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the Hellenic Trench, Greece

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INTERNATIONAL  
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## UPDATE ON SPERM WHALE SHIP STRIKE RISK IN THE HELLENIC TRENCH, GREECE

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### ABSTRACT

Ship strikes are recognised as a significant threat to the eastern sub-population of Endangered Mediterranean sperm whales. Analyses of the distribution patterns of sperm whales and shipping in the Hellenic Trench, Greece suggest the potential for small changes in shipping routes to dramatically reduce collision risks. Examination of available data on fin whale distribution in the area provided no evidence that routing measures to take shipping offshore of areas of high sperm whale density would increase the risk of collisions to fin whales. A total of 28 sperm whale strandings have been reported between 1992 and 2014 along the coast of Greece. 23 of these were examined and of those, 12 showed clear evidence of ship strikes with another three that could possibly be due to ship strike. Eight of these strandings occurred along the coasts of the Hellenic Trench. Following meetings with the Greek authorities there is an interest to address the risks to sperm whales through routing measures. This would require a proposal to IMO based on a risk analysis to whales of potential routing options and an evaluation of the impacts of these options on shipping.

### INTRODUCTION

The Hellenic Trench is core habitat for the eastern Mediterranean sperm whale sub-population which is believed to number just a few hundred individuals (Frantzis et al., 2014a). The Mediterranean sperm whale population is considered as Endangered by IUCN and is at risk from driftnet entanglement and ship strikes. In 2014 the Committee considered an analysis of sperm whale and shipping distribution patterns in the Hellenic Trench (Frantzis et al., 2014b), which noted that the potential for small changes in shipping routes to dramatically reduce risk in these high risk areas suggested considerable scope for effective mitigation. Following this risk analysis and also considering the number of reported ship strike incidents, the Committee recommended that a dialogue should be initiated with shipping regulators and interests in the area.

However, the possibility that fin whales may occur further offshore than the current shipping routes was raised and it was suggested that there should be further study of those deeper waters prior to recommending that shipping move offshore. In this paper we review available data on fin whale distribution around the Hellenic Trench. We also report details of a number of sperm whale strandings showing evidence of ship strikes including a new case from 2014.

Contacts have been established between the Secretariat, the Marine Environment Protectorate Division and the Safety of Navigation Directorate of the Hellenic Coast Guard. Alexandros Frantzis and Paraskevi Alexiadou attended a meeting with Capt. (H.C.G.) Ioannis Kourouniotis and Capt. Alexandros Lagouros who head the Greek delegations to Maritime Safety Committee and Marine Environment Protection Committee respectively at IMO.

## FIN WHALE DISTRIBUTION IN AREA OF CONCERN

There have been no sightings of fin whales that we are aware of from the area of the Hellenic Trench (including the coastal and offshore waters) from Kefallonia to Pylos (SW Peloponnese), for which a movement of shipping routes has been proposed. Fin whales are also absent in W and SW Crete where also movement of shipping routes can be beneficial to sperm whales. Figure 1 shows sightings of sperm and fin whales around SW Greece from the last 25 years based on the national cetacean sighting and stranding database that is maintained by the Pelagos Cetacean Research Institute. This database contains more than 1800 sighting records from all the Greek Seas for the period 1990-2014 and a few older ones. Data originate mainly from dedicated surveys, but also from documented opportunistic observations and the literature. Forty four fin whale sighting records are included in the database. Fin whales have been observed repeatedly only in the northern Ionian Sea with a particular concentration north of Kefallonia and west-northwest of Lefkada islands (Figure 1). Any movement of shipping away from the west coast of the Peloponnese and areas of sperm whale concentration would have little or no impact on the area to the north where fin whales have been seen.

