Mediterranean Action Plan
Specially Protected Areas

United Nations Environment Programme

World Conservation Union (IUCN)

REPORT ON THE STATUS OF

MEDITERRANEAN MARINE TURTLES

RAPPORT SUR LE STATUT DES

TORTUES MARINES DE MEDITERRANEE

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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 (BP), Priority Actions Programme (PAP), Specially Protected Areas (SPA) and Regional Marine Pollution Emergency Response Centre for the Mediterranean Sea (REMPEC).

Ce volume constitue le quarante deuxième numéro de la série des rapports techniques du Plan d'Action pour la Méditerranée.

Cette série comprend certains rapports élaborés au cours des diverses activités menées dans le cadre des composantes du Plan d'action pour la Méditerranée: Programme de surveillance continue et de recherche en matière de pollution (MED POL), Plan Bleu (PB), Programme d'actions prioritaires (PAP), Aires spécialement protégées (ASP) et Centre régional méditerranéen pour l'interrvention d'urgence contre la pollution marine accidentelle (REMPEC).

FOREWORD

The first draft of this report on the Status of Mediterranean Marine Turtles has been compiled by the Regional Activity Centre for Specially Protected Areas (RAC/SPA), in collaboration with IUCN and consultants (chiefly Mr. Luc Laurent), to serve as a basis for the work of the meeting on Conservation of Mediterranean Marine Turtles.

The experts designated by the governments have reviewed this report, during the meeting held in Nicosia (Cyprus), from 4 to 6 July 1989. During the same meeting, they have prepared a draft action plan for the conservation of mediterranean marine turtles. This action plan has been adopted by the Contracting Parties to the Convention for the Protection of the Mediterranean Sea against pollution (Barcelona Convention) during their Sixth Ordinary Meeting (Athens, 3-6 October 1989). This Action Plan is contained in Annex I.

In order to complete this document, a bibliography on Mediterranean marine turtles has been prepared and is contained in Annex II.

After a brief review of what is generally known about marine turtles, their problems of survival, and current research, training, information and legislation, the report gives a more detailed analysis of the present situation in each Mediterranean country.

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I. RECAPITULATION OF PRINCIPAL FACTS CONCERNING MEDITERRANEAN MARINE TURTLES

Turtles are reptiles that have been known since the Triassic period (200,000 years ago). They comprise 210 species, including land tortoises and freshwater and marine turtles.

The three principal species of Mediterranean marine turtles belong to two families:

-- The Dermochelyidae, with Dermochelys coriacea (the leatherback turtle),
-- The Cheloniidae, with Chelonia mydas (the green turtle) and, especially, Caretta caretta (the loggerhead turtle), the most frequent.

Three other species are found in the Mediterranean, but they are rare: Eretmochelys imbricata, or exceptionally Lepidochelys olivacea, and L. kempi.

In their travels, turtles are not concerned with national boundaries, hence the need for a regional plan of action grouping all efforts at national level.

BIOLOGY AND BEHAVIOUR

Knowledge relating to the biology and behaviour of marine turtles is fragmentary and needs to be extended. The main data available are as follows:

Lifetime
- may be as much as 50 years.

Sexual maturity
- is thought to be achieved between the ages of 8 and 15, depending on conditions.

Egg-laying period
- Extends from 15 May to 15 August, varying with the year and the areas of the Mediterranean. The eggs hatch about 60 days later, i.e., from 15 July to 15 October. This period coincides with that of the greatest number of tourists on the beaches.
- The turtles return to lay eggs every two or four years, according to the authors.

Periods and sites of reproduction, feeding and hibernation
- Little or nothing is known on subjects such as periods and sites of reproduction, feeding areas and places of hibernation.

Food
- Varies according to the species, sufficiently so that there is no competition between species or with man. Caretta caretta eats crabs, shellfish and fish; Dermochelys coriacea feeds mainly on jelly fish, and Chelonia mydas on plants.

Populations
- It is chiefly Caretta caretta that is found in the Mediterranean and that nests on the sandy coastlines of a large number of countries, the best known of which are Greece, Cyprus, Turkey and Israel. Other countries that have been studied less thoroughly also have nesting turtle populations -- examples are Libya and Tunisia.

PROBLEMS

The main factors and problems encountered by marine turtles during their nesting phase on the beaches or in the course of their sea travels are analyzed below.

Human factors affecting nesting: loss of egglaying sites
The effect of autogenous factors, whether direct or indirect, on the coasts, in particular the growth of activities (tourism, pollution, commercial use of sand and gravel on land and in the sea) has been and continues to be a reduction of potential egglaying sites.

Human factors affecting survival
- Pollution, destruction of the biotope producing food and overfishing, may limit the spaces favourable to the development and survival of turtles.

Mortality, pollution, collisions
- One of the causes of mortality often observed is the ingestion of plastic bags by marine turtles, which choke them.
- One of the causes of injury or death is collision with ships and boats, as turtles come to the surface regularly to breathe.

Deaths from human predacity on land: turtles, eggs
- Mediterranean marine turtles are vulnerable to human predacity during the nesting phase on the beaches; this applies to the turtles themselves and to their eggs; also throughout the year from fishing, whatever the method used (fixed nets, trawls, floating or weighted lines). Encounters between turtles and human beings are usually fatal to the turtles, which are prized, depending on country and habits, for their flesh, their eggs or their shells.

Mortality through destruction of nests
- A certain number of nests may be destroyed, either by predators or by extremes of weather (storm waves covering the beach, nests flooded by heavy rains), or else by human activities associated with the tourist industry (vehicles driven on beaches, parasol supports driven into nests, beaches cleaned by machines).

Mortality on hatching: birthrate and recovery
- A turtle lays 80 to 130 eggs in one nest, of which 60% to 85% hatch out. On leaving the nest, usually at night, the young turtles head for the sea by phototropism, since the surface of the sea shines and reflects light from the sky.
- Many young turtles die between the nest and the sea's edge due to various reasons:
-- they are attracted by the lights on land, and die of exhaustion;
-- they hatch out in daylight and die of heat stroke;

— they are eaten by birds;
— they are eaten by other creatures (e.g. crabs).
In the sea, the fate of the young ones is unknown, but it is probable that they fall prey to a certain number of other predators.

Mortality by human predacity at sea: the flesh, the shell
- Mediterranean marine turtles are vulnerable to human predacity through fishing, all the year round, whatever the method used (fixed nets, trawls, floating or weighted lines). Depending on region and habits, fishermen are interested in turtle meat for consumption or the shells for sale to tourists.

RESEARCH; TRAINING; INFORMATION

In the context of scientific research, training, and informing the public, a number of campaigns and achievements have occurred; these should be extended and coordinated.

Scientific research
- Scientific research on marine turtles has already tackled a number of problems, but these are generally concerned with the turtles coming ashore and nesting, and the essential aspect of hatching. Marking is another important aspect of scientific research, but the results are only fragmentary.
- Under this head, every country and every research group is requested to present a summary of its activities and its results, especialy on the following subjects:
  — egglaying sites,
  — surveillance of nests,
  — transplantation of nests,
  — incubation in the laboratory,
  — rearing of turtles in captivity,
  — physiology, and
  — marking.

Training; Information
- Some documentation exists on Mediterranean marine turtles, but it seems necessary to produce documents designed for information and training, with specific target groups in mind: administrators, fishermen, the general public, schools, etc. Production of a brochure or the establishment of a system of exchanging information among scientists and between scientists and associations is another essential requirement.

II. LEGISLATION IN THE MEDITERRANEAN REGION CONCERNING MARINE TURTLES

There is legislations for the protection of marine turtles, international conventions and for some countries national legislation. However, there is a need for more national legislation and for more enforcement of the existing texts.

THE INTERNATIONAL CONVENTIONS AND MEDITERRANEAN SIGNATORIES

1. The Convention on International Trade in Endangered Species of Fauna and Flora (CITES or Washington Convention, 1973).

The signatories of this Convention (90 countries worldwide, eleven Mediterranean countries -- see Table 1) undertake not to conduct any kind of trade whatever in species, the names of which are classified as being threatened with extinction (Annex I) or endangered species (Annex II). Among the turtles found in the Mediterranean, Caretta caretta, Chelonia mydas and Dermochelys coriacea are in Annex II; Eretmochelys imbricata and Lepidochelys kempi are on Annex I.

2. The Convention on the Conservation of European Wildlife and Natural Habitats (Bern, 1979).

The signatories agree to take effective legal measures to protect the habitats and prohibit the capture, killing, exploitation and disturbance of the fauna concerned. The marine turtles are on the list given in Annex II of this Convention. Six Mediterranean countries are signatories (see Table 1).

3. The Convention on the Conservation of Migratory Species of Wild Animals (Bonn, 1979)

The signatories undertake to conserve and restore the habitats and to monitor all the factors capable of endangering the species concerned. Eight Mediterranean countries are signatories to this Convention (see Table 1).

4. The Convention for the Protection of the Mediterranean Sea Against Pollution and its Related Protocols (Barcelona, 1976).

During the fourth meeting of the Contracting Parties to this Convention (18 Mediterranean countries and EEC are signatories, see Table 1), one of the ten priority objectives for the period 1985-1995 adopted by the signatories (Genoa Declaration) was the protection of endangered marine species (for example, the monk seal and marine turtles).

5. The Fourth Protocol to the Barcelona Convention, entitled Protocol Concerning Specially Protected Areas of the Mediterranean (1982).

This Protocol, signed and by 16 Mediterranean countries and EEC (see Table 1), is mainly applicated through the Regional Activity Centre for Specially Protected Areas (Tunis).

6. The Declaration for the Conservation of Fauna, Flora and their Habitat of the European Economic Commission (1988).

This Declaration makes it obligatory for all European countries to protect and study endangered species and to strengthen legislation concerning them.

Table 1. Mediterranean countries which are signatories of international conventions and major protocols for the protection of the environment (Y = yes) (August 1990).

CONVENTION & PROTOCOL	CITES 1973	BERN 1979	BONN 1979	BARCELONA 1976	SPA/PROT. 1982
COUNTRY					
Albania	-	-	-	Y	Y
Algeria	Y	-	-	Y	Y
Cyprus	Y	Y	-	Y	Y
Egypt	Y	-	Y	Y	Y
France	Y	Y	Y	Y	Y
Greece	-	Y	Y	Y	Y
Israel	Y	-	Y	Y	Y
Italy	Y	Y	Y	Y	Y
Lebanon	-	-	-	Y	-
Libya	-	-	-	Y	Y
Malta	-	-	-	Y	Y
Monaco	Y	-	-	Y	Y
Morocco	Y	-	Y	Y	Y
Spain	Y	Y	Y	Y	Y
Syria	-	-	-	Y	-
Tunisia	Y	-	-	Y	Y
Turkey	-	Y	Y	Y	Y
Yugoslavia	Y	-	-	Y	Y
EEC	-	-	-	Y	Y

LEGISLATION AT NATIONAL LEVEL

Few of the Mediterranean countries have any major national legislation on Marine turtles conservation.
According to our actual knowledge, the following countries have a national legislation: Cyprus, Spain, Greece, Israel, Italy and Turkey (see part II, description by country, legislation).

In some countries, specific legislations for protected areas can insure the protection of the turtles inside the area, as for other species of fauna and flora.

III. STATUS OF MARINE TURTLES IN EACH COUNTRY OF THE MEDITERRANEAN

In this document, the countries bordering the Mediterranean will be taken in succession: Albania, Algeria, Cyprus, Egypt, France, Greece, Italy, Israel, Lebanon, Libya, Malta, Monaco, Morocco, Spain, Syria, Tunisia, Turkey, Yugoslavia.

For each one, a standard descriptive index-card has been made, with the following format:

COUNTRY

A. CHARACTERISTICS OF THE COAST

B. STATUS OF MARINE TURTLES

1. PRESENCE
   - 1.1. Past data
     - 1.1.a. Loggerhead turtle: Caretta caretta
     - 1.1.b. Leatherback turtle: Dermochelys coriacea
     - 1.1.c. Green turtle: Chelonia mydas
   - 1.2. Recent data
     - 1.2.a. Loggerhead turtle: Caretta caretta
     - 1.2.b. Leatherback turtle: Dermochelys coriacea
     - 1.2.c. Green turtle: Chelonia mydas

2. NESTING
   - 2.a. Loggerhead turtle: Caretta caretta
   - 2.b. Leatherback turtle: Dermochelys coriacea
   - 2.c. Green turtle: Chelonia mydas

3. EXPLOITATION
   - 3.1. Past
   - 3.2. Present

4. CURRENT STATUS, THREATS, RESEARCH PROGRAMMES

C. LEGISLATION
   1. National
   2. International

D. PRESENT AUTHORITIES
   1. National
   2. International

ALBANIA

A. CHARACTERISTICS OF THE COAST

Length of coastline: 350 km
Area of continental shelf (0-180m): 5450 sq km
Mean distance of 180 m isobath: 15 km.

B. STATUS OF MARINE TURTLES

1. Presence

The only data on these animals obtained for this country are taken from the work by Frommhold (1960), according to whom "the false Caretta, Caretta caretta caretta, and the true Caretta turtle Eretmochelys imbricata, are observed". This mention of the tegulated turtle Eretmochelys imbricata, is extremely interesting. Indeed, until now there is only one mention of this species.

In Frommhold's list of reptiles of Albania, the leatherback turtle, Dermochelys coriacea is also included.

2. Nesting

The Albanian coast is very close to the Greek Ionian Islands, which have very many egglaying sites (Zakynthos, Kephalonia, Corfu) (see chapter on Greece), but none of the data mention any nesting or accidental capture in Albania.

C. LEGISLATION

1. National: no information
2. International: Albania has acceeded to the Barcelona Convention on 29 June 1990 and to the Specially Protected Area Protocol on 30 May 1990.

D. PRESENT AUTHORITIES

1. National: no information

2. International: no information

ALGERIA

A. CHARACTERISTICS OF THE COAST

Mean latitude: 36°20'N
Length of coastline: 1200 km
Area of continental shelf (0-180m): 10,700 sq km
Mean distance of 180 m isobath: 9 km.

B. STATUS OF MARINE TURTLES

1. Presence

1.1. Past data

1.1.a. Loggerhead turtle (Caretta caretta)

As long ago as 1862, Strauch (1862) gave a description of this species, which at that time was known as Chelonia caouana. He observed six specimens in April 1860 in the market in Algiers, and stated that they were very common all along the Algerian coast. In 1897, Lallemant reported that in the summer fishermen brought this turtle to the market in Algiers, and said that the species was fairly common on the coast, especially the shores of Grand Kabylia. Bouchon-Brandely and Berthoule (1890) in a report on sea fishing in Algeria, gave details of the extent of catches of marine turtles for the various ports on the coast; rare in Oran, found in Algiers, and frequent in Bone (Annaba). With reference to the last-named city, the authors stated that turtles were killed almost every day in summer. Olivier (1894), Doumergue (1899) and later Seurat (1930), confirmed the frequent observation and capture of this turtle on the entire Algerian coast.

