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**PRESENT STATUS AND TREND OF THE MEDITERRANEAN MONK SEAL
(*Monachus monachus*) POPULATIONS**

FOREWORD

The information contained in the present report has been compiled by the Parc National de Port Cros (France), and reviewed and edited in the present form by the Regional Activity Centre for Specially Protected Areas (UNEP/MAP), to serve as a working document at the Meeting of Experts for the Evaluation of the Implementation of the Action Plan for the Management of the Mediterranean Monk Seal (Rabat, Morocco, 6-9 October 1994).

The authors have largely based themselves on the work already carried out by Didier Marchessaux, published by the Council of Europe in 1989 as Nature and Environment Series under the title "The biology, status and conservation of the monk seal (*Monachus monachus*)". The relevant information has been updated in the light of available new data.

The present document is expected to be further updated on the basis of the information supplied by the participants to the above mentioned Expert meeting, and subsequently published as a section of a more comprehensive document on the Mediterranean monk seal currently being prepared by the Parc National de Port Cros and the Regional Activity Centre for Specially Protected Areas.

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

SPAIN

Legal protection

The monk seal is classified as a species threatened to extinction by the royal decree n° 459 of 20 March 1990, passed in pursuance of the law of 27 March 1989 on the protection of natural sites and wild fauna and flora; this classification implies the prohibition of killing, capturing, holding, transport, sell or disturb monk seals or disturb their breeding or resting sites.

The species is also protected under the legislation of some autonomous communities. In Andalusia, the decree n° 4/86 of 22 January 1986 protects all marine mammals and accordingly, the monk seal. In Catalonia, the law n° 3/1988 of 4 March 1988 on animal protection protects the monk seal.

Status of the species

Today, the monk seal has completely disappeared from the coasts of the Spanish mainland and from the Balearic islands (Fig. 1).

On the mainland coasts of Spain, the last known sites settled by seals were on the coasts of the provinces of Alicante and Murcia, where the species became extinct in the early 1950s (LOZANO-CABO, 1953; LOPEZ-JURADO, 1980). In the Cap Gata area, a small group appears to have survived until 1960-65, as evidenced by sightings reported in the area during this period (FUNDACION JOSE MARIA BLANC, 1986).

The last evidence of reproduction by monk seals on these coasts dates back to 1951, when a female and its pup were captured on a beach at Alicante (AVELLA, 1979).

Sightings of isolated specimens were reported during the 1970s (FUNDACION JOSE MARIA BLANC, 1986) and a young female was even killed in 1984 in the province of Almeria (AVELLA, 1986). It is likely that these more recent sightings concern errant seals that no doubt belonged to groups that had settled on the nearby coasts of North Africa. However, one cannot altogether exclude the hypothesis that a few indigenous specimens might have survived in the area as late the early 1960s.

In the Balearic islands, the monk seal survived somewhat later. The results of an investigation carried out by AVELLA (1979) show that during the first half of the 20th century, the monk seal survived somewhat later. The results of an investigation carried out by AVELLA (1979) show that during the first half of the 20th century, the monk seal frequented the coast of the northern islands of the archipelago (Minorca, Majorca and Cabrera) rather than the southern islands (Ibiza and Formentera). The species seems to have disappeared from the islands at the beginning of the 1960s. The last evidence of reproduction in the Balearics dates back to 1957-1958. Since 1965, there have been a few isolated sightings (AVELLA, 1986): one in Minorca in 1973, 6 in Majorca, the two most recent being in 1971 and 1975, and finally one last sighting at Cabrera in

1977. The possibility of setting up a national park at Cabrera has been discussed, since the coastal biotope of the island corresponds perfectly to the monk seal's traditional habitat (AVELLA, 1984).

A specimen is thought to still frequent the Chafarinas islands, off the coast of Morocco, which is a military zone where all hunting is forbidden (JUANA et al., 1981).

Causes of extinction

Killing by fishermen and mortality resulting from accidental capture by fishing equipment are the causes of the extinction of the species in Spain. In addition, tourism and industrial development have irreversibly altered the seal's potential habitat along virtually the whole of the continental coast of Spain (MARCHESSAUX, 1988a).

FRANCE

Legal protection

The species is covered by the decree of February 28, 1991, which established the list of protected seal species. This decree forbids the killing, mutilation, capture, removal, stuffing, transportation, utilisation, offer for sale, sale or purchase of listed animals, whether alive or dead.

Status of the species

Today, the monk seal has disappeared from the continental coasts of France and Corsica (cf: Fig. 1). The little historical data that are available (DUGUY et CHEYLAN, 1980) shows that the species frequented the whole of the continental coast of France until at least the 1850s. The first reference to the monk seal is to a specimen captured on a beach at Sete in May 1383 (BEC, 1977). The extinction of the species on the French coasts has been gradual: it had disappeared from the sandy coasts (especially those of Languedoc Roussillon) by about 1850 and from then on was only found on rocky coasts. As early as the first half of the 19th century, *Monachus monachus* was already considered as a rare species in the Nice region (VERNY, 1862), in Languedoc (CRESPON, 1844) and on the coast of the Pyrenees Orientales (COMPANYO, 1841). By the Second World War, the species had only survived in two areas: the islands of Hyeres (Var) and the calanques of Cassis (Bouches du Rhone). The last surviving specimens were sighted there at the very beginning of the 1950s.

In Corsica, the disappearance of the monk seal has been more recent, and the last indigenous specimens were killed in 1976. The last groups had settled on the west coast in the regions of Ile Rousse, Calvi, Scandola and Propriano. Subsequently, three reliable sightings have been reported, in 1979, 1980 and 1982 on the west coast of Cap Corse and the north of Cargese (CHEYLAN, 1987). These sightings were of errant seals of indeterminate origin.

Causes of extinction

Killing by fishermen and mortality resulting from accidental capture by fishing equipment are the causes of the extinction of the species in France. In addition, as in Spain, tourism and industrial development has irreversibly altered the seal's potential habitat along the whole of the continental coastline (MARCHESSAUX, 1988a).

ITALY

Legal protection

The species is protected since 1939 (article 38 of the hunting code). In addition, since August 1987, a decree from the Ministry of the Environment has banned navigation and fishing in most of the Gulf of Orosei where sightings of monk seals had been reported (NOTARBARTOLO DI SCIARA, written communication, 1987). Finally, the monk seal is on the list of specially protected species of 11 February 1992.

Status of the species

The species has become extinct on the continental coast of Italy, apparently since the Second World War.

The monk seal used to be present in the Tuscan archipelago (Fig. 2). The islands of Montecristo and Giglio are the only sites where sightings have been reported after 1980 (NOTARBARTOLO DI SCIARA, 1986).

In Sicily, *Monachus monachus* occurred until 1972 in the Mazzara region, in the south-west of the island (MASSA, 1972). The monk seal also survived in the Egadi islands until 1975, when the last two specimens were killed at Marettimo (BOITANI, 1979). One sighting was reported at Lampedusa, in the autumn of 1980 (G. NICOLINI, Pers. Comm.). This probably involved specimens in transit from neighbouring populations, as there have been no seal colonies on this island since the end of the last century (MINA-PALUMBO, 1868).

The monk seal seems to have disappeared also in Sardinia (Ardizzone, et al., 1992). Actually, the species had been considered as in the process of extinction on the Sardinian coast as early as 1935 (Del LUNGO, 1935). The Gulf of Orosei, where several caves have been used by monk seals since 1960, has been considered as sheltering the last surviving nucleus of the Sardinian population (TAGLIAFICO, 1966; REINHARDT and SCHENK, 1969; Anon., 1972:173; RONALD and HEALEY, 1974; BAREHAM and FURREDU, 1975; BOITANI, 1979). A spectacular regression and the desertion of the main caves occurred between 1975 and 1980, to the point where the extinction of the population was feared in the early 1980s (Anon., 1984). Sightings of one pup and some adults over the last few years could induce to think that the species is still surviving and reproducing on the north-western coast of the island (PANI, Pers. Comm., 1994).

Causes of extinction

The major regression factors have been killing by fishermen and accidental capture in fishing equipment. Three of the five specimens found dead in Sardinia between 1984 and 1987 were killed by fishing equipment, the last two having probably been killed deliberately.

Tourism pressure, which has resulted in excessive seasonal frequentation of the caves habitually used by monk seals, is and additional factor, since it has lead to their last caves being deserted by the seals (Anon., 1984).

MALTA

Legal protection

The monk seal is included in the list of protected species under the regulation relating to the protection of marine mammals of 1992, which prohibits their killing, capture, pursuit, holding, selling, importation and exportation.

Status of the species

Occasional sightings of seals have been reported, the last dating from June 1974 (Anon., 1977). This was no doubt an animal in transit in the vicinity of the island (cf: Fig. 2), since the species has never been common in this area (IUCN, 1987).

TUNISIA

Legal protection

The monk seal is protected under the legislation on hunting by the annual decrees relevant to the opening and the closure of the hunting season. Hunting, killing, capture, sale, purchase, holding and exportation of seals are prohibited by these decrees.

Status of the species

In 1836, the monk seal was reported to be abundant on the Tunisian coast by De La MARMORA, but since 1979, it has survived only in the archipelago of La Galite (KTARICHAKROUN, 1979) (cf: Fig. 2). Studies carried out in this archipelago in the 1970s showed that a small though relatively constant population of seals was living in fairly satisfactory conditions on Galiton de l'Ouest, despite frequent disturbances during the summer season (MERULO, 1974; GAULTIER, 1978; ROSSER et al., 1978; MILES, 1979). This population has declined over the past ten years: whereas 8 specimens were sighted in 1978, the numbers had shrunk to 3 by 1986 (MARCHESSAUX, 1987b, 1988b).

The last reports of the species on the mainland coast of Tunisia (Cap Bon and Cap Blanc areas) date from 1975 (BOULVA, 1975; FURREDDU, 1975).

In the Zembra archipelago (BOUDOURESQUE et al., 1986), on the other hand, the monk seal survived up until 1977. The range of this population, based on Zembra, stretched as far south as Sousse and as far north as Bizerta or beyond. Estimated in 1976 at 3 or 4 specimens (KTARI-CHAKROU', 1979), this population subsequently disappeared. The isolated sighting reported in June 1986 (AVELLA, Pers. Comm.) is the first mention of the species at this site for almost 10 years. It is, besides, highly likely that this sighting was in fact of an errant specimen.

In 1986, a foetus 50 cm long was found near Hergla (BEN MAIZ, Pers. Comm.).

Causes of regression

Killing by fishermen and accidental capture are the causes of the extinction of the small population at Zembra.

With regard to the La Galite archipelago population, the activities of underwater spear fishermen and capture by foreigners are no doubt responsible for its decline. At least two adults were killed in this way, in September 1983, in a cave on Galiton de l'Ouest, by Europeans in an attempt to capture two pups, despite the fact that Galiton de l'Ouest had been declared a total Reserve (ministerial edict of 4 July 1980). Similarly, the illegal placing of bottom lines and underwater fishing by scuba divers have been reported in the waters of the Reserve (MARCHESSAUX, 1987b, 1988b).

Local fishermen who were questioned about the presence of monk seals showed no animosity towards the animal. This is due to the fact that the fishermen from Bizerta and Tabarka who fish in this area are almost exclusively involved in lobster fishing, and cases of monk seals “stealing” from lobster pots are very rare. They are therefore not in competition with the seals.

In the absence of accurate information, it is difficult to assess the impact of the uncontrolled frequentation of the islands by leisure craft during the summer season. It is certain that this has resulted in serious disturbance in the seals' breeding and resting caves, and that this has contributed to the decline of the local monk seal population.

ALGERIA

Legal protection

The monk seal is protected under the decree of 20 August 1983 relevant to protected nondomestic animal species passed in pursuance of the law of 5 February 1983 on the protection of the environment. Under this law the killing, mutilation, removal, transport, sale and purchase of protected animals are prohibited.

Status of the species

In the 1960s, the monk seal was found along the whole of the Algerian coast (BOUGAZELLI, 1979). Today, it is mainly found on the west coast of Algeria between Mostaganem and Beni Saf (Fig. 3). The species probably still survives on the east coast (in the Constantine region), but the population is most likely very small (IUCN, 1987).

It is difficult to assess the current situation of the monk seal on the east coast of Algeria because of the serious lack of data. The last sightings were in the region of El Kala en 1974 (MARCHESSAUX, 1987b). It is possible that a few specimens persist in this area near the Tunisian border. Some reports suggest that there have been occasional sightings here (AVELLA, Pers. Comm.). If the persistence of these seals is confirmed, it might be supposed that the specimens sighted are those that frequent the La Galite archipelago in Tunisia, given the proximity of these islands.

On the west coast (the Oran region), the monk seal population is split up into small groups or solitary specimens (MARCHESSAUX, 1988b). The population has been estimated at twenty or so specimens, scattered among a dozen different sites (BOUTIBA et al., 1987). The number of seals in this population has already decreased significantly since 1960 (BOULVA, 1979), and this decline is continuing.

The decrease in the number of specimens is on average 11 % per year, which is in agreement with findings from studies carried out in Greece (MARCHESSAUX, 1983).

In addition, BOUDOURESQUE and LEFEVRE (1988) have reported that the dispersal of the surviving seals is very marked in this area, and that in contrast to what was noted by SOUABRIA (1987) and BOUTIBA et al. (1987), no seal pup has been sighted since 1988. This latter author records today only eight specimens.

Causes of decline

The killing of seals in the past is probably responsible for the decline of the species (BAHRI, 1974; JAQUIN, 1974). It should be pointed out, however, that as in Tunisia, the local fishermen show no hostility towards the seals. They rather appear to show respect for them, which is also confirmed by the literature (CHEBAB and BOUABDELLI, 1987; AVELLA, 1987). It would appear, then, that the major regression factor at present is the impoverishment of the marine

environment, to the point that the seals seem to experience real difficulty in feeding themselves (BOUDOURESQUE et LEFEVRE, 1988). The shortage of food supplies results from overfishing over the last decade. At the same time, tourism and industrial development projects, such as the provision of accommodation for 3000 tourists in the El Kala National Park (IUCN, 1987), will have the effect of definitively reducing the potential habitat of the species in this region.

MOROCCO

Legal protection

The monk seal is protected under the legislation on hunting, in particular by the annual decrees. Recently a Decree of the Ministry of Maritime Fishing and Merchant Marine of 26 October 1993 prohibits the fishing of monk seals and other marine species within twelve miles off the "Côte des Phoques".

Status of the species

One population of monk seals survives on the Mediterranean coast of Morocco (cf: Fig. 3) between Al Hoceima and the Cap des Trois Fourches (AVELLA et GONZALES, 1984a; BAYED et BEAUBRUN, 1987). It is difficult to estimate the exact size of the population, but it would appear from the available data that it probably does not exceed twenty or so specimens.

The occurrence of monk seals has been reported periodically over the past five years along the coast between Torres de Alcala in the west and Al Hoceima in the east (BETURESETAME, 1985).

Causes of decline

Deliberate killing and accidental capture by fishing gears are the main causes of the decline of this monk seal population. Since 1970, the bodies of 16 dead monk seals have been found, some of them killed by explosives, some by spearfishermen and others as a result of drowning accidentally in fishing nets or injuries from the propellers of boats (BAYED and BEAUBRUN, 1987).

THE COUNTRIES OF FORMER YUGOSLAVIA

Legal protection

The species is protected in Croatia by regulations imposed on the basis of the law of 1976 concerning the protection of the environment. The monk seal is on the list established by regulations instituted in 1985, that provides for the payment of damages in the case of illegal killing of a listed animal. The damages for the killing of a monk seal are particularly high.

Status of the species

The seal survives in the Dalmatian Archipelago (cf: Fig. 3), where it frequents the southernmost islands such as Hvar, Korcula, Susac, Vis, Bisevo, Lastovo and Mljet. Sightings have occasionally been reported along the coast of the Mljet National Park, but it is not known whether the seal occurs there on a regular basis (IUCN, 1987). The population that frequents these islands has been estimated at about twenty specimens (GAMULINBRIDA, 1979; GOMERIC et al., 1984; IUCN, 1987; JARDAS et DRAGANOVIC, 1987).

Over the last years, increasingly frequent sightings have suggested that a small group of 5 or 6 specimens has survived further north, on the coast of the island of Pag (GOMERIC et al., 1984; IUCN, 1987).

Causes of regression

The main regression factor is destruction caused by fishermen (fishing by dynamite and reduction of fish stocks by overfishing), despite the decrees and other protection measures in force. The development of tourism in the Dalmatian archipelago has considerably reduced the habitat favourable for the species (IUCN, 1987).

ALBANIA

Legal protection

The species is protected under the legislation on hunting.

Status of the species

The Albanian coast (Fig. 4) does not appear to be frequented by *Monachus monachus*. Nevertheless, there have been unconfirmed reports of the possible occurrence of seals in the region of Sazan. This area, that is virtually undeveloped in terms of tourism, might serve as a kind of bridge between the countries of the former Yugoslavia federation and the Ionian Sea (IUCN, 1987).

GREECE

Legal protection

The capture and killing of seals are forbidden under the Decree n° 67 of 29 November 1980.

Status of the species

Greece is, with Turkey, the country that at present shelters most of the monk seal populations in the Mediterranean (MARCHESSAUX, 1977; SERGEANT et al., 1979; RONALD and YEROULANOS, 1984). The range of distribution of the monk seal includes virtually the whole of the Greek coast (Fig. 5); according to Prof. Scoullos seals can be found everywhere with the exception of the Gulf of Corinth.