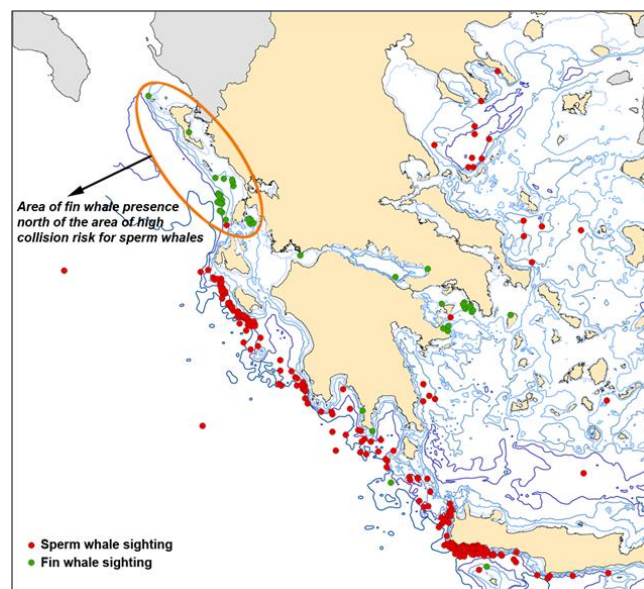


Figure 1. Locations of sperm and fin whale sightings in the Greek Seas during the last 25 years (1990-2014) plus a few older ones. Data originate from the national cetacean sighting and stranding database of Pelagos Cetacean Research Institute.

There have been several surveys further offshore in the Ionian Sea that have not reported any sightings of fin whales. These include surveys by IFAW (RV Song of the Whale; Lewis et al., 2007) in 2003 (Figure 2A), surveys by (Gannier et al., 2002) in 1998 and 2000 (Figure 2B) and surveys by Ocean Alliance (RV Odyssey; The Ocean Alliance; 2004) in 2004 (Figure 3A). None of these surveys reported any sightings of fin whales.

In addition, the Pelagos Cetacean Research Institute conducted surveys annually from 2002 to 2009 and in 2014 along the Hellenic Trench (Figure 3B) up to 10 to 70 km off the coasts (beyond the sperm whale high density zone). It has to be noted that these surveys covered also an area of the northern Hellenic Trench (west of Lefkada Island) where fin whales may occasionally occur. The absence of sightings over many years of surveys indicates that fin whales are scarce in the area. In addition, if fin whales were present further offshore in the area of Zakynthos or off the west and southwest Peloponnese, at least in some years they should be expected to be sighted closer to the coasts, as has been observed in the northern Ionian Sea and elsewhere.

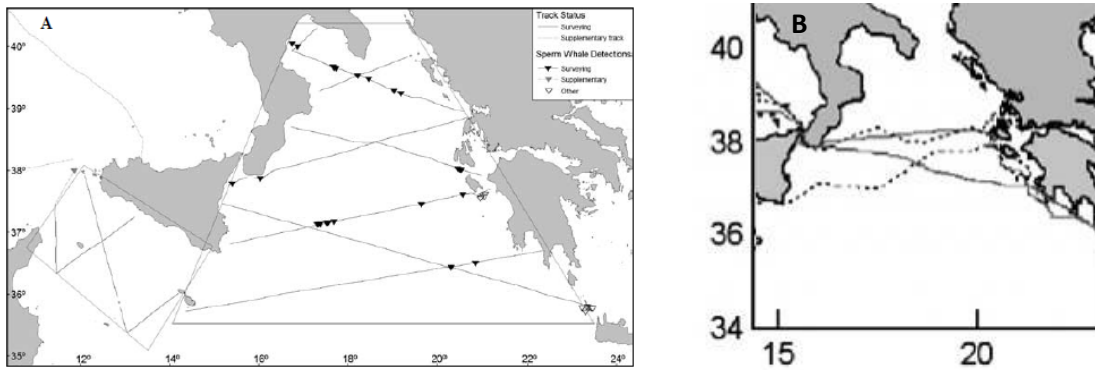


Figure 2. Survey tracks in the Ionian Sea from International Fund for Animal Welfare research vessel Song of the Whale in 2003 (A) and Gannier et al. in 1998 and 2000 (B). No fin whales were seen.. These survey tracks do include some acoustic only effort at night and poor sighting conditions. Triangles indicate sperm whale detections. Figures from (Lewis et al., 2007) and Gannier et al., 2002, respectively.

