 (220 pages) (parties en anglais, français ou espagnol seulement).

No. 3 PNUE/FAO: Etudes de base et surveillance continue du DDT, des PCB et des autres hydrocarbures chlorés contenus dans les organismes marins (MED POL III). MAP Technical Reports Series No. 3. UNEP, Athens 1986 (128 pages) (parties en anglais, français ou espagnol seulement).

No. 4 PNUE/FAO: Recherche sur les effets des polluants sur les organismes marins et leurs peuplements (MED POL IV). MAP Technical Reports Series No. 4. UNEP, Athens 1986 (118 pages) (parties en anglais, français ou espagnol seulement).

No. 5 PNUE/FAO: Recherche sur les effets des polluants sur les communautés et écosystèmes marins (MED POL V). MAP Technical Reports Series No. 5. UNEP, Athens 1986 (146 pages) (parties en anglais ou français seulement).

No. 6 PNUE/COI: Problèmes du transfert des polluants le long des côtes (MED POL VI). MAP Technical Reports Series No. 6. UNEP, Athens 1986 (100 pages) (anglais seulement).

No. 7 PNUE/OMS: Contrôle de la qualité des eaux côtières (MED POL VII). MAP Technical Reports Series No. 7. UNEP, Athens 1986 (426 pages) (parties en anglais ou français seulement).

No. 8 PNUE/AIEA/COI: Etudes biogéochimiques de certains polluants au large de la Méditerranée (MED POL VIII). MAP Technical Reports Series No. 8. UNEP, Athens 1986 (42 pages) (parties en anglais ou français seulement).

No. 8 Add. PNUE: Etudes biogéochimiques de certains polluants au large de la Méditerranée (MED POL VIII). Addendum, Croisière Océanograhique de la Grèce 1980. MAP Technical Reports Series No. 8, Addendum. UNEP, Athens 1986 (66 pages) (anglais seulement).

No. 9 PNUE: Programme coordonné de surveillance continue et de recherche en matière de pollution dans la Méditerranée (MED POL - PHASE I). Rapport final. 1975 - 1980. MAP Technical Reports Series No. 9. UNEP, Athens 1986 (276 pages) (anglais seulement).

No.10 PNUE: Recherches sur la toxicité, la persistance, la bioaccumulation, la cancerogenicité et la mutagenicité des certaines substances (Activité G). Rapports finaux sur les projets ayant trait à la toxicité (1983-85). MAP Technical Reports Series No. 10. UNEP, Athens, 1987 (118 pages) (anglais seulement).

No.11 PNUE: Rehabilitation et reconstruction des établissements historiques méditerranéens. Textes rédigés au cours de la première phase de l'action prioritaire (1984-1985). MAP Technical Reports Series, No. 11. UNEP, Priority Actions Programme, Regional Activity Centre, Split, 1986 (158 pages) (parties en anglais ou français seulement).

No.12 PNUE: Developpement des ressources en eau des petites #les et des zones côtières isolées méditerranéennes. Textes rédigés au cours de la première phase de l'action prioritaire (1984-1985). MAP Technical Reports Series, No. 12. UNEP, Priority Actions Programme, Regional Activity Centre, Split, 1987 (162 pages) (parties en anglais ou français seulement).

No.13 PNUE: Thèmes spécifiques concernant le développement des ressources en eau des grandes #les méditerranéennes. Textes rédigés au cours de la deuxième phase de l'action prioritaire (1985-1986). MAP Technical Reports Series No. 13. UNEP, Priority Actions Programme, Regional Activity Centre, Split, 1987 (162 pages) (parties en anglais ou français seulement).

No.14 PNUE: L'expérience des villes historiques de la Méditerranée dans le processus integré de rehabilitation du patrimoine urbain et architectural. Documents établis lors de la seconde phase de l'Action prioritaire (1986). MAP Technical Reports Series No. 14. UNEP, Priority Actions Programme, Regional Activity Centre, Split, 1987 (500 pages) (parties en anglais ou français seulement).