1.1.b. Leatherback turtle (Dermochelys coriacea)

Mention of this species goes back even further. In fact, Piret (1789) in the letters he sent from what was formerly Namibia, considered that the leatherback turtle, which he described perfectly, was very common all along the Barbary coast and in the Mediterranean. Lallemant (1867) on the other hand, says that it is rare in the Mediterranean; he saw two captured specimens in Sidi-Ferruch. Later, the same author (1876) described a specimen caught in a net by fishermen from Algiers, and stated that from time to time medium-sized specimens were taken on the Algerian coast. Bureau (1893) reported the capture in the neighbourhood of Algiers, of a leatherback turtle, later displayed in the Naples Museum. Doumergue (1896) tells of a large specimen on the beach at Arzew about 1885. Both Doumergue (1899) and later Seurat (1930) again stressed the rarity of this species.

1.1.c. Green turtle (Chelonia mydas)

No individual reports the presence of this species in Algeria. Only Blanc (1935) who had found the green turtle from 1901 in the south of Tunisia and observed a specimen in the market at Tunis, thought it possible that this species might be found on the Algerian coast.

1.2. Recent data

These are sparse.

1.2.a. Loggerhead turtle (Caretta caretta)
Lanteri (1982) mentions that taking of loggerheads in Orania, either in nets or by lines, is not very frequent. The same author describes the observation by Mr. Descamps on board the car ferry Tassili. In January 1980 this vessel, sailing in a calm sea, met a group of several hundred loggerheads about 100 km north of Oran. In 1982, another large gathering of these turtles was seen off Oran (Lanteri, pers. comm.).
In the summer of 1986, a large loggerhead was observed 8 miles northeast of Rachyoun Island by persons making a 2-day sailing trip along the Oranian coast (Laurent, 1988).
A brief survey made recently in Algeria tends to show that loggerheads are localized on the eastern part of the Algerian coast (Ducruet, pers. comm.).

1.2.b. Leatherback turtle (Dermochelys coriacea)
A leatherback measuring two metres long and weighing 400 kgs was caught in June 1987 by a fisherman about 100 km west of Algiers (Le Soir, June 1987).

1.2.c. Green turtle (Chelonia mydas)
No information.

2. Nesting
2.a. Loggerhead turtle (Caretta caretta)
The first information on this species is found in the statements of Doumergue (1899), who stated that "the large beaches of Oran are much frequented by this turtle" and, in a more general way (in the section on ethology) that "it approaches the coast only in the spring, when the eggs are to be laid. It lands at night on the beach where it buries its eggs".
With regard to this part of the coast, recent reports make it likely that eggs are laid at Cape Blanc or on the islands near Oran (Lanteri and Bouchereau, pers. comm.).
For Algeria in general, two recently published papers mention that the loggerhead nests in the country. Argano (1979) made enquiries in Algeria concerning the accidental capture of turtles. He considers the Algerian coast as being of little interest with regard to nesting, despite the numerous large beaches. A paper published anonymously (1987) states that Algeria has few turtle nests, the same number as Libya (25 nests)! In view of the size and number of beaches on this coast, a survey should be made to find out the true situation regarding egglaying. This survey could be carried out first on the west part of the coast, using as an indication the statement of Doumergue; then, later, on the eastern coast, especially the extensive beach between Annaba and La Calle, also the beaches of Kabylia. Certain reports seem to indicate that there may be more turtles in these areas than had been thought and particularly in summer. A total absence of nests would be surprising and would require study.

2.b. Leatherback turtle (Dermochelys coriacea)
Many individuals in the past (Fournet, 1853; Daudin, 1801) and even some contemporary ones (Loveridge and Williams, 1957) have stated that leatherback turtles lay eggs on the coasts of the Barbary states (chiefly Algeria). This information seems to have been taken from the book by Lacépède (1778), who wrote of this

species "it frequents, or at least at egglaying time it prefers, the deserted and largely sandy shores bordering the Barbary states". Unfortunately, the sources of this statement are unknown, and do not correspond to the specimens donated to the Paris Museum and conserved to this day (Lescure, Delaugèrre and Laurent, in press). At present the leatherback turtle is regarded as rare on the whole of this coast, and nesting seems unlikely.

2.c. Green turtle (Chelonia mydas)
Groombridge and Luxmoore (1987) put forward the hypothesis that nesting sites are a certainty or a possibility for Algeria, in their report on the world status of the green turtle; but there is no information to support this hypothesis.

3. Exploitation/Use
Marine turtles are caught now and again, usually by accident. Their use as food varies. The whole of our documentation on the subject may be cited:

- Bouchon-Brandely and Berthoule (1890) mention the marine turtle as being rare in Oran market. In Algiers, the marine turtle was listed in the second category of fish, proof of some frequency in the market at that time. At Bône (Annaba), turtles were caught in summer. The fishermen approached turtles floating in calm weather, briskly turned them over and lifted them into the boat. At the time there was fishing specifically for turtles. In Algiers turtle meat was not much prized and the shells were valueless. The fat was made into oil.
- Doumergue (1899) considered that the flesh of the green turtle was good to eat. He said that before it was cooked the meat should be cut into slices and pressed to remove the oil.
- In 1926, Gruvel, writing about Algerian fisheries, stated "The green turtle is sometimes sold on the Mediterranean markets, although its flesh has an unpleasant taste; it is eaten only by the poor".
- Lanteri (1982) reported that marine turtles were not eaten in Orania. If caught accidentally, they were released.

The only figures on accidental capture are those given by Argano (1979). As the result of a survey in nine Algerian ports, he considers that about 50 turtles are caught each year, which is a very small number. Most of the turtles are caught in trawls, but also sometimes by small-scale fishing (in fine-mesh nets or on lines); they are usually released (Lanteri, 1982).

4. Current Status

4.a. Loggerhead turtle (Caretta caretta)
A relatively common species. It is thought to nest in the country. It is little exploited.

4.b. Leatherback turtle (Dermochelys coriacea)
Rare species, observed occasionally.

4.c. Green turtle (Chelonia mydas)
Might be observed occasionally along the whole Algerian coast.

C. LEGISLATION

1. National

There is no national legal text protecting marine turtles and their eggs. The legal instruments in force and relating to wild fauna are:

a) Law No. 82-10 of 21 August 1982, relating to hunting;
b) Law No. 83-03 of 5 February 1983 relating to the protection of the environment;
c) Decree No. 83-809 of 20 August 1983, relating to protected species of non-domestic animals. This text establishes the list of protected mammals, birds and reptiles. It includes marine species such as the monk seal, Audouin's gull and the cormorants, also land tortoises and freshwater turtles, but not marine turtles. The texts regulating fishing could not be obtained.

2. International

Algeria is Party to CITES since 23 November 1983 and to the African Convention since 24 June 1983.
Algeria ratified the Barcelona Convention on 16 February 1981 and the Specially Protected Areas Protocol on 16 may 1985.

D. PRESENT AUTHORITIES

No information.

CYPRUS

A. CHARACTERISTICS OF THE COAST

Mean latitude: 35°05'N
Length of coastline: 537 km
Area of continental shelf (0-180m): 2500 sq km
Mean distance of 180 m isobath: 4.6 km.

B. STATUS OF MARINE TURTLES

1. Presence

1.1. Past data

1.1.a. Loggerhead turtle (Caretta caretta)

This species was reported in Cyprus in 1865 (Unger and Kotschy, 1865), then by Bedriaga in 1879. Boulenger (1910) gives no species of marine turtle in his list of reptiles and Batrachia found in Cyprus.

2. Nesting

2.a. Loggerhead turtle (Caretta caretta)

Egglaying sites

In 1971, Demetropoulos reported that marine turtles come to lay eggs on the beaches of Cyprus. Later, the same author (Demetropoulos, 1977) confirmed that Caretta caretta lays eggs on a number of the island's beaches, but gave no details of the location and size of the egglaying areas. He then reported (Demetropoulos, 1978) that this species nests chiefly in the northwest of the island. Finally, Demetropoulos and Hadjichristophorou (1981) gave the location of the principal egglaying sites:

1) Lara (several beaches)
2) Kissonerga
3) Latchi Polis (Chrysochou Bay).

For the north and north-eastern coasts of Cyprus three sites may be mentioned: Ayia Irini beach (Morphou Bay), Pachyammos (Cape Andreas) and Alakati (Demetropoulos and Hadjichristophorou, 1981). Also there is the area between Pachyammos and Galounopetra (Cape Andreas) (Bell in litt. 1986) and several unspecified sites reported by Whitmore (RAC/SPA survey).

Extent of sites

Figures are derived from the operations of the hatchery set up at Lara. These show the number of nests placed in incubation under total protection (away from predators), by the transplantation of nests (taken from the site at Latchi Polis) into the sand of Lara beach, close to the hatchery.

Table 2: The total number of nests placed in "protected" incubation into the sand of Lara beach.

YEAR	NUMBER OF NESTS Caretta	YEAR	NUMBER / NESTS Caretta
1981	26	1986	20
1982	21	1987	34
1983	27	1988	36
1984	27	1989	76
1985	30		

These numbers represent the minimum nesting figures for the west and north-west coastal zone of Cyprus. There are no annual follow-up data for the egglaying sites (number of nests/season/site; number of nests/km/season for each site). According to Demetropoulos and Hadjichristophorou (1982), the population of Caretta caretta is much larger than that of Chelonia mydas and has been estimated at about 300.

2.b. Green turtle (Chelonia mydas)

Egglaying sites

Demetropoulos reported the nesting of this species in Cyprus. It is said to take place mainly in the west of the island (Demetropoulos, 1978). More exact information on the localities of the egglaying sites were given by Demetropoulos and Hadjichristophorou (1981):

1) Lara (several beaches including Toxeftra)
2) Kissonerga

and Demetropoulos, in Groombridge and Luxmoore (1987), gives

3) Polis (Occasional)
4) Takkas.

Extent of egglaying sites

The hatchery at Lara was set up chiefly to protect the green turtle, whose situation gives much more cause for concern than that of the Loggerhead turtle. It is thought that the overall number of green turtle nests, placed in incubation under complete protection, corresponds to the total number of nests in the area.

Table 3: Number of green turtle nests placed in "protected incubation" on Lara Beach.

YEAR	NUMBER / NESTS Chelonia mydas	YEAR	NUMBER / NESTS Chelonia mydas
1981	14	1986	22
1982	26	1987	11
1983	16	1988	19
1984	22	1989	46
1985	26		

These data permit the hypothesis (Groombridge and Luxmoore, 1987) that a dozen or so female turtles nest in this area every year. Yet Demetropoulos and Hadjchristophorou (1979) give a tentative estimate of 100. The true number of nests is almost certainly higher than those incubated and the numbers of nests given

previously represent a minimum. So far 45 female turtles have been tagged and unscarred females are found each year. It was postulated (Demetropoulos 1984) that this may mean that the population may be larger, breeding in a wider area or that the breeding cycles are longer. Indications since then from the tagging programme are, however, that the breeding frequency is mainly two years and sometimes three for the turtles laying on the west coast of Cyprus (Demetropoulos and Hadjichristophotou, pers. comm.)

2.c. Leatherback turtle (Dermochelys coriacea)
A number of specimens have been observed, especially in the western part of the island (Demetropoulos and Hadjichristophorou, 1988). The first of these observations was when a specimen was caught by a floating fishing line in the summer of 1978 (Demetropoulos and Hadjichristophorou, 1981). This species does not nest on Cyprus.

3. Exploitation and Threats

Gruvel (1931) reported the scale of the trade in turtles (especially Caretta caretta) between Cyprus and England. At that time, the English were "fond of turtle soup". The Cyprus turtles were often sent via Alexandria. Demetropoulos (1971) thinks that the turtles were killed mainly for their shells and rarely eaten. Demetropoulos and Hadjichristophorou (1981) emphasize that turtles are killed at times by fishermen as the captive animal causes dammage to the trammel nets. There is little information concerning accidental catches on floating lines. The number is, however small: some are handed to the Fisheries Department or released by the Fishermen. No landings take place. The decline in the turtle population seems to be caused by past exploitation based on the trade in turtle meat. The chief threat nowadays lies in the destruction of the egglaying beaches through tourism. The building industry, which uses the sand for construction (Demetropoulos and Hadjichristophorou, 1982) is now strictly forbidden to do so. Some beaches have, however, been damaged as a result of past sand extraction rendering them, in some cases, unsuitable for nesting.

4. Current Status

4.1. Marking

Two groups of the turtle population have been marked:
-- the females at egglaying time;
-- the young, reared from the newly hatched stage in a laboratory, then in floating cages, and released at different ages. The sex of the released and marked animals is not known, however it is assumed to be 50% female as the hatching techniques used (in the sand) theoretically produce this ratio. Small numbers were "feminised" by laboratory hatching at higher temperatures but were not head started.

a) Marking females
Two types of tags are used:
-- plastic rings (Jumbo tag, Dalton Supplies, UK)
-- metal rings (National Bag and Tag Co., USA).

The rings are blue (although some yellow tags were used in 'double tagging' and carry a number on one side and the word "Cyprus" on the other. Marking was first carried out in 1980.

Table 4: Number of turtles marked and type of ring from 1980 to 1989.

Year	Number of turtles marked	Type of ring
1980	3 Chelonia mydas, 2 Caretta caretta	double marking
1981	5 Chelonia mydas	double marking
1982	8 Chelonia mydas, 1 Caretta caretta	double marking
1983	3 Chelonia mydas, 2 Caretta caretta	double marking
1984	3 Chelonia mydas, 2 Caretta caretta	plastic rings
1985	3 Chelonia mydas, 4 Caretta caretta	plastic rings
1986	3 Chelonia mydas, 4 Caretta caretta	plastic rings
1987	1 Chelonia mydas, 4 Caretta caretta	plastic rings
1988	1 Chelonia mydas.	plastic rings
1989	15 Chelonia mydas, 7 Caretta caretta	plastic rings (2 dble tagged)

Locally, many recaptures have been recorded in a single season and from one season to another. One turtle from Cyprus was found in Tunisia.

b) Marking the young

The first release of young turtles was made in 1982 (Demetropoulos, 1982): there were 10 specimens, each 4 years old. The turtles were released on Lara beach. One of them was observed near Paphos two weeks later. In 1987, 5, nine years old Chelonia mydas were released at Lara Beach, also 2 eight year old Caretta caretta were released.

4.3. Hatchery and rearing farm

A hatchery has been operating at Lara under the aegis of the Fishery Department since 1978, solely for conservation purposes. Nests are transferred to the beach at Lara and eggs are reburied in the sand. Nests layed on the Station beach are left where they were made and are protected by wire cages. Between 3000 and 4000 newly hatched turtles of the two species are released each year (4165 in 1985, 3229 in 1986). A small number from both species are kept each year, to be reared and released later at different ages. For example, 33 specimens (aged 2 and 4) were released in 1982. Rearing is carried on in a laboratory in Nicosia and in floating cages in the port of Paphos.

C. LEGISLATION

1. National

All marine turtles and their eggs are protected since 1971 (legal text derived from the law governing fishing, Section 135, 1971). In 1989 regulations were passed, based on the same law, providing habitat protection to the main west coast beaches (Toxeftra and Lara).

2. International

Cyprus is Party to CITES since 18 November 1974 and to the Bern Convention since 1 September 1988.
Cyprus ratified the Barcelona Convention on 19 November 1979 and the Specially Protected Areas Protocol on 28 June 1988.

D. PRESENT AUTHORITIES

Department of Fisheries- Ministry of Agriculture and Natural resources.

1. Mr. Andreas Demetropoulos (A+S)
2. Ms. Myroula Hadjichristophorou (A+S)

EGYPT

A. CHARACTERISTICS OF THE COAST

Mean latitude: 31°15'N
Length of coastline: 1000 km
Area of continental shelf (0-180m): 29,200 sq km
Mean distance of 180 m isobath: 26.5 km.

