

CETACEANS IN THE EASTERN IONIAN SEA: RESULTS OF AN OBSERVERS' NETWORK

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Abstract In the Ionian Sea, Greece, a network for the collection of cetacean sightings has been established since 1989. Up to the present time, six cetacean species have been positively identified by photographs and/or by own sightings: the bottlenose dolphin (*Tursiops truncatus*), the common dolphin (*Delphinus delphis*), the striped dolphin (*Stenella coeruleoalba*), Risso's dolphin (*Grampus griseus*), Cuvier's beaked whale (*Ziphius cavirostris*), and the fin whale (*Balaenoptera physalus*). The first two species are considered as endangered in the Mediterranean. The presence of Risso's dolphins in the Greek part of the Ionian Sea was first stated through our network. Additionally, there are unconfirmed reports about at least four more species: sperm whales (*Physeter catodon*), pilot whales (*Globicephala melana*), killer whales (*Orcinus orca*) and false killer whales (*Pseudorca crassidens*). The biodiversity in cetacean species is particularly high in the eastern Ionian Sea. The network proved to be an effective tool for the collection of data.

Περίληψη Στο Ιόνιο πέλαγος λειτουργεί από το 1989 ένα δίκτυο συλλογής πληροφοριών για τα κητώδη της περιοχής. Μέχρι στιγμής έχει επιβεβαιωθεί με φωτογραφίες ή/και απ'ευθείας παρατηρήσεις η ύπαρξη έξι ειδών κητωδών: του ρινοδέλφινου, του κοινού δελφινιού, του ζωνοδέλφινου, του σταχτοδέλφινου, του ζιφιού και της περοφάλαινας. Τα δύο πρώτα είδη θεωρούνται απειλούμενα στη Μεσόγειο. Η ύπαρξη του σταχτοδέλφινου στο Ιόνιο πιστοποιήθηκε για πρώτη φορά μέσω του δικτύου. Υπάρχουν ακόμη ανεπιβεβαίωτες μαρτυρίες για την ύπαρξη τουλάχιστον άλλων τεσσάρων ειδών: του φυσητήρα, του μαυροδέλφινου της όρκας και της ψευδόρκας. Η βιοποικιλότητα της περιοχής σε κητώδη θεωρείται ιδιαίτερα υψηλή. Το δίκτυο είναι σημαντικό εργαλείο για την ευαισθητοποίηση του κοινού και τη συλλογή στοιχείων.

INTRODUCTION

The cetacean fauna of the Mediterranean is as yet largely unknown, especially with in its eastern part (MARCHESSAUX 1980, DUGUY *et al.* 1983, FAO 1987, MARTIN 1990). For the marine area of Greece, only limited and fragmentary information exists (CEBRIAN & PAPAConstantinou 1992, POLITI *et al.* 1992, ANDROUKAKI & TOUNDA 1994, CARPENTIERI *et al.* 1994, POLITI *et al.* 1994, PULCINI & ANGRADI 1994, Y. Pouloupoulos pers. comm.).

In the Ionian Sea, W.Greece (see Fig.1), a local network for the collection of cetacean sightings has been launched in 1989 by a permanent team of scientists working since 1985 on conservation issues in the area of the Central Ionian Sea (Mediterranean monk seal, marine turtles, fish resources etc.). Main aims of the project, designed on a long-term basis, are: (1) to collect information on cetacean biodiversity in that poorly studied area, and (2) to directly involve local people as well as visitors in their conservation.

METHODS

Occasional sightings or strandings of cetaceans along with data about the date, time and position of the observation, the number and behaviour of the animals and other details (necropsies, etc.) were recorded by the principal authors (KP, AP) and other scientists of the team during other work throughout their permanent presence in the study area for over a decade (1985-96). Additionally, information about sightings and strandings in former times has been collected. The network of local participants for the collection of cetacean observations was launched in 1989 on the occasion of the liberation of a nine m-long Cuvier's beaked whale (*Ziphius cavirostris*) by local professional fishermen. The animal had been entangled in drift nets, was severely lacerated on its back and dorsal fin by the net and burnt by the sun while floating on the surface (PANOU & TSELENTIS 1989). Since then, the number of participants motivated through public awareness activities on the basis of long personal contacts is steadily increasing.

