

SHORT COMMUNICATION

Two sperm whale (*Physeter macrocephalus*) sightings in Cyprus from social media

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Abstract

We report on two sightings of sperm whales (*Physeter macrocephalus*) off eastern Cyprus, in the Eastern Mediterranean, reported through social media. The records are of relevance because there is a paucity of information for this endangered population in Cyprus waters, these being the first published direct observations. One is of a solitary male and another of a social unit. Human threats to the species such as anthropogenic noise and plastic debris are significant and growing. Long-term systematic surveys are called for, to better understand the ecology of the species in Cyprus waters, while opportunities for better reporting of deep-diving cetaceans are discussed. Marine development and resource exploitation projects must be appropriately assessed and their impacts on deep diving cetaceans mitigated.

Keywords: Cetacean, marine mammal, sperm whale, Cyprus, citizen science, fisher, *Physeter macrocephalus*

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Marine megafauna such as sea turtles, cetaceans, seabirds, large elasmobranchs and pinnipeds, typically roam across great distances, often using habitats over the scales of ocean basins (Croxall *et al.* 2005; Hays and Scott 2013). Due to their long generation times and low reproductive rates (Lewison *et al.* 2004), these species are susceptible to population declines in response to increasing human pressures such as fisheries bycatch (Peckham *et al.* 2007), interactions with anthropogenic marine debris (Battisti *et al.* 2019; Duncan *et al.* 2018) and seismic surveys (Nelms *et al.* 2016; Wright and Cosentino 2015). Therefore, international and regional conventions have been established, requiring contracting parties to identify important habitats for these species and to protect them, for example through fisheries legislation and establishment of networks of Marine Protected Areas (Bustamante *et al.* 2014; Hays *et al.* 2019; Ramirez *et al.* 2017). However, development of such management solutions is often hindered by lack of information, since these highly migratory and often elusive marine animals are difficult to study (Maxwell *et al.* 2013; Robinson *et al.* 2009). Deep-diving whales, such as Ziphiidae (e.g., *Ziphius cavirostris*, *Hyperoodon* spp. and *Mesoplodon* spp.) and sperm whales (families Physeteridae and Kogiidae), provide a great example, as their use of deep, offshore habitats and their long dive durations make them particularly difficult to detect and survey (Virgili *et al.* 2019). Considering the relatively sparse global literature base for these species (especially in regions such as in the Eastern Mediterranean where survey data are scarce (Boisseau *et al.* 2010; Dede *et al.* 2012; Diogou *et al.* 2019)) every opportunity should be used to report on their observations.

Sperm whales (*Physeter macrocephalus*) in the Mediterranean Sea form a genetically distinct, Endangered sub-population (Notarbartolo di Sciara 2014) which is in decline due to threats including fisheries bycatch, ship strikes, ingestion of marine debris and direct impacts of anthropogenic noise (Notarbartolo di Sciara 2014; Frantzis *et al.* 2019). Although survey data are low in many areas, sperm whales are thought to roam across the Mediterranean Sea, congregating in favourable habitats (Boisseau *et al.* 2010). Published acoustic transect survey data estimate a population density of 2.1 individuals per 1000 km² in the Western Basin and 0.1 individuals per 1000 km² in the Eastern Basin (Lewis *et al.* 2018). In the Eastern Basin, the Central Aegean, Hellenic Trench and Northern Ionian Seas appear to be core areas of sperm whale habitat use (Lewis *et al.* 2018). Among these, the Hellenic Trench (IUCN-MMPATF 2017) is of regional significance, as an area where sperm whales using both basins converge, with particularly high densities (Lewis *et al.* 2007; Frantzis *et al.* 2014; Lewis *et al.* 2018) and high human threats (Frantzis *et al.* 2019).

The few Mediterranean-wide acoustic and visual survey assessments for sperm whales did not detect any in Cyprus waters (Boisseau *et al.* 2010; Lewis *et al.* 2018). However, sperm whales were detected acoustically off the south of Cyprus

during a regional survey (Ryan *et al.* 2013) and in 2017 three individuals were photographed off South-West Cyprus during an unpublished survey (Frantzis *et al.* 2019). One of which had previously been identified using the Hellenic Trench, Western Greece, in 2008 (Frantzis *et al.* 2019). Before this recent observation, no direct visual encounters have been made around the island (Reeves and Notarbartolo di Sciara 2006).