B. STATUS OF MARINE TURTLES

1. Presence

1.1. Past data

1.1.a. Loggerhead turtle (Caretta caretta)

The oldest information dates from the beginning of this century and comes from studies of parasitology. Thus, Loos (1901, 1902) thought that the marine turtles Thalassochelys corticata (loggerhead turtle) and Chelone mydas were very common in summer on the Egyptian coast, especially at Abuquir. Later, Flower (1933) in an article giving a list of reptiles and amphibians of Egypt, considered the loggerhead turtle as being the most common of the marine turtles on the Mediterranean coast of Egypt. He stated that the turtles he observed had been captured on the Egyptian coast. This statement is significant, since many turtles intended for shipment to England passed through the market in Alexandria at that time, after being caught throughout the eastern Mediterranean (Gruvel, 1931). The loggerhead turtle is included in the list of Reptiles of Egypt, by Marx (1968). During the period December 1973-December 1974, 33 Caretta caretta were bought in the market in Alexandria by Sey (1977) for a study on parasitology. This author thinks it very probable that the turtles were caught off the Egyptian coast.

1.1.b. Leatherback turtle (Dermochelis coriacea)

There have been few observations of this species in Egypt. Flower (1933) quotes one observation in 1920 of a leatherback turtle shell in the market in Alexandria, the place of capture of the turtle being unknown. This information was repeated by Loveridge and Williams (1957) who give the capture site as Alexandria. The only mention of a known observation on the Mediterranean coast of Egypt is that by Faouzi (1936) concerning a leatherback turtle caught in a net on 1 May 1935, 15 miles to the west of Port Said. The scarcity of observations and captures are attributable to the great length of sparsely inhabited shoreline and the small amount of fishing activity.

1.1.c. Green turtle (Chelonia mydas)

According to the authors quoted above on the loggerhead turtle, the green turtle appears to be less common. Sey (1977) observed only seven Chelonia mydas in the market in Alexandria in the period December 73-March 74, as compared with 33 Caretta caretta.

2. Nesting

2.a. Loggerhead turtle (Caretta caretta)

These turtles seem to be common along this Mediterranean coast. Nesting by marine turtles (species not specified) was reported for the first time by Flower (1933) on the Sinai coast and by Sella (1980) for the southern coast of Gaza (Sinai) as far as Port Said. The latter author (1982) reports that Caretta caretta lays eggs at scattered points along this coast. This species of reptile is not mentioned at all in the description of the coastal nature reserve located between El Arish and Rafah (UNEP-IUCN-RAC/SPA, 1988, in press). Egglaying by this species undoubtedly takes place not only in Sinai but on the very long sandy coastline (800 km) between Port Said and the Libyan frontier. Argano (1979), incidentally, considers the area of Mersa Matru of great interest and thinks that it might contain egglaying sites. There is therefore a very great deal of research to be done on the Mediterranean coast of Egypt.

2.b. Leatherback turtle (Dermochelys coriacea): No information.

2.c. Green turtle (Chelonia mydas)

The information given by Flower (1933) and Sella (1980) makes it likely that egglaying by the green turtle is quite possible in Egypt, particularly on the eastern part of the coast. Again, research is necessary.

3. Exploitation and Threats

The presence of these animals in the fish markets, as mentioned by Loos (1901, 1902) Flower (1933), Sey (1977) and Groombridge (1987), is proof that they are used for eating in Egypt. The large numbers of turtles reported in Alexandria (Gruvel, 1931) and destined for England came mainly from other countries of the eastern Mediterranean. According to Groombridge and Luxmoore (1987), the Coptic community still uses quantities of turtles, in particular for their blood. No current information on accidental capture could be obtained. The consumption of the blood and flesh of turtles is not in accordance with the Muslim religion.

4. Current Status and Research Programmes

Each year, about 200 turtles are caught by fishermen in their nets, but they are released as they have the reputation to bring good luck to people.

C. LEGISLATION

1. National

According to Groombridge and Luxmoore (1987), there is no legislation in Egypt prohibiting the capture of marine turtles, except in protected areas where it is forbidden to capture any animals at all. There are no marine turtles on the list of protected species in Egypt.

2. International

Egypt is Party to CITES since 4 January 1978 (accession), to the African Convention since 12 May 1972, and to the Bonn Convention since 1982.

Egypt ratified the Barcelona Convention on 24 August 1978 and Specially Protected Areas Protocol on 8 July 1983.

D. PRESENT AUTHORITIES

Egyptian Environmental Affairs Agency (EEAA)
Cabinet of Ministers, 11-Hassan Sabry Street, Zamalek, Cairo.

FRANCE

A. CHARACTERISTICS OF THE COAST

Mean latitude:
- mainland coastline: 43°15'N;
- coast of Corsica: 42°00'N

Length of coastline:
- mainland coast: 741 km
- Corsican coastline: about 500 km

Total area of continental shelf (0-180m): 20,450 sq km
Area of the Gulf of Lions (0-200 m): 17,639 sq km
Mean distance of 200 m isobath: 55 km.

B. STATUS OF MARINE TURTLES

1. Presence

1.1. Past and recent data

1.1.a. Loggerhead turtle (Caretta caretta)

It is necessary to differentiate between the coasts of mainland France and Corsica. The two areas are in fact comparatively far apart, and data are sparse for the first, while being comprehensive for the second, thanks to the work of Delaugère (1987).

For the mainland coast, all past and recent information on this species has been assembled in a single table (5) giving the name of the author, the date, place of observation and comments. There is no mention of egglaying sites in any of the past literature. It might be suggested, in view of the latitude and the hydrological conditions, that turtles have never nested on this coast. Matz and Weber (1983) mention nesting in the past in Provence, but this statement appears to be without foundation. The presence of loggerheads is not at all frequent in the summer months on this coast. Accidental captures are made by small-scale fishing operations on the Côte d'Azure (small-mesh nets, floating lines) and by tuna-fishing boats with seine nets; but the principal method responsible is trawling, and then only in the Gulf of Lions. Argano (1979) gives the number of 10 to 100 turtles captured yearly in a port of this region (he does not state which port). A survey should be made in all ports, to estimate the annual number of captures and to find out what happens to the turtles.

Table 5: Past and recent information on Loggerhead turtles for France.

Mainland coast Author	Year	Place of observation	Comments
Rondelet, G.	1558	Languedoc	-
Risso, A.	1826	Maritime Alps	"Almost sedentary, stays on the surface of the sea. Appears in spring, summer".
Crespon, J.	1844	Languedoc	"Sometimes found dead on the shore".
Campanyol, L.	1863	Eastern Pyrenees	"It is not uncommon to catch it when fishing".
Mingaud, G.	1894	Languedoc	"Caught a loggerhead turtle".
Richard, J.	1907	Monaco	"It even comes from time to time to the south of France".
Mourgue, M.	1909	Languedoc	"Three loggerheads at Grau du Roi (Gard)".
Mourgue, M.	1912	Languedoc	Species "caught fairly often in the Gulf of Aigues Mortes".
Marcellin, P.	1926	Grau du Roi	Capture of a loggerhead on 5.8.1924 with trailing net, on 8.8.1924 with a tuna net.
Van den Eeckhoodt, J.P.	1954	Provence	"Fairly frequent in the sea along the rocky coast".
Berner, L.	1955	Marseilles	"Sometimes caught at sea in the Gulf of Marseilles".
Knoepffler, A. & Schureck, E.	1956	French Mediterranean	Many captures
Petit, G. & Knoepffler, P.H.	1959	French Mediterranean	"They are caught in greaters numbers than generally thought, even in some parts of the Côte d'Azur, in a systematic way by fishermen who sell the shells".

Author	Year	Place of observation	Comments
Euzet & Combes	1962	Languedoc	Caught in a trawl in summer. 4-5 captures per year for the port of Sète.
Knoepffler, L.P.	1962	Eastern Pyrenees	Caught fairly frequently in summer.
Knoepffler, L.P.	1962	Islands of Hyères	Frequently observed in summer.
Maigret, J.	1988	Monaco	2-3 captures per year
Olivier, G.	1988	Perpignan	Captures

Methods of capture

Author	Year	Comments
Marcellin, P.	1926	Trailing net - tuna net
Euzet, L. & Combes, C.	1962	Trawl
Knoepffler, L.P.	1962	Sardine trawl net
Maigret, J.		Coastal fishing
Olivier, G.		Trawl

For the Corsican coast, Delaugère (1987) has drawn up a summary of observations and captures from past and recent data. He has also clarified the situation relating to nesting by Caretta caretta in Corsica in the past (south-east coast). On this subject, he concludes, "While remaining very prudent, it may be thought that a small number of turtles in fact came to lay their eggs more or less regularly at the beginning of the century. The east coast of Corsica would of course have been a more or less marginal site for reproduction of the species".

On accidental capture, the author gives the following figures:
- Ten accounts of 19 loggerheads caught in small-mesh nets weighted down at a depth of more than 60 m (mainly dragnets for lobsters). 95% of the turtles brought to the surface were dead.
- Five accounts (27 loggerheads, all caught separately) by trawls.
- Two accounts of capture with weighted fishing lines on the bottom.
- Ten accounts of catching turtles in trammel nets weighted at shallow depth.

It is trawling that causes the greatest number of accidental capture of turtles in Corsica (turtles caught alive and released) (Delaugère, RAC/SPA survey). It may be assumed that several dozen loggerhead turtles are taken in this way every year (26 in 1986).

1.1.b. Leatherback turtle (Dermochelis coriacea)
Olivier (1986) collated all the observations and captures on the French Mediterranean coast: there were 28 mentions. Duron (1986) added four further reports, three for 1985 and one for 1986. There were no reports of this turtle in the French Mediterranean in 1987 (Duguy, 1988). Over the past five years, the number of sightings or captures is seven (Table 6).

Table 6: Capture and sightings of leatherback turtles

Year	Captured	Sightings	Total
1984	0	1	1
1985	1	4	5 (1 in Corsica)
1986	1	0	1
1987	0	0	0

1.1.c. Green turtle (Chelonia mydas)
According to Salles (1861), this turtle nested in Corsica, but this statement was the result of confusion between the green turtle and the loggerhead turtle. Knoepffler (1961) includes it in his list of reptiles and amphibians of Provence, but there has been no real mention to this day of its presence in French Mediterranean waters (mainland or Corsican).
It is expected that all the data of the last 15 years will be very soon published (1989) in an Atlas of Reptiles and Amphibians of France by the Herpetological Society of France.

2. Nesting
No informmation

3. Exploitation/Use/Threats
The main dangers are associated with fishing. We know little about the use made of turtles caught in trawls in the Gulf of Lions. Olivier (RAC/SPA survey) however reports on this subject that these turtles are either killed for no reason, or for their shells. In Corsica, the danger lies in dragnets for lobsters, which almost automatically lead to the death of the captured animal.

4. Current Status, Research Programmes
Little information on current status.
4.1. Marking
Three specimens picked up at sea (Caretta caretta) were marked by J. Maigret with round plastic rings bearing the address of the Oceanographic Museum of Monaco.

C. LEGISLATION

1. National

There is no protective legislation in metropolitan France. The Ministerial order of 24 April 1979 establishing the list of amphibians and reptiles protected throughout the territory does not include any species of marine turtle.

2. International

France is Party only to CITES, since 11 May 1978 (approval) is signatory of Bern and Bonn Convention.
France ratified the Barcelona Convention on 11 March 1978 and the Specially Protected Areas Protocol on 2 September 1986.

D. PRESENT AUTHORITIES

1. Mr. J. Maigret
2. Mr. Jean Lescure
3. Mr. Michel Delaugère
4. Mr. Luc Laurent
5. Mr. Jacques Fretey
6. Mrs Michèle Duron
7. Mr. Guy Olivier
8. Mr. Raymond Duguy

GREECE

A. CHARACTERISTICS OF THE COAST

Mean latitude: 38°00'N
Length of coastline: 16,500 km, about 2000km of sandy beaches.
More than 2000 islands.

B. STATUS OF MARINE TURTLES

1. Presence

1.1. Past and recent data

1.1.a. Loggerhead turtle (Caretta caretta)

Marine turtles were frequently mentioned in the texts of Ancient Greece. One of the first pictures in the country, moreover, (5th Century BC) shows a marine turtle. Later, many authors reported that this species was abundant. Bibron and Bory de Saint Vincent (1833) observed several specimens in the Peloponnese. Erhard (1858) considered that the sea turtle Chelonia cephalo was widespread in the Cyclades. De Betta (1868) also mentioned this species, and Bedriaga (1881) stated that he often met with loggerhead turtles during his voyages in the Greek archipelagos.

1.1.b. Leatherback turtle (Dermochelys coriacea)

The leatherback turtle is one of those that were best known to the ancient Greeks, since it lived in their country; everyone knows that in various parts of Greece, and in other countries around the shores of the Mediterranean, those who created music made the shell of a large turtle into a musical instrument by attaching chords made of animal gut or metal. It has been recorded that they chose the shell of a leatherback turtle, which thus became the first primitive lyre, which was used "to bring to a people who were still hardly civilized the charm of an art whose power they were to augment so greatly". It was with these words that Lacépède (1778) mentions the existence of the leatherback turtle in Greece.

Later, the species was included on the list of reptiles of Greece (Ondrias, 1968). No exact observation had been mentioned until the article by Margaritoulis (1986), who reports 14 turtles captured or stranded, 11 of them between 1982 and 1984.

Margaritoulis considers that the true number of annual captures and strandings must be much higher. Indeed, the 16,500 km of extremely indented coastline (with more than 2000 islands) with some parts very sparsely inhabited, makes it difficult to record strandings, and the new law of 1980 on the protection of turtles restricts the amount of information from fishermen concerning accidental capture.

Table 7: Captures, strandings and sightings of leatherback turtles in Greece between 1982 and 1984 (from Margaritoulis, 1986)

Date		Stranding or capture resulting in death	Observation or release of turtle
February	1982	1	
November	1982	1	
June	1983	1	
August	1983	2	1
September	1983	1	
October	1983		1
July	1984	1	
September	1984	1	
November	1984	1	

1.1.c. Green turtle (Chelonia mydas)
Bedriaga (1881) thought it probable that this species existed in the Aegean Sea. Ondrias (1968) includes it in the list of reptiles of Greece; and Margaritoulis et al., (1986) record three young specimens caught or found stranded between 1981 and 1984. Thus, the observation of the green turtle in Greece is very rare, though the recording of captures, like that for the leatherback turtle, is very difficult in a country with such a long coastline.

2. Nesting

2.a. Loggerhead turtle (Caretta caretta)
The first mention of egglaying by this species in Greece dates from 1833. It coincides with the sighting (and dissection) by Bibron and Bory de Saint Vincent, of a female "which probably died in coming to lay her eggs" on a beach in the Peloponnese (between Arcadia and the mouth of the Neda). Later, Werner (1894) describes how many Caretta caretta come in August, on nights of full moon, to the shores of Zante (Zakynthos) and also of Corfu to lay their eggs. Mertens (1961) quotes the statement by Werner (1894) and simply reports the observation of a Caretta caretta probably captured by fishermen, in Corfu by Koch (1932). After Mertens, there is a complete absence of information. Only at the end of the 1970s were egglaying sites mentioned again in Greece. At present, thanks to the work of many researchers (Marinos, 1977, 1981; Margaritoulis, 1980, 1981, 1982, 1983; Argano, 1979; Sutherland, 1984, 1985; Strijbosch, 1984), the principal egglaying sites have been listed and described; but many areas remain to be studied. During 1988, there were monitoring activities in the nesting areas of the Bay of Kipenissia/Peloponnesos, the Bay of Laconicos and on Rhodes Island.