Since 1990, sightings are being regularly collected by the co-authors and participants of the network (SK, SM, YM, LT, NV, VV. selected reliable and well-trained captains and crew of swordfish vessels based on the island of Kefalonia, Central Ionian Sea, Greece (see Fig.1). Fishing trips covered the entire Greek Central and S. Ionian Sea for the total of the fishing season (March-June through to September). Each observation was recorded on a single chart along with details about date, position, number of animals, etc., and, if possible, photographs were taken. Other contributors to the network - mainly coastal fishermen, crews of ferry boats and tourists visiting the area on leisure boats but also other local people - have contributed substantially to the collection of data by providing valuable information and films or photographs of their sightings. For instance, photographs of a stranded fin whale in the gulf of Argostoli, the capital of Kefalonia, in the early 50's, and of three fin whales in the channel between the islands of Kefalonia and Zakynthos in 1992 were provided by local people.

Identification of cetacean species at sea, however, can be done only by skilled and scientifically trained observers. Even so, it is sometimes impossible to be sure about the encountered species depending on weather and sea conditions, the sighting's duration, the distance from the observer, etc. Furthermore, training of local people is a rather gradual process. Therefore, and in order to avoid the presentation of possibly doubtful data about frequencies of sightings and numbers of animals, we refer in this paper only about cetacean species that have been identified with absolute certainty in the study area. Therefore, only information obtained either by direct observation in situ by the principal authors themselves or by photographs of good quality provided by the network's participants that allowed unbiased identification is considered. Quantitative data are not considered in this paper. As a result of this strict method of data evaluation, false killer whales, for instance, are not included in the list of species positively identified in the area of study: although the principal authors most probably observed two animals in the gulf of Myrtos, NW. Kefalonia, the photographs taken on the spot did not allow their identification since the animals' heads are not visible.

