

Sightings and stranding reports of fin whales (*Balaenoptera physalus*) in the Levantine Sea

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ABSTRACT

Fin whales (*Balaenoptera physalus*) are the most commonly observed mysticetes within the Mediterranean Sea. Their IUCN red list status remains vulnerable (VU) with their population in decline, mainly due to increasing anthropogenic stressors. Sightings of fin whales in the eastern Mediterranean are negligible relative to the central and western basins which gives the impression that the eastern Mediterranean provides a less favourable habitat for these cetaceans. This study outlines the sighting and stranding reports of fin whales in the Levantine Basin, the latest sighting (an opportunistic sighting of four sub-adults off the coast of Anamur, Turkey in March 2019) alongside previous sightings and strandings, to demonstrate the presence of this species in the eastern Mediterranean. This short paper highlights the need for increased targeted survey effort and collaborative research between these neighbouring waters to enhance our understanding of the population status of this vulnerable species and aid in the implementation of the necessary conservation actions that are long overdue.

KEYWORDS: FIN WHALE; INCIDENTAL SIGHTINGS; LEVANTINE SEA; MEDITERRANEAN; STRANDINGS; CONSERVATION; DISTRIBUTION.

INTRODUCTION

Fin whales are regularly observed within the western and central Mediterranean basins where they show seasonal feeding aggregations with high site fidelity (Canese *et al.*, 2006; Notarbartolo di Sciara *et al.*, 2016; Notarbartolo di Sciara *et al.*, 2003). They are rarely seen in the eastern Mediterranean. Notarbartolo di Sciara *et al.* (2003) reported 28 fin whale encounters in the eastern Mediterranean, 15 and 13 in the Levantine and Aegean respectively, compared to more than 80 in the central Mediterranean (Adriatic and Ionian) and 2,266 in the western Mediterranean (from Sicily to the Strait of Gibraltar). This is however likely due to the bias in survey effort as well as the actual presence of fin whales. Many of the countries that line the northern coast of the central and western Mediterranean are part of the European Union and are required to report the conservation status of species such as fin whales listed as part of the EU Habitats Directive (Article 17, Arcangeli *et al.*, 2017). Whereas the countries surrounding the Levantine in the eastern Mediterranean are not obliged to conduct these dedicated studies.

Fin whales are listed as vulnerable on the IUCN list and currently there are no Mediterranean basin-wide abundance estimates for fin whales, with estimates only existing for regions within the western Mediterranean basin (Bauer *et al.*, 2015; Forcada *et al.*, 1996; Forcada *et al.*, 1995; Laran *et al.*, 2016; Panigada *et al.*, 2011; Panigada *et al.*, 2017). Their abundance within the western basin has been found to be highest from late spring to early summer, during the feeding season (Kerem *et al.*, 2012), and has shown a reduced abundance during

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winter (Forcada *et al.*, 1995; Gannier and Gannier, 1993; Laran and Drouot-Dulau, 2007; Laran *et al.*, 2016) when they likely disperse throughout the basin (Notarbartolo di Sciara, 2002). Genetic studies also suggest that the Mediterranean sub-population of fin whales are endemic due to the area providing both suitable breeding and feeding grounds (Bérubé *et al.*, 1998; Notarbartolo di Sciara, 2002). Within the Strait of Messina there is a year-round presence of fin whales, with an increased abundance from the end of summer to the end of autumn (Aïssi *et al.*, 2008; Sciacca *et al.*, 2015). In the Strait of Sicily, an increased abundance off the coast of Lampedusa has been observed in winter which has led to the suggestion that this region may be a winter-feeding ground (Canese *et al.*, 2006; Panigada *et al.*, 2017; Sciacca *et al.*, 2015).

There is considerable uncertainty regarding the presence, habitat use and movements of fin whales in the Levantine Basin, due to a lack of observations (Notarbartolo di Sciara *et al.*, 2016). However, Druon *et al.* (2012) produced potential fin whale feeding models that suggest a suitable habitat exists in the Levantine Basin from autumn to spring. Although, Kerem *et al.* (2012) contradicts this by stating that the extremely oligotrophic conditions in the Levantine would likely not be able to meet the feeding requirements.

The current report documents recent sightings of fin whales off the coast of Turkey and provides a compilation of the sightings and stranding records of fin whales from the last 50 years within the Levantine Basin.