This short communication reports two recent observations of sperm whales off the east coast of Cyprus. In publishing these records our aim was to highlight the presence of sperm whales in Cyprus and promote their consideration in research and conservation efforts in the region.

The two observations of sperm whales off Eastern Cyprus, one on October 10, 2015, and one on June 13, 2019 were sourced at online media platforms (YouTube and Facebook respectively). Uploaded videos were encountered by the authors using the search engine Google and through reports at a Facebook page for amateur fishers. The authors contacted the observers by phone and asked them to provide date, location, depth, sea state, number of individuals observed, duration of observation, and to comment on the behaviour of the whales. Observers agreed permission of the authors to use the online clips for scientific publication.

In both observations, the whales were identified as sperm whales (*Physeter macrocephalus*) based on their morphology, such as distinct square heads, wrinkled skin, dorsal fins and triangular flukes (Otero *et al.* 2019).

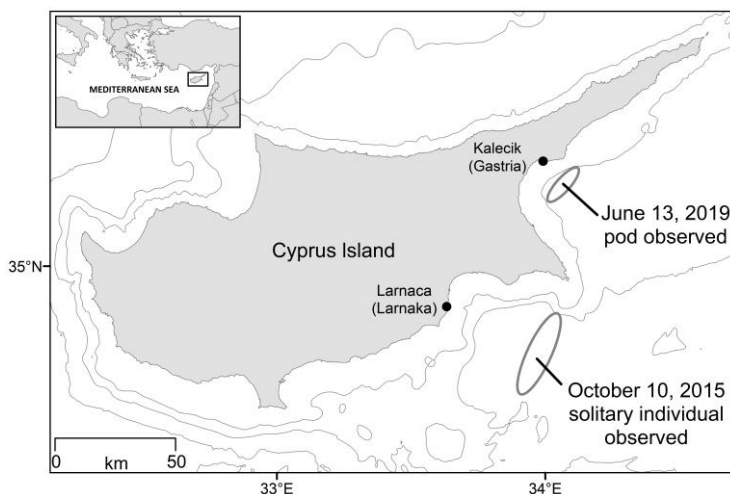


Figure 1. Map showing approximate location of two sperm whale pod sightings off western Cyprus described in this article. Grey bathymetric contours are 500, 1000 and 2000 and use gridded bathymetric data sourced at GEBCO (General Bathymetric Chart of the Oceans; www.gebco.net).

The first observation was of a solitary individual on the morning of October 10, 2015, by an anonymous observer. The whale was filmed 20 – 25 nautical miles off the City of Larnaca (Figure 1), where it was observed at the surface for approximately one hour before the observer began filming and moved the vessel closer to the whale. No depth information was recorded, and no coordinates were available. The sea state was Beaufort two. The 1 minute and 24 second video clip shows a mature whale at the surface filmed from the whale's right side (Figure 2a), with the vessel moving closer and posteriorly around the whale to also film its left side. The whale travelled directionally throughout the clip and made three blows before making a deep vertical dive (Figure 2b). According to the position of land and the aspect of the sun in the clip, the direction of travel is approximately southwest.

