



BOTTLENOSE DOLPHINS (*TURSIOPS TRUNCATUS*) IN THE TURKISH LEVANTINE SEA: ENCOUNTER RATES, DISTRIBUTION AND RESIDENCY PATTERNS

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INTRODUCTION

Once widely distributed, the Mediterranean subpopulation of bottlenose dolphins is now assumed to be less than 10,000 individuals and is currently classified as ‘vulnerable’ (VU) under A2cde categories, due to a range of anthropogenic activities¹.

The current study conducted the first multiyear dedicated surveys in the north-western Levantine Sea. It employed a photo-identification technique and collected data of bottlenose dolphin sightings between 2015 and 2016.

Project aim

The project aimed to identify the seasonal encounter rates, as well as to clarify the distribution and residency patterns of bottlenose dolphins within the North-Western Levantine Sea.



Figure 1. Bottlenose dolphin in Antalya (Gansen, 2017).

METHODS

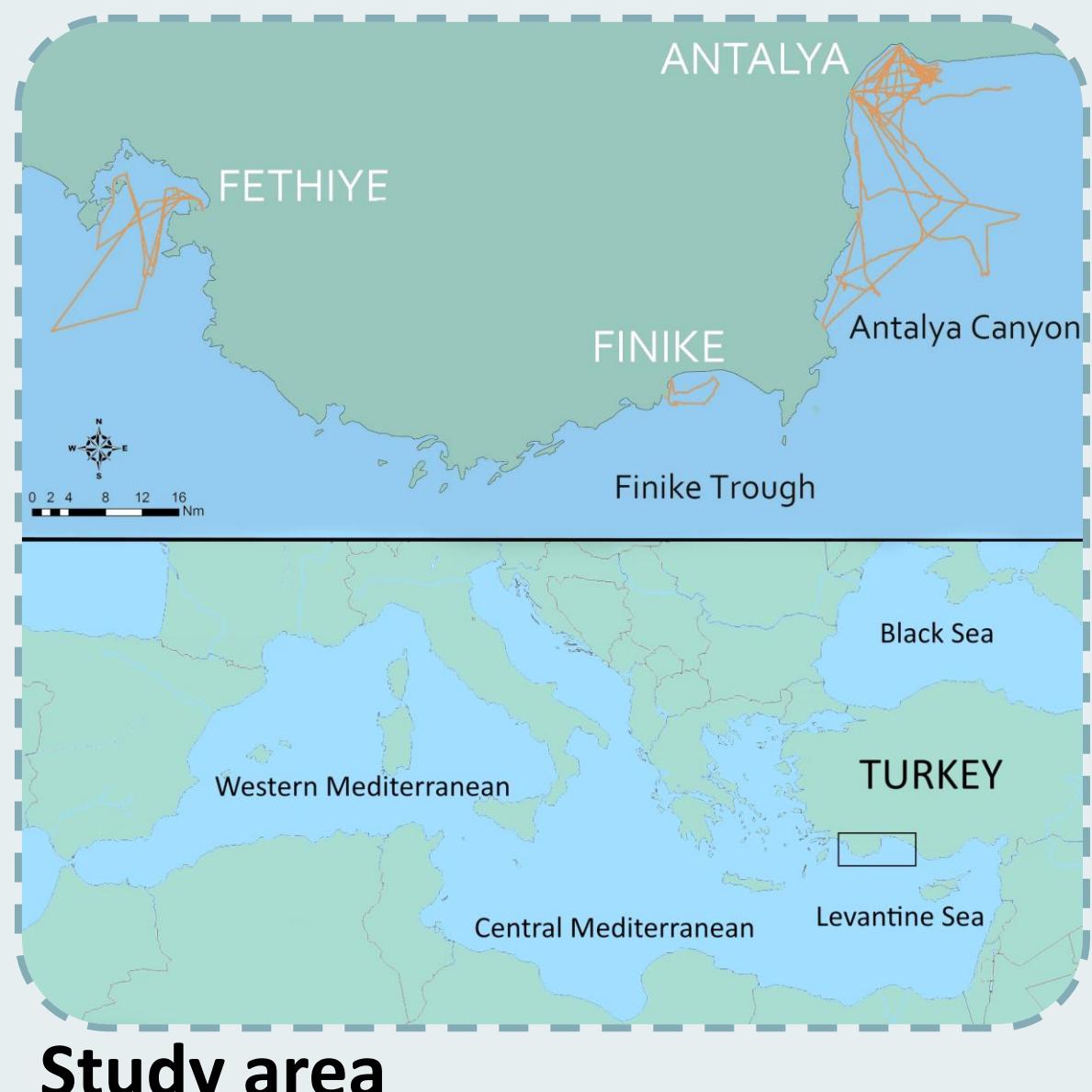


Figure 2. Survey tracks that were followed in 2015-2016.