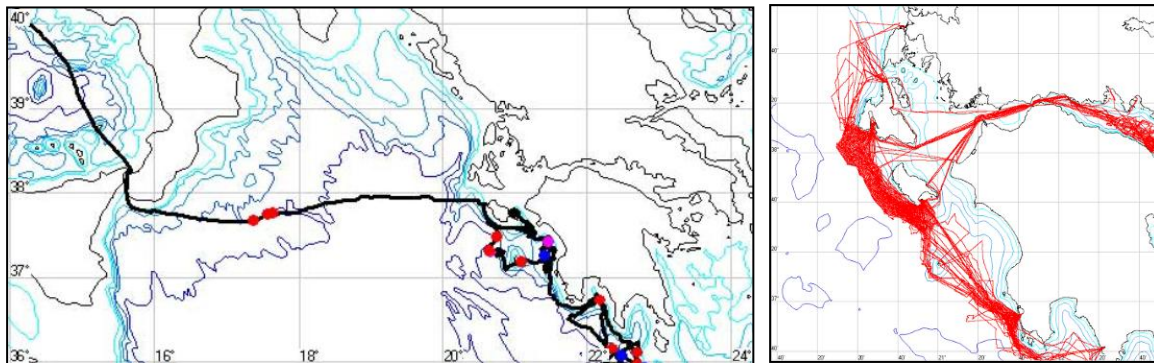


Figure 3. A: Transit by RV Odyssey in the Ionian Sea in 2004 (A). Cetacean species sightings (not including *P. macrocephalus*): *Stenella coeruleoalba* (red) and Unidentified dolphin species (blue). The sightings of loggerhead turtles (*Caretta caretta*) (pink) and *Monachus monachus* (black) are included. B: Survey tracks from surveys by the Pelagos Cetacean Research Institute in 2002 to 2009 and 2014. No fin whales were seen from these.

### INCIDENTS OF SPERM WHALE SHIP STRIKES

Twenty eight strandings of sperm whales have been recorded from 1992 to 2014 along the Greek coasts. In twenty three of these cases there was a visit in situ or the available photographic material that was collected shows the animal soon after the stranding. Twelve cases concern sperm whales with propeller marks or cuts that only a ship strike could provoke (Table 1). Three more cases could be the result of a ship strike and eight cases had no obvious ship strike signs or the death was shown to have another cause. Five of the stranded sperm whales that had ship strike marks plus three that potentially could be the result of a ship strike, were from the area of the Hellenic Trench. The total number of ship strikes with sperm whales is not known, since it would be expected that a number of carcasses would not strand or be recorded. In addition, live sperm whales with deep wounds apparently caused by propellers have been observed during surveys (at least four out of 181 photo-identified whales).

The most recent case occurred on 15 February 2014 in Agia Kyriaki Filiatron, 25 km north of Pylos in SW Peloponnese. The stranded sperm whale was a very freshly dead male 10.5 m long and had three big cuts from a large propeller all along its body (Figure 4).

Table 1. Data on sperm whale strandings that occurred along the coasts of Greece and had marks from a ship strike or could potentially be due to a ship strike. HT: Hellenic Trench.