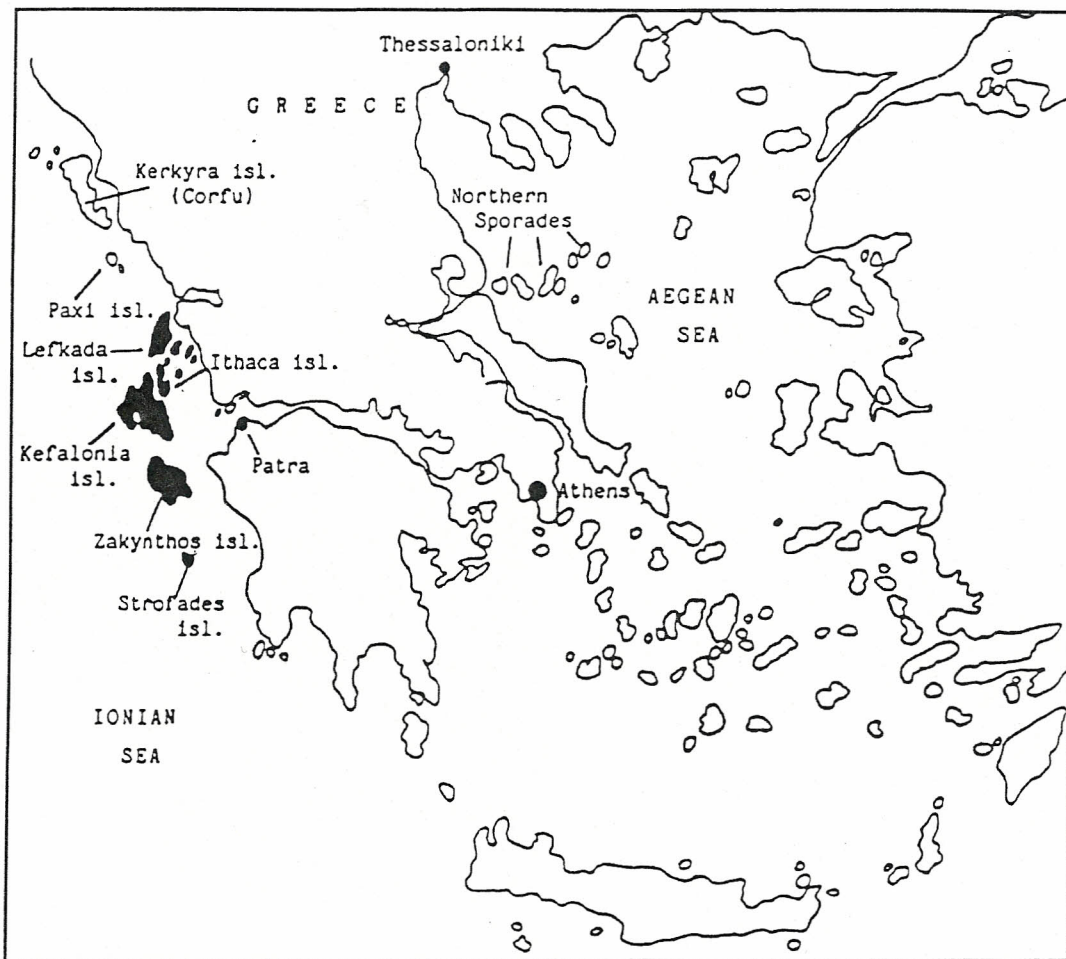


Fig.1 Map of Greece and the study area

RESULTS AND DISCUSSION

As yet, a total of six cetacean species has been positively identified by photographs and/or by own sightings: the bottlenose dolphin (*Tursiops truncatus*), the common dolphin (*Delphinus delphis*), the striped dolphin (*Stenella coeruleoalba*), Risso's dolphin (*Grampus griseus*), Cuvier's beaked whale (*Ziphius cavirostris*), and the fin whale (*Balaenoptera physalus*). The presence of Risso's dolphins in the Greek part of the Ionian Sea was first stated in 1995 by photographs obtained through the observers' network (NV).

Except for Risso's dolphin with only one confirmed observation off-shore, the other five species have been sighted also close to the shores. Some of them are often observed in shallow inshore waters. A large herd of 30-50 striped dolphins was observed for three hours in the Gulf of Myrtos, Kefalonia island, at a distance of 0.5 to 3 nautical miles from the shore; striped dolphins are often sighted in that area. Additionally, Cuvier's beaked whales are often reported from the same area. Bottlenose and common dolphins are frequently sighted in the Ithaca channel and the inshore waters east of Ithaca island. As mentioned above, three fin whales were photographed in the channel between the islands of Kefalonia and Zakynthos from where sightings of at least two dolphin species - yet to be identified - are also regularly reported.

Additionally to the above species, yet unconfirmed sightings of sperm whales (*Physeter catodon*), have often been reported by the network's participants from throughout the study area. Pilot whales (*Globicephala melana*) and killer whales (*Orcinus orca*) have been reported sporadically, and, as mentioned above, two false killer whales (*Pseudorca crassidens*) were most probably observed by the principal authors in 1995. Although the presence of these species could not be identified with certainty yet, their existence in the deep open waters of the eastern Ionian Sea is very probable (DI NATALE & MANGANO 1985, NOTARBARTOLO DI SCIARA 1987, MARTIN 1990).

The biodiversity in cetacean species is particularly high in the eastern Ionian Sea. From nineteen cetacean species known to occur in the Mediterranean, at least one third but most probably nearly two thirds occur in the study area including two highly endangered species in that region: *Tursiops truncatus* and *Delphinus delphis*. The deep waters of the Ionian Sea along the western part of the islands and in close proximity to the shore, coupled with productive inshore and off-shore waters may be one cause for the co-existence of this rather high number of cetacean species in a limited area and also the cause for the wandering into shallow waters of those cetacean species having well-known pelagic habits.

The reproduction of *Delphinus delphis* in the inshore waters of the Central Ionian Sea is confirmed (own observations; E. Politi, pers. comm.). This observation along with the confirmed reproduction of the sperm whale in the central Mediterranean Sea (DI NATALE & MANGANO 1985) and in the Aegean Sea (Y. Pouloupoulos, pers. comm.) as also an own observation of an eight m-long unidentified whale in the waters south of Zakynthos island loosing clots of blood and accompanied by approximately ten dolphins suggest that the eastern Ionian Sea may be a reproduction area for several cetacean species inhabiting the Mediterranean Sea.