Data analysis

- Density:** The kernel density function of ArcGIS was employed to map the aggregation of dolphin sightings
- Encounter rates:** Overall and seasonal encounter rates were computed and calculated per km as n (total number of sightings) and L (total number of km travelled)
- Residency pattern:** Residency pattern analyses were carried out to assess tendency of individuals remaining in or returning to study area. Monthly and seasonal residency rates were calculated in addition to overall residency rate, using hierarchical cluster analysis

RESULTS

- Total survey time (land and boat): 132 days (631 hours)
- Boat surveys conducted between 1st March 2015 and 30th July 2016
- Total combined transect length covered 1433 km
- Boat surveys conducted: 32 days (213 hours), covering 1643 km
- During boat surveys, 25 focal groups of bottlenose dolphins were encountered on 17 of 32 days
- 65 % of TT sightings took place between 0 and 200 m isobaths and no sightings were recorded beyond 500 m isobath (Figure 3)

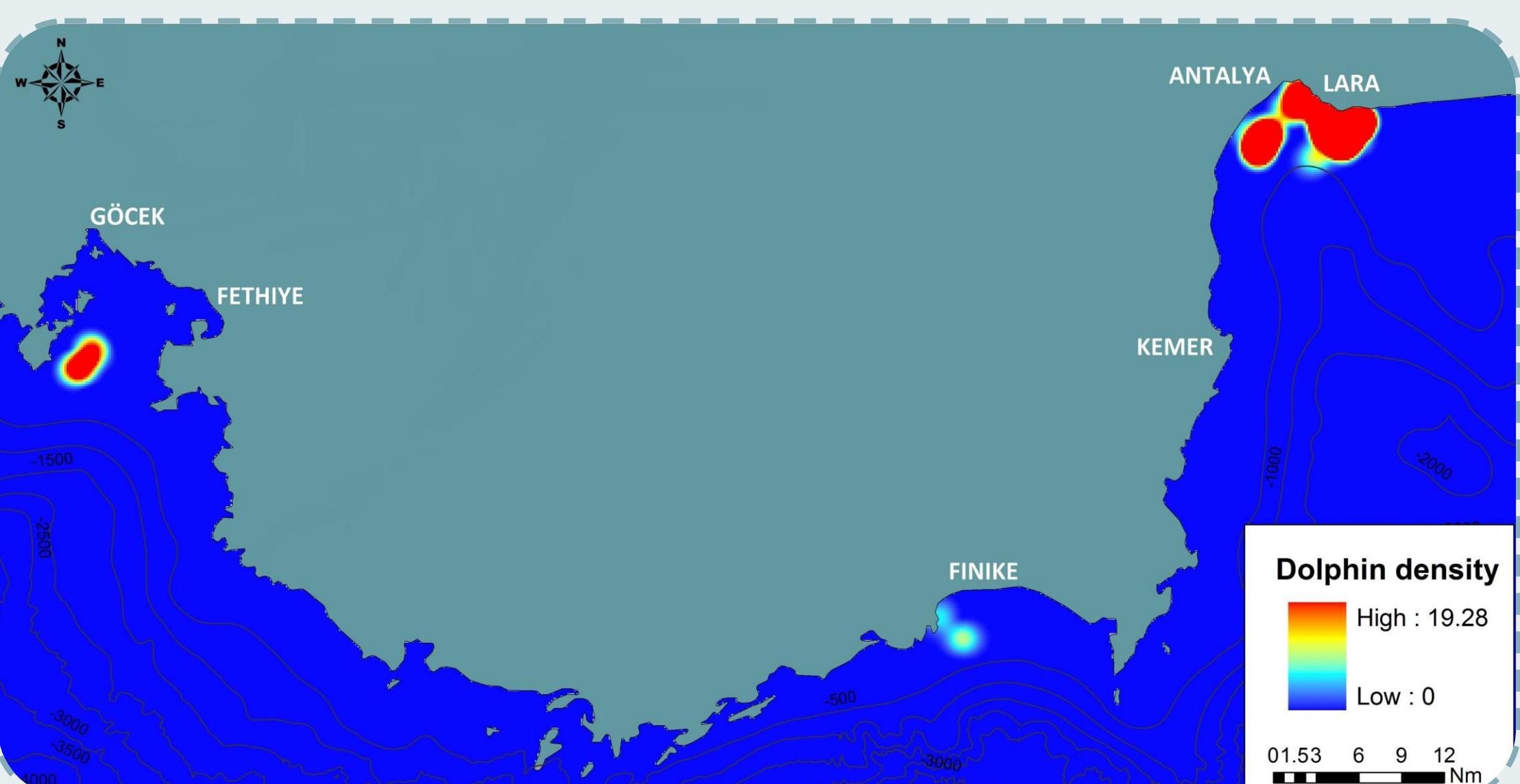
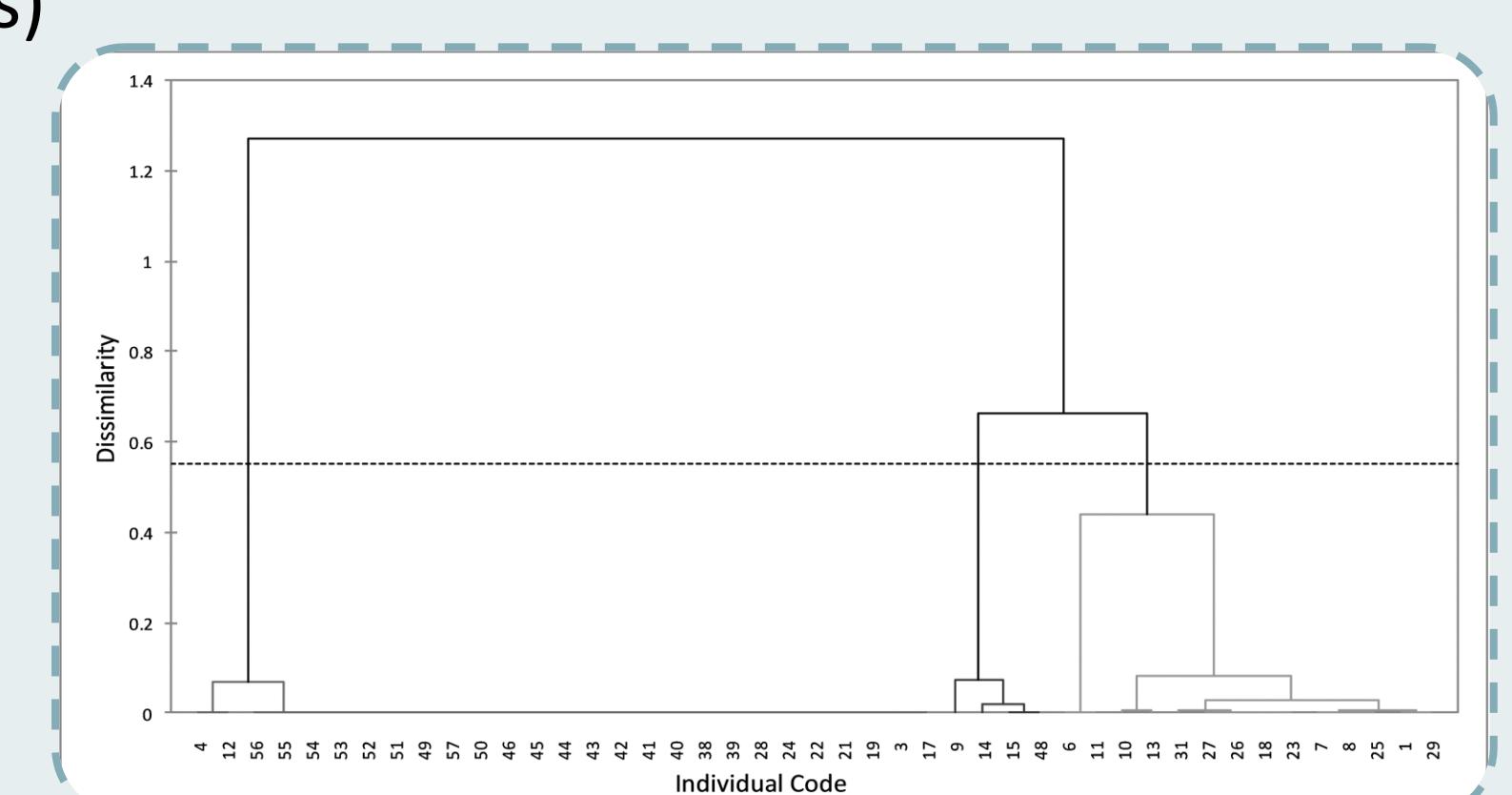