MATERIALS AND METHODS

The authors undertook a comprehensive review of peer-reviewed articles relating to sightings, strandings and distribution of fin whales throughout the Levantine Sea in the last 50 years. The search used web-based databases including Google Scholar, JSTOR, Wiley, Science Direct, Scopus and Web of Science, which were selected due to access to a wealth of papers from different disciplines. Alongside this, routine searches for fin whale sightings on the social media platforms of Instagram, Facebook and YouTube were conducted. By contacting the account holders for the videos obtained which depict fin whale sightings, it was possible to collect information regarding date and location. However, exact geographic coordinates could not be recorded in all instances, so descriptions of sighting and stranding locations were used to approximate their geographic location. Recent sightings, historic sightings and strandings were mapped using ArcGIS (version 10.3.1).

RESULTS

According to previous and current sighting and stranding reports, fin whales have been encountered on at least 23 different occasions since the early 1970s within the Levantine Basin, with the majority of recordings concentrated in the territorial waters of Israel and Turkey (Table 1). There are generally more marine mammal studies conducted in Israel and Turkey, with Turkey having a considerably larger coastline than the other countries in the Levantine and so these higher recordings are likely biased by effort. While the presence of fin whales was regularly reported from Israel, with the highest number of recordings originating from Haifa Port (Kerem *et al.*, 2012), reports of the species were limited for Turkey (Notarbartolo di Sciara *et al.*, 2016; Notarbartolo di Sciara *et al.*, 2003; Öztürk, 1996). However, the sporadic and opportunistic nature of the data collection limits our understanding of their abundance, residency patterns and site fidelity.

Two instances of videographic evidence show sightings of fin whales within the Turkish Levantine Sea in the last five years. The first describes a single fin whale sighting on 10 May 2014, near İskenderun in MMK Metalürji Port³. The video depicts the whale travelling alongside the cargo ship from which the video was recorded, for a duration of 42 seconds. The individual is seen surfacing numerous times before diving and disappearing from sight. The second instance refers to a video recorded on 8 March 2019, by a member of the Turkish tourism agency (Cennet Anamur), of at least four individual fin whales, considered to be sub-adults due to their size, observed 15km off the coast, between Kaledran and Anamur, travelling alongside the vessel from which the video was taken (Fig. 1). The whales are visible for 10 seconds before disappearing below the surface.

Overall, fin whale strandings were reported on twelve occasions and sighted on thirteen, including the most recent ones in Turkish territorial waters (Table 1; Fig. 2). The majority of the sightings and strandings were

³<https://www.youtube.com/watch?v=XJGjf6fjOkA>.



Fig. 1. Frame extracted from videographic evidence from the most recent fin whale sighting (2019).

Table 1

Sighting and stranding information for fin whales over the last five decades.

'–' refers to instances where information was absent. SI = Sighting; ST = Stranding; NA = Not applicable; M = Male; F = Female; C = Current report; * = approximated geographic coordinates.