The species mainly frequents the archipelagos of the Dodecanese, the Cyclades, the Northern Sporades and the Ionian islands. The populations are highly scattered along the coasts of these archipelagos. The total seal population on the Greek coasts was estimated to 180 specimens in April 1994, in the occasion of the P.H.V.A. meeting in Athens.

Most of the seals are to be found in the Aegean, but the most stable populations are located in the Northern Sporades, the Ionian islands and around the island of Kastellorizon (VERRIPOULOS and KIORTSIS, 1985).

In the Northern Sporades, there is a population of some forty monk seals (KUMERLOEVE, 1982), including about twenty in the National Park, which is a protected area that includes the islands of Youra, Skantzoura, Psathoura, Kyra-Panaghia and Piperi (MATSAKIS et al., 1985; PANOU and RIES, 1985; ECONOMOU, 1986).

HARWOOD (1987) reported a group of a dozen specimens that appeared to frequent several caves on the north coast of Cephalonia, in the Straits of Ithaca.

Nonetheless, the general pattern of decline of populations of *Monachus monachus* that is apparent in the Mediterranean as a whole has not spared the Greek populations (MARCHESSAUX, 1983). The colony on the island of Kos, estimated at 20 specimens in 1971-72 (SERGEANT et al., 1978) only numbered 3 seals in 1977 (BOULVA, 1979). A study carried out in the Gulf of Corinth (MARCHESSAUX, 1979) showed a similar drop in numbers: 20 monk seals in 1975, and only 5 in 1978. In the Ionian islands, 30 to 40 seals were reported in 1977 (MARCHESSAUX and DUGUY, 1979) whereas in 1987, there were only 13 to 20 (PANOU, 1987).

Causes of regression

The major regression factor is killing by fishermen, since monk seals cause considerable damage to fishermen' nets and bottom lines (PANOU, 1987).

Other factors, including tourism development (hotel construction project in the Straits of Ithaca in immediate proximity to certain caves frequented by seals), overfishing in certain regions and accidental capture of seals in fishing nets, are also responsible for the decline of the species.

TURKEY

Legal protection

The monk seal is protected since 1977. It is included in the list of species fully protected under the annual decrees on hunting. Hunting, trading and exportation of the species are forbidden. The monk seal is also included as protected species in the annual decrees on fishing.

Status of the species

The range of the monk seal, that used to include the whole of the Turkish coastline (Fig. 6), is now limited to the Aegean coast, in the West, and the Mediterranean coast in the South. The species is on the verge of extinction in the Black Sea and the Sea of Marmara. (MURSALOGLU, 1986; MARCHESSAUX, 1987a).

The Aegean coast population is split up into small groups that frequent different stretches of coast. According to MURSALOGLU (1986), the most stable group of seals is the one that has settled on the stretch of coast between Alacati et Seferihisar. The shoreline of the Dilek Peninsula National Park is said by the Park wardens to be still frequented by two seals (MARCHESSAUX, 1987a).

On the southern Mediterranean coast, the only area that is frequented at present is Gazipasa. A group of at the most ten specimens use three caves in the vicinity.

Monachus monachus appears to have disappeared altogether from the Sea of Marmara and its survival in the Black Sea is far from certain. Nevertheless, sightings have been reported in the Bosphorus (N.YAZGAN, Pers. Comm., 1987) and according to GURPINAR (Per. Comm. 1986), a small group persists on the stretch of coast between Zonguldak et Sinop.

In 1978, the Turkish seal population was estimated at 150 – 300 specimens (BERKES et al. 1979). In 1984, BERKES noted that this was certainly an overestimate (in RONALD and DUGUY, 1984). Other studies have shown that the monk seal population around the Turkish coast numbers between 50 and 100 specimens, the real figure being no doubt closer to 50 than 100 (MARCHESSAUX, 1987a). It should be pointed out that this population is at least in part that same as that which frequents the neighboring Greek islands of the Dodecanese.

Causes of regression

The main regression factor is killing by fishermen, most of whom still consider the seal as a pest that should be exterminated (MARCHESSAUX, 1987a).

The deterioration of the habitat resulting from industrial and tourism development has appreciably reduced the biotope favourable to the species. Similarly, overfishing has resulted in a marked decline in fish stocks.

CYPRUS

Legal protection

The monk seal is protected under the regulation of application of 1952 (amended to this aim in 1971) of the law on fishing, which prohibits the killing, capture, detention or sale of animals belonging to this species.

Status of the species

The monk seal is considered as extinct (IUCN, 1987). A small group survived up until 1975 on the coast of the Akamas peninsula (Fig. 7). In 1986, 2 seals were sighted on the north coast of this peninsula, and 2 other sightings were reported near Paphos in 1987 (HADJICHRISTOPHOROU, in lit. 05/09/1988). Episodical sightings have been reported for the last three years (Mr A. DEMETROPOULOS, personal communication).

It is thus possible that a small group of seals may still survive.

Causes of extinction

The killing of seals by fishermen is largely responsible for the disappearance of the species in Cyprus.

Tourism development, that has resulted in the partial disappearance of the most favourable biotopes, and overfishing are the causes of the deterioration of the monk seal's habitat along most of the coastline of the island.

SYRIA

Legal protection

No information

Status of the species

The last monk seal captured on the Syrian coast was caught in fishing nets at Jebleh in 1973 (cf: Fig. 7). The specimen was stuffed and is still visible in that locality (JEUDY DE GRISSAC, Pers. Comm., 1988).

LEBANON

Legal Protection

No information

Status of the species

The species is considered as being probably extinct in the Lebanon.

The monk seal had survived at least until 1975 in the Beirut region (ICUMERLOEVE, 1976). Up until 1970, monk seals were frequently sighted in an area known locally as Pigeon Cave. Monk seals are still reported to the south of Beirut, but only from January to March (IUCN, 1987).

Sightings were also reported until 1970 in the Tripoli area in north Lebanon (Fig. 13). The monk seal has in the past been known to frequent the Iles des Lapins Park, off Al Mina in the Tripoli region, but today it is doubtful whether the seal still occurs there.

Causes of regression

Cases of accidental capture were reported during the 1960s (KUMERLOEVE, 1966).

Disturbance resulting from the presence of a major conurbation in the immediate vicinity of the sites frequented by the seals, as well as the pollution of the sea near Beirut resulting from urban and industrial wastes have no doubt contributed to the decline of the local population.

ISRAEL

Legal protection

The species is protected under the law on the protection of wild fauna of 1955. Hunting, trading, importation, exportation and detention are forbidden without a permission from the Ministry of Agriculture.

The monk seal is also protected since 1963 as “natural asset” by the law on national parks and reserves. This law is now replaced by the law of 1992 on parks, reserves and sites which provides for the same provisions of the- previous text concerning the “natural assets”. It is forbidden to destroy, damage, collect, disturb, buy, sell, import and export any specimen of the species so classified.

Status of the species

The species is today extinct on the Israeli coast (cf: Fig. 7).

The monk seal was regularly sighted on the north coast of Israel up until 1941 (BERTRAM, 1943). The last evidence of reproduction dates back to the late 1920s, to the south of Haifa.

One sighting of a monk seal was made in 1959 (IUCN, 1987). The last known sighting was in 1986 at Rosh Hanikra, a region of chalky hills and caves near the Lebanese border (ROTENBERG, in litt. to JEUDY DE GRISSAC).

Causes of decline

Deliberate killing of seals is probably the main cause of their disappearance. It is worth noting that the coastline consists mainly of beaches, except for a short stretch near the Lebanese border, where there are some caves. The absence of refuges might be an additional explanation for the species' early disappearance.

EGYPT

Legal protection

No information

Status of the species

The monk seal seems to be extinct on the Egyptian coast (Fig. 8). The species was already rare in the 1920s (FLOWER, 1932).

In 1941, a single specimen was sighted at El Arish, to the east of the Suez Canal. In 1981, a reliable sighting of a seal was reported at El Dabaa, to the west of Alexandria (BOUDOURESQUE, Pers.Comm.).

LIBYA

Legal protection

No information

Status of the species

The monk seal is reported to frequent the Cyrenaican coast in the region of Tulmaythah and the coast between Bunbah and Marsa Sahel (NORRIS, 1972), but the size of the local seal population is unknown. Between 1971 and 1976, it was estimated at 20 specimens (SERGEANT et al., 1979). It is probable that this population still persists, since the Cyrenaican coast is relatively undeveloped and sparsely populated (Fig. 8). The local human population is more involved in farming than fishing.

Finally, seals have been reported on the shores of the Kouf National Park, situated 35 kilometres to the west of Tulmaythah.

Causes of decline

Cases of accidental killing of seals have been reported over the past twenty years as the result of the massive use of dynamite for fishing. On the other hand, no persecution of the species by man has been reported in Libya; the local fishermen have a superstitious respect for the seal. In addition, most of the local population is not involved in fishing, and is not therefore in competition with the monk seal (IUCN, 1987).

ATLANTIC

The range of the species in the Atlantic in recent times corresponds to the north-west coast of Africa between the Straits of Gibraltar and the Cap Blanc peninsula on the 20th parallel, and the archipelagos situated off this coast – the Canaries and Madeira.

There is no formal proof of the occurrence of the species in the Azores in the past, although there has been speculation as to the possibility of these islands having been settled by *Monachus monachus* (RONALD and HEALEY, 1974). The range of the species in the Atlantic corresponds to the region that is subject to certain specific hydrological conditions (Moroccan and Mauritanian upwelling).

The data available today shows that the species did not settle on the Atlantic coasts of Europe (Portugal, Spain, France). There have, however, been three reports of isolated specimens along the French coast: 1 specimen captured in the Gironde estuary in March 1817 (BURGUET, 1843), 1 specimen captured at Cormier in the Loire Atlantique in August 1927 (BAUDOIN-BODIN, 1964) and 1 specimen captured in a trawl net off La Rochelle in June 1950 (POSTEL, 1950).

SPAIN – CANARY ISLANDS

Historical records attest to the abundance of the monk seal in these islands in the 14th, 15th and 16th centuries (MONOD, 1932, 1948; HERNANDEZ, 1986). This abundance was apparently short-lived, because of the slaughter inflicted by Europeans following their arrival on the islands (Fig. 9). The monk seal has probably disappeared from the Canary Islands at the beginning of the 20th century (GARCIA, 1971). The species probably survived here until 1920. BOETTGER (1951) reported a series of sightings of seals during his visit to the archipelago in 1913. This author also reported that the species was already rare at that time. In 1973, DUGUY (1976) recorder a sighting of a seal following a fishing boat. A few isolated specimens were sighted in 1975, 1978 and 1983 (HERNANDEZ, 1986; LOPEZ, 1991; Pers. Comm., 1992). It is altogether likely that these errant specimens came from the Saharan coast population, that is located not far away.

PORTUGAL

Legal protection

Protection for the monk seal has been in force since 1981 (decree of law n° 263/81 of 03/09/1981). This was reinforced on April 16, 1986 by further legislation (decree n° 6/86) to protect all marine mammals within 200 nautical miles of the coast of Madeira and in the coastal waters of the Portuguese mainland (BISCOITO, Pers. Comm., 1988).

Status of the species

The monk seal was abundant at Madeira and on the neighbouring islands of the Desertas (Fig. 9) at the time of the European colonisation (REINER, 1985). There is a site on the south coast of Madeira which was called “Camera de Lobos” by sailors in the 15th century because of the abundance of monk seals that were found there (MONOD, 1948). The occurrence of the species is referred to in a few documents published in the 19th century (GRAY, 1854) and the first half of the 20th century (Anon., 1926; CADOGAN, 1945). As in the Canaries, the monk seal population was drastically reduced over the space of a few decades by the wholesale slaughter that was carried out.

The seal is still to be found in the Madeira archipelago on the Desertas islands (MELO MACHADO, 1978; REINER, 1981; REINER and DOS SANTOS, 1984). A small group of 10 to 12 specimens has survived on the islands of Chao, Deserta Grande and Bugio, which are uninhabited volcanic islands situated to the south-east of Madeira between 32° 24' and 32° 35' north and 16° 28' 16" 33' west. The Desertas islands have thus become the last refuge of *Monachus monachus*. Proposals were made for the setting up of a reserve (BISCOITO, 1984; REINER et DOS SANTOS, 1984), and this reserve is in fact operational (COSTA NEVES, Pers. Comm., 1994).

Some sightings of monk seals around the island of Madeira have been recorded, but it is difficult to tell if these are the same seals as those sighted at the Desertas islands or different specimens.

Causes of decline

The monk seal has been widely hunted by fishermen over the past thirty or forty years.

Overfishing around the Desertas islands has also had an impact on the monk seal population.

MOROCCO

Status of the species

From Tangier to Cap Tarfaya

The monk seal has today disappeared from the Atlantic coast of Morocco between Tangier and Cap Tarfaya (Fig. 10).

The data concerning the seal's range and abundance in the past is very fragmentary, and insufficient to provide a clear picture of the decline of the species along this coast. DIEUZEIDE (1927) reported that four seals had been killed on a beach near Agadir in about 1840- 1850.

The disappearance of the species along this coast can be attributed to the nature of the habitat, 80% of which consists of sandy beaches. The absence of refuges that are difficult of access for man certainly contributed to the seals' early extermination in the region. It can be taken as certain that the species had become extinct by the **beginning** of the 20th century at the latest.

A few sightings have been reported since then, but these probably concern errant specimens from populations on the Western Saharan (in the case of those sighted in the south) or the Mediterranean (for those sighted further north) coasts.

South of Cap Tarfaya

The 1000 Km of the Saharan coast between Cap Tarfaya (28° N) and the northern limit of the cliffs of Guerguerat (21° 15'N) – that is, the part of the Western Sahara known as Rio de Oro (Fig. 10) – have always been a region of thinly populated desert, even at the time of the Spanish colonisation. Thus, virtually nothing was known of the distribution and status of *Monachus monachus* along this coastline until the withdrawal of the Spanish in December 1975. The political conflict that ensued made any research or field surveys along this stretch of coast impossible until December 1987. For reasons of safety, it is still difficult, despite the cessation of hostilities, to carry out detailed surveys on land along the southern part of the coast of the former Spanish Sahara, that is, between Cap Barbas and Guerguerat. Nevertheless, two recent studies have provided data on the situation to the north of Dakhla (BIANCONI, 1988), and subsequently to the south of Dakhla (MARCHESSAUX and AOUAB, 1988).

According to palaeoecological studies, the monk seal probably occurred in this region in the Neolithic age (DELIBRIAS et al., 1976; ORTLIEB and PETIT-MAIRE, 1976; PETIT-MAIRE, 1979a, 1979b; ROSSO AND PETIT-MAIRE, 1979; PETIT-MAIRE, 1980)

Some of the bones of *Monachus monachus* that have been found had been burnt at the time (PETIT-MAIRE, 1979b), which provides clear evidence that the species was consumed by Neolithic coast-dwellers. Analysis of remains of the fauna associated with excavation sites has shown in addition that the monk seal did not occur south of 21° N (ORTLIEB et

PETIT-MAIRE, 1979b), that is, south of Cap Blanc. This suggests that the range of the species did not extend further south than Cap Blanc during the Holocene period.

The southern limit of the range of the monk seal on the north-west coast of Africa has thus remained unchanged for the past 6 000 years.

In the 15th century, the largest concentration of monk seals ever known seems to have frequented the Western Saharan coast. The species was certainly abundant along part of the Saharan coast at least until the 15th century. Accounts left by the first Portuguese explorers to arrive on these coasts attest that the seals were sufficiently abundant to justify organising hunting expeditions in what is now known as the Bay of Dakhla, between 1436 and 1441 (MONOD, et al., 1959). The size of the monk seal population along this coast at that time can be gauged by the fact that the Portuguese ships returned loaded with seal skins and barrels of seal oil.

From the 16th century until the beginning of the 20th century, there is no further mention of the species in the numerous accounts of voyages undertaken to the Saharan coast. The presence of monk seals here was rediscovered by MONOD (1923) and GRUVEL (1924). Some additional information was provided by MORALES-AGACINO (1945) and VALVERDE (1957). These authors report that the monk seal was sighted in the 1940s and the early 1950s in the region of Cap Bojador, near Dakhla Bay and along the coast between Cap Barbas and Puerto Nuevo. These records, based on sporadic sightings by various seafarers, are insufficient to provide a clear picture of the distribution and status of the seal population up to the late 1950s.

The monk seal survived on the stretches of coast where there are cliffs and caves, notably on the Aguerguer coast. This habitat is virtually inaccessible to man, which explains why these inhospitable coasts, which are particularly hazardous for navigation by sailing boats, and where landing is impossible, have remained unexplored.

The rather meagre historical records suggest that the monk seal probably frequented most of the Saharan coast until the 15th century. The monk seal population was considerable at the time, to judge from the testimony of the earliest explorers. The massacre of seals perpetrated by the first European visitors was to result in the extermination of species on the beaches, which were the open habitat it then occupied. The seal's disappearance from the beaches appears to have occurred from the end of the 15th century on. The monk seal continued to survive in caves, mainly on the Aguerguer coast. The inhospitality and difficulty of access of this coastline probably explains why there is no mention of the seal in contemporary accounts.

The range of the monk seal on the Saharan coast has therefore shrunk since the Neolithic period.

The present distribution and status of the species along the 1 000 km of the Western Saharan coast is still poorly known, and it has not been possible so far to carry out an overall survey. The occasional observations carried out on the Saharan coast between Cape Tarfaya (28 N) and Dakhla (24 N) over the past twenty years raise doubts about the persistence of the seal colonies in this region.

A detailed survey along the coast between Cap Bojador and Dakhla (Fig. 11) has shown that there are no permanent monk seal colonies along this stretch of coast. The absence of caves, and thus of sheltered places of refuge, probably partly explains the disappearance of the species on this part of the coast. The occasional sightings of isolated specimens that are reported from time to time no doubt concern seals from the Aguerguer population.