The fast growing number of persons involved in the collection of information is a very important step towards the conservation of cetaceans in the study area. This fact, along with the results presented above, proves that the network is a particularly effective tool for the sensitization of the public and, in parallel, for long-term data collection since quite a large area is being covered both in time and space. At the same time, the public's acceptance for conservation measures and the preparedness for action when necessary are growing as the following example clearly demonstrates:

One severe threat to the cetaceans in the Ionian Sea is fishing with drift nets which were heavily used in the study area and the neighbouring off-shore waters over the period 1985-92, mainly by the Italian fleet (DE METRIO & MEGALOFONO 1988, NOTARBARTOLO DI SCIARA 1990, PANOU & MOSCHONAS 1990, PANOU *et al.* 1992, DI NATALE & NOTARBARTOLO DI SCIARA 1994). The generally disastrous impact of drift net fishing is well known. Since 1989, strong and repeated protests have been made through the network's participants towards national and international authorities against driftnetting in the Ionian Sea where the use of such gear may deplete the rich cetacean fauna along with swordfish and other marine resources. Among other activities, more than 5,000 signatures against driftnetting were collected and sent to Greenpeace and WWF, Rome, and in summer, 1992, five Italian swordfish vessels were caught operating illegally in the Gulf of

Myrtos, Kefalonia island, in a joint effort of the port police forces and fishermen. Since 1992, there has been a ban to drift nets longer than 2.5km by the EU. Nevertheless, fishing using drift nets still continues in the eastern Ionian Sea although with lower intensity than before.

Epizootics have affected the populations of dolphins (primarily striped dolphins) in the Ionian Sea in late summer 1991 (VAN BRESSEM *et al.* 1993, Panou, unpubl. data), and, possibly, also that of the beaked whales in 1993 when two animals stranded in S.Kefalonia (Panou, unpubl. data). Levels of PCBs and heavy metals are rather low in the study area (JACOBS & PANOU 1988, PANOU 1991, YEDILER *et al.* 1993), and are generally low throughout the Mediterranean compared to those in the North and Baltic Seas. However, and with respect to the conservation of cetaceans in the Mediterranean, these highly toxic contaminants may prove to be an important factor in the future, particularly regarding the long migratory routes of many cetacean species.

It is strongly recommended, paralleling the sensitization efforts such as the establishment of observers' networks etc., to design and implement effective protection measures in the coastal and pelagic zones of the Ionian Sea aiming at the conservation of the rich cetacean fauna. In particular, all efforts should be made to eliminate drift netting in this particularly sensitive area where also other highly endangered species such as the Mediterranean monk seal, *Monachus monachus*, and the Loggerhead turtle, *Caretta caretta*, live and breed.

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REFERENCES

- ANDROUKAKI E. & TOUNDA E. 1994. A preliminary study on the distribution and pathology of the Cetaceans in Greece. *8th Annual Congress of the European Cetacean Society. Montpellier, France, March 1994.*
- VAN BRESSEM M.F., VISSER I.K.G., DE SWART R.L., ORNELL C., STANZANI L., ANDROUKAKI E., SIAKAVARA K. & OSTERHAUS A.D.M.E. 1993. Dolphin Morbillivirus infection in different parts of the Mediterranean Sea. *Arch. Virol.* 129: 235-242.
- CARPENTIERI P., MARINI L. & CONSIGLIO C. 1994. A cetacean survey in the Aegean Sea: work in progress. *Eur. Res. Cetaceans* 8: 108-110.
- CEBRIAN D. & PAPAConstantinou C. 1992. Distribution of cetaceans in Greece 1990-1992. *Rapp. Comm. int. Mer Médit.* 33: 288.
- DE METRIO G. & MEGALOFONOUP P. 1988. Mortality of Marine Turtles *Caretta caretta* L. and *Dermochelys coriacea* (L.) consequent to accidental capture in the Gulf of Taranto. *Rapp. Comm. int. Mer Médit.* 31(2).