No.15 PNUE: Aspects environnementaux du développement de l'aquaculture dans la région méditerranéenne. Documents établis pendant la période 1985-1987. MAP Technical Reports Series No. 15. UNEP, Priority Actions Programme, Regional Activity Centre, Split, 1987 (101 pages) (anglais seulement).

No.16 PNUE: Promotion de la protection des sols comme élement essentiel de la protection de l'environnement dans les zones côtières méditerranéennes. Documents sélectionnés (1985-1987). MAP Technical Reports Series No. 16. UNEP, Priority Actions Programme, Regional Activity Centre, Split, 1987 (424 pages) (parties en anglais ou français seulement).

No.17 PNUE: Réduction des risques sismiques dans la région méditerranéenne. Documents et études sélectionnés (1985-1987). MAP Technical Reports Series No. 17. UNEP, Priority Actions Programme, Regional Activity Centre, Split, 1987 (247 pages) (parties en anglais ou en français seulement).

No.18 PNUE/FAO/OMS: Evaluation de l'etat de la pollution de la mer Méditerranée par le mercure et les composés mercuriels. MAP Technical Reports Series No. 18. UNEP, Athens, 1987 (354 pages) (anglais et français).

No.19 PNUE/COI: Evaluation de l'etat de la pollution de la mer Méditerranée par les hydrocarbures de petrole. MAP Technical Reports Series No. 19. UNEP, Athens, 1988 (130 pages) (anglais et français).

No.20 PNUE/OMS: Etudes épidemiologiques relatives aux critères de la qualité de l'environnement pour les eaux servant à la baignade, à la culture de coquillages et à l'élevage d'autres organismes marins comestibles (Activité D). Rapport final sur le projet sur la relation entre la qualité microbienne des eaux marines côtières et les effets sur la santé (1983-86). MAP Technical Reports Series No. 20. UNEP, Athens, 1988 (156 pages) (anglais seulement).

No.21 PNUE/UNESCO/FAO: Eutrophisation dans la mer Méditerranée: capacité réceptrice et surveillance continue des effets à long terme. MAP Technical Reports Series No. 21. UNEP, Athens, 1988 (200 pages) (parties en anglais ou français seulement).

No.22 PNUE/FAO: Etude des modifications de l'écosystème dans les zones soumises à l'influence des polluants (Activité I). MAP Technical Reports Series, UNEP, Athens, 1988 (146 pages) (parties en anglais ou français seulement).

No.23 Programme National de Surveillance Continue pour la Yugoslavie, Rapport pour 1983-1986. MAP Technical Reports Series No. 23. UNEP, Athens, 1988 (223 pages) (anglais seulement).

No.24 PNUE/FAO: Toxicité, Persistance et bioaccumulation des certaines substances vis-à-vis des organismes marins (Activité G). MAP Technical Reports Series No. 24. UNEP, Athens, 1988 (122 pages) (parties en anglais ou français seulement).

No.25 PNUE: Le plan d'action pour la Méditerranée, perspective fonctionnelle: une recherche juridique et politique. MAP Technical Reports Series, No. 25. UNEP, Athens, 1988 (105 pages) (anglais seulement).

Issued and printed by:

Mediterranean Action Plan
United Nations Environment Programme

Additional copies of this and other publications issued by
the Mediterranean Action Plan of UNEP can be obtained from:

Co-ordinating Unit for the Mediterranean Action Plan
United Nations Environment Programme
Leoforos Vassileos Konstantinou, 48
P.O. Box 18019
11610 Athens
GREECE

Publié et imprimé par:

Plan d'action pour la Méditerranée
Programme des Nations Unies pour l'Environnement

Des exemplaires de ce document ainsi que d'autres
publications du Plan d'action pour la Méditerranée
du PNUE peuvent être obtenus de:

Unité de coordination du Plan d'action pour la Méditerranée
Programme des Nations Unies pour l'Environnement
Leoforos Vassileos Konstantinou, 48
B.P. 18019
11610 Athènes
GRECE