A detailed survey of the coast between Dakhla the cliffs of Guerguerat (cf: Fig. 10), and data collected from fishermen and military personnel, show that the species no longer settles on the coast between the Dakhla peninsula and Cap Barbas. In addition, aerial reconnaissance has shown that there are no caves along this stretch of coast. The area is much frequented by local fishermen, who have established permanent camps at various sites here.

The Cap Blanc Peninsula: the Seal Coast

The main monk seal population on the Atlantic coast of the Sahara is to be found in the caves of the Seal Coast (Cote des phoques), to the north of the place known as the “Sugar Boat” (sucre”) (Fig. 12). This colony has been frequently observed since 1922, especially the famous Seal Cave (Grotte des phoques) which housed part of the colony.

The **Seal Cave, also known** as “Las Cuevecillas” (Fig. 13), was first mentioned by MONOD (1923), who had the opportunity to visit it in July 1923 during his first stay at Nouadhibou (ex Port-Etienne). But he did not see any seals inside the cave. The frequentation of the cave by seals was known to the local population, who often served as guides to Monod. The first naturalist to observe the seals, packed against each other on the beach at the end of the cave, was MORALES-AGACINO (1950) in December 1945. Subsequently, the monk seal population of the Cap Blanc peninsula was associated almost exclusively with the famous cave, to which all the naturalists visiting or staying at Nouadhibou made the pilgrimage (BERGES, 1949; COUSTEAU and DUMAS, 1950; POSTEL, 1950; VALVERDE, 1957; Van WIJNGAARDEN, 1969; BOULVA, 1975 ; DUGUY, 1976; MAIGRET et al., 1976; TROTIGNON, 1979, 1982). We therefore possess a wealth of data on the frequentation of the cave by monk seals. This frequentation came to an end in 1978 with the collapse of the roof of the cave, which resulted in its being abandoned. In contrast, there is very little data on the frequentation more closely at the data in the literature on the frequentation of other caves by *Monachus monachus*.

The first surveys to identify other caves occupied by seals were carried out between 1946 and 1949 (BERGES, 1949; POSTEL, 1950; CAUSSE in TROTIGNON, 1979a). The results of these surveys, as reported by their authors, are worth examining, since they contribute to a better understanding of the distribution of the species. The article by BERGES (1949) has, besides, apparently been ignored in the scientific literature on the subject.

The surveys undertaken in 1946 by CAUSSE led to the discovery of a second cave used by seals, to the north of the Las Cuevecillas cave. The new cave has no entrance above the water line, and has at the centre of the chamber a circular rock platform emerging from an inner basin. The only dry opening to the cave is a small aperture situated about two metres from the top of

the cliff. This cave was used for breeding, as is evidenced by the sightings of very young pups reported by CAUSSE.

The second author to locate a new cave occupied by monk seals was BERGES (1949), who wrote: "There are seals along a stretch of coast of more than one kilometre. A hundred or so seals are to be observed among the various creeks and inlets, although two caves are particularly -favoured. We have seen the cave they use for resting (the Las Cuevecillas cave). One kilometre further north, through a mysterious tunnel ..., there is the maternity cave. Here, the females give birth to their pups on a protected rock, out of reach of the high tide, and we had the joyous experience of seeing twenty or so seal pups lying in a heap there ...". This cave, referred to as the "Maternity cave", was mentioned again by POSTEL (1950), who refers in his article to BERGES, who served as his guide during his stay at Nouadhibou. POSTEL provides some further information on this cave (page 341): "The second (the "maternity cave"), separated from the sea by a threshold, possesses a large bowl-shaped basin into which a slightly inclined rock ledge slopes down... It is on this ledge that the females generally rest, accompanied by their pups". He also points out, like BERGES, that "the two caves are a kilometre apart".

The frequentation by the monk seal of several caves along this coast is therefore a reality, which has sometimes been overlooked by naturalists because their attention was exclusively focused on the Las Cuevecillas site. This cave had the further advantage that it was sufficiently open to afford a good view of the seal colony that frequented it to observers at the top of the cliff.

The monk seal population of the whole Cap Blanc Peninsula has been estimated to 100150 specimens in 1985 (MARCHESSAUX, 1988a): a non-reproducing group of a dozen seals at the edge of Cap Blanc and the reproducing population in the caves of the Seal Coast. The most recent sightings (EL AMRANI, 1991; SAN MARTIN, unpubl. data, 1994) seem to indicate that the population remained steady.

Causes of regression

This population is relatively stable. A potential regression factor is accidental capture in the trawl nets of the fishing fleet. This is sometimes fatal for the seals, but it is difficult to assess the real impact of this mortality on the local monk seal population. Since the end of the hostilities, fishermen reaching the area on foot also represent an important threat to the survival of the colony.

The major potential regression factor is overfishing in the waters of the Saharan coast over the past twenty years, which is likely to affect the local monk seal population, as well as the sea bird populations, in the very near future. Measures to restrict industrial fishing in the area would appear to be required if the destruction of the coastal ecosystem is to be avoided.

MAURITANIA

Legal protection

Protective measures have been in force since April 2, 1986. The subsidiary reserve at Cap Blanc (cf: Fig. 12) was specially set up for the conservation of the monk seal (MARCHESSAUX, 1986).

Status of the species

Cap Blanc marks the southern limit of the range of the species. The group of seals frequenting the edge of Cap Blanc occupy a short stretch of coast 300 to 400 metres long, directly below the cross that marks the cape. This stretch of coast consists of a cliff, with piles of boulders at its base.

The coast is fringed by reefs. The cliffs slope down to the north-east to the beach of Cap Blanc. To the north-west, they extend to the Pointe de l'Opera, with rocky cornices and sandy creeks here and there. The perimeter within which seals are regularly sighted corresponds to the 5 metre isobath.

Individual specimens are sporadically sighted in the Baie du Levrier, and sometimes further north in the Baie de l'Etoile.

According to information provided by fishermen from Imragen, seals are occasionally found further south on the Kiaones islands on the Arguin bank (Fig. 14).

SENEGAL

The occurrence of monk seals on the Senegalese coast (Fig. 21) has been reported on several occasions, although apparently Senegal has never been within the known range of *Monachus monachus*.

According to HOLT (1984), it is even possible that monk seals have been sighted in Gambia.

CONVENTIONS AND INTERNATIONAL TREATIES RELEVANT TO THE PROTECTION OF THE MEDITERRANEAN MONK SEAL

Several international conventions relevant to the protection of wild flora and fauna have been ratified by Mediterranean countries. Hereafter are listed and annotated the international conventions relevant to the protection of the Mediterranean monk seal.

1. African Convention for the conservation of nature and natural resources, signed in Algiers on September 16th 1968.

This text includes an annex listing the species that the Parties have to protect. The species under Class A must be fully protected by the Contracting States. Therefore, hunting, slaughtering, capture and withdrawal have to be forbidden. Exceptions may be allowed only for reasons of national interest or for scientific purposes. Hunting, killing, capture and collecting of the species under Class B require a special permission.

The monk seal is listed under Class A and should be therefore fully protected.

The Mediterranean riparian countries which are parties to the convention are *Algeria, Egypt, Libya, Morocco and Tunisia*.

2. Convention for the protection of the Mediterranean Sea against Pollution (Barcelona Convention), 1976 – Protocol concerning Mediterranean Specially Protected Areas (Geneva, 1982)

Within the framework of the Barcelona Convention, the Geneva Protocol is the main instrument dealing with the conservation of wildness. The Contracting Parties to this Protocol engage themselves to take all appropriate measures with a view to protecting the marine and coastal areas which are important for the safeguard of the natural resources and natural sites of the Mediterranean Sea Area. This by the establishment of protected areas aimed at safeguarding, inter alia, “...the genetic diversity, as well as satisfactory population levels, of species, and their breeding grounds and habitats;...” (Art. 3, 2a). The monk seal has been recognized as a species whose safeguard is a priority within the framework of the Convention: in 1985, at their fourth ordinary meeting, the Contracting Parties adopted a declaration on the targets to be achieved as a matter of priority in the decade 1986-1995, referred to as the Genoa Declaration: among these objectives, there is the “protection of the endangered marine species (e.g. monk seal and Mediterranean sea turtles)”. Following the Genoa Declaration, an Action Plan on the management of the Mediterranean monk seal was adopted within the framework of the Convention; this Action Plan represent a global strategy for the conservation of the species, providing for a series of monk seal protection and management measures.

20 Mediterranean countries are at present Parties to the Convention, namely *Albania, Algeria, Bosnia and Herzegovina, Cyprus, Croatia, Egypt, France, Greece, Israel, Italy, Lebanon,*

Libya, Malta, Monaco, Morocco, Slovenia, Spain, Syria, Tunisia, Turkey. The *European Community* is also a party to the Convention as such.

3. Convention on the Conservation of Migratory Species of Wild Animals, signed in Bonn, June 23rd 1979.

Annex I to this convention lists the migratory species threatened to extinction whose withdrawal, in any form, must be forbidden. Moreover, the Parties shall endeavour to take measures for the conservation of the habitat of these species. Annex II lists the

species for which the countries included in their area of distribution shall endeavour to enter into agreements for their protection and management. One species may figure in the two annexes. It is the case of the monk seal. The Parties to the Convention must on one side ensure a full protection to this species, and on the other make efforts to conclude agreements for its protection.

The Mediterranean riparian countries which are Parties to the Bonn Convention are *Egypt, France, Israel, Italy, Spain, Tunisia.* The *European Community* is also a party to the Convention as such.

4. Convention on the conservation of European wildlife and natural habitats, signed in Bern on September 19th 1979.

The Parties have the obligation to protect the species listed in the annexes as well as their habitats. Annex I is a list of protected plants not including sea species. Annex II lists the animal species to which the Parties has to ensure protection, forbidding all forms of their capture, detention, and intentional killing as well as the intentional deterioration or destruction of their reproduction and rest areas. Annex III includes the animal species that the Parties have to protected by the control of their exploitation. Monk seal is included in Annex II and must therefore be fully protected by the Parties.

The Mediterranean riparian countries which are Parties to the Bern Convention are *Cyprus, France, Greece, Italy, Malta, Monaco, Spain, Turkey.* The *European Community* is also a party to the Convention as such.

5. Convention on International Trade in Endangered Species of wild fauna and flora, signed in Washington, March 3rd 1973 (CITES).

The monk seal is listed in Annex I to the Convention and its international trade is therefore forbidden.

The Mediterranean riparian countries which are Parties to the CITES are *Algeria, Cyprus, France, Greece, Israel, Italy, Malta, Monaco, Morocco, Spain, Tunisia.*

6. EEC Directive on the conservation of natural habitats and wild flora and fauna
(Directive 9243 of May 21st 1992).

The monk seal is listed in Annex IV as a species of community interest for which strict protection is required, and in Annex II as a species whose protection requires to designate special conservation areas. These areas have to be established within 12 years since the date of notification of the Directive. The monk seal is also listed as a priority species.

The Mediterranean riparian countries which are members to the EEC are *France, Greece, Italy and Spain*.

**STATUS OF THE MAIN CONVENTIONS RELEVANT TO THE PROTECTION OF
THE MEDITERRANEAN MONK SEAL**

<i>Country/Covnven.</i>	<i>ALGIERS</i>	<i>BARCELONA</i>	<i>BONN</i>	<i>BERN</i>	<i>WASHINGTON</i>
<i>Albania</i>	yes	yes			
<i>Algeria</i>	yes	yes			Yes
<i>Bosnia and Herzegovina</i>		yes			
<i>Cyprus</i>		yes		yes	yes
<i>Croatia</i>		Yes			
<i>EEC</i>		yes	yes	yes	
<i>Egypt</i>	yes	yes	yes		
<i>Spain</i>		yes	yes	yes	yes
<i>France</i>		yes	yes	yes	yes
<i>Greece</i>		yes		yes	yes
<i>Israel</i>		yes	yes		yes
<i>Italy</i>		yes	yes	yes	yes
<i>Lebanon</i>		yes			
<i>Libya</i>	yes	yes			
<i>Malta</i>		yes		yes	yes
<i>Morocco</i>	yes	yes			yes
<i>Monaco</i>		yes		yes	yes
<i>Slovenia</i>		yes			
<i>Syria</i>		yes			
<i>Tunisia</i>	yes	yes	yes		yes
<i>Turkey</i>		yes		yes	

FIGURES

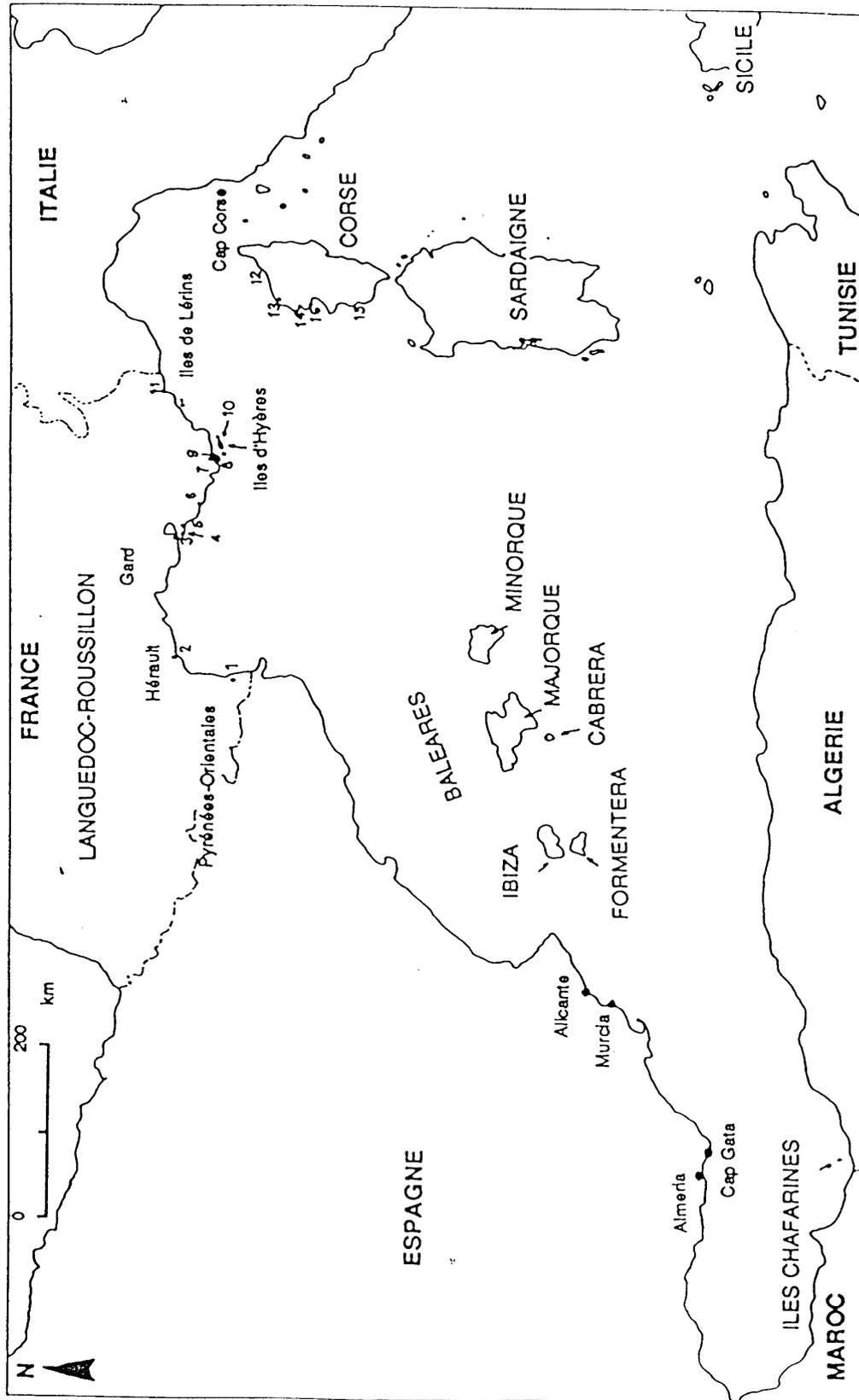


Figure 1: Geographical location of sites referred to in Spain and France. 1. Banyul sur mer; 2. Sète; 3. Salins de Giraud; 4. La Couronne; 5. Sausset le Pins; 6. Cassis; 7. Toulon; 8. Presqu'île de Giens; 9. Porquerolles; 10. Port-Cros; 11. Nice; 12. île Rousse; 13. Calvi; 14. Scandola; 15. Propriano; 16. Cargèse.