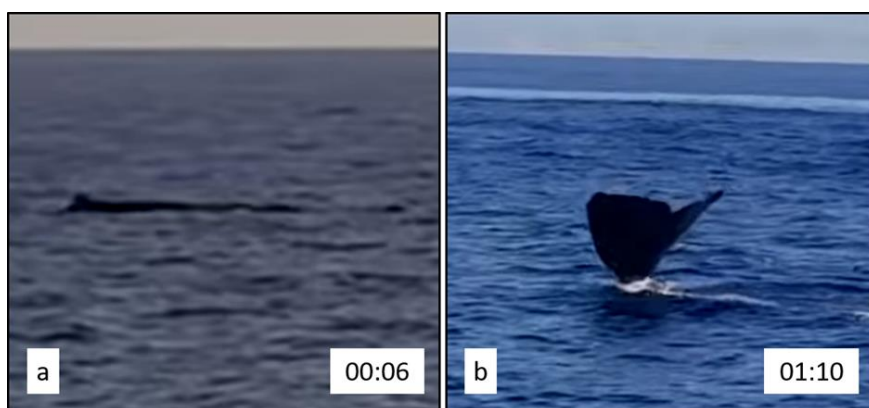


Figure 2. Solitary male sperm whale sighted off the Southeast of Cyprus 10 October 2015 a) lateral view and b) fluke during dive. Figures in bottom left corners of each panel represent time of each frame within the 01:24 minute video clip.

The second observation was made by sports fishers and reported through the social media operated by the Non-governmental Organisation SABDER (Sportif Amatör Balıkçılık Deniz Koruma Derneği; Sport and Amateur Fishing and Marine Conservation Society). On June 13, 2019, a group of fishers were jig fishing for albacore (*Thunnus alalunga*) in Famagusta Bay in a recreational outboard fishing vessel. Sea state was Beaufort zero. At 18:00 the fishers noticed a pod of whales at the surface and approached them. No coordinates were available. The vessel sonar device read approximately 650m for depth (Figure 1). The fishers described the location as being off the village of Kalecik (Gastria). During the 1 minute and 45 second clip, the vessel approached the whales to an estimated distance of 10-15 m and maintaining this distance the fishers cruised past the pod. By viewing the clip frame-by-frame, we confirmed a minimum of four sperm whales in the observed pod (Figure 3a). The fisher, however, stated that the pod was part of a larger group which they estimated to contain

approximately 20 individuals. The whales were viewed by the fishers at the surface, for approximately 30 minutes, after which they made deep dives, showing uplifted flukes (eg. Figure 2b) and were not seen again. The four whales at the surface were not moving directionally as a group but were moving in opposing directions (Figure 3 a-c). At least one individual was rolling laterally (Figure 3b), evidenced by showing of a half-fluke raised from the surface. The group consisted of individuals of various developmental stages, given their varying size and dorsal fin appearance (Figure 3c).

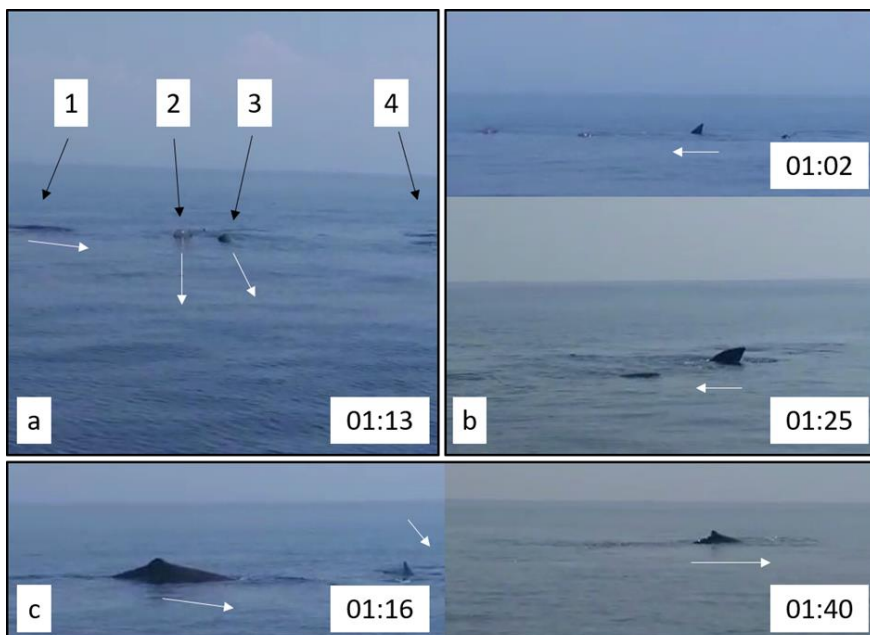


Figure 3. Pod of sperm whales sighted off the East of Cyprus June 13, 2019 a) minimum count of four sperm whales, b) sperm whales rolling laterally and c) larger, more mature individual (left) and a smaller individual in the observed sperm whale pod. White arrows depict relative direction of movement. Figures in bottom left corners of each panel represent time of each frame within the 01:45 minute video clip.