| ID | Date | SI/ST | GPS location | | Area | Depth (m) | Ind no. | Juv. | Sex | References |
|-----|--------------|-------|--------------|-------------|---------------------------|-----------|---------|------|-----|-------------|
| | | | Lat. | Long. | | | | | | |
| 1 | 1971 | ST | 36°52.428'N | 30°39.624'E | Antalya, Turkey | – | 1 | – | – | [1] |
| 2 | 1980 | ST | 31°3.203'N | 32°39.949'E | Dakhla, Sinai, Egypt | – | 1 | 1 | – | [3] |
| 3 | Feb. 1981 | ST | 32°43.017'N | 34°96.624'E | Megadim, Israel | – | 1 | – | – | [3] |
| 4* | 1987–95 | SI | 36°39.252'N | 28°58.596'E | Fethiye, Turkey | – | 1 | – | – | [2] |
| 5* | 1987–95 | SI | 36°48.036'N | 30°40.998'E | Antalya, Turkey | – | 1 | – | – | [2] |
| 6 | 27 Dec. 1993 | SI | 31°26.178'N | 33°50.388'E | Gaza | 600 | 1 | – | – | [3] |
| 7 | 21 Jul. 1997 | ST | 33°02.37'N | 35°05.298'E | Nahariyya, Israel | 5 | 1 | – | – | [3] |
| 8 | 08 Mar. 2000 | ST | 36°46.164'N | 35°47.514'E | Yumurtalık, Adana, Turkey | NA | 1 | 1 | F | [4] [5] |
| 9* | 15 Jun. 2000 | ST | 32°49.584'N | 34°57.534'E | Haifa Port, Israel | 11 | 1 | 1 | – | [3] |
| 10 | 21 Oct. 2001 | SI | 34°57.036'N | 33°43.374'E | Larnaka Bay, Cyprus | – | 3+ | 1 | – | [2] [6] |
| 11 | 08 May 2002 | ST | 36°45.516'N | 35°41.964'E | Yumurtalık, Adana, Turkey | NA | 1 | – | M | [3] [4] [7] |
| 12* | 11 Apr. 2005 | ST | 32°49.902'N | 34°58.164'E | Haifa Port, Israel | NA | 1 | 1 | M | [3] |
| 13 | 14 Nov. 2006 | SI | 31°48.204'N | 34°34.302'E | Ashqelon, Israel | 48 | 5 | – | – | [3] |
| 14 | 09 Feb. 2007 | SI | 32°10.338'N | 34°43.632'E | Tel Aviv, Israel | 30 | 1 | – | – | [3] |
| 15* | 15 Feb. 2007 | ST | 32°47.118'N | 34°57.204'E | Haifa Port, Israel | NA | 1 | 1 | M | [3] |
| 16* | 04 Feb. 2008 | ST | 31°38.28'N | 34°31.206'E | Ashqelon, Israel | NA | 1 | – | M | [3] |
| 17* | 26 Jul. 2008 | SI | 32°49.422'N | 35°0.21'E | Haifa Port, Israel | 14 | 1 | – | – | [3] |
| 18* | 03 Apr. 2009 | SI | 32°05.322'N | 34°46.026'E | Tel Aviv, Israel | – | 1 | – | – | [3] |
| 19* | 16 May 2010 | ST | 31°59.322'N | 34°40.35'E | Israel | NA | 1 | – | – | [3] [5] [8] |
| 20 | 03 Feb. 2012 | SI | 31°48'N | 34°36'E | Ashqelon, Israel | – | 2 | – | – | [8] [9] |
| 21* | 29 Aug. 2013 | ST | 31°44.244'N | 34°35.61'E | Ashqelon, Israel | NA | 1 | – | – | [3] [5] [8] |
| 22* | 12 May 2014 | SI | 36°36.312'N | 36°11.382'E | Iskenderun, Turkey | – | 1 | – | – | C |
| 23* | 08 Mar. 2019 | SI | 35°55.344'N | 32°35.406'E | Anamur, Mersin | – | 4–6 | 4–6 | – | C |

References: [1] Öztürk (1996). [2] Notarbartolo di Sciara *et al.* (2003). [3] Kerem *et al.* (2012). [4] TUDAV. [5] MEDACES. [6] Frantzis and Economou, pers. comm. [7] Çiçek *et al.* (2007) [8] IMMTRAC. [9] OBIS-SEAMAP. [10] Marchessaux (1980) in Notarbartolo di Sciara *et al.* (2003). [11] Öztürk, pers. comm., in Notarbartolo di Sciara *et al.* (2003).

reported during spring months with the highest number of reports within Turkish waters being from Iskenderun. All the recordings in Turkish waters refer to sightings of single individuals, except the latest sighting in 2019, which was a sub-adult group of four to six individuals (Fig. 1, Table 2).

There are also reports of Israeli parties having spotted fin whales close to the shore on three occasions. Two such occasions reported a lone individual and one occasion reported a group consisting of five individuals, however no further information was provided (Kerem *et al.*, 2012). Additionally, in the 1930s and 1940s, fin whale jaw bones would occasionally be brought up by bottom trawlers off the coast of Jaffa, Israel (Mendelsohn H, Yom-Tov Y. in Kerem *et al.*, 2012).

Table 2
Number of sightings reported separated into countries
and mean group size.

| | Number of sightings | Mean group size |
|--------|---------------------|-----------------|
| Turkey | 4 | 1.8 |
| Israel | 6 | 1.8 |
| Cyprus | 1 | 3 |