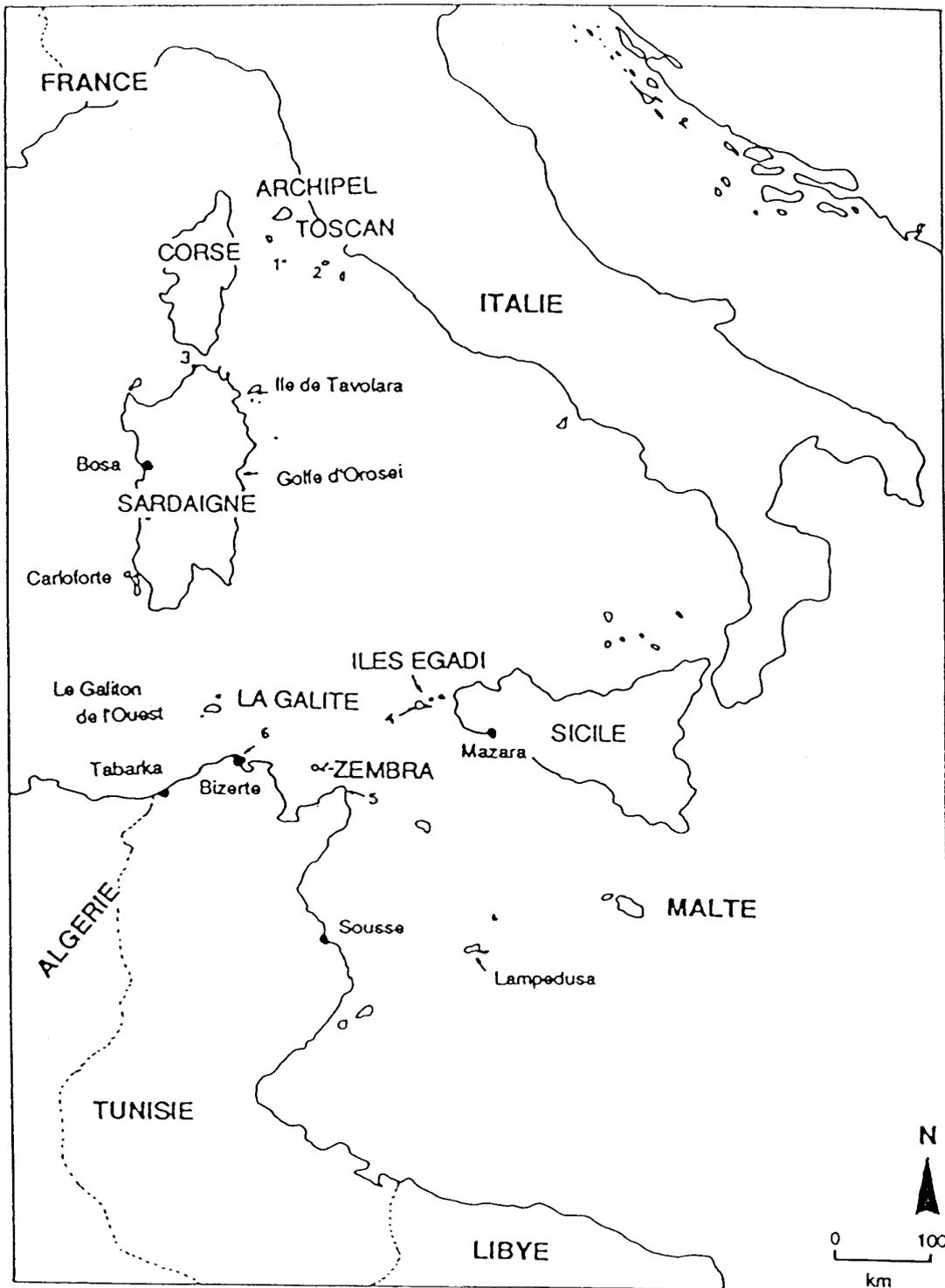


Figure 2: Geographical location of sites referred to in Italy, Malta and Tunisia. 1. Island of Montecristo; 2. Island of Giglio; 3. Santa Teresa di Gallura; 4. Island of Marettimo; 5. Cap Bon; 6. Cap Blanc.

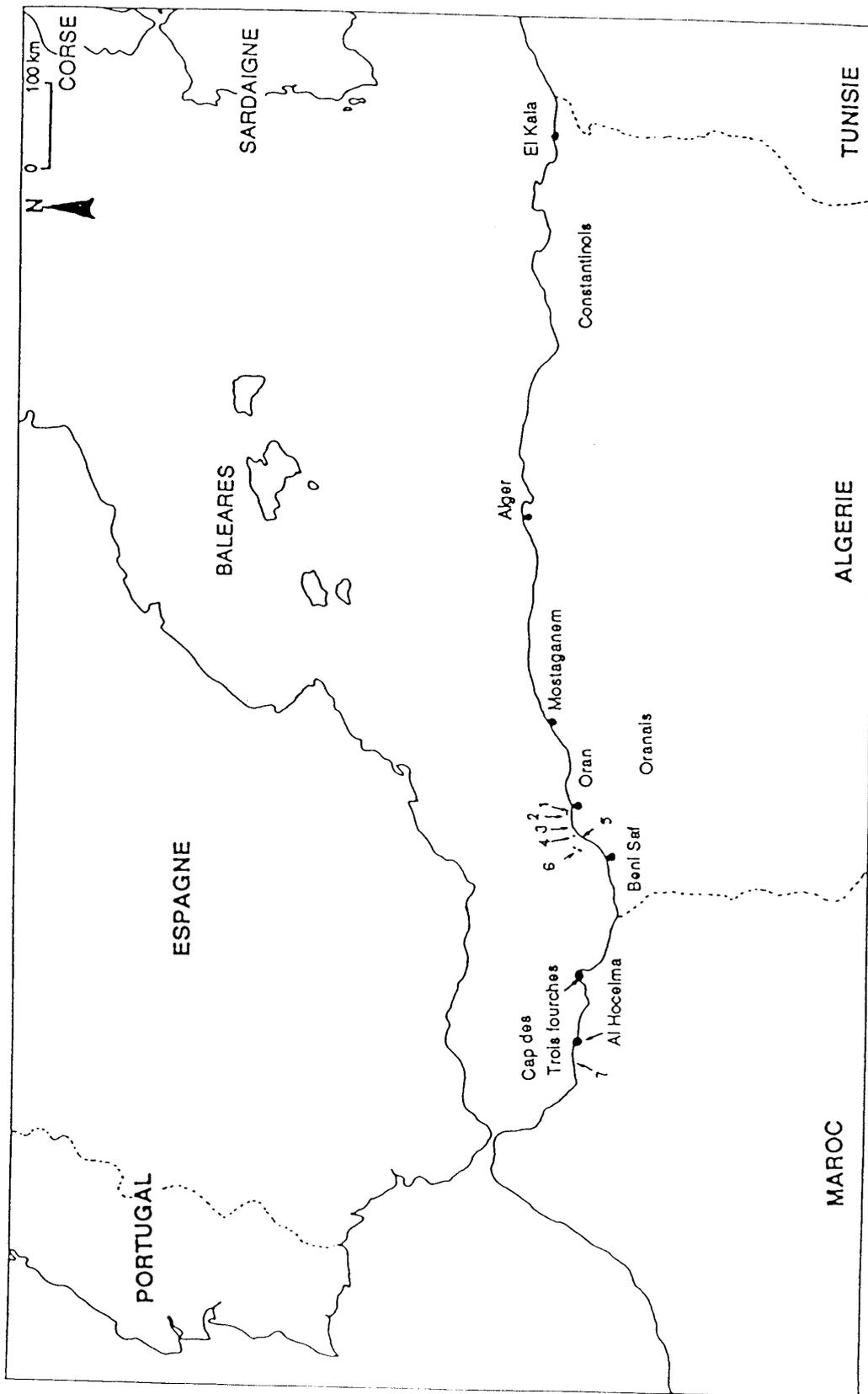


Figure 3: Geographical location of sites referred to in Algeria and Morocco. 1. Cap Falcon; 2. ile Plane; 3. Cap Blanc; 4. ile de la Fourmi; 5. Maddagh; 6. Habibas Islands; 7. Torres de Alcala.

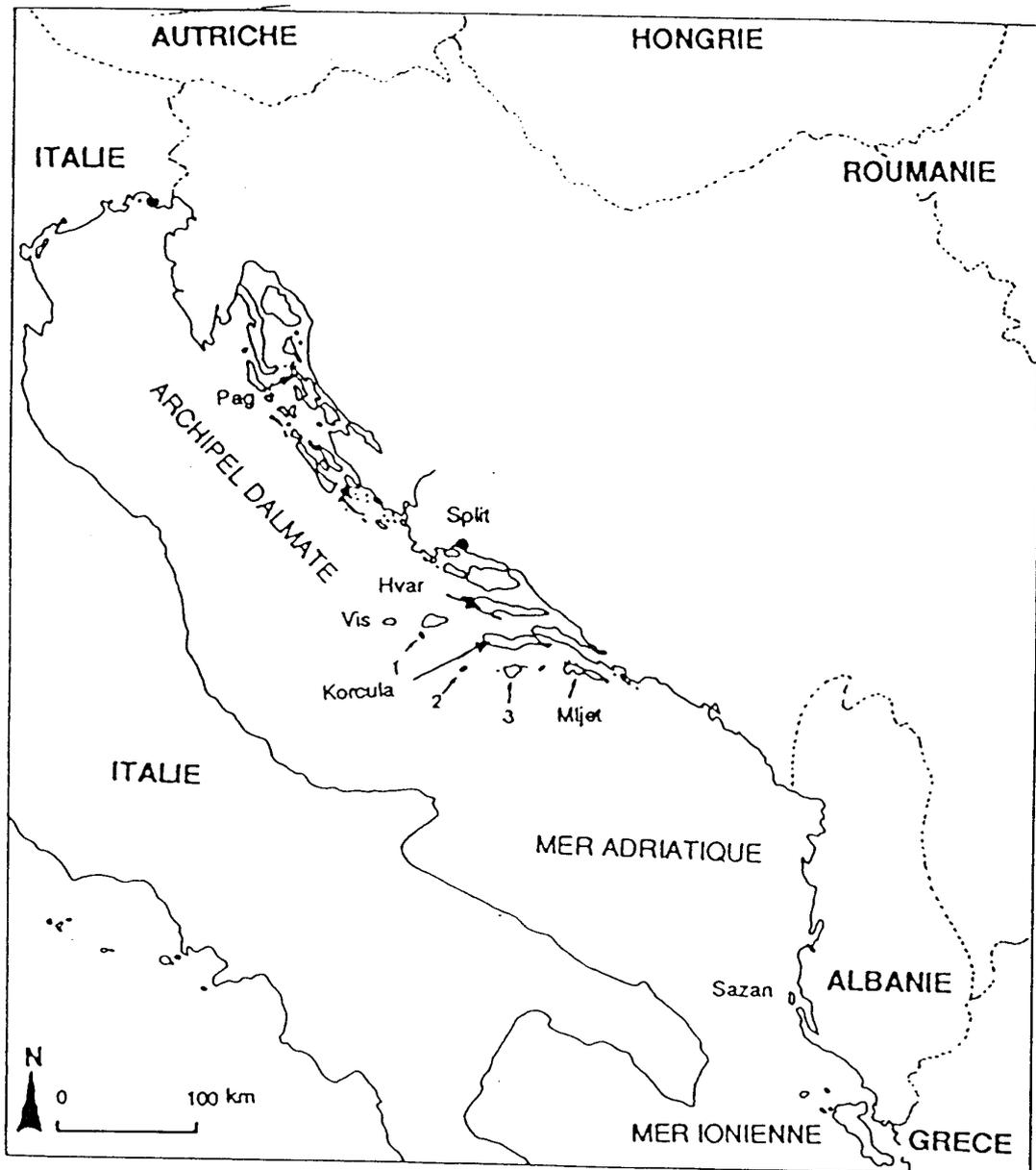


Figure 4: Geographical location of sites referred to in the former Yugoslavia Federation and Albania. 1. Island of Bisevo; 2. Island of Susac; 3. Island of Lastovo.

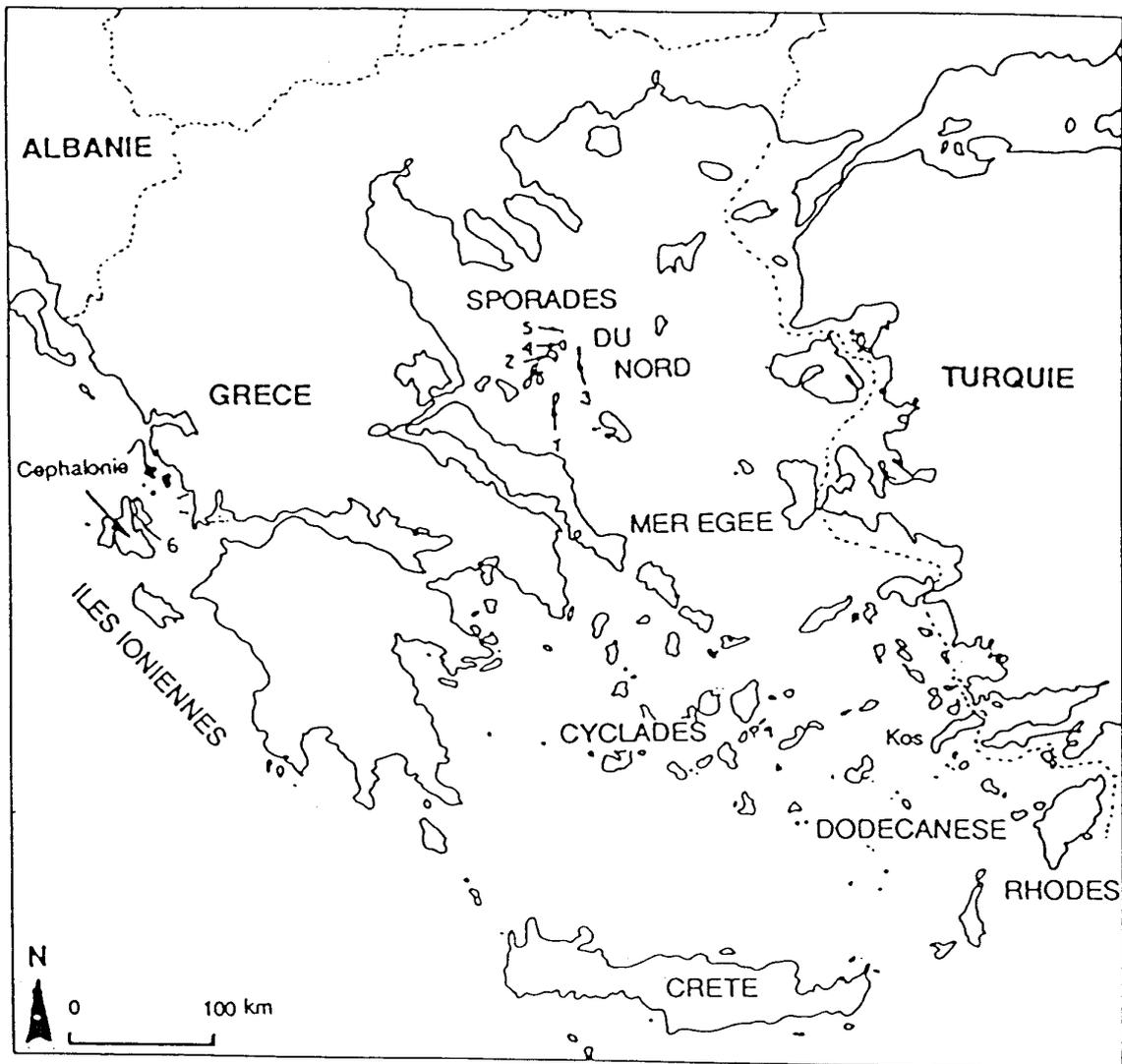


Figure 5: Geographical location of sites referred to in Greece. 1. Skantzoura; 2. Kyra-Panaghia; 3. Piperi; 4. Youra; 5. Psathoura; 6. Channel of Ithaca; 7. Gulf of Corinth.

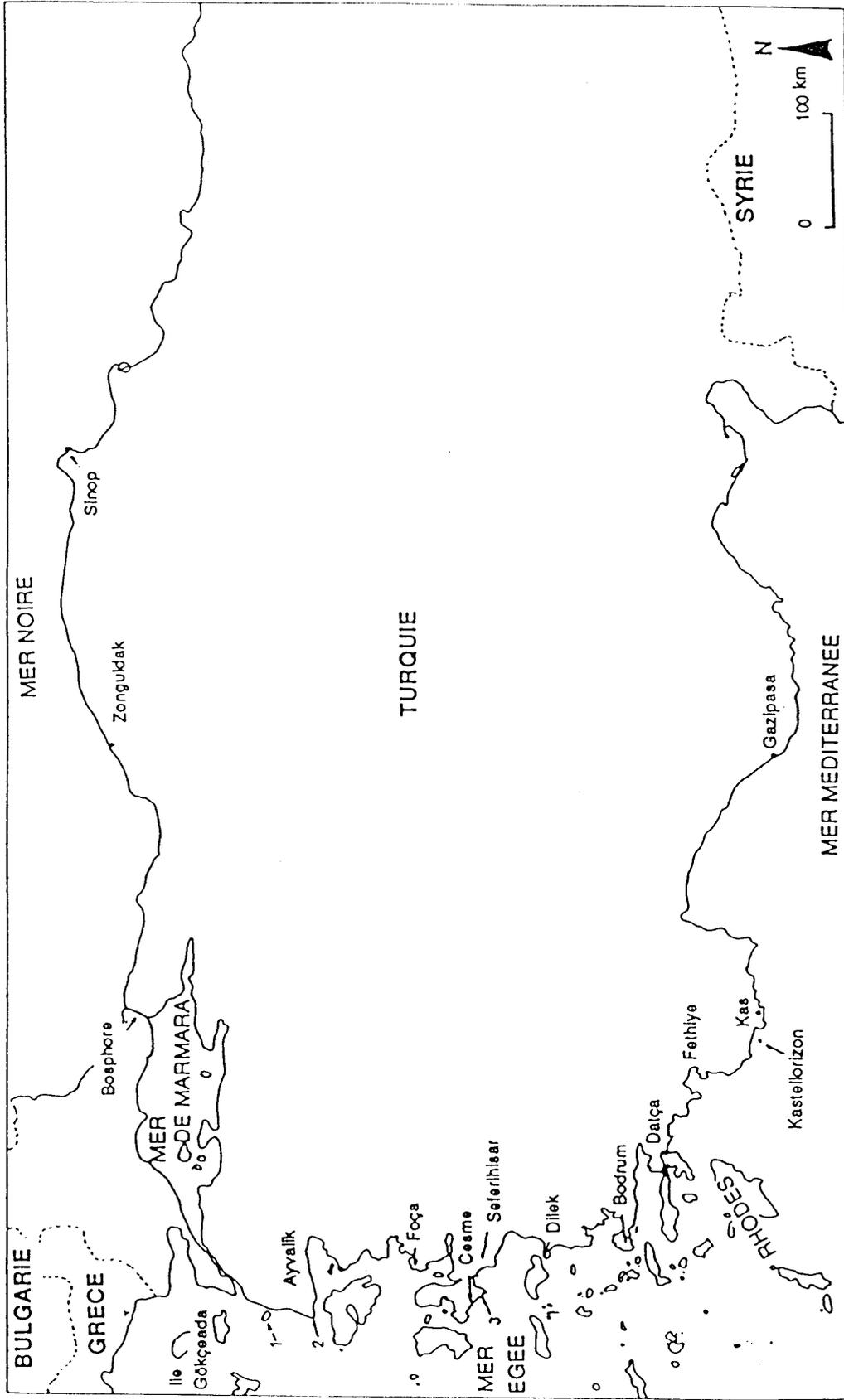


Figure 6: Geographical location of sites referred to in Turkey. 1. Bozcaada island; 2. Cap Blanc; 3. Alaçati.

