Mapping the Stranding Whales in Turkish Marine Waters

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Abstract

Whales' distribution in the Mediterranean is mostly known through stranding records. In the present study, the stranding records of whales in Turkish Marine waters were mapped to elucidate the number of whale species stranding and see the general pattern of distribution of whale's stranding in Turkish marine waters that might help to generate mitigation measures for their conservation. The primary data consisted of occurrence points of whale species in Turkish marine waters were obtained from the published literature, grey literature, and personal communications. Geographic coordinates represent the location of stranding points of whales across the Turkish Marine Waters. Google Earth was applied to gather coordinates of the records if there were only localities. QGIS was used to locate the accuracy of all records prior to use, and R Studio was used to generate heat map. The number of stranding whale species were 6, of which records were varied and mainly located on the Mediterranean and Aegean coasts of Turkey. The name of stranding whale species were as Cuvier's beaked whale *Ziphius cavirostris*, the fin whale *Balaenoptera physalus*, sperm whale *Physeter macrocephalus*, minke whale *Balaenoptera acutorostrata*, the True's beaked whale *Mesoplodon mirus* and Mesoplodon sp..

Introduction

Whales are a widespread and diverse group of fully aquatic placental marine mammals. Turkey has a long coastline in the Aegean Sea and Mediterranean Seas. There has been not many effort to understand whale fauna in Turkish coastal waters. Strandings can be good indicators of the whale fauna of the area, although they may not represent the true composition of local populations. Nevertheless, there is little sighting effort for relatively rare species, since the information obtained from the strandings cannot be ignored.

Ziphius cavirostris (Cuvier, 1823) are deep-diving pelagic whales that inhabit the nearshore waters of all oceans (Reeves et al., 2002). *Balaenoptera physalus* (Linnaeus, 1758) is a cosmopolitan species, that primarily inhabits all oceanic waters in both hemispheres and, less commonly, tropical waters, while only occasionally surfacing along coasts when the water is deep enough (Jefferson et al. 2011). *Physeter macrocephalus* Linnaeus, 1758 has a wide geographic range (Rice 1989) and found in almost all marine regions from the equator to high latitudes but generally stays on the continental slope or in deeper water. *Balaenoptera acutorostrata* (Lacepède, 1804) is a cosmopolitan species found in all oceans, which is the smallest species of the family *Balaenopteridae*. *B. acutorostrata* are considered rare visitors to the Mediterranean (Fraija-Fernández et al., 2015). *Mesoplodon mirus* (True, 1913) are known only from strandings in Great Britain, from Florida to Nova Scotia in the North Atlantic, and from southeast Africa and southern Australia in the Indo-Pacific Ocean.

In this study, the stranding records of whales in Turkish Marine waters were mapped to elucidate the number of whale species stranding and see the general pattern of distribution of whale's stranding in Turkish marine waters that might help to generate mitigation measures for their conservation.

Material and Methods

The primary data consisted of occurrence points of whale species in Turkish marine waters were obtained from the published literature, grey literature, and personal communications. Geographic coordinates represent the location of stranding points of whales across the Turkish Marine Waters. Google Earth was applied to gather coordinates of the records if there were only localities. QGIS was used to check the accuracy of all occurrence records prior to use. Several operations of caring the stranding whales from Iskenderun Bay in the Mediterranean part of Turkey by Nature and Science Society and Iskenderun Technical University is given below. This research is generated from the Project as ''The determination of threaten factors and mitigation measures of marine mamals in Turkish Marine waters (DBD-2020-P03)'' supported by Nature and Science Society (www.dogavebilim.com).

Results and Discussion

On the coasts of Turkey, a total of twenty-six whale stranding records from the Turkish coasts were reported to date (Table 1; Figure 1). The first stranding report was *Z. cavirostris* from Gökçeada since 1964 (Marchessaux, 1980) and last report was *B. physalus* on 2.03.2021. There are six stranding whale species reported in Turkish marine waters which were as *Ziphius cavirostris* (Figure 2), *Balaenoptera physalus* (Figure 3), *Physeter microcephalus* (Figure 4), *Balaenoptera acutorostrata* (Figure 5), *Mesoplodon mirus* and *Mesoplodon sp*. (Figure 6).