2.b. Leatherback turtle (Dermochelys coriacea)
No nesting sites have been reported so far.

2.c. Green turtle (Chelonia mydas)
According to Marinos (1981, 1984) the green turtle may well nest in the Eastern Aegean and in the south of Crete, the latitude of which is the same as that of Cyprus, where nesting takes place.

3. Exploitation/Use

The accidental capture of marine turtles on the Greek coastline is infrequent (Marinos, 1981). The turtles are very rarely killed deliberately for subsequent use (Sutherland, 1984). Panou (RAC/SPA survey) considers that in some Ionian islands (Cephalonia/Ithaca), which she knows very well, the turtles are caught accidentally by the following fishing methods:

-- floating lines for catching swordfish (17 sightings)
-- sometimes, fine-mesh nets (most common fishing method)
-- rarely, weighted lines on the bottom (an often used method).

Table 8: Number of turtles captured (by month and year) and subsequent use, showing the various fishing methods (data: Panou)

Floating lines	Fine-mesh nets	Weighted lines on bottom	Utilization
1 (10.85)			killed for sale (souvenirs)
	1 (8.86)		
2 (5.86)			released
3 (5.86)			released
1 (6.86)			
		1 (7.86)	
	1 (8.86)		
		1 (8.86)	
6 (8.86)			
	1 (8.86)		
4 (9.86)			killed for souvenirs

According to Panou (RAC/SPA survey) the captured turtles are either released (by professional fishermen) or killed for their shells (amateur or semi-professional fishermen), but they are rarely eaten except by some fishermen of Arab origin. However these data are very few and fragmentary and do not reflect Greek behaviour and conditions. Data covering all the country is collected through a network consisting of the Port Authorities, the Ministry of Agriculture, fishermen and the Seaturtle Protection Society. It must be stressed that no exploitation is taking place in Greece.

4. Current Status, Threats, Research Programmes

4.1. Threats
Greece certainly has the largest egglaying site in the Mediterranean and its coastline possesses perhaps the largest number of nests of all the Mediterranean coastline. Some of the sites however are under severe threat mainly due to disturbance by

coastal development.
Specific legislation and management measures have been taken for the nesting beaches of Zakynthos (see B.4.2.4 and C). There has been an improvement in cooperation among visitors, conservationists, local inhabitants and authorities, however urgent management actions still have to be completed such as the seasonal establishment of a port police station in the protected area, the reduction of light and noise disturbance and the agreement on a plan for the alternative development of certain areas in which land owners request compensation. The Ministry of Environment coordinates these actions.
In total and taking into account the major restrictions (see legislation) which have been imposed around the nesting sites of Zakynthos and have lead to the cancellation of massive touristic enterprises and to a change in the development of tourism, the implementation of the protection measures can be considered beneficial to the nesting sea-turtle populations. With regard to Zakynthos, opinions are divided as to the extent of the threat. Corbet (1987) and Veniselos (1988a, 1988b), however, consider that the situation on Zakynthos gives cause for concern. The rest of the regular nesting sites do not face any serious threat from development. However, in order to prevent any problems the Ministry of Environment is preparing several actions.

4.2. Research and conservation programmes

4.2.1. Beach monitoring and marking

A long term tagging and beach monitoring programme which was started in 1982 and is coordinated by the Ministry of Environment is carried out by Greek Universities and the Sea Turltle Protection Society of Greece (STPS) with financial assistance from the EEC. It has given a precise picture of the nesting activity of the loggerhead turtles in Greece.

Table 9: Results of the beach monitoring in Zakynthos:

Nesting Season	Total numbers of nests
1983	ca. 2000 (from 2 sites)
1984	1061
1985	857
1986	1822
1987	1110

In the context of the above mentioned programme, female turtles are tagged on Zakynthos and Peloponnesus nesting sites. Three types of tags are used; models No. 49 and 681 and plastic 'rototags' of different colours. During six nesting seasons (1982-1987), 1525 Loggerhead Turtles have been tagged on Zakynthos and Peloponnesus. Most of the tagged animals appear on the same beach in subsequent seasons. Long range recoveries of tagged sea turtles have been reported from a vast area, mainly in the central Mediterranean. Two individuals appeared in the W. Mediterranean (Sardinia) at a distance of more than 1500 km from Zakynthos.

A most interesting fact is that most of the long range recoveries of tagged turtles (about 40%) have been reported from the Gulf of Gabes in Tunisia. Provided that most of the recoveries were reported during the winter months, it might be said that the Gulf

of Gabes is a wintering area of the Loggerhead population that nests in Greece (Margaritoulis 1988). Another interesting observation is that of a turtle ringed in 1982 on Zakynthos that was found laying eggs on Cephalonia in 1984 (Sutherland 1985). An additional number of turtles (ca. 30) has been tagged at sea by the STPS in cooperation with fishermen. Apart from Zakynthos, the project covers more than 120 km of nesting beaches in western and southern Peloponnesus as well as on the island of Rhodes. Other areas suitable for nesting are under investigation by the STPS in order to be included in the monitoring routine.
A sample of nests is monitored each season in order to determine the fate of the nests and the hatching success. From a sample of 91 nests on the western peloponnesus coast, 48.4% have been disturbed by predators during incubation and 29.7% were inundated by seawater at least once. Excavation of undisturbed nests (after hatchling emergence) showed that the percentage of emerged hatchlings was 54.9% (Margaritoulis 1989).

4.2.2. Hatcheries and on-site protection of nests
In order to save 'doomed' nests, ie. clutches laid very close to the water or in areas with heavy human use, beach hatcheries are established in the most important areas by the STPS. During the 1988 nesting season 62 nests (41 in western Peloponnesus, 15 on Zakynthos and 6 in Laconicos Bay) were transplanted.
Doomed clutches are transferred to the hatchery within 12 hours of oviposition. A number of nests were also protected in situ by fencing.

4.2.3. Research projects on factors affecting nesting
Greek universities, under a contract by the Ministry of the Environment and the EEC, have carried out an evaluation of various abiotic, biotic and anthropogenic factors on loggerhead turtle nesting in Greece. In particular, the physical oceanography of Laganas bay, the geomorphology of the coasts of Zakynthos, the sedimentology of the nesting beaches, the use of Zakynthos nesting beaches by humans, the vegetation and the predation of nests were studied. The conclusion was a set of management proposals for the Zakynthos nesting areas (Arianoutsou, 1988).

4.2.4. Conservation and management programmes
In order to integrate the management of the protected areas in the Gulf of Laganas and to assist the implementation of the measures that were introduced by legislation, the Ministry of Environment has initiated two programmes.
The first provides equipment and personnel for guarding the nesting beaches throughout the nesting season, closing of roads that lead to the beaches using bar-gates, and delimitation of the protected marine areas using marker buoys
The second programme provides a mean of assisting in the development of compatible land uses within the protected areas which will be declared Nature Parks. Several aspects of this plan are being discussed with the local communities, including the development of 'ecotourism'.

4.2.5. Public awareness programme

A public awareness programme was started in 1987 by the STPS in cooperation with the Ministry of Environment and the Prefecture of Zakynthos. Tourists and visitors receive educational material from two field stations on Laganas and Gerakas beaches and are invited to participate in several activities such as slide lectures and films, these are also given to tourist groups in the main hotels in Laganas. The results have been very encouraging, as about 25,000 tourists visited the station in 1988 and the disturbance in the nesting beaches has been diminished to a great degree.

Furthermore a school education programme is conducted by the STPS in cooperation with the Ministry of Education. Priority is given to areas with known nesting sites as well as in major fishing ports.

C. LEGISLATION

1. National

1a. For turtles in general: Presidential Decree 67/1980 declared marine turtles a threatened species and prohibited their capture, killing or sale. The Presidential Decree 617/1980 prohibits fishing for marine turtles, the destruction of eggs and the seizing of hatchlings. Law 1650/1986for the protection of the environment is also relevant to the safeguard of the seaturtle.

1b. For Zakynthos in particular there is further legislation:

I. For the land areas

Definition of zones and building restrictions in Lagana, Secania, Daphine.... and islets of Zakynthos -Presidential decree 3/1984. Establishment of a zone for controlled development (ZCD) in S.E. Zakynthos which includes areas of absolute (450ha) and Partial (250ha) protection - Ministerial decision 88208/3723/87 (Govt. gazette 37D/29-1-1987). No touristic development is allowed in tthe protected areas and housing is controlled under strict regulations.

In the surrounding areas where touristic development is permitted, special regulations exist on the size, capacity and height of the installations. No lights are allowed in the nesting areas and at sea in front of them. Discharge of wastes and the burrying of trash is prohibited in the ZCD. Nesting beaches are closed at night and vehicular access to the beaches is prohibited. Sun umbrellas, deck chairs and paddle boats are allowed only at the specially designated beach sectors.

II. For the marine area

Establishment of protected marine areas - Ministerial decision 18670/777/88 (Govt gazette 137B/10-3-1988). These comprise a core area (2000ha) where all kinds of vessels and fishing by any means is prohibited and a buffer area (13,000ha) where there is a speed limit of 6 knots. Stopping and anchorage in the buffer is allowed only with a special permit. No aquaculture is allowed in the protected area.

2. International

Greece signed the Bern Convention on 1 October 1983 and is also signatory of the Bonn and Cites Conventions.
Greece ratified the Barcelona Convention on 3 January 1979 and the Specially Protected Areas Protocol on 26 January 1987.

D. PRESENT AUTHORITIES AND INFORMATION SOURCES

1. National

a. National Authorities
Ministry of the Environment, Physical Planning and Public Works, Directorate of Environmental Planning, Section of Nature Management

b. Non-Governmental organisations
Sea Turtle Protection Society of Greece (STPS)
Mediterranean association for Seaturtles (MEDASSET)

ISRAEL

A. CHARACTERISTICS OF THE COAST

Mean latitude: 32°12'N
Length of coastline: 230 km
Area of continental shelf (0-180 m): 3250 sq km
Mean distance of 180-m isobath: 14 km

B. STATUS OF MARINE TURTLES

1. Presence

1.1. Past data

1.1.a. Loggerhead turtle (Caretta caretta)

The first mention of this species for the coast of Israel is found in Bottger (1879) who reported the capture of a loggerhead turtle south of Jaffa (Haifa). Later, Lortet (1883) observed many hundreds of Thalassochelys caouana stranded on the beach between Acre (Akka) and Haifa after a violent storm. Haas (1951) stressed that it is found in Israeli waters. This species is included in the list of reptiles of Israel (Hoofien, 1972).

1.1.b. Leatherback turtle (Dermochelis coriacea)

According to Sella (1980) this species is rarely seen on the coast of Israel. Ashkenazi (RAC/SPA survey) reports 10 sightings of leatherback turtles on the Mediterranean coast of Israel between 1956 and 1988 (four sightings in 1986, two in 1987 and one in 1988). All were single sightings, and most of them were stranded and dead.

1.1.c. Green turtle (Chelonia mydas)

No past data; Haas (1951) mentions this species, stating that it is much rarer than the loggerhead turtle. It is included in the list of reptiles of Israel (Hoofien, 1972).

1.2. Recent data

A campaign was carried out by the national authorities (Nature Reserve Authority) during the period 1979-1988 to assess the numbers of marine turtles and their nests.

2. Nesting

2.a. Loggerhead turtle (Caretta caretta)

Nesting by this species has, to our knowledge, only recently been reported. Sella (1980) is the first to mention its nesting, mainly on the Mediterranean coast of Israel. The same author (1982) describes the egglaying sites for this species in 1950 and 1964 as being:

- the area between Nechariyya and Rosh Anikra (5 km long) with a density of 15 nests/km/season;
- the beach at Atlit (8 km long), with a density of 15 nests/km/season.

Since 1979, the whole coast has been completely surveyed (Ashkenazi, RAC/SPA survey). The nests are scattered all along the coast, but three main areas can be distinguished.

Table 10: Number of nests found between 1979 and 1988 (10 egglaying seasons) for all egglaying sites and for each species

Site	Length of coast	Caretta caretta	Chelonia mydas	Not det.	Total
1. Between Nahariya & Rosh Manigura	5-6 km	21	5	8	34
2. Between Atlit & Megadir	2-3 km	45	10	5	60
3. Between Caesarea & Atlit	20 km	0	0	0	0
4. Each side of Ashkelon	10 km	10	3	3	16
Total:		76	18	16	110

Extent of sites

The very large turtle population at the beginning of the century has declined considerably since the 1970s. At present the most important site is the area with 45 nests in 10 seasons (16 nests in 1986), yet even this is not a great number. In the case of Caretta caretta it can be assumed that the Israeli coast has 10-15 nests a year. This figure corresponds to a residual population.

2.b. Leatherback turtle (Dermochelys coriacea)

Sella (1982) reports that on 30 June 1983 there was found on the beach of Palmachim (south of Tel-Aviv) a track 1.10 m wide and an incomplete excavation two metres in diameter, which leaves no doubt as to the species. The track did not lead to a nest. This attempt at egglaying shows that it is possible that the leatherback turtle does nest in the Mediterranean (Lescure, Delaugère and Laurent, in press), but it is difficult to conclude that there are nesting sites in Israel of this species, which is somewhat rare, although regularly observed. Moreover, the methodical and exhaustive survey of the coast of Israel carried out by the members of the Nature Reserve Authority since 1979 has never discovered any fresh traces of Dermochelys coriacea.

2.c. Green turtle (Chelonia mydas)

Sella (1980) reports that it nests, then later (1982) gives egglaying sites for this species. Dispersed nests were found on the beaches at Netanya, Caesarea, Atlit, and between Nahariya and Rosh Manigura. At present, the area where nests of Chelonia mydas are found coincide with the nesting areas of Caretta caretta (Ashkenazi, RAC/SPA survey). The nests are scattered every year in areas 1, 2 and 4 (see Table 5), the number being 2-3 for the whole coast. This too corresponds to a residual population.

3. Exploitation/Use

At the beginning of the century (according to Sella, 1980), there were more than 30,000 turtles of the two species, living in the north of Israel. Between the end of the First World War and the end of the 1930s, at least 30,000 were estimated to have been caught (Sella, 1932). At the height of the catching season, a total of 600 turtles might be caught daily. Ninety-five percent of them were green turtles. This organized fishing continued until the 1960s, but on a smaller scale. From that time onward, captures were occasional, and the turtles were no longer intended for export. Between 1963 and 1969, 162 turtles (67% of them loggerheads) were brought to the market at Acre, which had always been the centre of turtle fishing and the trade in turtles. Since 1970, the sale of turtles has ceased, for lack of profit rather than because of the limited legislation on the subject (see section Legislation).
The turtles must also suffer from the destruction of their egglaying sites due to the use of sand for construction during the 1960s.