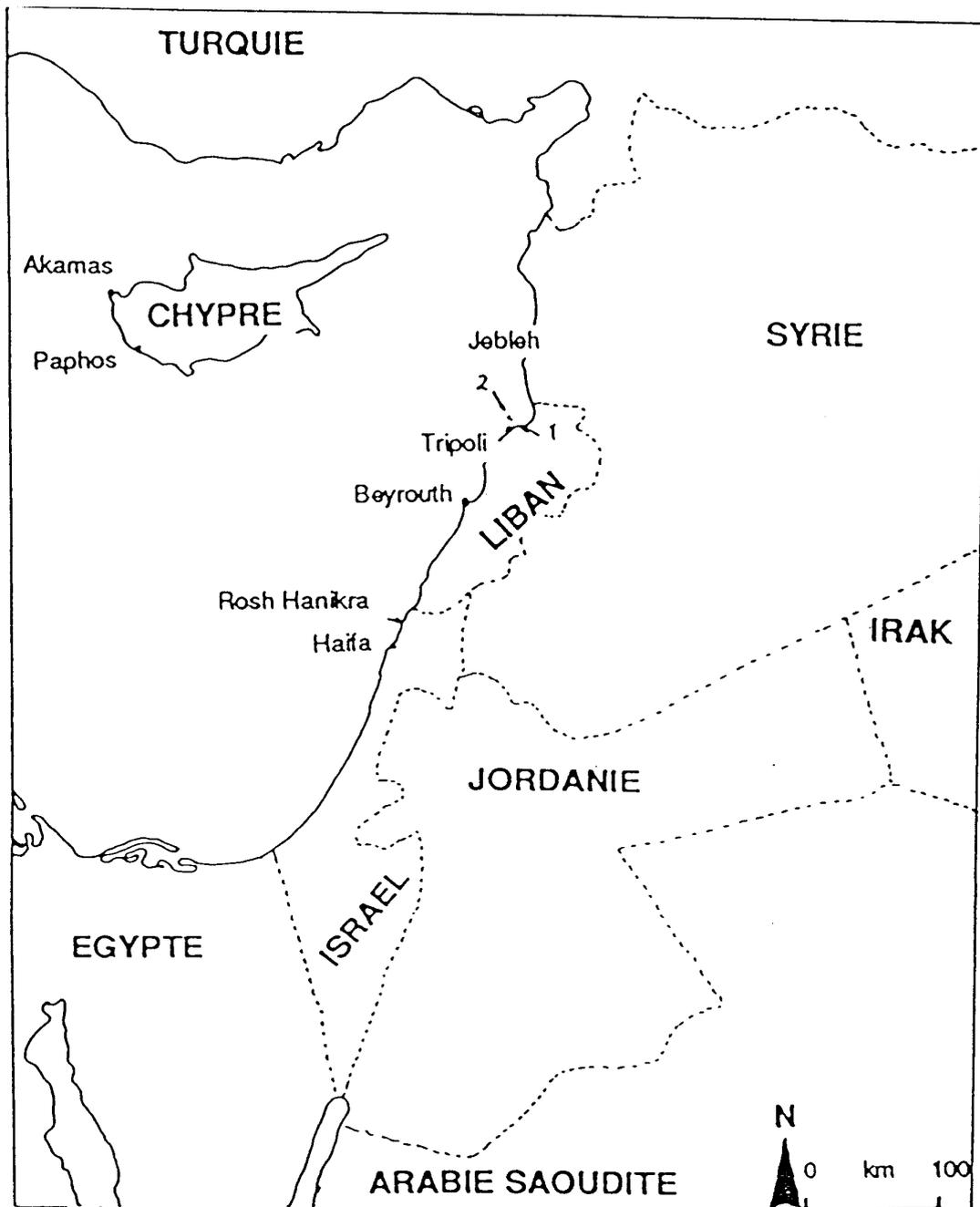


Figure 7: Geographical location of sites referred to in Cyprus, Syria and Lebanon. 1. Al Mina; 2. Iles des Lapins National Park.

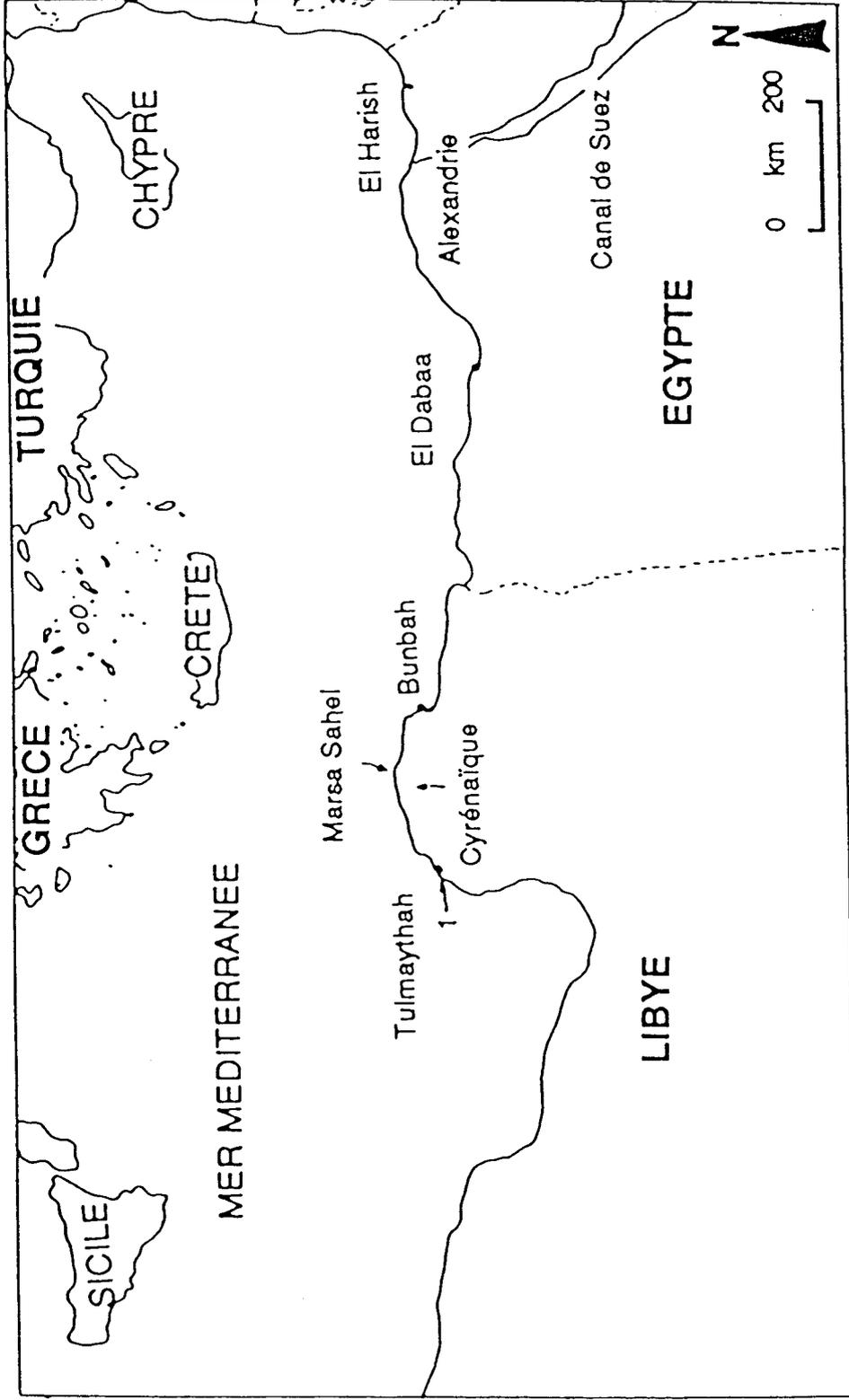


Figure 8: Geographical location of sites referred to in Egypt and Libya. 1. Kouf National Park.

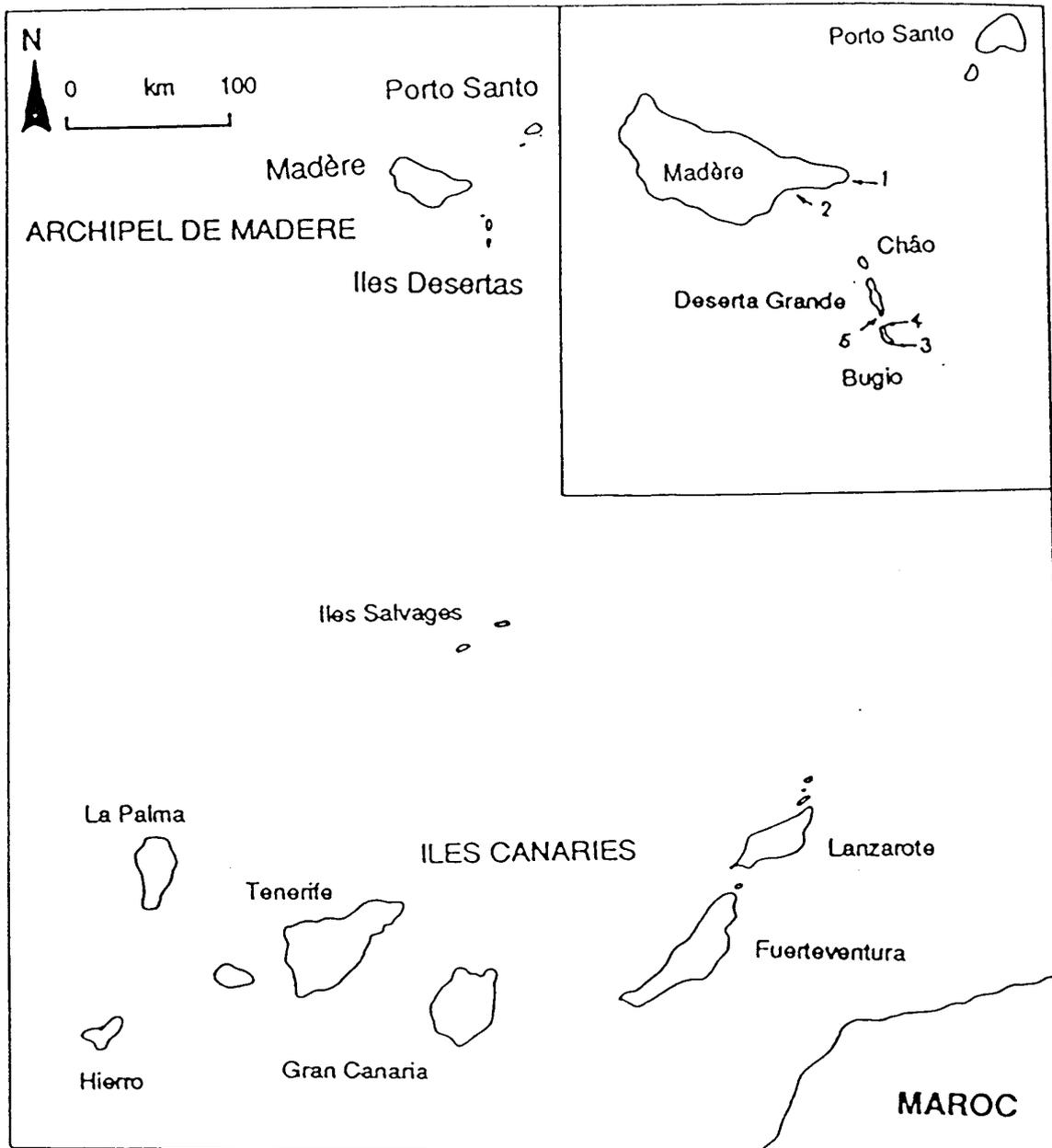


Figure 9: Geographical location of the Canary Islands and the Madeira archipelago. 1. Pointe S. Lourenço; 2. Santa Cruz; 3. Pointe d'Agulha; 4. Pointe Cagado; 5. Pointe Tabaqueira.

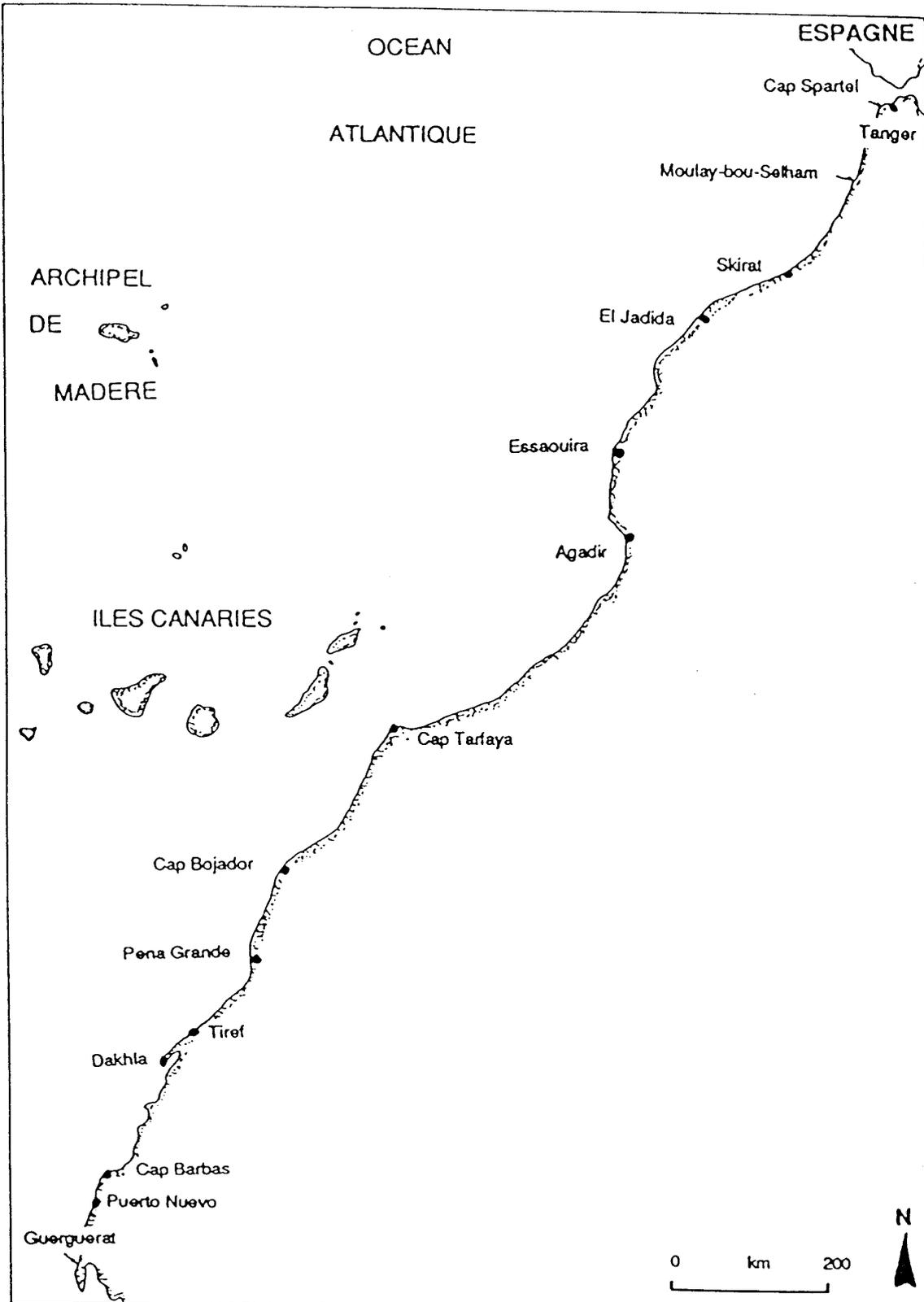


Figure 10: Geographical location of the sites referred to on the Atlantic coast.