Although this report comprises just two observations, they are an important contribution to a limited knowledge base for the island, confirming that social groups and solitary males are sympatric in Cyprus waters. Sperm whales migrate across broad areas as family groups containing adult females and developing adolescents (Reeves and Notarbartolo di Sciara 2006). As males reach maturity, they become solitary, splitting off and roaming individually, occasionally entering family groups for brief periods to mate (Reeves and Notarbartolo di Sciara 2006). It is possible then that breeding might occur in Cyprus waters, because both a mature roaming male, and a family group are reported.

Sperm whales have been sighted on multiple occasions along the nearby Turkish coast of the Mediterranean (Öztürk *et al.* 2013) and also occur in nearby Syria (Saad 2008). However, as there are insufficient baseline data, it is unclear whether these and the current sightings are a sign of increasing importance of the region for the species, or whether sperm whales have always frequented these areas and were merely overlooked.

Cyprus has a steeply shelving coastline (Figure 1) which makes both oceanic and continental shelf habitats readily accessible using small outboard vessels. With economic development occurring rapidly in both ethnic communities of Cyprus, coastal and pelagic sports fishing is increasingly common, particularly among young people (lead author personal observations). A Facebook group for amateur fishers operated by SABDER, has over 20,000 members at the time of writing (August 2020), which is evidence of the popularity of this sport on the island. Vessels of young sport fishers are trailered to any coast, in all seasons and are equipped with sophisticated devices including sonar depth readers, Global Positioning Systems (GPS) and most fishers have latest model smart phones, capable of shooting quality digital photography and recording GPS coordinates. Harnessing these young sports fishers and also the substantial small-scale fishing fleet (Snape *et al.* 2018; Ulman *et al.* 2015), may be a strong citizen science tool to collect data using social media and digital applications. This could supplement current survey efforts such as yacht-based surveys being undertaken by local research groups and NGOs, and international boat-based (eg. Ryan *et al.* 2013; Lewis *et al.* 2018) and aerial surveys (eg. the ACCOBAMS Survey Initiative: <https://accobams.org/main-activites/accobams-survey-initiative-2/asi-preliminary-results/>) covering Cyprus waters. Indeed, the power of citizen science/crowdsourcing data sets in augmenting and directing the scientific survey of marine mammals is increasingly recognised (Ballance 2018; Derville *et al.* 2018; Harvey *et al.* 2018). Images from Facebook and YouTube were recently used to augment survey data to obtain broad-scale, baseline information on cetacean communities, including sperm whales off Italy (Pace *et al.* 2019).

Sperm whales are in decline because of fisheries bycatch, ship strikes, ingestion of marine debris and direct impacts of anthropogenic noise, and around Cyprus, all these threats are prevalent (Coll *et al.* 2012). The seas around Cyprus are among the most plastic-polluted seas in the world (Liubartseva *et al.* 2018), with ingestion/entanglement regularly occurring in sea turtles (Duncan *et al.* 2018; 2019). Entanglement in and ingestion of plastics can be fatal to sperm whales (Stephanis *et al.* 2013). Seismic survey, a tool commonly used in hydrocarbon exploration (which is of current interest in Cyprus waters; Adamides and Odysseas 2016; Semb 2009), can have negative impacts on cetaceans due to its strong acoustic disturbance (Wright and Cosentino 2015).

In view of these continued and growing potential threats, we recommend that occurrence and distribution of sperm whales and other elusive deep-diving

cetaceans should be urgently assessed in Cyprus waters. Long-term monitoring, employing systematic visual and acoustic surveys and promoting citizen science should be supported, to assess the requirement for management of these marine mammals (Rendell and Frantzis 2016). Impacts of seismic surveys should be rigorously assessed (eg. see recommendations of Wright and Cosentino 2015), under the assumption that sperm whales and other cetaceans are present and resolutions adopted by the contracting parties to ACCOBAMS (Notarbartolo di Sciara 2014) should be adhered to across the island.

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