Figure 3. Density of bottlenose dolphins encountered during boat surveys, within the north-western Levantine Sea.

- Overall encounter rate: average of 3.3 groups (25 individuals) per 100 km
- Highest encounter rate in spring with 11.6 groups (100 individuals) per 100 km
- Total catalogued individuals: 51 (Table 1)
Antalya and Finike Bay: 45 individuals
Fethiye Bay: 6 individuals
- TT was sighted in up to seven months and 2 seasons in consecutive years
- While seasonal, visitor and transient dolphins were reported, no year-round residency was documented (Table 2, Figure 4)
- Group 1 = seasonal residents (14 individuals)
- Group 2 = transients (27 individuals)
- Group 3 = visitors (4 individuals)

Table 1. Residency pattern of 51 catalogued individuals in the north-western Levantine Sea (Lighter shade = one day encounter, darker shade = two days encounter, ID = individual ID, TOTAL = photographed number individuals).

ID	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEP.	OCT.	NOV.	DEC.	JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	TOTAL
1																		3
35																		1
3																		1
4																		2
37																		1
6																		7
7																		3
8																		3
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56																		1



Results of first multiyear study in north-western Levantine Sea:

- Uneven spatial distribution of bottlenose dolphins
- High seasonal encounter rates in SPRING
- Preference of coastal zones like in other areas of the Mediterranean Sea²
- High number of seasonal and transient dolphins
- Possibility that home range is larger than study area
- Possibility that area might be important calving and/or nursery ground
- Bottlenose dolphins in the region are considered to be under anthropogenic stressors (figure 5)
- Study results should be investigated by future studies with annual and higher survey effort



Figure 5. Example of a bottlenose dolphin with a starvation sign.

DISCUSSION

BEHAVIOUR2017
29th July – 04th August

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SHORT BEAKED COMMON DOLPHIN

Delphinus delphis



Kuskavağı Mh. 543 Sok. No.6 , Konyaaltı





Scientific classification

Class = Mammalia

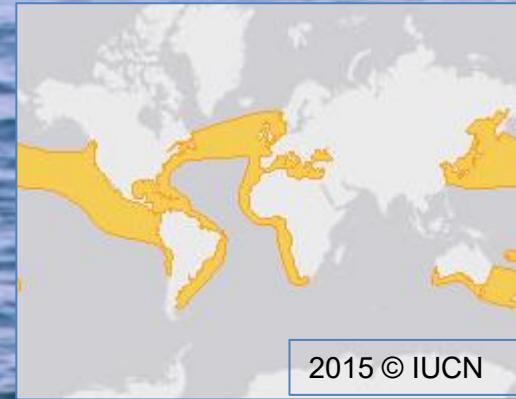
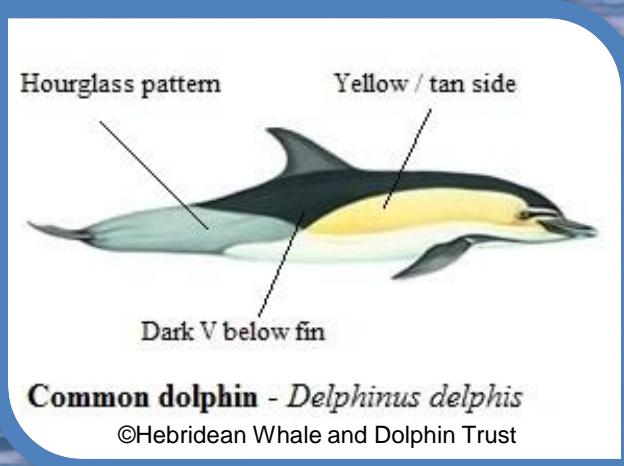
Order = Cetacea

Suborder = Odontoceti

Family = Delphinidae

Genus = *Delphinus*

Species = *D. delphis*



2015 © IUCN

❖ The short-beaked common dolphin (*Delphinus delphis*) is widely distributed in warm temperate and tropical waters of the world (10°C to 28°C). Very common in the Mediterranean, this small dolphin is found both in the deep waters and coastal environments, often found in big groups, averaging hundreds of individuals.