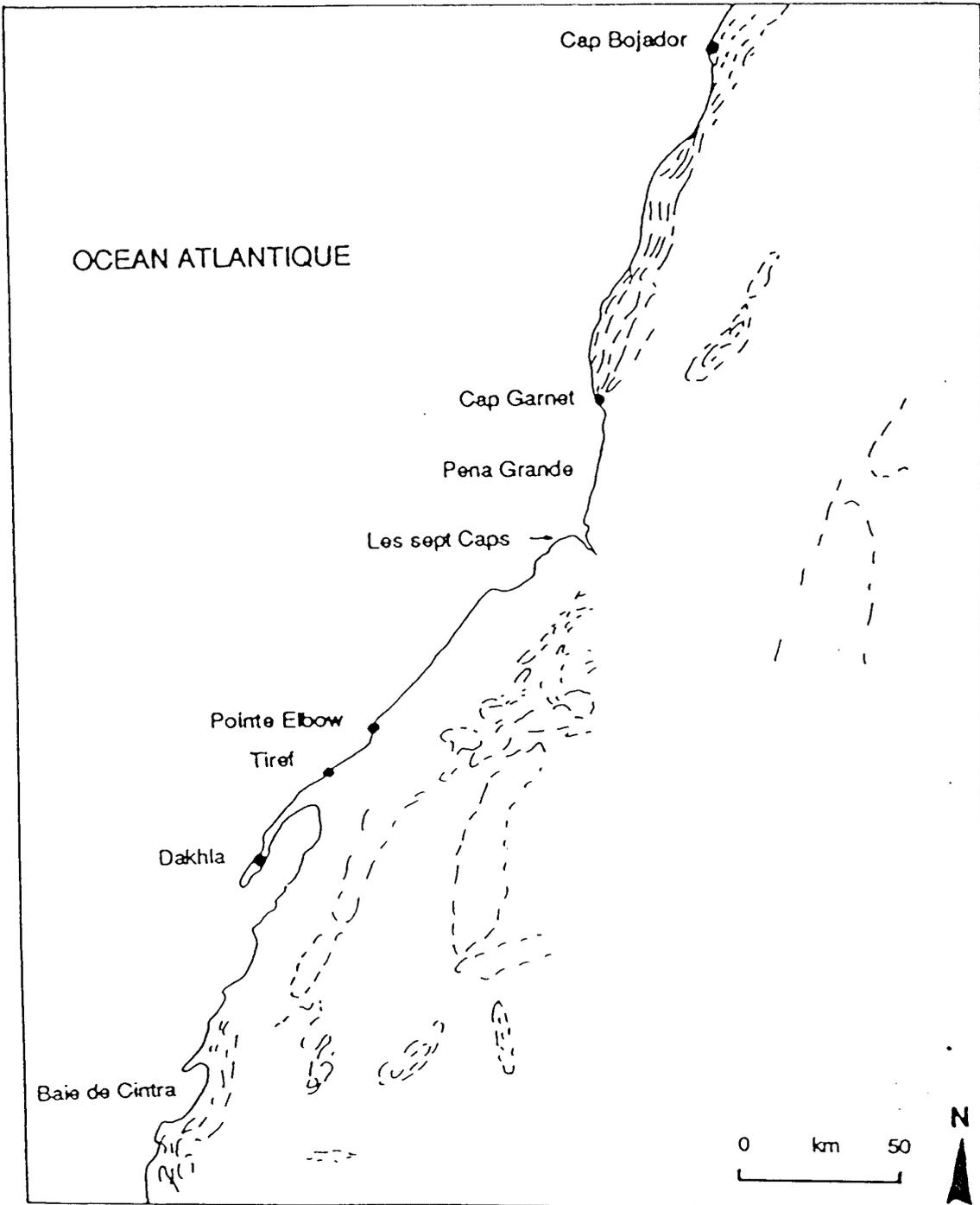


Figure 11: Chart of the Saharan coast between Cap Bojador and the Bay of Dakhla.

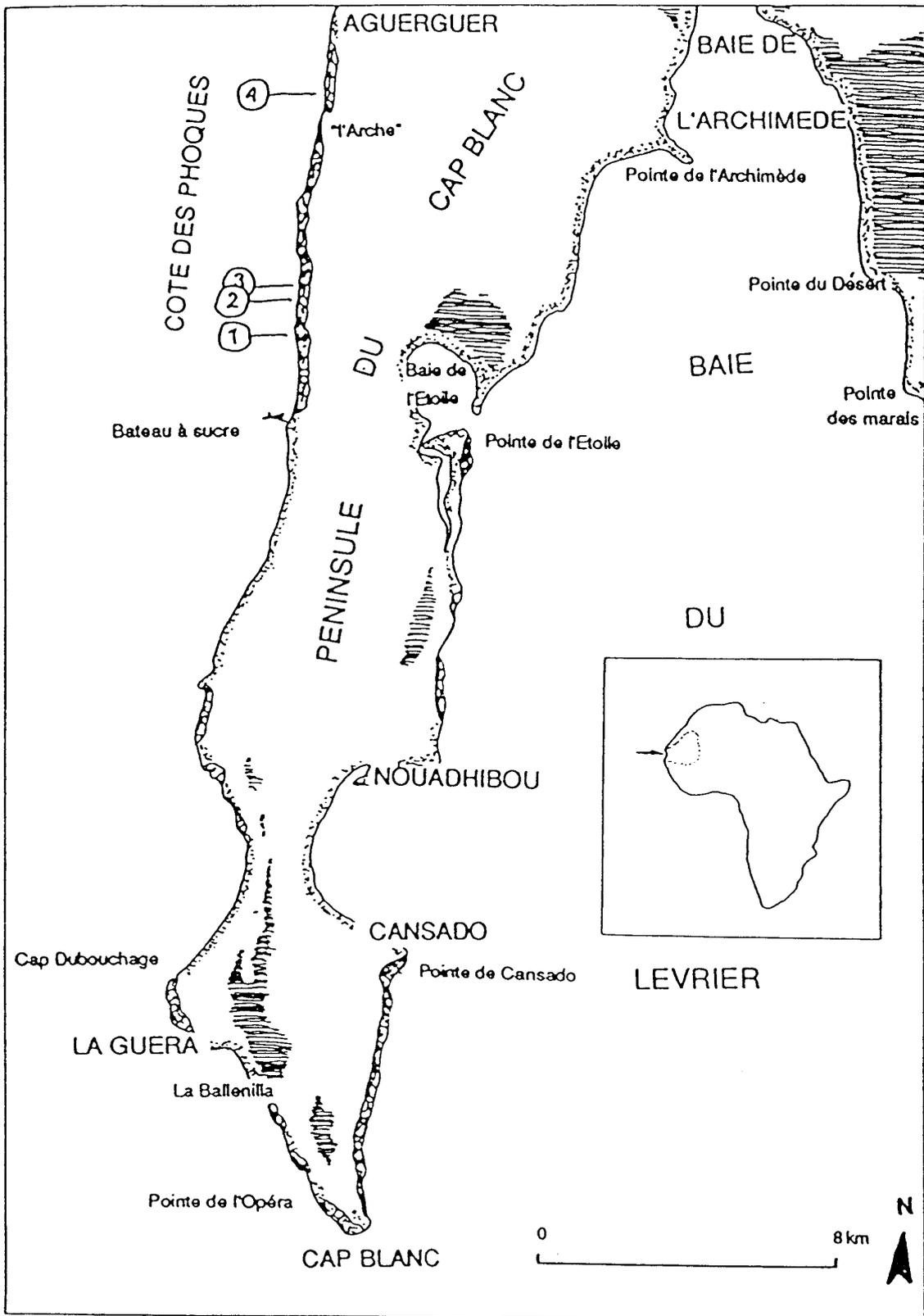


Figure 12: Chart of the Cap Blanc peninsula. The ringed numbers indicate caves occupied by the monk seal.



Figure 13: Chart of the Saharan coast between the Bay of Dakhla and Guerguerat.

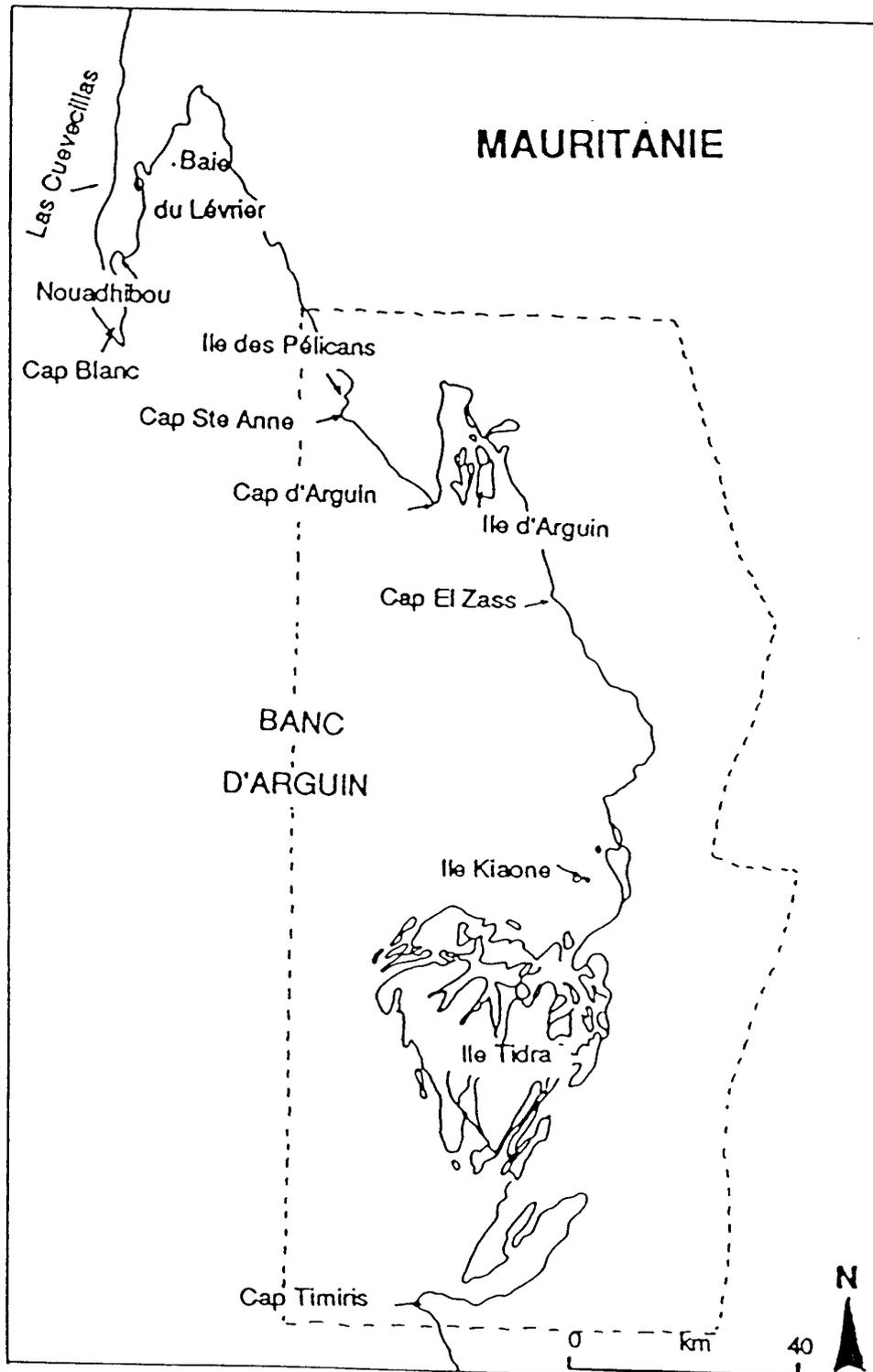


Figure 14: Places where monk seals have been sighted in the Banc d'Arguin National Park.

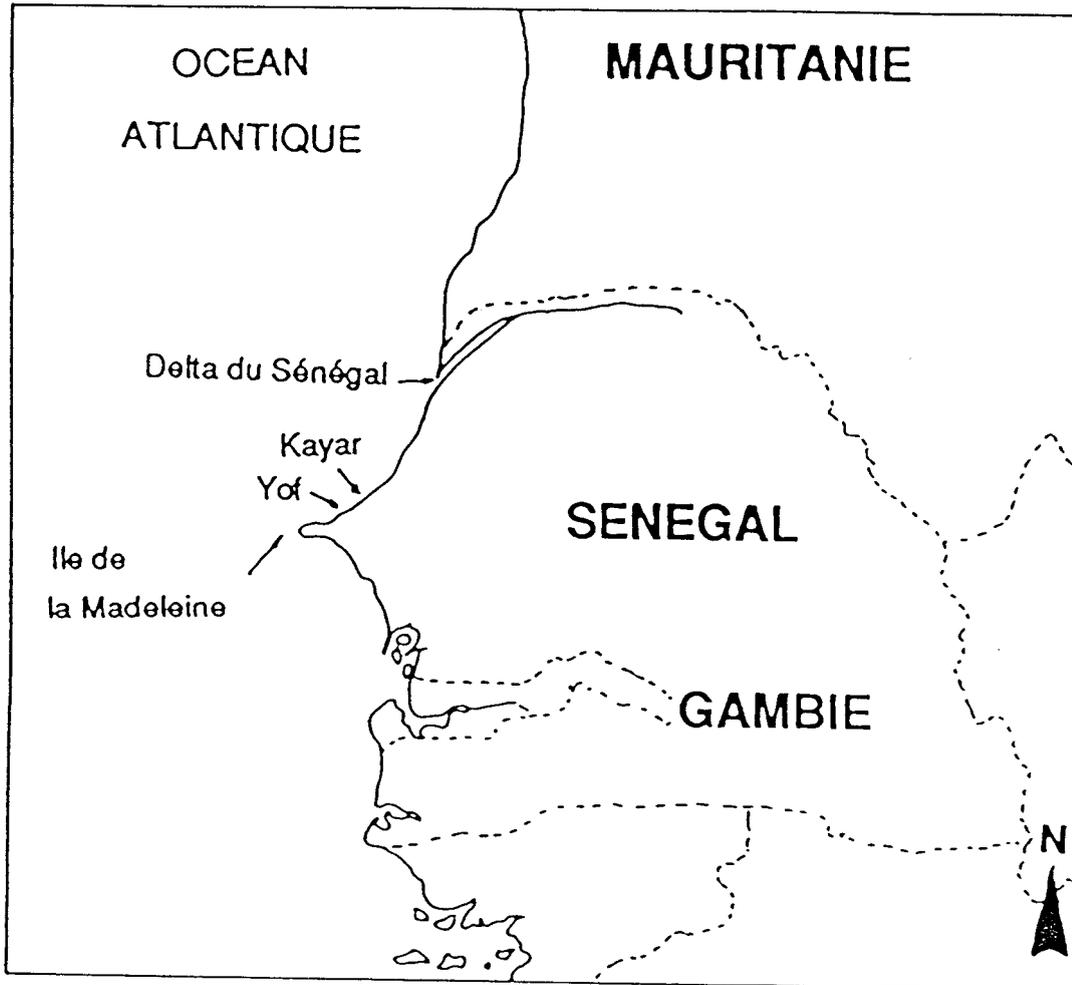


Figure 15: Places where sightings of monk seal have been reported in Senegal.

REFERENCES

The references listed below were consulted for the realization of this report. Only the references marked with () are cited in the text.*

ALLAVENA A., 1985. – Le status et la conservation du phoque moine en Italie. In: Rapport du Seminaire International sur la Stratégie de Conservation du phoque moine, Port-Cros, 13-14 Juin 1985, 61 pp; Minutes de la communication vale, Parc National de Port-Cros Ed., Fr.: 18-20.

(*) ARDIZZONE G., ARGANO R., BOITANI L., 1992. – Le declin du phoque moine (*Monachus monachus*) en Italie et sa survie dans un contexte mediterraneen. In: *Protection du phoque moine de Méditerranée – Aspects scientifiques et techniques*, Concil Europe Press, *Rencont. environ.*, 13: 30-31.

(*) AVELLA F.J., 1979. – The status of the monk seal on the spanish Mediterranean coast. In: *The Mediterranean Monk Seal*, Proceeding of the First International Conference Rhodes, Greece, 2-5 May 1978. U.N.E.P. Technical Series, K. RONALD & R. DUGUY (Eds.), Pergamon Press Publ., Oxford & New York, 1: 95-98.

(*) AVELLA F.J., 1984. – A plan for the reintroduction of the Monk Seal (*Monachus*) in the archipelago of Cabrera, Balearic Islands, Spain. In: *The Monk Seals*, Proceedings of the Second International Conference, La Rochelle, France, 5-6 October 1984. K. Ronald & R. Duguay (Eds.). *Ann. Soc. Sci. net. Charente-Maritime*, Fr., suppl.: 92-101.

(*) AVELLA F.J., 1986. – Las ultimas foc as del Mediterraneo. *Quercus*, 22: 4-16.

(*) AVELLA F.J., 1987. – Man versus Monk Seal in North Africa: a preliminary report. Third international conference on the Mediterranean Monk seal, Antalya, November 1987, *Turquie*: 1 – 11.

(*) AVELLA F.J., GONZALES L.M., 1984a. – Monk Seal (*Monachus*): A survey along the Mediterranean coast of Morocco. In: *The Monk Seals*, Proceedings of the Second International Conference, La Rochelle, France, 5-6 October 1984. K. Ronald & R. Duguay (Eds.). *Ann. Soc. Sci. net. Charente-Maritime*, Fr., Suppl.: 60-78.

AVELLA F.J., GONZALES L.M., 1984b. – Some data on the monk Seal (*Monachus*) in Eastern atlantic. In: *The Monk Seals*, Proceedings of the Second International Conference, La Rochelle, France, 5-6 October 1984. K. Ronald & R. Duguay (Eds.). *Ann. Soc. Sci. net. Charente-Maritime*, Fr., Suppl.: 56-59.

BACESCU M., 1948. – Foca un animal pe cale de disparitie in Marea Negra. *Rev. Stiint. V. Adamachi* (Bucarest), Romania, 34: 302-303.