- DI NATALE A. & MANGANO A. 1985. Mating and calving of the Sperm Whale in the central Mediterranean Sea. *Aquat. Mamm.* 1: 7-9.
- DI NATALE A. & NOTARBARTOLO DI SCIARA G. 1994. A review of the passive fishing nets and trap fisheries in the Mediterranean Sea and of the cetacean bycatch. *Rep. int. Whal. Commn.* 15(Spec. Issue): 189-202.
- DUGUY R., CASINOS A., DI NATALE A., FILELLA S., KTARI-CHAKROUN F., LLOZE R. & MARCHESSAUX D. 1983. Répartition et fréquence des mammifères marins en Méditerranée. *Rapp. Comm. int. Mer Médit.* 28(5).
- FAO 1987. *Fiches FAO d'identification des espèces pour les besoins de la pêche. Méditerranée et Mer Noire, Zone de pêche 37, Volume II Vertébrés*, Rome, Italy. pp. 770-1529.
- JACOBS J. & PANOU A. 1988. *Conservation of the Mediterranean Monk Seal, Monachus monachus, in Kefalonia, Ithaca and Lefkada isl., Ionian Sea, Greece*. Final report to the EC, contract 6611/28, "Descriptive Analysis and Pilot Project for the Establishment of a Conservation Strategy for the Monk Seal and its Habitat", Institute of Zoology, Munich, Germany, December 1988. 221p.
- MARCHESSAUX D. 1980. A review of the current knowledge of the cetaceans in the eastern Mediterranean. *Vie Marine* 2: 59-66.
- MARTIN A. 1990. *The Illustrated Encyclopedia of Whales and Dolphins*. Salamander Books Ltd., London, U.K., 192p.
- NOTARBARTOLO DI SCIARA G. 1987. Killer whale, *Orcinus orca*, in the Mediterranean Sea. *Mar. Mamm. Sci.* 3(4): 356-360.
- NOTARBARTOLO DI SCIARA G. 1990. A note on the cetacean incidental catch in the Italian driftnet swordfish fishery, 1986-88. *Rep. int. Whal. Comm.* 40: 459-460.
- PANOU A. 1991. Heavy metals in the food chain of the Mediterranean monk seal. In: *Report on the Annual Meeting of the European Seal Group (ESG)*. Compiled by P.J.H. Reijnders, 6-7 March 1991, Texel, The Netherlands.
- PANOU A. & TSELENTIS L. 1989. *Report on a Cuvier's Beaked whale caught in drift nets in the Central Ionian Sea, Greece*. Unpubl. manuscript, August 1989.
- PANOU A. & MOSCHONAS S. 1990. *Incidental catches of Loggerhead turtles, Caretta caretta, in swordfish long lines in the Ionian Sea, Greece*. Unpubl. rep., Inst. of Zoology, Munich, Germany, 15p.
- PANOU A., ANTYPAS G., GIANNOPOULOS Y., MOURELATOS D., MOURELATOS CH., MOURELATOS G., MOSCHONAS S., TOUMAZATOS P., TSELENTIS L., VOUTSINAS N. & VOUTSINAS V. 1992. Incidental catches of Loggerhead turtles, *Caretta caretta*, in swordfish long lines in the Ionian Sea, Greece. *Testudo* 3(4): 47-57.
- POLITI E., BEARZI M., NOTARBARTOLO DI SCIARA G., CUSSINO E. & GNONE G. 1992. Distribution and frequency of cetaceans in the waters adjacent to the Greek Ionian Islands. *Eur. Res. Cetaceans* 6: 75-78.
- POLITI E., AIROLDI S., NOTARBARTOLO DI SCIARA G. 1994. A preliminary study of the ecology of cetaceans in the waters adjacent to the Greek Ionian islands. *Eur. Res. Cetaceans* 8: 111-115.
- PULCINI M. & ANGRADI A.M. 1994. Observations of Cuvier's beaked whale in the Ionian islands of Greece. *Eur. Res. Cetaceans* 8: 116-119.
- YEDILER A., PANOU A. & SCHRAMMEL P. 1993. Heavy metals in hair samples of the Mediterranean Monk Seal (*Monachus monachus*). *Mar. Poll. Bull.* 26: 156-159.

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