4. Current Status, Threats, Research Programmes

4.1. Current threats
These are less severe than previously, but for the survival of the small residual population they may well be critical. Every year, about 10 turtles are found dead on the beaches. Accidental captures of both species of turtles in Israel still occur, principally in nets, but the number seems to be small (Ashkenazi, RAC/SPA survey). There are no data available on fishing with floating lines. All the observations and nesting data are computerized in INRA ecological database.
According to Sella (1982), the two species of turtle and from time to time their eggs are eaten by Muslims and Christians in Israel and in Egypt. Preying by man and domestic animals has been noted (Ashkenazi and Sofer, 1988), but appears to be infrequent. The other threats to the turtles come from natural preying on the eggs and the hatchlings (by the crab Ocypode cursor), and from flooding of nests in storms.

4.2. Research Programmes

4.2.a. Marking
Marking was carried out on marine turtles bought in the market at Acre and later released. Between 1963 and 1969, for example, 53 green turtles and 109 loggerheads were marked (Sella, 1982). There is no information on the type of ring used.
The Nature Reserve Authority, in charge of protection of turtles since 1979, has hitherto carried out no marking of adults (Ashkenazi, RAC/SPA survey). But from 1982 to 1988, 68 young turtles of both species, aged 10 months and 3 years, also 44 newly hatched young, were marked and released. The marks were made by hand and not numbered. The purpose of the operation was to find out whether these young turtles were thrown up on the shore a few days after being released and whether it was better to make such releases from the shore or at sea. Only one specimen, aged one year, was found 10 km from the release point two days after it had been released.

4.2.b. Artificial incubation and rearing
Between 1979 and 1984, experiments were made in artificial incubation and rearing (Ashkenazi and Sofer, 1988), and this led to releases. But according to these authors, the best policy for conserving the turtles in Israel is natural egg incubation under constant surveillance. Artificial incubation is used when the nests are in danger (floods, predators). Most of the egglaying sites are located in protected areas. Research was also carried out and completed on physical conditions in nests of Caretta caretta and on oxygen consumption and gas exchange in nests of C. caretta and Chelonia mydas.

C. LEGISLATION

1. National
Marine turtles have been protected by legislation since 1955. A text dating from 1983 explicitly prohibits the destruction of eggs and nests (Ashkenazi, RAC/SPA survey).

2. International
Israel is Party to CITES since 18 December 1979 and to the Bonn Convention since 1983.
Israel ratified the Barcelona Convention on 3 march 1978 and the Specially Protected Areas Protocol on 28 October 1987.

D. PRESENT AUTHORITIES

1. National
Dr. Shoshana Ashkenazie
Professor A. Ar.

ITALY

A. CHARACTERISTICS OF THE COAST

- Length of coastline: 8500 km

B. STATUS OF MARINE TURTLES

1. Presence

1.1. Past data

1.1.a. Loggerhead turtle (Caretta caretta)

Numerous authors in the 18th and 19th Centuries represented this species as being very common in Italian waters: in the Adriatic (Stossich, 1879; Faber, 1883), in Sardinia (Cetti, 1777; Azuni, 1802; Gené, 1839; Carrucio, 1869), in Sicily and around the pelagic islands and Pantelleria (Doderlin, 1881; Mina Palumbo, 1890) and the whole coast of Italy (Camerano, 1891, Vandoni, 1914).
More recently, other authors (Kolosvary, 1940; Mertons, 1955; Tortonese and Lanza, 1968; Bussani, 1972; Massa, 1974; Di Palma, 1978; De Metrio et al., 1983; Voesenek and Van Rooy, 1984; Bruno, 1986; Cocco et al., 1988) confirmed that the species was relatively abundant all around the Italian coast.

1.1.b. Leatherback turtle (Dermochelis coriacea)

The Dermochelis coriacea was first described by Vandelli (1761) in Padua, following a capture made on the coast near Rome in 1760 (Fretey and Bour, 1980). The paper by Linnaeus, (1766), always considered as the discoverer of taxonomy, is therefore later. Capra (1949) and Capocacia (1968) compiled a list of observations and captures on the coast of Italy. The latter author reported that between 1756 and 1962 there had been 23 captures. Later, Bruno (1970) observed two females in Sicily; Di Palma (1978) described two unusual captures, one in 1968, the other in 1975. De Metrio et al., (1983) and De Metrio and Megalofonou (1988) give the captures resulting from fishing with floating lines: four turtles captured in 1979, one in 1980, 1981, and 1982. The fishermen considered the meat delicious.
The great length of the Italian coastline no doubt makes it impossible for scientists to report all the observations, captures and strandings. But the species appears to be as rare as on the coast of France and as regularly observed.

1.1.c. Green turtle (Chelonia mydas)

This species was first reported in Italian waters in 1830 by De Betta (1874). Three later observations were also mentioned (Nardo, 1864; Depoli, 1898; Stossich in Vandoni, 1914). All four observations were made in the Adriatic. Bruno (1973) reported having counted 15 shells in Sicily between 1967 and 1971 and six in Sardinia in 1968. The species is rare and only occasionally observed in Italian waters.

2. Nesting

2.a. Loggerhead turtle (Caretta caretta)

Bruno (1969) reported that this species nested in the past in the Italian peninsula (Tuscany, Lazio, Apulia), but now (1986) considers that these sites have disappeared. De Metrio and Megalofonou (1988) wonder whether egglaying sites still exist in Calabria. Doderlin (1881) was the first to mention egglaying sites in Sicily, in the south of the island. The Sicilian sites of Eraclea Minoa, Siciliana and Maconibeach, reported by Argano and Baldari (1983) were greatly reduced by the end of the 1970s (Di Palma, 1978; Argano, 1979). Bruno (1986) now considers that they have been completely abandoned, although nests are found at times on the southern coast (between Marsola and Mazara del Vallo and from Gella to Capo Passero - Cocco et al., 1988). In Sardinia, this species is said to have nested on the western coast (Bruno, 1978) while Argano and Baldari (1983) report that a few egglaying sites have been found on the same coast. Despite fruitless searches, Voesenek and Rooy (1984) believe that the sandy beaches of the Gulf of Crosei (eastern coast) could have egglaying sites.

At present in Italy (mainland and islands), the only site used regularly for egglaying is that on the beach of Carrigli on the Island of Lampedusa, the larges of the Pelagian islands. Di Palma (1978) and Argano (1979) and later Graments (1986) reported nesting there. The latter author gives the number of nests in the years 1975, 1977, 1978 and 1984-85 as, on average, one per season. During the 1950s many turtles came to lay eggs on the various beaches of Lampedusa; but tourism has meant the disturbance of these nesting areas.

2.b. Leatherback turtle (Dermochelys coriacea)

The length of the Italian coastline makes a complete survey of othe sites difficult, and it is unknown if nesting takes place. According to Bruno (1969, 1970, 1978), this species visited the beaches of southern Sicily to lay its eggs. But so far this author has never supplied formal proof of even occasional nesting by this species. His statements are open to doubt (Lescure, Delaugère and Laurent, in press).

2.c. Green turtle (Chelonia mydas)

No information.

3. Exploitation/Use

Italy has the most highly developed fishing industry of any Mediterranean country, and the greatest annual tonnage (353,000 tonnes in 1980). The extent of fishing in waters fairly well frequented by marine turtles (mainly Caretta caretta) is bound to result in the exploitation of the numbers of these reptiles. Accidental captures are numerous.

Argano (1979) was the first to put a figure to the annual captures. For the southwest coast of Italy and Sicily, captures were as high as 2000 per year, most of them by trawlers. For the south of Sicily, where over 500 trawlers are employed, the annual captures number between 1000 and 1500, according to Argano (1979), who states that the

majority of turtles are released, but that some are killed for their shells or meat.

In the Aeolan Islands turtles are captured deliberately when immobile on the surface of the sea. Di Palma (1978) considered that the number of turtles killed in these islands was between 500 and 600 per year.

De Metrio et al., (1983) and De Metrio and Megalofonou (1988) report the capture of loggerhead turtles by fishermen using floating lines off Lecce (southeast Italy) to catch swordfish and albacore (tuna).

Table 11. Capture of loggerhead turtles by year and by fishing techniques in Lecce.

	Year	Number/loggerhead caught and brought ashore at Lecce	Number/boats carrying on/ type fishing
Fishing for sword-fish and albacore	1978	251	36
	1979	1010	57
	1980	301	57
	1981	363	73
	1982	139	31
Fishing for albacore only	1983	0	27
	1984	110	29
	1985	29	36
	1986	6	34

The reduction in the number of turtles caught from 1980 onward coincides with the publication of a law prohibiting the capture of turtles. Before this law, turtales were sold in the markets of the region, for their meat and shells. After the law was published, turtles disappeared from the markets, but continued to be used in the same way as previously. Fishermen are now reluctant to give information about accidental capture, hence the decrease in the recorded data. Indeed, the absence of any specimens captured in 1983 is completely impossible (De Metrio and Megalofonou, 1988). The same authors also report large numbers of accidental captures by boats fishing with seine nets for tuna in the Gulf of Taranto. Up to 16,000 captures and recaptures take place every year -- and this may be an underestimate.

The turtles captured are released, but seine fishing results in the death of some of them, mainly by drowning. The mortality rate calculated by the authors mentioned is about 30% (N = 31). If, like De Metrio and Megalofonou (1988), we apply a mortality rate of 10% only to the captures and recaptures of the preceding years, we obtain the alarming figure of 1600 turtles killed each year.

The turtles caught by floating lines go back into the sea when released, with a hook in their digestive tract. As in the Balearic Islands, the mortality rate among them is unknown. Voesenek and Van Rooy (1984) report many captures of Caretta caretta on the east coast of Sardinia; most of them are eaten and their shells are sold as souvenirs.

In the Pelagies islands, despite the law, very many turtles are killed (Gramentz, 1985).

Adriatic: In many parts of this sea the bottom can be trawled. We have no current information on turtles captured accidentally and their ultimate fate. The only data are from the past and relate to Caretta caretta being brought ashore in Trieste (Stossich, 1879; Faber, 1883).

Gramentz (1988) considers that, for the whole of Italy, 2000 to 2500 turtles are killed every year.

4. Current Status, Threats, Research Programmes

4.1. Current threats

There are three kinds:

a) The total destruction of egglaying sites in Lampedusa and Sicily by tourist developments on the coast. The sites are not numerous, but ought to be saved.
b) The high level of exploitation of marine turtles after accidental capture.
c) Chronic mortality rate from the various fishing methods (seining for tuna, floating lines).

4.2. Marking

Cocco et al. (1988) were able to obtain, mark and release 537 turtles captured by accident in 1985 and 1987. The turtles were of both sexes and were caught at sea. Monel tags were used, but we were unable to obtain any further information. Bentivegnia (RAC/SPA survey) also reports the marking of eight turtles captured accidentally and obtained from fishermen in the Gulf of Naples. Five were released, after being kept for a few months in an aquarium, in the south of Sicily. One specimen was seen a month later in Tunisia.

C. LEGISLATION

1. National

Since 1980 there has been a law prohibiting the capture and sale of marine turtles. Law: M.D. (Ministerial Order) of 21 May 1980 - U.G. N156 9 June 1980. This law does not seem to be very effective. (De Metrio et al., 1983; De Metrio and Megalofonou, 1988; Gramentz, 1988).

2. International

Italy is Party to three Conventions: CITES (1979), the Bern Convention (1982) and the Bonn Convention (1983).
Italy ratified the Barcelona Convention on 3 February 1979 and the Specially Protected Areas Protocol on 4 July 1985.

D. PRESENT AUTHORITIES

1. National

1. Mr. R. Argano
2. Mr. M. Cocco
3. Mr. G. de Metrio
4. Mrs. P. Megalofonou
5. Mr. R. Basso
6. Mrs. Flegra Bentivegna
7. Mr. S. Bruno
8. Mrs. M.G. di Palma

LEBANON

A. CHARACTERISTICS OF THE COAST

Mean latitude: 33°50'N
Length of coastline: 240 km
Area of continental shelf (0.180 m): 1450 sq km
Mean distance of 180-m isobath: 6 km

B. STATUS OF MARINE TURTLES

1. Presence

1.1. Past and current data

1.1.a. Loggerhead turtle (Caretta caretta)
The first mention for this coast dates from 1883: Lortet (1883) reported very large specimens on the coast near Cape Ras and Abriad (south of Sur). Tristram (1884) reported the capture of loggerheads by fishermen from Sidon (Saida), and Gruvel (1931) stated that many of this species were to be found in Beirut, on their way to England via Alexandria.

1.1.b. Leatherback turtle (Dermochelis coriacea)
No information.

1.1.c. Green turtle (Chelonia mydas)
Bottger (1879) reported the existence in the Frankfurt Museum of a specimen caught off Beirut, and stated that the green turtle was rare. We have no current information on marine turtles in this country (nesting, accidental capture, etc.).

2. Nesting

2.a. Loggerhead turtle (Caretta caretta)
The sparse data available are derived from the paper by Lortet (1887), who gave the following first-hand account: "On the sandy beaches that stretch south from the small town of Tyre (Sur), I caught very large ones which had come out of the sea during the night and which we found mating on the shore.... The fishermen of the Tyre coast told me that the young turtles emerge from the egg only in the month of July and that they rush into the sea immediately they have hatched". These details leave no doubt about nesting of this species south of Tyre. But the lack of a precise location may mean that the site is no longer on the present coast of Lebanon but on the coast of Israel. Tyre (Sur) is in fact 20 km north of the present Israeli frontier.

C. LEGISLATION

1. National: no information.
2. International: Lebanon ratified the Barcelona Convention on 8 November 1977.

D. PRESENT AUTHORITIES

No information.

LIBYA

A. CHARACTERISTICS OF THE COAST

Mean latitude: 31°50'N
This coast has the most southerly point of the Mediterranean, at El Agheila (latitude 30°15'N)
Length of coastline: 2000 km
Area of continental shelf (0.180 m): 55,000 sq km
Mean distance of 180-m isobath: 30 km

B. STATUS OF MARINE TURTLES

1. Presence

1.1. Past and current data

1.1.a. Loggerhead turtle (Caretta caretta)
Many authors agree in attributing great importance to the Libyan coast as a place where marine turtles feed and nest, especially Caretta caretta. A visit realized in June 1990 (Jeudy de Grissac) has confirmed this importance for the eastern part of Libya, from Benghazi to the boarder with Egypt. Turtles are nesting on all the sandy beaches of the region, and Caretta caretta certainly the most important.

1.1.b. Leatherback turtle (Dermochelis coriacea)
The long Libyan coastline, as yet largely unexploited by fishermen and still less explored by naturalists, does not make it easy to record captures and strandings of turtles. Nevertheless, the leatherback turtle was reported in Libya during the period of Italian colonization, two captures having been recorded, one in 1927 at Benghazi, the other in 1928 at Tripoli (Capra, 1949).

1.1.c. Green turtle (Chelonia mydas)
It is virtually certain that this species is found in Libyan waters, but at present there are no data.

2. Nesting

2.a. Loggerhead turtle (Caretta caretta)
Nesting by this species is probable at various places on the Libyan coast (at El Beida, to the west of Syrte and to the east of Tripoli - Argano, 1979). Another author, Bruno (1969, 1986) mentioned the Gulf of Syrte as a possible nesting site. During exploration in Tunisia, Laurent (1988) obtained information indicating the possible existence of large egglaying sites to the west of Tripoli.