(*) BAHRI R., 1974. – Epargnez les derniers phoques de la Méditerranée. *Algerie Actualite*, Alg., 465: 1p.

(*) BAREHAM J.R., FURREDDU A., 1975. – Observations on the use of grottos by Mediterranean Monk seals (*Monachus monachus*). J. Zool., Lond., U.S.A., 175: 291 -298.

(*) BAUDOIN-BODIN J., 1964. – Capture de phoque moine dans l'Atlantique. Mammalia, Fr., 28: 522..

*) BAYED A., BEAUBRUN P.C., 1987. – Les mammifères marine du Maroc : Inventaire préliminaire. Mammalia, Fr., 51: 437-446.

(*) BEC P. (Ed.), 1977. – Anthologie de la prose occitane du Moyen Age, XIème XVème siècles. Edition Aubanel, Avignon, Fr.

BEN OHTMAN S., MOKHTAR F., QUIGNARD J.P., 1971. – Presence d'un phoque moine *Monachus monachus* (Hermann, 1779) dans le golfe de Tunis. Bull. Inst. oceanogr. Peches Salammo, Tunisia, 2: 267.

(*) BERGES E.M.R., 1949. – Phoques en Mauritanie. Tropiques, Fr., 47(315): 31 -33.

(*) BERKES F., ANAT H., KISLALIOGLU M., ESENEL M., 1979. – Distribution and ecology of *Monachus monachus* on Turkish coasts. In: The Mediterranean Monk Seal, Proceeding of the First International Conference Rhodes, Greece, 2-5 May 1978. U.N.E.P. Technical Series, K. RONALD & R. DUGUY (Eds.), Pergamon Press Publ., Oxford & New York, 1: 113-127.

(*) BERTRAM G.C.L., 1943. – Notes on the present states of the Monk Seal in Palestine. J. Soc. Preserv. Fauna Emp., 47: 20-21.

(*) BETURE-SETAME, 1985. – Protection des richesses naturelles de la cote mediterraneenne du Maroc. Reserve biologique des Bokoyas. Rapport prepare par la Societe d'Etudes d'Urbanisme, d'Amenagement et d'Equipement, Paris, Fr.: 1 -91.

(*) BIANCONI C.H., 1988. – Le phoque moine sur le littoral du Sahara occidental. Rapp. Mission du 27 Mars au 10 Avril, 1988 en cooperation avec ONP du Maroc et PNPC de France, 5p.

(*) BISCOITO M., 1984. – On the creation of a natural reserve in the Desertas Islands, Madeira, Portugal. In: The Monk Seals, Proceedings of the Second International Conference, La Rochelle, France, 5-6 October 1984. K. Ronald & R. Duguy (Eds.). Ann. Soc. Sci. net. Charente-Maritime, Fr., Suppl.: 88-91.

(*) BOETTGER C.R., 1951. – Notizen zur Verbreitung und über die Verwandtschaftsbeziehungen der Monchsrobbe (*Monachus albiventer* Boddaert). Zool. Anz., West Germany, 147: 303-310.

(*) BOITANI L., 1979. – Monk Seal *Monachus monachus* in Italy: Status and conservation perspectives in relation to the condition of the species in the western Mediterranean. In: The Mediterranean Monk Seal, Proceeding of the First International Conference Rhodes, Greece,

2-5 May 1978. U.N.E.P. Technical Series, K. RONALD & R. DUGUY (Eds.), Pergamon Press Publ., Oxford & New York, 1: 61-62.

BORGES J.G., MAUL G.E., VASCONCELLOS G.M. (De), ZINO P.A., 1979. – The Monk Seal of Madeira. In: The Mediterranean Monk Seal, Proceedings of the first International Conference, Rhodes, Greece, 2-5 May 1978. K. Ronald & R. Duguay (Eds.), Pergamon Press Publ., Oxford & New York: 63-64.

(*) BOUDOURESQUE C.F., HARMELIN J.G., JEUDY DE GRISSAC A., 1986. – Le benthos marin de l'île de Zembra (Parc National, Tunisie). UNEP-IUCN-RAC/SPA, Boudouresque C. F. , Harmelin J .G . et Jeudy de Grissac A. Eds. , GIS Posidonie Publ., Marseille, Fr.: 1-199.

(*) BOUDOURESQUE C.F., LEFEVRE J.R., 1988. – Nouvelles donnees sur le status du phoque moine *Monachus monachus* dans la region d'Oran (Algeria). GIS Posidonie Publ., Marseille, Fr.: 1-30.

BOUDOURESQUE C.F., LEFEVRE J.R., 1992. – Ressources alimentaires, Phoque moine (*Monachus monachus*) et strategie de protection. In: Protection du phoque moine de Méditerranée – Aspects scientifiques et techniques, Council Europe Presse, Rencontre environ ., 13 : 73-78.

(*) BOUGAZELLI N., 1979. – Quelques donnees sur le phoque moine d'Algerie (*Monachus monachus*). In: The Mediterranean Monk Seal, Proceedings of the first International Conference, Rhodes, Greece, 2-5 May 1978. K. Ronald & R. Duguay (Eds.), Pergamon Press Publ., Oxford & New York: 175-178.

(*) BOULVA J., 1975. – Survey of the Mediterranean Monk Seal, *Monachus monachus*, in the western Mediterranean and eastern Atlantic. Report to the International Fund for Animal Welfare and to the International Union for the Conservation of Nature, Switzerland: 1-26.

(*) BOULVA J., 1979. – Perspectives d'avenir du phoque moine de Méditerranée, *Monachus monachus*. In: The Mediterranean Monk Seal, Proceeding of the First International Conference Rhodes, Greece, 2-5 May 1978. U.N.E.P. Technical Series, K. RONALD & R. DUGUY (Eds.), Pergamon Press Publ., Oxford & New York, 1: 85-94.

(*) BOUTIBA Z., SQUABRIA B., ROBINEAU D., 1987. – Etat actuel de la population du phoque moine (*Monachus monachus*) sur le littoral Ouest Algerien (Region d'Oran). Communication presentee a la troisieme Conference Internationale sur les Phoques Moines, Antalya, Novembre 1987, Turquie: 1 -9.

(*) BURGNET H., 1843. – Melanges d'histoire naturelle pour servir a la faune du departement de la Gironde. Actes Soc. Inn. Bordeaux, Fr., 13: 300-318.

(*) CADOGAN F., 1945. – Monk Seals of Madeira. J. Soc. Preserv. Fauna Emp., 52: 54-55.

CALTAGIRONE A., ESCOUBET P., 1992. – Le Rescue Center du parc national de

Port-Cros. In: Protection du phoque moine de Méditerranée – Aspects scientifiques et techniques, Council Europe Press, Rencont. environ., 13: 73-78.

(*) CHEBAB R., BOUABDELLI M.B., 1978. – Etude statistique et ethologique de *Monachus monachus* (Hermann, 1779) sur le littoral guest algerien. Diplom. Etudes sup., Biol. anim., Univ. Oran, Alg.: 1-32 + 11 pl. h.t.

(*) CHEYLAN G., 1987. – Le phoque moine, *Monachus monachus*. In : Les Mammifères en Corse. Parc net. region. Res. net. Corse Publ., Fr.: 88-95.

(*) COMPANYO L., 1841. – Catalogue descriptif des mammifères qui ont été observés et qui vivent dans le département des Pyrénées-Orientales. Bull. Soc. agric. scient. litt. Pyren. Orient., Fr., 5: 421-471.

(*) COUSTEAU J.Y., DUMAS F., 1950. – Le monde du silence. Edition de Paris, Fr., : 162-173.

(*) CRESPON J., 1844. – Faune meridionale. Nimes, Fr., 1: 57-58.

(*) DELIBRIAS G., ORTLIEB L., PETIT-MAIRE N., 1976. – New 14C data for the Atlantic Sahara (Holocene). Tentative paleoclimatic interpretation. J. Human Evol., U.S.A. 5: 535-546.

(*) DIEUZEIDE R., 1927. – Sur quelques points d'anatomie du phoque moine de la Méditerranée (*Monachus albiventer* Bodd.). Bull. Sta. Aquic. Peches Castiglione, Alg., 2: 215-249.

DRAGANOVIC E., 1992. – Distribution and legal protection of Monk Seal along the Eastern Adriatic Coast of Yugoslav. In: Protection du phoque moine de Méditerranée – Aspects scientifiques et techniques, Council Europe Press, Rencont. environ., 13: 32.

(*) DUGUY R., 1976. – Contribution à l'étude des mammifères marins de la côte Nord-Ouest Afrique. Rev. Trav. Inst. Peches Marit., Fr., 39: 321-332.

(*) DUGUY R., CHEYLAN G., 1980. – Les phoques des côtes de France. I. Le phoque moine *Monachus monachus* (Hermann, 1779). Mammalia, Fr., 44: 203-209.

DUGUY R., MARCHESSAUX D., sous presse. – Der Monchrobbe, *Monachus monachus*. In: Handbuch der Säugetiere Europas. Vol. VI (R. Duguy & D. Robineau Eds.); Aula Verlag, Wiesbaden, West Germany.

DURAND S., HARWOOD J., 1992. – Assessment of monitoring and management strategies for local populations of the Mediterranean monk seal *Monachus monachus*. Biol. Conserv., 61: 81-92.

(*) ECONOMOU A., 1986. – Pilot project for the establishment of the Marine Park in Northern Sporades, concerning the protection of Monk Seals *Monachus monachus*. Ministry of the Environment, Planning and Public Works, Division of the Environment, Athens, Greece: 1-8.

FRANCOUR P., MARCHESSAUX D., ARGIOLAS A., CAMPREDON P., VUIGNIER G., 1990. – La population de phoque moine (*Monachus monachus*) de Mauritanie. Rev. Ecol. (Terre Vie), 45: 55-64.

(*) FUNDACION JOSE MARIA BLANC/JUNTA DE ANDALUCIA, 1986. – Estudio de viabilidad de las costas de cabo de Gata (Almeria), para la recuperacion de foca monje (*Monachus monachus*). Fundacion Jose Maria Blanc Ed., Madrid, Spain: 1-66 + annexes.

(*) FURREDU A., 1975. – La foca monaca in Tunisia. Speologia Sarda, Cagliari, Ital., 13: 26-31.

(*) GAMULIN-BRIDA H., 1979. – Protection du phoque moine de l'Adriatique. In: The Mediterranean Monk Seal, Proceeding of the First International Conference Rhodes, Greece, 2-5 May 1978. U.N.E.P. Technical Series, K. RONALD & R. DUGUY (Eds.), Pergamon Press Publ., Oxford & New York, 1: 163-166.

(*) GARCIA C.C., 1971. – Interrelaciones entre las faunas marinas de las Antillas y Canarias. An. Est. Atlanticos (Madrid-Las Palmas), Spain, 17: 37-55.

(*) GAULTIER T., 1978. – L'île de La Galite et ses ilots. Manuscript, 19p.

GAVARD 1927. – Observations sur le phoque moine *Monachus albiventer* (Bodd.) faite au laboratoire de Castiglione. Bull. Sta. Aquic. Peches Castiglione, Alg., 2: 175-211.

GERRODETTE T., GILMARTIN W.G., 1990. – Demographic consequences of changed pupping and hauling sites of the Hawaiian monk seal. Conservation Biology, 4: 423-430.

GOEDICKE T.R., 1981. – Life expectancy of Monk Seal colonies in Greece. Biol. Conserv., England, 20: 173-181.

(*) GOMERCIC H., HUBER D., RONALD K., 1984. – A note on the presence of the mediterranean monk seal (*Monachus monachus*) Herman 1779 in the Eastern Part of the Adriatic sea. In: The Monk Seals, Proceedings of the Second International Conference, La Rochelle, France, 5-6 October 1984. K. Ronald & R. Duguay (Eds.). Ann. Soc. Sci. net. Charente-Maritime, Fr., Suppl.: p.51.

GONZALES L.M., GONZALES J.R., FELIS M.S., GRAU E., LOPEZ-JURADO L.F., AGUILAR A., 1994. – Pupping season and annual productivity of the monk seal (*Monachus monachus*) in “Cabo blanco” peninsula (Western Sahara-Mauritania). European Cetacean Society, Annual Conference, Montpellier 5-6 March 1994.

(*) GRAY J. E., 1854. – Description of a new genus and species of seals (*Heliophoca atlantica*) from Madeira. Ann. Mag. nat. Hist., England, ser.II, 13: 200-202.

(*) GRUVEL M.A., 1924. – Quelques observations zoologiques faites au cours d'un voyage en Mauritanie. Bull. Soc. nat. Acclim. France, 71: 13-14.

(*) HARWOOD J., (Ed.), 1987. – Population biology of the Mediterranean Monk Seal in Greece. A report on research conducted by the Natural Environment Research Council's Sea Mammal Research Unit with financial assistance from the Commission of the European Communities and the International Fund for Animal Welfare, Cambridge, England: 1-72.

(*) HERNANDEZ E., 1986. – Le phoque moine dans les îles Canaries: Données historiques et notes relatives à sa réintroduction. Conseil de l'Europe, Convention relative à la conservation de la vie sauvage et du milieu naturel de l'Europe, 1^{ère} réunion du groupe d'experts sur le phoque moine de Méditerranée, Strasbourg, 15-16 septembre 1986; Mimeo: 1-9.

HOLDEN A.V., 1975. – The accumulation of Oceanic contaminants in marine mammals. In: Biology of the Seal, K. Ronald & A.W. Mansfield (Eds.). Rapp. P.V. Reun. Cons. int. Explor. Mer, Denmark, 169: 353-361.

(*) HOLT S.J., 1984. – News from West Africa. League for the Conservation of the Monk Seal, Newsletter N°7, College of Biological Sciences, University of Guelph, Ontario, Canada: p12.

IUCN, 1972. – Red Data Book. Vol. 1. Mammalia. Goodwin H.A. & C.W. Holloway (Comp.), Morges, Switzerland.

IUCN, 1976. – League for the conservation of the Monk Seal, Newsletter n°1. Printed: College of Biological Science, University of Guelph, Ontario, Canada: 22p.

(*) IUCN, 1987. – Report on the status of the Mediterranean Monk Seal. Joint expert consultation on the management of the Mediterranean Monk Seal, Athens, 11-12 January 1988. IUCN/UNEP/MM-IC/1.3: 1-35.

IUCN/UNEP, 1988. – The Mediterranean Monk Seal. Mar. mamm. act. plan series, :1-59.

(*) JACQUIN M., 1974. – A propos du Phoque moine ou Veau marin. Enseignement Sci. net. Alg., 12: 89-91.

(*) JARDAS I., DRAGANOVIC E., 1987. – Geographic distribution, number and protection of the Mediterranean Monk Seal, *Monachus monachus* (Hermann, 1779), with particular reference to the Adriatic sea. In: Symposium on Protection of endemics in the living world of Yugoslavia (Sarajevo, May 15-16, 1986). Spec. Publ. Acad. Sci. Arts Bosnia Herzegovina, Yugoslavia, 83: 79-94 (en serbe).

JOHNSON A.M., DELONG R.L., FISCUS C.H., KENYON K.W., 1982. – Population status of the Hawaiian monk seal (*Monachus schauinslandi*), 1978. J. Mamm., 63(3): 415-421.

(*) JUANA E. (De), VARELLA J.M., WITT H.H., 1981. – The Mediterranean monk seal, *Monachus monachus*, in the Chafarinas islands (Mellila). Internation. Council Explor. Sea, Denmark, CM 1981/2, Mar. Mamm. Ctee: 1-3.

KING J.E., 1956. – The Monk Seals, genus *Monachus*. Bull. Brit. Mus. Nat. Hist., Zool.,

England, 3: 201-256.

KIORTSIS V., VERRIOPOULOS G., 1985. – Observations et inferences sur la biologie du phoque moine (*Monachus monachus*). Rapp. P.V. Commiss. internation. Explor. sci. Medit., Monaco, 29(8): 171-172.

(*) KTARI-CHAKROUN F., 1979. – Le phoque moine *Monachus monachus* (Hermann, 1779) en Tunisie. In: The Mediterranean Monk Seal, Proceeding of the First International Conference Rhodes, Greece, 2-5 May 1978. U.N.E.P. Technical Series, K. RONALD & R. DUGUY (Eds.), Pergamon Press Publ., Oxford & New York, 1: 179-180.

(*) KUMERLOEVE H., 1966. – Zum Vorkommen der Monchsrobbe, *Monachus monachus* (Hermann, 1779), im libanesischen Küstengebiet. Säugetierk. Mitt., Germany, 14: 114-118.

(*) KUMERLOEVE H., 1976. – Sur la presence du phoque moine, *Monachus monachus* (Hermann 1779) dans l'île de Kos, Dodecanese. Säugetierk. Mitt., München, Germany, 24(2): 159-160.

(*) KUMERLOEVE H., 1982. – Erneute bestatigung der Monchsrobbe, *Monachus monachus* (Hermann, 1779), im Bereich der Nordlichen Sporaden (Griechenland). Säugetierk. Mitt., Germany, 30(1): 1p.

LACY R.C., 1993. – VORTEX: A computer simulation model for population Viability Analysis. Wildl. Res., 20:45-65.

LACY R.C., HUGHES K.A., KREEGER T.J., 1994. – Vortex. Users manual. Version 6. A Stochastic simulation of the extinction process. IUCN, SSC, CBSG: section 1 -3.

LLOZE R., 1979. – Repartition et biologie du *Monachus monachus* (Hermann, 1779) sur la cote oranienne. In: The Mediterranean Monk Seal, Proceeding of the First International Conference Rhodes, Greece, 2-5 May 1978. U.N.E.P. Technical Series, K. RONALD & R. DUGUY (Eds.), Pergamon Press Publ., Oxford & New York, 1: 101 -112.