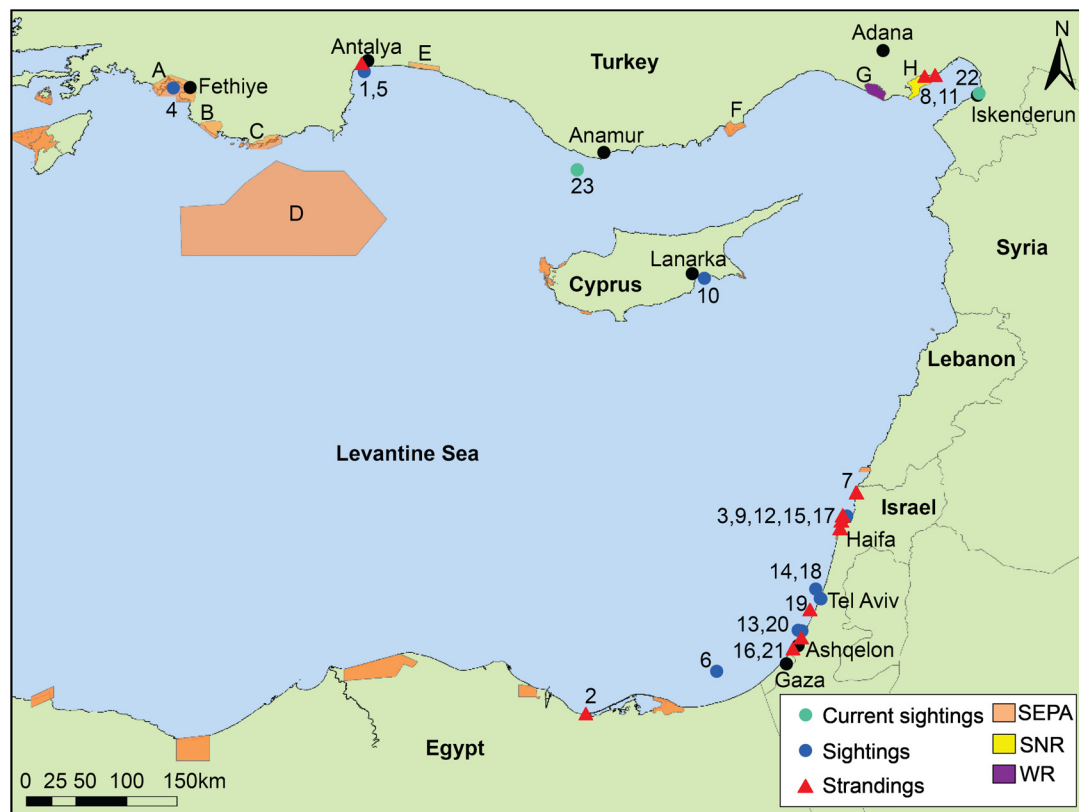


Fig. 2. Geographic locations of sightings and strandings of *B. physalus* throughout the Levantine Basin with respect to MPCA boundaries, numbers correspond to ID (Table 1). (A) Fethiye-Göcek SEPA, (B) Patara SEPA, (C) Kaş-Kekova Special Environmental Protected Area (SEPA), (D) Finike Seamount SEPA, (E) Belek SEPA, (F) Göksu Delta SEPA, (G) Akyatan Wildlife Refuge (WR), (H) Yumurtalık Lagoon Strict Nature Reserve (SR).

DISCUSSION

Based on the reports of fin whales to date in the Turkish Levantine Sea, it appears that the waters between Iskenderun and Adana are likely to hold potentially important habitats for fin whales. The coastal waters of Israel contain a large portion of the encounters within the Levantine Sea, with a concentration around Haifa port. This suggests that this region may also hold potentially important habitat for fin whales. Furthermore, the numerous recordings of sub-adults may indicate the presence of previously unknown calving grounds in the Mediterranean

Basin (Notarbartolo di Sciara, 2002). Nevertheless, without dedicated survey efforts in the Levantine Sea, reaching an accurate conclusion is not feasible.

These sightings also confirm the importance of selected Marine and Coastal Protected Areas (MCPAs) on the sustainable existence of marine biodiversity. Cetaceans are considered indicator species of ecosystem health and are hence used as flagship species for MCPA implementation (Bearzi and Saylan, 2011; Bossart, 2011; Hooker *et al.*, 1999). Yet only 4% of Turkish territorial waters are protected by law (MPAtlas, 2019) and only three of the protected areas along the Turkish Levantine coastline extend offshore.

Although encounters with fin whales are recorded year-round, with sightings reported in each of the four seasons and strandings reported in spring, summer and winter months, the data here is limited. It would be of great benefit to conduct a basin-wide winter survey to investigate the theory that fin whales are more abundant in the area than the present data would suggest. A recent ACCOBAMS Survey Initiative was carried out in the summer of 2018, using visual methods (aerial and boat-based surveys) as well as Passive Acoustic Monitoring in order to provide an overview of abundance and distribution of all species in the Mediterranean. Despite the sightings and stranding reported here, that ACCOBAMS survey did not record any fin whales in the Levantine Basin.

A lack of knowledge and understanding is inevitably the biggest setback to marine conservation. The Levantine Basin, including its Turkish waters, is identified as one of the least known waters of the entire Basin (Mannocci *et al.*, 2018). Therefore, an increase in dedicated cetacean research effort, with international collaboration between neighbouring waters, is of critical importance to collecting the missing baseline data and to comprehensively map the abundance and distribution of at-risk cetacean species like fin whales, within the Levantine Sea. Only then can we understand their population status, movement patterns and key habitats (i.e. foraging, breeding and calving), within the Levantine Sea.

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