The only certain data at present relate to the National Park of El Kouf, and were obtained by Laurent (pers. obs.) during his mission in Tunisia. This marine and land park is located 400 km west of the Egyptian frontier (longitude 21°E - 22°E). It includes about 20 km of coastline. Merbert (1979) stated that Caretta caretta

was found from 1979 onward, but did not say whether or not it nested there. Armsky (1980), Hemskey (1981) and then Schleich (1987) confirm that it does nest there. Of the 12 km of coast (6 or 7 km of small beaches) explored by Armsky (1980) and Schleich (1987) in 1979 and 1983 respectively, the number of nests found was between 50 and 60 per season.

2.b. Leatherback turtle: (Dermochelis coriacea)
Nesting by this species in Libya was a hypothesis put forward by Fretey (1986), but the source of the information is unknown and the supposition appears erroneous. Nevertheless, as stated by Lescure, Delaugère and Laurent (in press), in view of the proof that it nests in the Mediterranean, it cannot be excluded that the leatherback turtle may lay eggs on coasts as little explored as those of Libya and Egypt.

2.c. Green turtle: (Chelonia mydas)
Since it is found in tropical areas, it might well nest on the most southerly shores of the Mediterranean, especially as some specimens have been observed in Tunisia (Gulf of Gabès). However, movements along the Libyan coast from egglaying sites in Cyprus or Turkey could also explain these sightings.

3. Exploitation/Use

At the beginning of the 1980s, fishing was not extensive, but the situation could change rapidly as a result of the quality of the coast. We have no current information on the accidental capture of turtles and their ultimate fate. It is essential to carry out surveys in the ports to find the extent of these captures. Schleich (1987) mentions that humans took the eggs to eat.

4. Current Status, Threats, Research Programmes

A recent visit to the East seashore of the country (between Syrte Gulf and the boundary with Egypt (june 1990, national and RAC/SPA experts) has shown the real importance of this coast for marine turtles. All the sandy beaches are visited by turtles. The disturbance by men occurs only near the settlements (consumption of the eggs).

Threats: Owing to the absence of data relating to fishing, the only real threat at present is the taking of eggs and of females coming to lay eggs on the only known sites in Libya (Kouf National Park). According to Schleich (1987), jackals prey on a very high proportion of the nests (something like 90%), and also attack the female turtles (five turtles were found killed in 1983). Humans also take the eggs for eating and the females for their shells. This high level of preying on eggs and the females must also occur with regard to the newly hatched young. This situation is disquieting in the confines of a park.

The long Libyan coastline is the most southerly of the whole Mediterranean and the least known by naturalists. The exploration of this coast is now absolutely essential, partly to understand the pattern and dynamics of the numbers of Caretta caretta in the eastern

Mediterranean and partly to protect the nesting sites before human activities expand in the future.

Marking
One female turtle coming to lay eggs was marked by Armsky in 1980 (ring number P23371).

C. LEGISLATION

1. National
The Legislative Act on Environmental Protection (Number 7, 17 February 1982) alllows the protection of areas and of species. This law could be applied to the protection of marine turtles, or of their nesting beaches.

2. International
On 10 November 1988, Libya was not Party to any international convention (CITES, African Convention, Bonn Convention).
Libya ratified the Barcelona Convention on 31 january 1979 and the Specially Protected Areas Protocol on 6 June 1989.

D. COMPETENT AUTHORITIES

1. National: Biological Marine Research Centre, PO Box 30830, Tajura, Tripoli.

2. International
1. Hans Herman Schleich.

MALTA

A. CHARACTERISTICS OF THE COAST

Mean latitude: 36°00'N
Length of coastline: 130 km
Area of continental shelf (0.180 m): 5460 sq km
Mean distance of 180-m isobath: 42 km

B. STATUS OF MARINE TURTLES

1. Presence

1.1. Past and current data

1.1.a. Loggerhead turtle (Caretta caretta)
This species is very common around the islands of Malta (Despott, 1914, 1915; Gulia, 1914; Brongersma and Carr, 1983; Gramentz, 1986a, 1986b). Nests were reported particularly on the island of Gozo (Despott, 1915). But these sites disappeared many years ago (Brongersma, 1972; Gramentz, 1986).

1.1.b. Leatherback turtle (Dermochelis coriacea)
Brongersma and Carr (1983) state that this species has been reported a number of times in Maltese waters. The only precise information relates to the capture of two specimens, one on 3 June 1977 (Lanfranco, 1979) and the other, a male leatherback (overall length 1.85 m), captured off Gozo 10 November 1977 (Den Hartog, 1980). The species is therefore rare.

1.1.c. Green turtle (Chelonia mydas)
Despott (1930a, 1930b) states that in 1929 two specimens of Chelonia mydas of different sizes were captured. But Carr (1957) concluded, after scrutinizing the photos in Despott's articles, that the large specimen was indeed a green turtle but that the other was more likely a Lepidochelys kempii. Brongersma and Carr (1983), following the recent rediscovery of the "small turtle", give definite confirmation of the observations of Carr (1957). This means that only one green turtle has hitherto been reported in Malta. The report of Kemp's turtle is the only one, not only for Malta, but for the whole of the Mediterranean. These two species are therefore the exception in the Maltese islands.

2. Nesting

2.a. Loggerhead turtle (Caretta caretta)
Despott (1915) reported that it nested, especially on the island of Gozo. But the sites disappeared many years ago (Brongersma, 1972; Gramentz, 1986).

3. Exploitation/Use

The loggerhead turtle is extensively caught and eaten by the Maltese. Despott (1915) noted this gastronomic tradition at the beginning of the century. Anon (1987) and Gramentz (1988b) confirm this situation and,

according to the latter, a total of 500 to 600 turtles are killed every year in Malta. The consumption of turtles results from accidental capture due to various fishing methods (floating lines, etc.).

4. Current Status, Threats, Research Programmes

Threats: The greatest threat comes from accidental capture and the use of turtles for food. Fishing for swordfish (with floating lines) leads to many captures of turtles, and the mortality rate of those released is not known.

Another major problem in the Mediterranean as a whole, but emphasized with regard to these waters by Gramentz (1986b; 1988a) must be taken into consideration: the chemical and physical pollution to which Caretta caretta is subjected in the central Mediterranean. This includes the swallowing of tar, and of plastic and metal wastes, also contamination of their bodies by crude oil. The consequences are disastrous: death by gastric occlusion or by physical and chemical poisoning (disablement); metabolic disturbance caused by diminished intestinal absorption or by chemical contamination. Of the hundred or so turtles observed by Gramentz, 20% were suffering from pollution.

Marking
About 100 Caretta caretta of both sexes, captured at sea, were marked by Gramentz with plastic rings bearing the address of the Monaco Oceanographic Museum.

C. LEGISLATION

1. National
There is no law protecting turtles (Gramentz, 1988b), but a draft legislation is under preparation.

2. International
Malta ratified the Barcelona Convention on 30 December 1977 and the Specially Protected Areas Protocol on 11 January 1988. Malta has recently ratified the CITES Convention (December 1988).

D. COMPETENT AUTHORITIES

1. National: Ministry of Education and Environment, Environment Division, Lascaris, Valletta, Malta.

2. International
1. Dieter Gramentz.

MONACO

A. CHARACTERISTICS OF THE COAST

Mean latitude: 43°45'N
Length of coastline: 3 km

B. STATUS OF MARINE TURTLES

1. Presence

Only the loggerhead turtle (Caretta caretta) has been reported on the short coastline of Monaco (Richard, 1907; Maigret, RAC/SPA survey).

2. Nesting

There are no nests.

3. Exploitation/Use

The loggerhead turtle is sometimes captured accidentally by coastal fishermen.

C. LEGISLATION

1. National
There is no protection of marine turtles.

2. International
Monaco is Party to CITES since 19 April 1978.
Monaco ratified the Barcelona Convention on 20 September 1977 and the Specially Protected Areas Protocol on 29 May 1989.

D. COMPETENT AUTHORITIES

1. National
   1. Dr. J. Maigret.

MOROCCO

A. CHARACTERISTICS OF THE COAST

Mean latitude: 35°20'N
Length of coastline: 450 km
Area of continental shelf (0.180 m): 4480 sq km
Mean distance of 180-m isobath: 10 km

B. STATUS OF MARINE TURTLES

1. Presence

1.1. Past data

Publications on the reptiles of Morocco that mention marine turtles (Pelleum, 1972; Pasteur, 1959; Pasteur and Bons, 1960; Bouns, 1967, 1972) refer to their presence only in the Atlantic. The only past reference to the presence of turtles on the Mediterranean coast of Morocco is the photo of a turtle (probably a loggerhead taken on a floating line at Mellila) in the article by Ponte y Avila (1923).

1.2. Current data

1.2.a. Loggerhead turtle (Caretta caretta)

Laurent (1988) states that it is found in summer in the Mediterranean waters of Morocco (one specimen observed on 12 July 1986 at the Cape of Three Forks, and two turtles with the shell covered in scales, not identified). A shell of Caretta caretta caught in a trawl at the beginning of 1986 was seen in the port of Ras el Ma (Laurent, pers. obs.).

1.2.b. Leatherback turtle (Dermochelis coriacea)

Fernandez and Moreno (1984) report strandings of many dead turtles on the beaches at Ceuta (three on 12 November 1980, two on 15 November 1980, one in August 1982 and one on 14 August 1983) and on a nearby Moroccan beach (6 in December 1980). Crespo et al., (1988) again emphasize the high frequency of observations of this species in the area, particularly in winter. During talks with fishermen from Mellila (Laurent, in litt.) it appeared that they knew the leatherback turtle (they described it accurately), which is found all along the Mediterranean coastline of Morocco.

1.2.c. Green turtle (Chelonia mydas)

In 1984, 10 kg of stuffed green turtles (3 or 4 specimens) were exported to Japan (Milliken and Tokunage, 1987), but there is no information as to whether these turtles came from the Atlantic or the Mediterranean.

2. Nesting

2.a. Loggerhead turtle (Caretta caretta)

According to Beaubrun (in litt., 1986) there are no egglaying sites on the Mediterranean coast of Morocco. The area between Ceuta and Mellila has been explored many times for ornithological purposes (Berthon and Berthon, 1984). One of these authors

reports that the beaches in this area were visited for the birdlife in June and July over a number of years, and that no trace of turtles was seen (Berthon, pers. comm.) A report of the Council of Europe (Anon, 1987) suggests, without giving a source, that Morocco has very few turtle nests on its coast (25 nests). Unless Beaubrun's statement is based on the systematic exploration of the beaches during the egglaying period, then it is essential to carry out such exploration, in particular between Mellila and the Algerian frontier. If it is confirmed that there is no egglaying on this coastline, which is almost undisturbed by human activities, it would be interesting to analyse the reasons: geomorphological, sedimentological or simply hydrological.

2.b. Leatherback turtle (Dermochelis coriacea)
No information

2.c. Green turtle (Chelonia mydas)
Groombridge and Luxmoore (1987) describe Morocco as a country that may well have a nesting population of green turtles. The information, with no specific references, probably applies to the Atlantic coast.

3. Exploitation/Use

Bibliographic information is sparse. At Ras el Ma, turtles are caught in trawls. Up to the present they have been released, but this may change, since a wholesaler from Saidia (town on the frontier) now comes to this port to buy turtle shells from the fishermen for sale to tourists (Laurent, pers. obs. 1986). Leatherback turtles are captured accidentally in the tuna fishing nets at Ceuta (Fernandez and Moreno, 1984, and Crespo et al., 1988).

4. Current Status, Threats, Research Programmes

Caretta caretta is found frequently in the Mediterranean waters of Morocco. It is doubtful whether it nests in Morocco, but this has to be confirmed. There is no information on Chelonia mydas but it does not seem to nest in this country. The leatherback turtle is frequently observed.

C. LEGISLATION

1. National
The only existing legal texts relating to wild fauna are concerned with hunting. Three texts are in force:
— Dahir of 6 hija 1341 (21 July 1923) on hunting regulations;
— Order of the Ministry of Agriculture N 58262 of 3 November 1962 including the permanent regulations for hunting;
— Annual orders of the Ministry of Agriculture giving dates of opening and closure of the hunting season and special hunting regulations.

The lists of harmful or protected species in the various texts mentioned concern only mammals and birds, with the exception of one type of insect. To our knowledge, there is no legislation

protecting marine turtles and their eggs.

2. International
Morocco is Party to CITES since 16 October 1975 and to the African Convention since 14 November 1977.
Morocco ratified the Barcelona Convention on 15 January 1980, and signed (but not ratified) the Specially Protected Areas Protocol on 2 April 1983.

D. PRESENT AUTHORITIES

1. National
   1. Mr. A. Bayed

2. International
   1. Mr. P.Ch. Beaubrun
   2. Mr. S.C. Moreno.

SPAIN

A. CHARACTERISTICS OF THE COAST

Mean latitude: 39°25'N
Length of coastline (mainland and Balearic Islands): 2372 km
Area of continental shelf (0-180m): 44,100 sq km
Mean distance of 180 m isobath: 18.5 km.

B. STATUS OF MARINE TURTLES

1. Presence

1.1. Past and recent data

1.1.a. Loggerhead turtle (Caretta caretta)

This species is common in Spain and especially in the Balearic Islands, where it is plentiful. The large numbers were first reported by Salles (1861), who stated that "the first boat to arrive would provide as many as required, in the Balearics". Later, Bosca (1880) stated that it was common there. The only captures of marine turtles made during oceanographic surveys in the western Mediterranean took place in the Balearics. On 7 July 1892, two of these turtles were observed, one caught south of Formentera (survey by the schooner Melika, Chevreux and de Guerne, 1893). Two others were caught on 11 June 1894 between Ibiza and Majorca (survey by the Princess Alice, Prince Albert I, 1934). Maluguer (1919) considered the loggerhead turtle to be common on the coast of Catalonia and plentiful in the sea off Majorca.

Recently, other authors have reported the presence of large numbers (Salvador, 1978; Pascual, 1985; Mayol, 1985). After many sailing trips as a naturalist in the Mediterranean, Laurent (1988) found that the most favourable areas for observing these turtles were the waters around the Balearic Islands. Holidaymakers very often encounter them near these islands.

1.1.b. Leatherback turtle (Dermochelis coriacea)

Pascual (1985) reported that there had been eight observations of this species in the Mediterranean around Spain, the specimens having been caught or stranded between 1808 and 1983. Duron (1986) reported two sightings in the Balearics for that year. For the period 1975-1987, Crespo et al., (1988) add to this figure 33 new sightings, 17 of which concern specimens observed in winter close to Gibraltar.

1.1.c. Green turtle (Chelonia mydas)

The census of marine turtles made by Pascual (1985) mentions the observation of two specimens in Spanish waters, one in 1850 (Barcelo, 1876), the other in 1899 (Bosca, 1916). Mayol (1985) reported that two specimens were seen in the 19th Century in the fish market in Palma de Majorca. The most recent information on this species is given by Rey et al., (1986), who mention that among the species caught by floating fishing lines

are Caretta caretta and Chelonia mydas but give no further details. The species Chelonia mydas is extremely rare in Spanish waters.

2. Nesting

2.a. Loggerhead turtle (Caretta caretta)

Nesting in the Balearics has been reported by Knoepffler (1962) and Dumont (1973). But Mayol (1985, in litt. 1986), basing his statements on eye-witness accounts by fishermen and on the islands' traditions, concludes that no egglaying sites existed there, recently or in the past. Nesting has also been reported on the island of Alboran (Salles, 1861), in association with numerous observations of turtles around this island.