(*) LOPEZ-JURADO L.F., 1980. – Observaciones de foca monje (*Monachus monachus* Herm.) en las costas del sureste de la Peninsula Iberica. Donana Acta Vert., Sevilla, Spain, 7: 91-93.

(*) LOZANO-CABO F., 1953. – Nota sobre la presencia de un ejemplar de *Monachus monachus* (Hermann) en las costas de Alicante. Boll Real Soc. Esp. Hist. Nat., Spain 1953: 135- 138.

(*) LUNGO A. (Del), 1935. – La foca monaca, *Monachus albiventer* Bodd., nei marl de Sardegna. Rass. Faunist., Roma, Ital., 2: 13-19.

MAIGRET J., 1984 – The Monk Seal (*Monachus monachus*) on the saharian coast : present status of the colony. In: The Monk Seals, Proceedings of the Second International Conference, La Rochelle, France, 5-6 October 1984. K. Ronald & R. Duguay (Eds.). Ann. Soc. Sci. net.

Charente-Maritime, Fr., Suppl.: 52-55.

(*) MAIGRET J., TROTIGNON J., DUGUY R., 1976. – Le phoque moine *Monachus monachus* Hermann 1779, sur les cotes meridionales du Sahara. Mammalia, Fr., 39: 413-422.

(*) MARCHESSAUX D., 1977. – Will the Mediterranean Monk seal survive. Aquatic Mammals, Netherlands, 5: 87.

(*) MARCHESSAUX D., 1979. – Nouvelles donnees sur le phoque moine de Méditerranée, *Monachus monachus*, dans le golfe de Corinthe, Grece. Rapp. P.V. Reun. Commiss. internation. Explor. sci. Medit., Monaco, 25t26: 143-145.

(*) MARCHESSAUX D., 1983. – Distribution, status et biologic du phoque moine, *Monachus monachus*, sur les cotes de Grece. Memoire de D.E.A, Univ. Aix-Marseille III, Fac. Sci. St. Jerome, Fr.: 1-55.

(*) MARCHESSAUX D., 1986. – Conservation du phoque moine, *Monachus monachus*, sur la peninsule du Cap Blanc, Republique Islamique de Mauritanie. Plan d'amenagement de la Reserve Satellite du Cap Blanc. Rapport final, WWF/IUCN Project No.3690; World Conservation Centre, Gland, Switzerland: 1-34.

(*) MARCHESSAUX D., 1987a. – The Mediterranean Monk Seal in Turkey. Report on a mission to Turkey for IUCN and UNEP, World Conservation Centre, Gland, Switzerland: 1-24.

(*) MARCHESSAUX D., 1987b. – Etude de l'evolution du status du phoque moine en Tunisie et dans l'archipel de La Galite, Propositions pour une gestion regionale. UNEP-IUCN-RAC/SPA, GIS Posidonie Publ., Marseille, Fr.: 1-33.

(*) MARCHESSAUX D., 1988a. – Biologie, status et conservation du phoque moine, *Monachus monachus*. Rapp. Conseil de l'Europe; Parc National Port-Cros Publ., Fr. : 1-44.

(*) MARCHESSAUX D. (Ed.), 1988b. – Resultats des etudes scientifiques engagees par le Parc National de Port-Cros dans le cadre du Programme Communautaire pour la conservation du phoque moine. Rapp. Final Parc National Port-Cros, a Inst. Royal Sci. net. Belgique, Projet pilote A.C.E. 6611/28, Conservation du phoque moine dans la Communaute Europeenne: 34p.

MARCHESSAUX D., 1989. – Recherches sur la biologic, l'ecologie et le status du phoque moine, *Monachus monachus*. These de l'Universite d'Aix-Marseille 11, 285 pp. GIS Posidonie Publ., ISBN n°2-905540-13-3, Marseille, Fr.: 1-280.

MARCHESSAUX D., 1989. – Distribution et status des populations de phoque moine *Monachus monachus* (Hermann, 1779). Mammalia, 53(4): 621-642.

(*) MARCHESSAUX D., AOUAB T., 1988. – Le phoque moine sur le littoral Atlantique du Royaume du Maroc. Rapp. public par GIS Posidonie, Marseille, Fr. : 1-30.

MARCHESSAUX D., DUGUY R., 1977a. – Le phoque moine, *Monachus monachus*

(Hermann, 1779), en Grece. Mammalia, Fr., 41: 419-439.

MARCHESSAUX D., DUGUY R., 1977b. – Note sur l'observation du phoque moine, *Monachus monachus*, en Grece. Rapp. P.V. Commiss. internation. ExpJor sci. Medit., Monaco, 24: 27-30.

(*) MARCHESSAUX D., DUGUY R., 1979. – Le phoque moine, *Monachus monachus*, en Grece. In: The Mediterranean Monk Seal, Proceeding of the First International Conference Rhodes, Greece, 2-5 May 1978. U.N.E.P. Technical Series, K. RONALD & R. DUGUY (Eds.), Pergamon Press Publ., Oxford & New York, 1: 65-84.

MARCHESSAUX D., MULLER N., 1985. – Le phoque moine, *Monachus monachus*: Distribution, status et biologic sur la cote saharienne. Parc National Port-Cros Publ., Fr.: 1-68.

MARCHESSAUX D., MULLER N., 1987. – Le phoque moine *Monachus monachus* distribution, status et biologic sur la cote saharienne. Sci. Rep. Port-Cros natl. Park, 13: 25-84.

MAIGRET J., TROTIGNON J., DUGUY R., 1976. – Le phoque moine *Monachus monachus* Hermann 1779, sur les cotes meridionales du Sahara. Mammalia, 39: 413-422.

(*) MASSA B., 1972. – La foca monaca (*Monachus monachus*) esiste encore in Sicilia. Atti Soc. Ital. Sci. Nat. Mus. Civ. St. Nat. Milano, Ital., 113: 385-390.

(*) MATSAKIS J., (Ed.), 1985. – Etat de la population du phoque moine. In: Programme de recherches des Sporades du Nord. Departement de Biologie, Universite d'Athenes, Panepistimiou, Athenes, Greece: 45-73.

(*) MELO MACHADO A.J., 1978. – Historia dos mamiferos das Desertas. Notas Est. Mus. Mar, Cascais, Portugal, 1: 1-18.

(*) MERLO R., 1974. – La Galite. Mondo sommerso, Ital.

(*) MILES D., 1979. – In search of the monk seal. Hand in Hand, 3(1): 11-17.

(*) MINA-PALUMBO F., 1868. – Catalogo dei Mammiferi della Sicilia. Ann. Agr. Sic. Palermo, Ital., 12(2).

(*) MONOD T., 1923. – Note sur la presence de *Monachus albiventer* Bodd. sur la cote saharienne. Bull. Mus. net. Hist. nat., Paris., Fr., 29: 555-557.

(*) MONOD T., 1932. – Phoques sahariens. Terre Vie, Fr., 3: 257-261.

(*) MONOD T., 1948. – Le phoque moine dans l'Atlantique. Publ. Inst. Zool. Dr Augusto Nobre, Fac. cienc. Porto, Portugal, 34: 1-19.

(*) MONOD T., MA'JNY R., DUVAL G., 1959. – De la premiere decouverte de la Guinee. Recit par Diogo Gomes (fin du XVe siecle). Trab. Centro Est. Guinee Port., Guinee, 21: 1-71.

(*) MORALES-AGACINO E., 1945. – Algunos datos sobre ciertos mamíferos del Sahara occidental. *Boll Real Soc. esp. Hist. nat.*, Madrid, Spain, 43: 199-212.

MORALES-AGACINO E., 1950. – Notes sur le phoque moine (*Monachus monachus* Herm.) du littoral saharien espagnol. *Mammalia*, Fr., 14: 1-6.

MURSALOGLU B., 1964. – Occurrence of the monk seal on the Turkish coasts. *J. Mammal.*, U.S.A., 45: 316-317.

MURSALOGLU B., 1984. – The survival of mediterranean monk seal (*Monachus monachus*) pup on the Turkish coast. In: *The Monk Seals, Proceedings of the Second International Conference, La Rochelle, France, 5-6 October 1984*. K. Ronald & R. Duguay (Eds.). *Ann. Soc. Sci. net. Charente-Maritime, Fr., Suppl.*: 41 -47.

(*) MURSALOGLU B., 1986. – Pup-mother environment relations in the Mediterranean Monk Seal, *Monachus monachus* (Hermann, 1779), on Turkish coasts. *Comm. Fac. Sci. Univ. Ankara, Ser. C, Turkey* 5(4): 1-8.

(*) NORRIS W.J.T., 1972. – Monk Seals in Lybia. *Oryx*, England, 11: 328-330.

(*) NOTARBARTOLO DI SCIARA G., 1986. – La foca monaca in Italia c'e encore ? *Aqua*, Milano, Ital., 6: 12-13.

PANHOUSE J.B., 1957. – Les mammifères du Maroc. *Trav Inst. Sci. cherif.*, Tanger, Maroc, Ser. Zool. 5: 137-139.

(*) PANOU A., 1987. – Descriptive analysis and Pilot project for the establishment of a Conservation strategy for the Protection of the Monk Seal in Greece. Interim. Report to Inst. Royal Sci. net. Belgique, August 1987; Contract 6611/2B, Univ. Munich, West Germany,; 16p.

(*) PANOU A., RIES R., 1985. – Preliminary report on some data on the biology and behavior of the Mediterranean Monk Seal, *Monachus monachus*. *Rapp. P.V. Commiss. internation. Explor. sci. Medit.*, Monaco, 29(8): 173-174.

(*) POSTEL E., 1950. – Un phoque tropical: le phoque moine. *La Nature*, Paris, Fr., 3187: 341-342.

REIDMAN M., 1990. – *Seals, Sea Lions, and Walruses*. Univ. California Press, 439pp.

REIJNDERS P.J.H., DE VISSCHER M.N., RIES E. (eds), 1988. – *The Mediterranean Monk Seal*. IUCN publ., Gland. 59 pp.

(*) REINER F., 1981. – Contribuc, ao pare 0 estudo e problematica da conserve ceo do lobo-marinho *Monachus monachus*, Hermann 1779 no arquipelago da Madeira. *Mem. Mus. Mar, Cascais, Portugal*, 2(13): 1-14.

(*) REINER F., 1985. – Mammifères de l'Atlantique portuguais et le phoque moine de Madere.

These de Doctorat d'Universite, Univ. Aix-Marseille 111, Fac. sci. St Jerome, Fr.: 1-244.

(*) REINER F., DOS SANTOS M., 1984. – L'extinction imminente du phoque moine a Madere. In: The Monk Seals, K. Ronald & R. Duguay (Eds.). Proceedings of the Second International Conference, La Rochelle, France, 5-6 October 1984. Ann. Soc. Sci. net. Charente-Maritime, Fr., Suppl.: 79-87.

(*) REINHARDT S., SCHENK H., 1969. – Zur Verbreitung der GroBsauger auf Sardinien. Bonn. Zool. Beit., West Germany, 20: 429-436.

RONALD K., 1973. – The Mediterranean Monk Seal. In: Working Meeting on Threatened and Depleted Seals of the World. International Union for the Conservation of Nature and Natural Resources, Morges, Switzerland: 113-123.

RONALD K., 1979. – The Mediterranean Monk Seal : plan for survival. In Symposium: Protection of Flora, Fauna and Biotypes in Greece, Proc. Conf. Prot. Flora Fauna and Biotypes, Greece, Athens, 11 -13, Oct. 1979. Hell. Soc. Prot. Nat., Greece: 227-239.

(*) RONALD K., DUGUY R., (Eds.), 1984. – The Monk Seals, Proceedings of the 2nd International Conference, La Rochelle, France, 5-6 October 1984. Ann. Soc. Sci. Nat. Charente-Maritime, Fr., Suppl.: 1-120.

(*) RONALD K., HEALEY P., 1974. – Present status of the Mediterranean Monk Seal (*Monachus monachus*). College of Biological Science, University of Guelph, Ontario, Canada; Migration Series 100: 1-36.

RONALD K., HEALEY P., 1976. – The Monk Seal (*Monachus monachus*). Scientific consultation on marine mammals, F.A.O., Bergen, West Germany: 9p.

(*) RONALD K., YEROULANOS M., 1984. – A conservation plan for *Monachus monachus* on Greek islands and coasts. In: The Monk Seals, Proceedings of the Second International Conference, La Rochelle, France, 5-6 October 1984. K. Ronald & R. Duguay (Eds.). Ann. Soc. Sci. net. Charente-Maritime, Fr., Suppl.: 31 -40.

(*) ROSSER A., RITCHIE R., PROBY C., MILES D., GORDON J., CRONK Q., COMPTON-BISHOP Q., ASTILL D., 1978. – Status of the Mediteranean monk seal (*Monachus monachus*) in Tunisia. Environ. Conserv., Switzerland, 5(4): 298.

SALNIKOV M.E., 1959. – Nouvelles donnees sur le phoque moine. Nauk. Zap. Odessk. Sta. A.N.U.S.S.R., U.R.S.S., 1: 57-65. (en russe).

SCHEFFER V.B., 1964. – Hair patterns in seals (Pinnipedia). J. Morphol., U.S.A., 115: 291 -303.

SCHNAPP B., HELLWING S., GHIZELEA G., 1962. – Contributions to the knowledge of the Black Sea seal (*Monachus monachus*) Herm. Trav. Bucharest Muz. NatL. Istor. Nat. Grigori Antipa, Romania, 3: 383-400.

SERGEANT D.E., 1973b. – Environment and reproduction in seals. *J.Reprod. Fert.*, England, Suppl. 19: 555-561.

(*) SERGEANT D.E., RONALD K., BOULVA J., BERKES F., 1978. – The recent status of *Monachus monachus*, the Mediterranean Monk Seal. *Biol. Conserv.*, England, 14: 259-287.

(*) SERGEANT D.E., RONALD K., BOULVA J., BERKES F., 1979. – The recent status of *Monachus monachus*, the Mediterranean Monk Seal. In: *The Mediterranean Monk Seal, Proceeding of the First International Conference Rhodes, Greece, 2-5 May 1978*. U.N.E.P. Technical Series, K. RONALD & R. DUGUY (Eds.), Pergamon Press Publ., Oxford & New York, 1: 31-54.

(*) SORIGUER R.C., 1976. – Problemática y medidas de conservación de la foca fraile (*Monachus monachus*, Hermann 1779) en el sahara occidental. *Donana Acta Vert.*, Sevilla, Spain, 3: 75-78.

SORIGUER R.C., 1979. – Données sur la colonie de phoque moine de La Guera (Sahara occidental). In: *The Mediterranean Monk Seal, Proceeding of the First International Conference Rhodes, Greece, 2-5 May 1978*. U.N.E.P. Technical Series, K. RONALD & R. DUGUY (Eds.), Pergamon Press Publ., Oxford & New York, 1: 173-174.

(*) SQUA8RIA B., 1987. – Contribution a l'etude du phoque moine *Monachus monachus* (Hermann, 1779). *Mem. Dipl. Et. sup.*, Univ. Oran, Alg.,: 1-52 + 5 Fig., 11 cartes, 4 Tabl., 2 annexes h.t.

(*) TAGLIAFICO C., 1966. – Le “Monache” di Cala Gonone. *Mondo Sommerso*, Ital., 8(5): 449-455.

(*) TROTIGNON J., 1979a. – Le phoque moine (*Monachus monachus*) en Mauritanie: Données recensées. In: *The Mediterranean Monk Seal, Proceeding of the First International Conference Rhodes, Greece, 2-5 May 1978*. U.N.E.P. Technical Series, K. RONALD & R. DUGUY (Eds.), Pergamon Press Publ., Oxford & New York, 1: 133-140.

TROTIGNON J., 1979b. – Regression des phoques moines de la presqu'île du Cap Blanc en 1978. In: *Comptes rendus d'activites scientifiques (octobre 1977-fevrier 1979) du Parc National du Banc d'Arguin, Nouadhibou, Mauritanie*: 60-69.

(*) TROTIGNON J., 1982. – Les derniers phoques sahariens. *Courrier de la Nature*, Paris, Fr., 77: 14-20.

(*) VALVERDE J.A., 1957. – Aves del Sahara espanol. Instituto de Estudios Africanos, Madrid, Spain.

VAMVAKAS C.E., TSIMENIDIS N., KAINADAS H., 1979. – Contribution to the knowledge of the distribution pattern of the Monk Seal, *Monachus monachus*, in Greek seas. Conservation plan by the establishment of Marine parks. In: *The Mediterranean Monk Seal, Proceeding of the First International Conference Rhodes, Greece, 2-5 May 1978*. U.N.E.P.

Technical Series, K. RONALD & R. DUGUY (Eds.), Pergamon Press Publ., Oxford & New York, 1: 147-150.

(*) VERANY J.B., 1862. – Zoologie des Alpes-Maritimes. Nice, Fr.

(*) VERRIOPOULOS G., KIORTSIS V., 1985. – Frequence et repartition du phoque moine (*Monachus monachus*) en Grece: resultats d'une enquete (1982-1984). Rapp. P.V. Commiss. internation. Explor. Sci. Medit., Monaco, 29(8): 169-170.

WIJNGAARDEN A. (Van), 1962. – The Mediterranean Monk Seal. Oryx, England, 6: 270-273.

(*) WIJNGAARDEN A. (Van), 1969. – La colonie des phoques moines de La Guera au Rio de Oro. Bull. Union Int. Conserv. Nat., Morges, Switzerland, N.S., 2: 77.