❖ They are social species and are often found together with striped dolphins, bottlenose dolphins and even Risso's dolphins. Very active at the surface and eager to bow ride cruising vessels, displaying somersaults, porpoising and breaching behaviours.

❖ They usually hunt small size fish.

❖ When hunting these dolphins often use cooperative techniques to herd the fish.

❖ These relatively small dolphins can reach 3m of body length and weigh up to 200 kg. Both males and females have an hourglass pattern usually coloured yellow or gold in front and dirty grey in back. They have white marks on their dorsal fin, serves as a fingerprint.

❖ They can dive up to 200m but usually stay at around 90m.

❖ Short-beaked common dolphins can live up to 35 years but Black Sea population life span average 22 years.

❖ They reach sexual maturity at around 7 years old, delivering one calf every 2-3 years. Gestation lasts between 10 to 11 months and breast feeding around 4 months.

❖ Overfishing, habitat loss, pollution and by-catch driven the Mediterranean subpopulation of common dolphins, a very abundant species in the past, to be classified as endangered by the IUCN Red List. These negative pressures keep having strong impact.

❖ They are a common by-catch of purse-seine, driftnet and trawlers fisheries. As they like to chase and associate with Yellow-fin tuna, often they get caught in the same nets as the tuna, and suffocate or die on board of the vessels.

❖ Currently there are several international convention and agreement that include this species being **the most important** the "Habitat Directive", the "Natura 2000 Network of Protected Areas" and the "ACCOBAMS Agreement"



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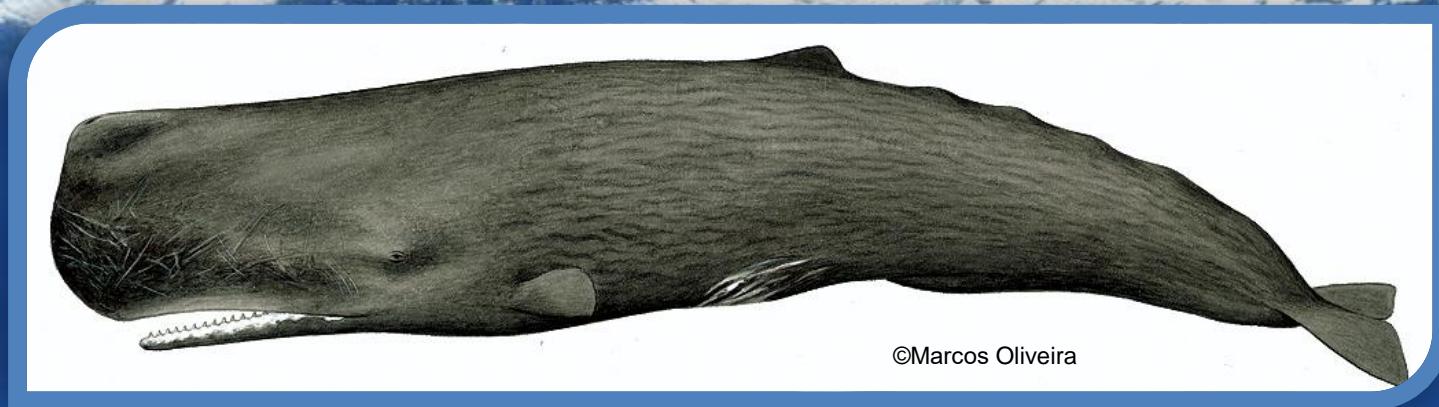
SPERM WHALE

Physeter macrocephalus





2015 © IUCN



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- ❖ They are the largest dolphin existing. They can dive very deep, for as long as 50 minutes at maximum recorded depths of 1200m. They can be seen resting at the surface for some time before long dives.
- ❖ Their presence indicates nutrient rich waters. They feed mainly on squids, including the colossal and the giant squids, who leave big scars on the sperm whale's face.
- ❖ They have an almost non-existent dorsal fin and a very large and square head. They live more than 60 years.
- ❖ They have extremely powerful echolocation capacity which can be used to find prey several hundred meters away
- ❖ They have names for each other and display complex social interaction. They live in matriarchal societies, with groups of up to 12 adult females, all females engage in babysitting the young, a unique social characteristic of sperm whales. Males roam around in smaller groups of "bachelors" when they are young, and revert to more solitary travel when they get older.