Table 1. List of whale stranding reports on coasts of Turkey (GL: Grey literature, PC: Personal communications)

Species	Location	Date	References
Ziphius cavirostris	Çanakkale, Gökçeada	8.03.1964	Marchessaux, 1980
Balaenoptera physalus	Antalya	1.01.1977	Tonay et al. 2020
Ziphius cavirostris	Adana, Karataş	13.09.1982	Kinzelbach, 1985
Ziphius cavirostris	Antalya, Serik	1.07.1994	Öztürk and Öztürk, 1998
Ziphius cavirostris	Muğla, Ören	19.03.1995	Öztürk and Öztürk, 1998
Ziphius cavirostris	Muğla, Dalyan	1.04.1997	Öztürk and Öztürk, 1998
Balaenoptera physalus	Aydın,Kuşadası	1.01.1998	Tonay et al. 2020
Balaenoptera physalus	Adana, Yumurtalık	2000	Tonay et al. 2020
Ziphius cavirostris	Mersin, Bozyazı	19.04.2001	Podestà et al., 2006
Ziphius cavirostris	Muğla, Fethiye	27.01.2002	Öztürk, 2002
Balaenoptera acutorostrata	Adana, Yumurtalık	10.04.2002	Tonay et al. 2020
Physeter macrocephalus	Muğla, Fethiye	21.06.2002	GL
Balaenoptera acutorostrata	Mersin, Erdemli	15.08.2005	GL
Mesoplodon sp	Muğla, Fethiye	9.01.2009	Notarbartolo di Sciara, 2009
Ziphius cavirostris	Muğla, Sarıgerme	7.02.2009	Öztürk et al., 2011
Ziphius cavirostris	NULL	12.04.2012	Bachara and Norman, 2013
Balaenoptera physalus	Hatay, Iskenderun	8.01.2016	Grey Litera
Ziphius cavirostris	Muğla, Gökova	3.06.2016	Öztürk et al., 2016
Ziphius cavirostris	İzmir, Seferihisar	5.06.2016	Öztürk et al., 2016
Physeter macrocephalus	Hatay,Arsuz	21.06.2017	PC
Ziphius cavirostris	Antalya,Kemer	14.11.2017	GL
Ziphius cavirostris	Antalya,Serik	29.05.2018	GL
Physeter macrocephalus	Muğla, Fethiye	10.07.2019	GL
Balaenoptera physalus	Saroz Körfez	10.07.2019	Tonay et al. 2020
Mesoplodon mirus	Antalya, Finike	16.11.2019	GL
Balaenoptera physalus	Hatay, Denizciler	2.03.2021	PC

Several operations of caring the stranding whales from Iskenderun Bay in the Mediterranean part of Turkey by Nature and Science Society and Iskenderun Technical University