#	Year	Location	Notes
1	1997	East Aegean Sea	Very fresh animal. Missing tailstock and large cut behind the dorsal fin.
2	1997	Cyclades, Aegean Sea	Three deep propeller cuts in front of the dorsal fin.
3	2001	SW Crete, HT	Very fresh animal. Large open wound at the base of the skull.
4	2001	Cyclades, Aegean Sea	2 m long incision laterally, from lower jaw to pectoral fin. <u>Potential</u> ship strike cannot be excluded.
5	2001	Cyclades, Aegean Sea	Three propeller cuts, two in front and one behind the dorsal fin.
6	2002	W Peloponnese, HT	Decomposed animal cut in two pieces. <u>Potential</u> ship strike cannot be excluded.
7	2004	North Crete	Two deep propeller marks laterally and ventrally, in front and behind the pectoral fin.
8	2005	W Peloponnese, HT	Three propeller cuts or marks, two in front and one behind the pectoral fin
9	2006	NW Aegean Sea	Two deep propeller cuts at the front and above and the blowhole
10	2007	West Crete, HT	Propeller cut on top of the head; stranded three days before the next record in the same location.
11	2007	West Crete, HT	Fresh animal cut in two just behind the dorsal fin.
12	2010	Central-East Aegean Sea	Very fresh animal with deep cut dorsally at the level of the blowhole.
13	2011	Corfu, North HT	Fresh animal. Cut and missing tailstock.
14	2012	Kythira Island, HT	Decomposed animal with cut at the tailstock. <u>Potential</u> ship strike cannot be excluded.
15	2014	SW Peloponnese, HT	Three deep propeller cuts, two in front and one behind the dorsal fin.



Figure 4. The most recent case of ship strike with a sperm whale occurred along the Hellenic Trench on 15 February 2014, 25 km north of Pylos in SW Peloponnese. Three big cuts from a large propeller were apparent on this very freshly dead whale.

## DISCUSSION

There has been a substantial amount of visual effort along the Hellenic Trench 10 to 70 km off the coasts and a number of surveys further offshore. The absolute lack of fin whale sightings from any of these studies suggests that fin whale densities are low in the Ionian and scarce if present in the area south of Kefallonia. The sightings that have been made further to the north were all close to the coast. If fin whales also occur further offshore in that area, they are far northern from the areas where shift in shipping is needed to protect sperm whales. It therefore seems unlikely that any shift in shipping away from the coast from Kefallonia and southern would increase the risk to fin whales.

The area to the west and southwest of Crete also has a high density of sperm whales but lower densities of shipping (Frantzis et al., 2014b) than the Hellenic Trench. Nevertheless, there have been reports of ship strikes to sperm whales (Table 1). Further analyses of shipping data are planned in this area to ensure that any proposed measures are as effective as possible for minimizing risks in this area as well.

Following meetings with the Greek authorities there is an interest to address the risks to sperm whales through routing measures. This would require a proposal to IMO based on a risk analysis to whales of potential routing options and an evaluation of the impacts of these options on shipping. Analysis of the effects on shipping needs to include economic, maritime safety and other potential environmental impacts. Paragraph 7 of the ‘Guidance document for minimizing the risk of ship strikes with cetaceans’ adopted by the IMO in 2009 (MEPC MEPC.1/Circ.674) lists the following principles to be taken into account with proposals for action to reduce and minimize ship strikes of cetaceans;

- 1) maritime safety is of paramount concern;
- 2) any actions taken should seek to accomplish the biological objective of reducing and minimizing the risk of ship strikes while also taking into account adverse impacts on the shipping industry and other interested entities;
- 3) documentation and the best available research on the identified species of concern as well as information pertaining to the vessel traffic in the area (e.g., types of vessels, traffic patterns, and density of traffic) should be gathered and analysed to determine the risk of a whale/ship interaction;
- 4) any measures adopted should be based on the best available science and be narrowly tailored to the time when, and areas where, the species is present;
- 5) action taken to address ship strikes should be part of an overall strategy for protection and recovery of the identified species;
- 6) a range of possible solutions to address ship strikes should be carefully analysed in light of the risk to the populations or species, the relative threat posed by ship strikes, and the impact on maritime safety and commerce; and
- 7) all actions taken should be reviewed periodically to determine their effectiveness and whether they should be adjusted to further reduce and minimize the risk of ship strikes.

It is anticipated that the advice of the Committee could be particularly relevant to items 3,4 and 6.

#### **ACKNOWLEDGEMENTS**

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