It is possible that eggs were laid on the beaches of mainland Spain, particularly on the beach at Almeria (Laurent, pers. obs.). Caminas (1988) reports the capture of a female that went ashore on a beach at Malaga, for an unknown reason. It may be concluded that there are few or no egglaying sites on the Spanish coast, whether mainland or islands, although turtles may attempt to go ashore from time to time on the beaches of Malaga and Almeria.

3. Exploitation/Use

The turtles (especially Caretta caretta) are caught by accident in trawls and on floating fishing lines. Argano (1978, 1979) after a survey in Spanish fishing ports, estimates the number of accidental captures per year at about 2000. He states that the turtles are caught mainly by floating lines. Most of them are released, but some are killed for the purpose of selling their shells and meat. Mayol (in litt., 1987) gives an annual capture figure of 15,000 to 20,000 resulting from floating lines. The captured animals are released with a hook in their digestive tract. Often they are caught again, some turtles having been observed with a number of fishing lines hanging from their jaws (Caminas, pers. comm.). This author (Caminas, 1988) gives a new estimate for captures and recaptures by floating lines on the whole coast of Spain of 20,000.

4. Current Status, Threats, Research Programmes

The chief problem in Spain is the large number of turtles captured (and recaptured) accidentally by persons fishing for swordfish. The turtles caught on the line are often released, it is true, but with a hook in their digestive tract. What is their survival rate? On this point, Caminas (1988) points out that on the beaches of Alboran, only two turtles were found dead in 1986 and 1987, one of them with a hook in its mouth. He reports an experiment in which six turtles caught by floating lines were placed in an aquarium. After a time, five of them spat out the hook. Research should be done on how to prevent these accidental captures by floating lines. Mayol (pers. comm.) draws attention to the size of the hooks, which might be modified to ensure that marine turtles were not caught. It is also essential to find out the origin of the marine turtles found in Spanish waters. Indeed, several populations of different origins might be living there together.

4.1. Marking
Some Caretta caretta were marked by Pascual (1986) and Mantaner (RAC/SPA survey).

C. LEGISLATION

1. National
Legislation to protect marine turtles exists (Mayol, in litt., 1986): it is in the form of a decree by the Ministry of Agriculture, No. 3181/1980, dated 30 December 1980 (B.O. del E., No. 56, 6 March 1981).

2. International
Spain is Party to CITES since 28 August 1986, to the Bern Convention since 1 September 1986, and to the Bonn Convention since 1985.
Spain ratified the Barcelona Convention on 17 December 1976 and the Specially Protected Areas Protocol on 22 December 1987.

D. PRESENT AUTHORITIES

1. J.A. Caminas
2. J. Crespo
3. J.C. Rey
4. J. Mas
5. X. Pascual
6. J. Mayol
7. R. Sagarminaga
8. S.C. Moreno

SYRIA

A. CHARACTERISTICS OF THE COAST

Mean latitude: 35°17'N
Length of coastline: 183 km
Area of continental shelf (0-180 m): 1160 sq km
Mean distance of 180-m isobath: 6.6 km

B. STATUS OF MARINE TURTLES

1. Presence

1.1. Past and current data

Gruvel (1931) reports the importance of the Turkish coast north of Syria for the turtle and in particular the "false tortoiseshell turtle" or Thalassochelys caretta (Caretta caretta). He reports less frequent captures of leatherback turtles in the same waters. It may be that these turtles travelled along the coast in Syria and were often caught there.

Enquiries made of the General Directorate of Fisheries at Jableh and of fishermen of the island of Araouad (RAC/SPA, 1989) the main fishing centre of Syria, have produced data on the current situation. Until 1960, captures were frequent and the turtles were exported to Egypt: some 200 to 250 a month in 1960. Now fewer and fewer turtles are caught, perhaps because fishing has been less active in recent years. The last information is the capture in 1970 near Ras El Bassit (North Lattakia). Eating of turtles locally is not common.

On the subject of nesting, there were frequent reports up until about 1975. Every year, students bring back young turtles found dead on the beach to the University of Lattakia, but no information has been found as to where these turtles originated. It might be the northern coast of Syria (about 10 km of beach), or the sandy area south of Lattakia, or the long shoreline south of Tartous to the frontier. A turtle has been observed near the beach "Golden sands" North Tartous. A monitoring survey of the whole Syrian coast needs to be made.

During the summer 1989, the beaches near Tartous have seen the coming of many turtles for nesting in June and a meeeting of turtles (breeding ?) in August (more than 200).

C. LEGISLATION:

1. National

No national legislation.

2. International

Syria ratified the Barcelona Convention on 26 December 1978.

D. PRESENT AUTHORITIES:

Dr Mohamed Al Nimeh

TUNISIA

A. CHARACTERISTICS OF THE COAST

This can be divided into two parts:
-- north coast: Algerian frontier to Cape Bonn (33% of coastline)
-- east coast: Cape Bon to Libyan frontier (67%).
Mean latitude: north coast -- 37°00'N; east coast -- 35°00'N
Length of coastline: 1300 km
Area of continental shelf (0-180 m): 72,000 sq km
Mean distance of 180-m isobath: 55.4 km

B. STATUS OF MARINE TURTLES

1. Presence

1.1. Past data

1.1.a. Loggerhead turtle (Caretta caretta)

This turtle has been known in Tunisia since 1899 (Servonnet, 1889), especially in the Gulf of Gabès. It was later mentioned by Olivier (1896) as found in Tunis and Bizerta; Mayet (1930) reported it in the Gulf of Gabès; Blanc (1908) and Mosanerr (1934) at Sfax; Blanc (1935) stated that it was found everywhere in Tunisia. According to these authors the loggerhead turtle was very common in the country. Others mentioned that many marine turtles were found, but did not give the species. For example, Bouchon-Brandely and Berthoule (1890) said "The marine turtle is very common in the waters of Sousse. In summer the fishing boats bring back up to five or six a day". Charcot (1923) visiting the shoal of Esquerquis, north-east of Bizerta, in June 1923, wrote "In calm weather, sea turtles floated on the surface in considerable numbers".

1.1.b. Leatherback turtle (Dermochelis coriacea)

The first mention of this turtle in Tunisia was given by Blanc (1903) who reported a specimen caught in the Gulf of Tunis in 1907. In 1933, Heldt produced a summary record of captures and strandings of this animal all along the coast of Tunisia, together with an extremely interesting anatomical study. Five specimens were recorded by this author between 1930 and 1933. Blanc (1935) then stressed again the rarity of this species in Tunisia. Heldt (1950) reported the capture of a leatherback turtle on 18 April 1880.

1.1.c. Green turtle (Chelonia mydas)

In 1908, Blanc gave a description of a species of turtle sometimes caught in Tunisia which left no doubt as to the type. He stated that it was to be seen more particularly in the Gulf of Gabès. Later, the same author (Blanc, 1935) reported the green turtle as fairly common in the south. Two other reports in the past (Bouchon-Brandely and Berthoule, 1890; Fages and Ponzevera, 1908) mentioned a species of marine turtle whose scales were black, and which was to be found near Djerba but was rarely seen.

The name given to this species by the fishermen was Bouzegza, the Arab name for the green turtle, according to Blanc (1908). These two reports seem to prove that the green turtle used to be found in Tunisia in the past, and was thus certainly known although rarely seen there (chiefly in the south-east).

1.2. Current Data

1.2.a. Loggerhead turtle (Caretta caretta)
At present this turtle is very common (Argano, 1979; Laurent et al., to be published). The species is to be found all through the year. Many of the turtles ringed in various Mediterranean countries are captured in Tunisia.

1.2.b. Leatherback turtle (Dermochelis coriacea)
Machaichi and Rais (1985) recorded observations of this species on the basis of past information (Heldt, 1933 and 1950; Postel 1955; Chakroun, 1966) and more recent data. Between 1930 and 1983, 13 of these turtles were observed. Since then, ten certified captures were discovered through newspaper cuttings and verified accounts (Laurent et al., to be published).

Table 12: Captures of leatherback turtles in Tunisia from 1985 to 1987.

Date and place	Number	Source
August 1985 (Djerba)	1	INSTOP/Sfax
December 1985	2	Laurent
End December 1985	1	Photo
August 1986	1	Press cutting
11 November 1986	1	Press cutting
December 1986	1	INSTOP
March 1987 (Djerba)	1	INSTOP/Sfax
April 1987	1	INSTOP
July 1987	1	INSTOP/Sfax

Various enquiries made among fishermen in 1988 produced information on other captures, but they were not sufficiently reliable (Laurent et al., to be published) It appears that there were two other captures in 1987, one at Kelibia, the other at Tebulba, and two in 1988, one at Tebulba in the spring and one at Monastir in May or June. The leatherback turtle is infrequently but regularly seen.

1.2.c. Green turtle (Chelonia mydas)
During enquiries made in Tunisia in June 1988 (Laurent), out of about a hundred turtle shells that were seen, three were shells of green turtles. The turtles had been captured in recent years in the Gulf of Gabès and by trawls.

1.2.d. Kemp's turtle: (Lepidochelys kempii)
Pritchard and Marquez (1973), in a monograph on this species, mention a statement by Dr. Ralph Mathamay that the Tunisian fishermen know a species of marine turtle with a wide shell, a species so rare that a man might see one only once in his lifetime. The turtle is locally known as "Zig-zag", an Arab

expression meaning copulation: the meat of this turtle, in fact, is considered a powerful aphrodisiac. The authors think that this species could be a Kemp's turtle.

2. Nesting

2.a. Loggerhead turtle: (Caretta caretta)

The only data relating to nesting by this species in Tunisia come from the articles published by Blanc (1935), Knoepffler (1972) and Argano (1979). The first-named states that "the loggerhead turtle lays its eggs in the sand of the islands and islets and the deserted shores of Tunisia and doubtless throughout North Africa". Knoepffler reported that the loggerhead had egglaying sites in Syrta Minor (Gulf of Gabès) while Argano states that an important site for eggs is located on the east coast of Tunisia, because of the huge uninhabited beaches. But his statements are based on information collected during his travels in Tunisia and he does not give the sources. A survey made in 1988 (Laurent et al., to be published) was able to demonstrate for the first time that egglaying sites existed and to envisage the possibility of their existance on other parts of the Tunisian coast.

The two recognized egglaying sites are on the Kuriate Islands and on the beach between Ras Dimas and Mahdia (10 km long). For these two sites the probable number of nests is 2 to 10 per year.

The principal potential sites requiring verification are:
-- the beach between the lagoon of El Bibane and the frontier with Libya;
-- the beach at Ghannush, north of Gabès;
-- the island of Ras Dimass or Thapsus, between Mahdia and Monastir.

Many other potential or past nesting sites should also be inspected.

2.b. Leatherback turtle (Dermochelis coriacea)

It was stated by Heldt (1933) that this species nested all along the North African coast, after he observed ovules 5 cm in diameter during the dissection of a female turtle. Lescure, Delaugère and Laurent (1988), in their article on the nesting habits of the leatherback turtle in the Mediterranean stated that this type of observation did not prove that nesting took place in the Mediterranean in view of the speed with which this species travelled. It can be said at present that the leatherback turtle does not nest in Tunisia.

2.c. Green turtle (Chelonia mydas)

No reliable data exist. Groombridge and Luxmoore (1987) advance the hypothesis that nesting is certain or possible in Tunisia, but give no data to support it. Nesting by the green turtle in Tunisia is not very likely.

3. Exploitation/Use

Captures of marine turtles during fishing is a long-standing practice in Tunisia. It has been mentioned by numerous authors (Servonnet, 1889; Bouchon-Brandely and Berthoule, 1890; Desfages and Ponzevera, 1908; Gruvel, 1926; Montconduit, 1927; Blanc, 1935). The methods of capture are not often described but it appears that most of the time the captures were accidental during fishing by various methods, apart from the direct capture of turtles immobile on the surface of the sea. Servonnet (1889) wrote, "It often happens during the summer that native fishermen come across marine turtles that have strayed among their fishing grounds or are asleep on the surface of the water, and they make a point of capturing them". André (1961) described the direct capture of marine turtles as practised in the Kerkennah Islands: "In good weather they are harpooned with a trident which the fishermen try to drive into the shell. The skill consists of flipping the turtle on to its back, in which position it is defenceless".

Fishermen in the past regarded these marine turtles as a species to be exploited. Indeed, they are to be found in the lists of species caught, proof that catching them was current practice. In 1927, the marine turtle was even described in the fishing statistics for the sector of Sousse Nabeul (Montconduit, 1927). The main use of these turtles at the various periods was for eating. "The meat of these marine reptiles has a taste comparable to that of the large ocean turtles" (Servonnet, 1889). "It was to be found fairly often in the markets of all the seaside towns, where it was sold as food" (Blanc, 1935). Its oil was sometimes used as a medicine (Servonnet, 1889). André (1961) reported that in the Kerkennah Islands the meat was not greatly prized, but that the blood and the heart were considered as remedies against some diseases. He stated that it was the shell that was of interest to the people there, to be made into cradles.

At present the loggerhead turtle is still exploited. Argano (1979), after a survey made in 1978 in four ports (Bizerta, Tunis, Sousse and Sfax) gives the estimate of 2000-3000 turtles captured per year, with more than 1000 for the port of Sfax. According to him, most of these accidental captures are made in trawls.

The turtles are used as food for the inhabitants. He adds that the sale of turtle meat in restaurants is not often found, likewise the use of the oil for therapeutic and other purposes. A mission to Tunisia in 1988 (Laurent et al., to be published) carried out a survey in 22 Tunisian ports, the main results of which were as follows:

- 4500 to 5000 turtles are captured every year in Tunisia. In Sfax, where we were able to obtain exact figures from the fisheries service, the number of turtles captured is 3500 per year.
- 80% of the captures are made at Sfax, Mahdia, Zarzis (Gulf of Gabès), and 70-80% of the annual captures are made in trawls. This means that the turtles are caught alive and could be released easily. The remaining numbers are caught during coastal fishing (small-mesh nets, floating and weighted lines).
- The turtles are used for eating by the poorest people. At present it seems that the shells are not often sold to tourists.

C. LEGISLATION

1. National

Marine turtles are still not really protected. Since 10 June 1987 there is in existence a note from the Fishing Commissiariat (Note No. 1155) requesting regional delegates to make sure personally that there should be no fishing for marine turtles. This note has no legal validity.

Article 8 of the Order of the Ministry of Agriculture dated 9 June 1987 relating to the hunting season 1987/88 and naming the protected species makes mention, among the reptiles, only of land tortoises and freshwater turtles.

2. International

Tunisia is Party to CITES since 10 July 1974 and to the African Convention since 4 March 1978.
Tunisia ratified the Barcelona Convention on 30 July 1977 and the Specially Protected Areas Protocol on 26 May 1983.

D. CURRENT AUTHORITIES

1. National
   1. Agence Nationale de Protection de l'Environnement
   2. Mr. Said Nouira

2. International
   1. Mr. Luc Laurent

TURKEY

A. CHARACTERISTICS OF THE COAST

There are four seas around the shores of Turkey, the Black Sea (1), the Sea of Marmara (2), the Aegean Sea (3) and the Mediterranean Sea (4), representing four coasts:

Coast	Mean latitude	Length/coast
1. Black sea	41°20'N	1700 km
2. Sea of Marmara	40°30'N	1100 km
3. Aegean Sea	38°15'N	3900 km
4. Mediterranean Sea	36°15'N	1600 km

-- The combined length of the Aegean and Mediterranean coastline is 5500 km.
-- The total length of the beaches for the Mediterranean and Aegean coastline (3 and 4) is about 2000 km (Geldiay et al., 1982), i.e. 36% of the total.
-- Mean distance of 180-m isobath: 4.7 km

B. *STATUS OF MARINE TURTLES*

1. Presence

1.1. Past data

1.1.a. Loggerhead turtle (Caretta caretta)

Lortet (1887) reported the presence of this species in great numbers in the Gulf of Alexandretta (Iskenderun) (see Map 4). Gruvel (1931) considered that this gulf was the homeland of the marine turtles, stating that "the most abundant by far is the false tortoiseshell turtle, or Thalassochelys caretta L. or loggerhead turtle..... It is found in the Gulf of Alexandretta and in the Gulf of Tarsus". The Gulf of Tarsus is now the Gulf of Mersin.