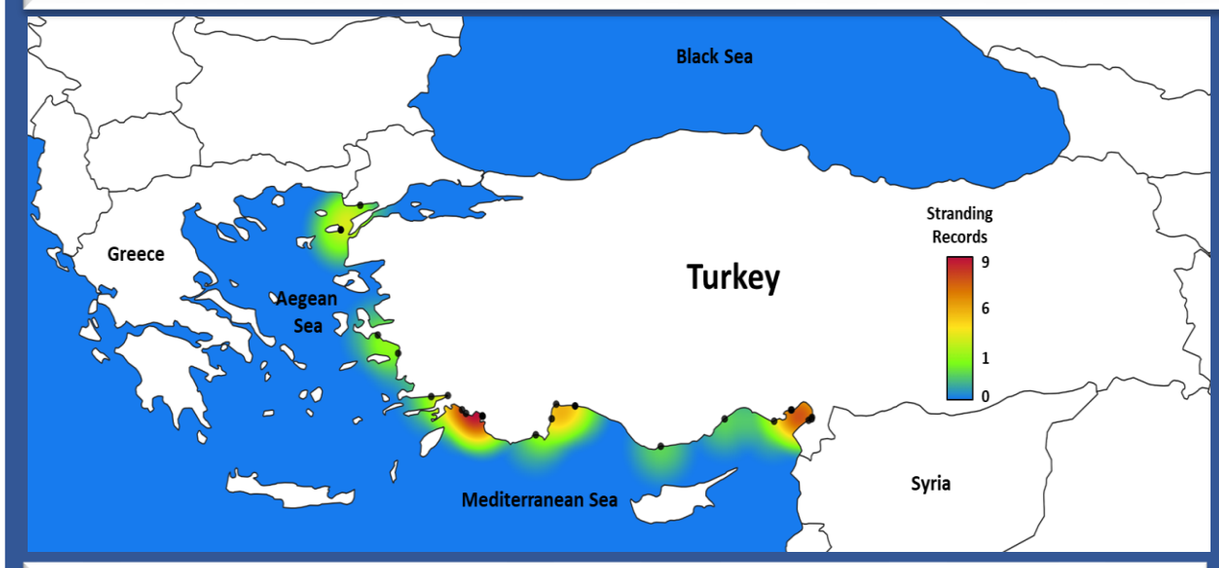

Figure 1. Heat map of total stranding reports of whales on the coasts of Turkey

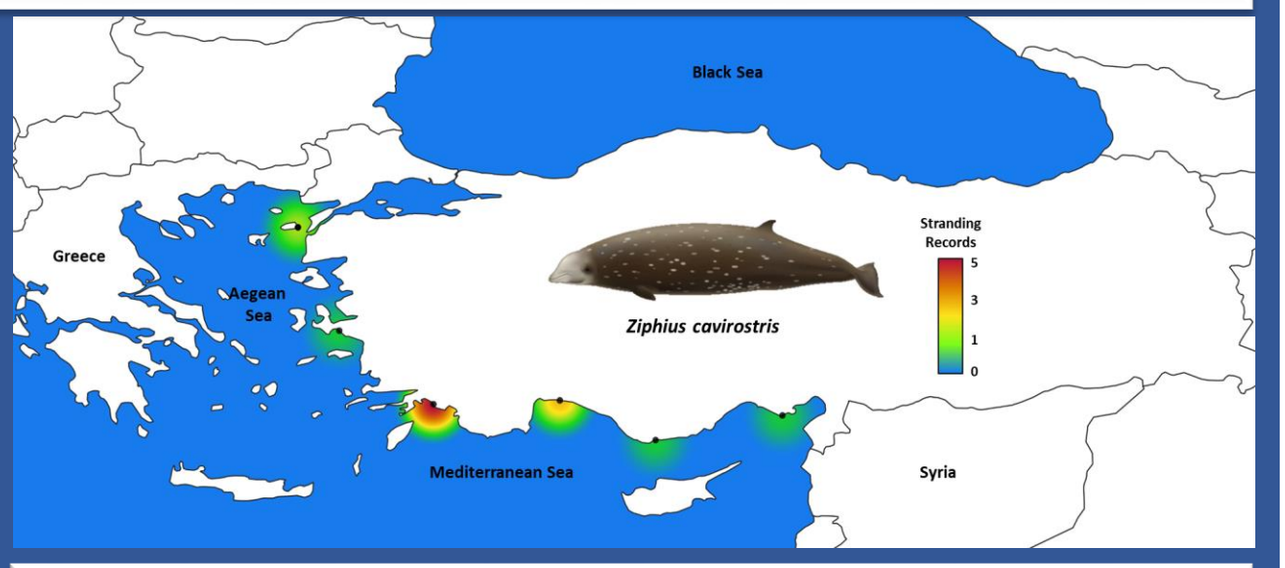

Figure 2. Heat map of *Z. cavirostris* stranding reports on coasts of Turkey.

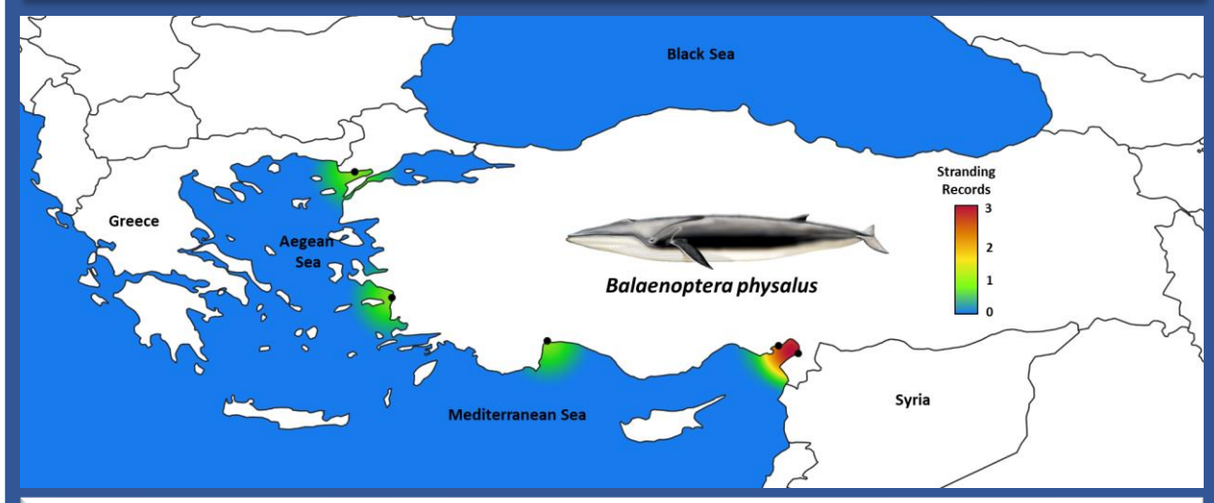

Figure 3. Heat map of *B. physalus* stranding reports on coasts of Turkey.

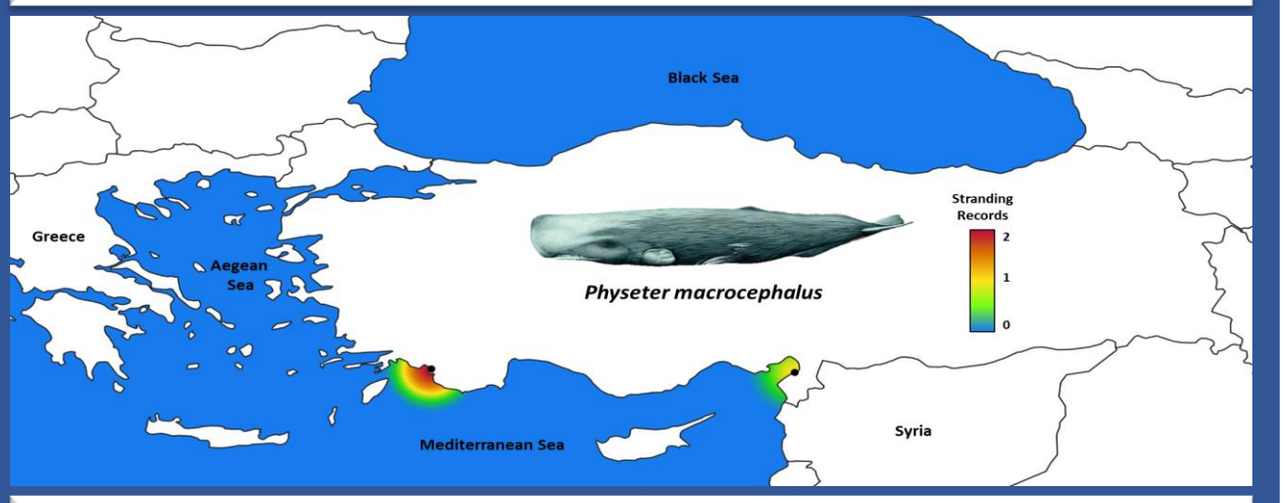

Figure 4. Heat map of *P. macrocephalus* stranding reports on coasts of Turkey.