1.1.b. Leatherback turtle (Dermochelis coriacea)

No details of observations or captures, but it is found in Turkish Mediterranean waters (Geldiay, 1982).

1.1.c. Green turtle (Chelonia mydas)

There is little information on this species. Gruvel (1931) regarded the green turtle as rare in the eastern Mediterranean and did not place it within the Gulf of Alexandretta (Iskenderun), which however he described as "the homeland of the marine turtles". The first mention of this species in Turkish waters dates from 1967 (Sella in Anon., 1967, where it is described as very abundant and exploited).

2. Nesting

2.a. Loggerhead turtle (Caretta caretta)

Reporting of egglaying sites of this species in Turkey are recent. The first mention is made by Geldiay (1978). The Mediterranean

and Aegean coastline is extremely long, 5500 km, with about 2000 km of beaches. While many sites have been discovered, much exploration still remains to be done and this may bring new sites to light.

2.b. Leatherback turtle (Dermochelis coriacea)
No information.

2.c. Green turtle (Chelonia mydas)
The data on nesting of this species are recent. There was nothing reported until 1977 (Basglu and Baron, 1977). Yet Sella (1980, 1982) writes that in 1965 and 1967 fishermen knew of the existence of egglaying sites, in the following places: Viransehil, Kazanli, Tuzla Karatas, Yummurtalik, Tasucu, Chahenem. The egglaying sites currently known are all located on the south-eastern coast of Turkey, between Belik and the Syrian frontier.

Table 12: Names and extent of sites known where the green turtle lays eggs in Turkey.

Site	Number of nests/km/day Chelinia mydas	Source
a) Mersin	fewer than 6	Geldiay, 1984
b) Tuzla	"	
c) Karatas	"	
d) Yummurtalik	"	
e) Alanya*	From 1 to 6	
f) Gazipasa*	More than 1	
g) Silifke*	-	
h) Side*	-	
i) Belek/Serik*	-	

The sites marked * are mixed, where both Caretta caretta and Chelonia mydas lay eggs, with the first species predominant.
The biggest sites are the first four. Turkey is the Mediterranean country with the largest sites and the greatest number of nests per season.

3. Exploitation/Use

Between 1952 and 1965, more than 15,000 turtles (chiefly Chelonia mydas) were captured in the Gulf of Mersin. Fishing then moved to the Gulf of Iskenderun, where 100 turtles a day were caught. These turtles were destined for Europe (Sella, 1982). In the same Gulf in 1972, captures were in the neighbourhood of 1200 in a season (Sella 1982). Exploitation ceased, but it is not known exactly when.

At present the turtles seem to be little used for food by the Turks (Geldiay, 1978). But we have no information on accidental captures, especially in trawls in the Gulfs of Mersin and Iskenderun. In the past, these two areas appear to have been full of Caretta caretta (Gruvel, 1931) and Chelonia mydas (Sella, 1982). According to Balik (RCA/SPA survey), marine turtles captured acccidentally are released.

4. Current Status, Threats, Research Programmes

Turkey has the largest egglaying sites of Chelonia mydas now known in the Mediterranean, and its coastline possesses the greatest number of nests of this species. It is also an important place for Caretta caretta: it is thought that the Turkish coastline has as many nests as the Greek coastline. In this context, two things are essential:

— a conservation policy for the sites currently known;
— exploration of the whole coastline before it is developed for tourism. A first general survey has been realized by WWF in 1989 and the 17 most important sites have been described and recommanded for a protection.

The present threat which is very serious is the destruction or alteration of egglaying sites as a result of development of the beaches for tourism. The case of Dalyan, a site of great importance for Caretta caretta has been resolved by the Turkish authorities. Others sites are under consideration for a protection.
Data on accidental captures are not available, so there is no way to assess the possible danger from fishing.

Marking: Female turtles have been marked on the beaches where eggs are laid, 150 marine turtles (Caretta caretta and Chelonia mydas) in 1982 with metal rings (Balik, RAC/SPA survey).

C. LEGISLATION

1. National
The capture of marine turtles and the destruction of nests and eggs are prohibited everywhere on the coast of Turkey (Balik, RAC/SPA survey). The law forms part of the legislation on fishing, Official Gazette of 28 February 1986, No. 930.

2. International
Turkey is Party to the Bern Convention since 1 September 1984.
Turkey ratified the Barcelona Convention on 6 April 1981 and the Specially Protected Areas Protocol on 6 November 1986.

D. COMPETENT AUTHORITIES

1. National
1. Professor I. Baran
2. Dr. Suleyman Balik
3. Dr. Tufan Koray
4. Professor Muktar Basoglu
5. Mrs Nergis Yazgan
6. Mr. Faik Koyuncuoglu

2. International
1. Professor Ragnar K. Kinzelbach
2. Mr. Ricardo Jesu
3. Mrs. Clare Whitmore
4. Mr. Brian Groombridge

YUGOSLAVIA

A. CHARACTERISTICS OF THE COAST

Length of coastline: 6616 km
Area of continental shelf (0-180 m): 43,500 sq km

B. STATUS OF MARINE TURTLES

1. Presence

1.1. Past and current data

There is little information available.

1.1.a. Loggerhead turtle (Caretta caretta)

This species is sometimes found on the coast of Yugoslavia (Karaman, 1939; Pozzi, 1966) and is included in the list of reptiles of the country (Brelih and Dzukic, 1974). The species is uncommon.

1.1.b. Leatherback turtle (Dermochelis coriacea)

According to Karaman (1939), this turtle was often captured on the Adriatic coast. Specimens are to be found in the museums at Split, Dubrovnik and Zagreb. Kosic (1895, 1896) and Babic (1920) described observations and captures of this species.

1.1.c. Green turtle (Chelonia mydas)

This species is observed from time to time in Yugoslavia (Pozzi, 1966) and is included in the list of reptiles compiled by Brelih and Dzukic (1974).

2. Nesting: No known nesting areas.

3. Exploitation/Use: No exploitation. No consumption.

C. LEGISLATION

1. National: No specific legislation.

2. International

Yugoslavia ratified the Barcelona Convention on 13 January 1978 and the Specially Protected Areas Protocol on 21 February 1986.

D. PRESENT AUTHORITIES

1. National

1. Mr. E. Draganovic National Focal point for SPA, Zagreb.
1. Mr. H. Gamulin - Brida
2. Mr. H. Gomercic
3. Mr. D. Huber
4. The scientific Institutes in Piran, Rowing, Split, Dubrovnik and Kotor

ANNEX I

ACTION PLAN
FOR THE CONSERVATION OF MEDITERRANEAN MARINE TURTLES

INTRODUCTION

1. The Parties to the Barcelona Convention included among their priority targets for the period 1985-1995 the protection of Mediterranean marine turtles (Genoa, 9-13 September 1985).

2. The populations of Mediterranean marine turtles are decreasing from year to year owing to the interaction of human activities (fisheries as regards the marine environment, occupation or deterioration of the sandy shores as regards the terrestrial environment). There are signs of general decline of populations of turtles nesting on monitored beaches.

3. Many important aspects of the biology and behaviour of marine turtles are too poorly known to plan a complete management strategy for the conservation of these species, but the actual degradation of the populations is so serious that action can no longer be postponed. Using the available information, it is possible to prepare an Action Plan for the conservation of Mediterranean marine turtles. This Plan will be adjusted if necessary as more information becomes available.

4. Information from various sources is taken into account in this Action Plan. Coordinated programmes for scientific research (population dynamics, ecology, biology and physiology), public awareness campaigns, proposals for the management of nesting beaches, etc..., can ensure the survival and help the reconstitution of populations of marine turtles.

5. An effective and durable protection of the Mediterranean Marine Turtles implies management of the Mediterranean as a whole, in co-operation with existing programmes and plans, in particular :
   - at the international level the Mediterranean Action Plan (MAP) and the Fisheries Management Plants (FAO/GFCM),
   - at the national level the plans established by the various countries.

6. The most serious threats to the turtles are those occuring:
   - on land, during the nesting period,
   - at sea, catches by fishermen.

   Both threats have to be counted in any plan for the conservation of marine turtles and appropriate protection measures proposed.

7. This Action Plan for the conservation of Mediterranean marine turtles outlines objectives, priorities, actions, coordinating structure, a time-table and financial provisions. The different components of the Action Plan are mutually reinforcing and must be taken together to have the best chance of success.

8. The objectives of this Action Plan are :

a. Protection, conservation and where possible enhancing of the population of marine turtles in the Mediterranean. Special priority should be accorded to Chelonia mydas wherever appropriate.

b. Protection and conservation of the marine turtles habitats including nesting, feeding, and wintering areas.

PRIORITIES

9. The general priorities are recommended:

- protection and management of nesting and wintering areas.
- banning of exploitation and minimization of accidental catches,
- investigation of new nesting areas,
- more knowledge on behaviour of the species.

10. The following priorities actions are specified:

a. for the protection and management of the species and their habitats:
- development and implementation of legislation,
- protection and enhancement of nesting areas,
- protection of over wintering areas,
- minimization of the impact of fishing on marine turtles.

b. for research:
- survey, concerning nesting beaches that are yet unknown,
- study of population dynamics and migration patterns in particular through co-ordinated tagging programmes, and monitoring of beaches
- reduction of impacts on marine turtles through accidental capture by fishermen and in particular by long-lining, as well as drift-nests and rawling;

c. for public awareness:
- the general public has to be addressed and in particular depending on specific conditions, the following target groups:
  - the local population and tourists in nesting areas
  - fishermen.

In order to satisfy the set of priorities:
- emphasis should be given to information media and in particula TV;
- production of Mediterranean information material is considered useful ;
- emphasis should be given to national information campaigns.

IMPLEMENTATION MEASURES

A. PROTECTION AND MANAGEMENT

11. With regard to management the following measures are recommended.

A.1. Legislation

12. The Contracting Parties that have not yet extended legal protection to the marine turtles should do so as soon as possible specially having regard to the relevant international conventions.

13. Each country should be encouraged to develop and implement the necessary legislation for the establishment and management of protected areas for marine turtles.

A.2. Protection and management of nesting areas

14. Public access, use of vehicles, use of artificial lights, noise, nautical activities, fisheries activities should be prohibited or at least restricted on and in front of nesting beaches during nesting season.

15. In the nesting areas of marine turtles, an information campaign for local authorities, local residents and tourists is urgent, in order to enlist their participation in the efforts for the conservation of marine turtles.

A.3. Banning of exploitation and/or minimizing accidental catches

16. So far as trade in carapace is concerned, instructions should be issued prohibiting the purchase and sale of carapace and giving effect to the relevant ratified international conventions.

17. Campaigns among fishermen should be carried out in order to urge them to release marine turtles caught accidentally, and to participate in the information network on turtles (report sightings of turtles, of tags, participation in the tagging campaign, etc...).

18. Campaign should be carried out for local population in order to ban the consumption and sale of all products derived from marine turtles.

19. Improved fishing trawl nests (TED System) allowing turtles to escape should be tried and used in the areas where the largest catches occur. For this purpose, in appropriated cases and at the request of the government of country concerned, aid donor agencies should consider the possibility of making grants to communities that depend on fishing for their livelihood in order to encourage them to try out fishing methods that would minimize accidental catches of marine turtles.

20. Effective measures need to be identified and applied urgently, in order to minimize the accidental catches by longlines fisheries.

A.4. Establishement of a Mediterranean Network of Marine and Coastal Protected Areas for Marine Turtles

21. All the countries that have nesting areas for marine turtles should make immediate efforts for the stringent protection of these sites.

22. An inventory of all the nesting areas all around the Mediterranean should be prepared urgently, for their inclusion in a network of protected areas for marine turtles. Such an inventory should include the known sites (protected or monitored) and the potential sites and should be regularly reviewed in the light of increased knowledge.

23. A network of marine and coastal protected areas throught out the Mediterranean should be created covering existing areas for reproduction, feeding, migration and wintering of marine turtles, in order to ensure the survival of the species.

A.5. Information and Training

24. A public awareness programmes for fishermen, local population and tourists should be developed to help reduce the mortality rates of marine turtles and to promote the reporting of any useful information concerning them.

25. Special documentary information material and activities should be developped for tourists and tourist industries near nesting areas for marine turtles.

26. A widespread campaign for the protection of Mediterranean marine turtles should be carried out in order to sensitize the public and encourage it to support conservation measures.

27. Training programmes should be developped for countries that have no experts with specialized knowledge of turtles, or for managers of specially protected areas including nesting beaches for turtles

B. RESEARCH

B.1 Scientific Research

28. The development of research and exchange of information should cover all the priority fields for the conservation of marine turtle population and in particular:
- survey for the nesting beaches
- population dynamics and migration
- tagging
- mortality due to fishing or pollution

29. For some countries, there is little or no information on nesting sites and size of population of marine turtles. These countries should be encouraged to undertake research programmes.

B.2 Data collection and dissemination

30. All Contracting Parties should encourage intensive programmes for gathering data concerning relevant aspects of the biology and ecology of marine turtles.

31. All the information on marine turtles should be studied and evaluated. National authorities are requested to submit an annual report to the Co-ordinating Organization, which will carry out the evaluation at the Mediterranean level. The information should be then disseminated appropriately.

C. COORDINATION STRUCTURE

32. It is necessary to co-ordinate the Mediterranean activities envisaged in the Actin Plan for Marine Turtles. It is considered that the Mediterranean Action Plan/Regional Activity Center for Specially Protected Areas is the most appropriate existing mechanism for this co-ordination - in co-operation with other bodies concerned.

33. The major function of the co-ordinating mechanism with regard to marine turtles would be to:
- collect and evaluate the data at the Mediterranean level,
- prepare inventories of existing and potential protected areas for marine turtles,
- contribute to the creation of a Mediterranean network of protected areas for marine turtles,
- prepare time-table of activities and financing proposals for the Contracting Parties Meetings.
- contribute to the dissemination and exchange of information,
- assist and/or organize expert meetings on specific topics regarding marine turtles, as well as training courses.

34. Complementary work carried out by other international bodies aiming at the same objectives should be encouraged, ensuring co-ordination and preventing possible overlapping.

35. The status of Mediterranean Marine Turtles and the content of this Action Plan for marine turtles should be reviewed whenever necessary.

ANNEX II

BIBLIOGRAPHY ON MEDITERRANEAN MARINE TURTLES

Prepared by Luc LAURENT and Alain JEUDY DE GRISSAC (November 1989)

Under the references, when possible, on the left is given the Mediterranean countries concerned (the three first letters of the country name ALB=Albania), and on the right, the main(s) subject(s) concerned (BIO for biology, POP for population, FIS for fisheries, BRE for breeding).

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