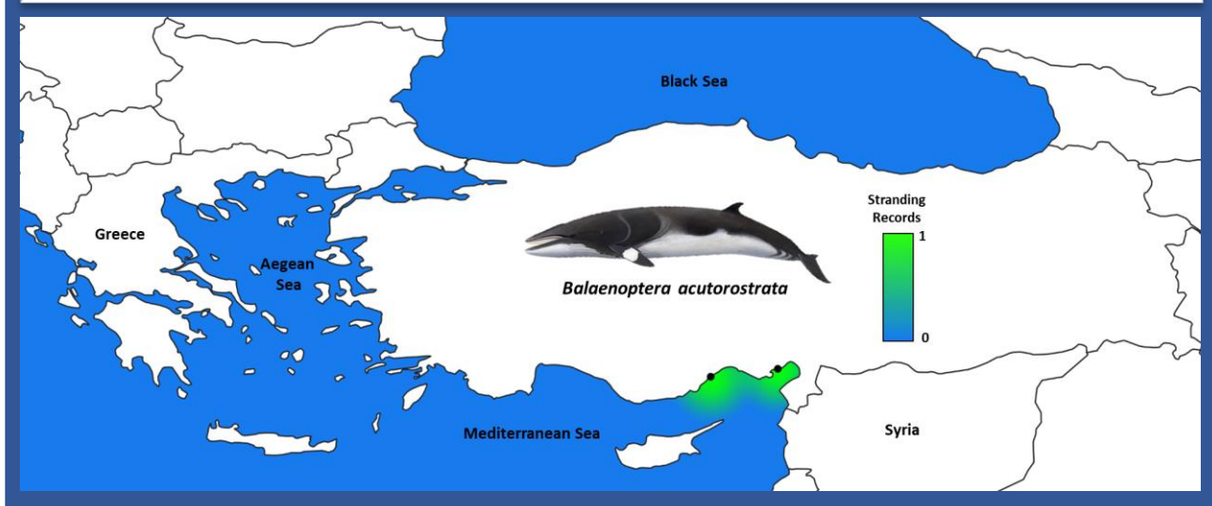

Figure 5. Heat map of *B. acutorostrata* stranding reports on coasts of Turkey.

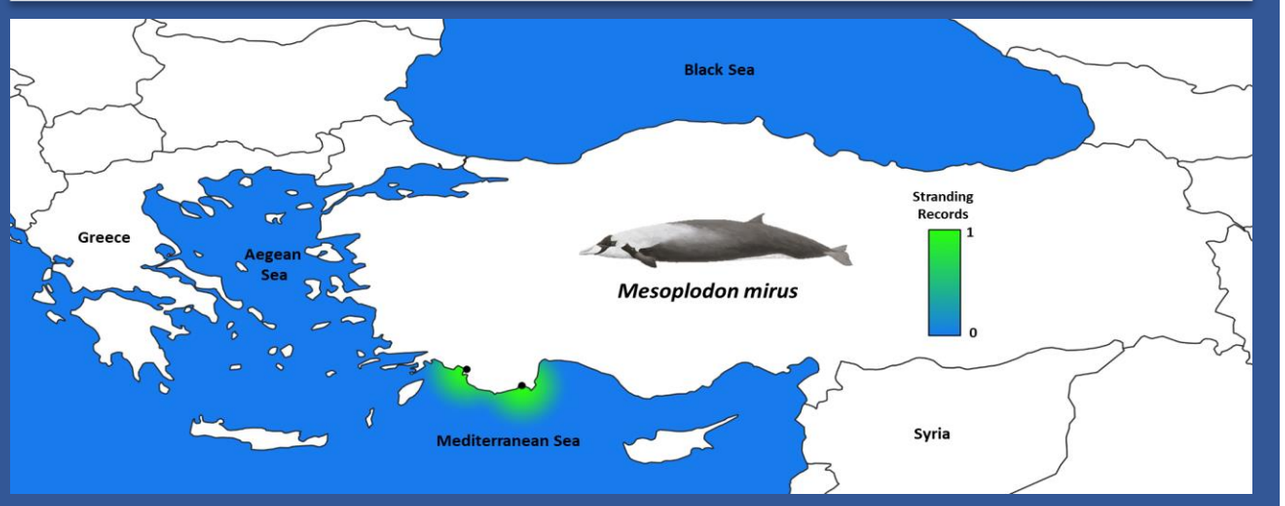

Figure 6. Heat map of *M. mirus* stranding reports on coasts of Turkey.