Scientific Classification

Class = Mammalia
Order = Cetacea
Suborder = Odontoceti
Family = Physeteridae
Genus = *Physeter*
Species = *P. macrocephalus*

- ❖ Due to their size sperm whales lack predators, but there has been some few recorded deaths of sperm whales by Killer whales, and pilot whales are known to harass sperm whales on some occasions.
- ❖ Sperm whales Mediterranean sub population is listed as endangered under IUCN.
- ❖ The main cause of decline has been the swordfish and tuna driftnets. Since the mid-1980s this type of fishing caused the unsustainable mortality. Although national and international regulations banning driftnets form the Mediterranean waters are still present not only in the western Mediterranean but recently also in the eastern basin (e.g., Greece and Turkey).

❖ Other sources of decline are the collision with marine traffic, namely big vessels as cargos, tankers and high-speed ferries. Also the noise pollution has been recognized as an important factor on sperm whale capacity to survive. The major sources of noise pollution are oil and gas prospecting, military testing and illegal dynamite fishing which is still a common practice in the eastern and south Mediterranean where sperm whales stay all year round.

❖ Sperm Whales are listed as a very important species under numerous international conservation conventions, agreements and protocols and are fully protected for commercial whaling under the moratorium by the International Convention for the Regulation of Whaling that took effect from 1986. Although all these efforts most of the critical habitat in the Mediterranean sea fall out of any kind of protection allowing for large habitat degradation.

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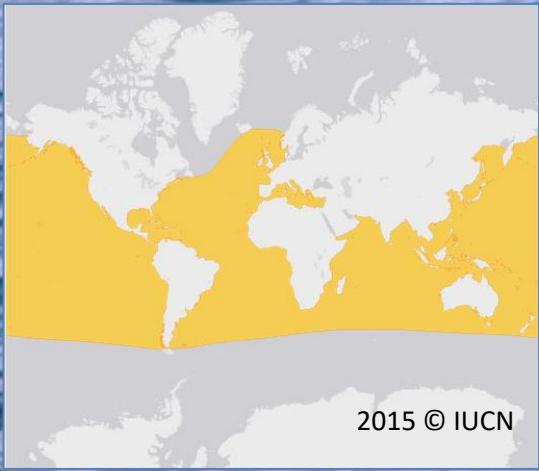
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CUVIER'S BEAKED WHALE

Ziphius cavirostris





- ❖ This beaked whale (*Ziphius cavirostris*) is cigar shaped with small dorsal fins and flippers. Their shape is very similar to most beaked whales and can easily be mistaken for another species, this is why confirmed sightings at sea are rare. The head is rather blunt in profile with a small, poorly defined "beak". Females present lighter coloration than males, and both present linear scars, from fights and play with other *Ziphius*, and round scars from cookie-cutter sharks.
- ❖ They reach sizes 5 to 7 metres and live up to 60 years. These animals inhabit deep offshore waters diving to over 1000 metres, chasing after their favourite meal, the deep-sea squid.

- ❖ Despite their wide cosmopolitan distribution, little is known about them. Much of the current knowledge of this species in the Mediterranean has come from stranding data.
- ❖ They seem to have a very specific habitat preference, with most of the sightings being made over oceanic slopes, where the seafloor drops rapidly from hundreds of meters to more than 1000m deep.
- ❖ They have been hunted in many countries including Japan, Indonesia and Taiwan. Also found entangled regularly in driftnets.

Scientific classification

Class = Mammalia

Order = Cetacea

Sub-order = Odontoceti

Family = Ziphiidae

Genus = *Ziphius*

Species = *Z. cavirostris*

❖ Mass strandings have occurred in tandem with military operations involving underwater sound transmission, leads researchers to believe this species is highly sensitive to sound pollution, high noises, making them very vulnerable to highly used shipping corridors at sea, and highly industrialized coastlines.

❖ The Mediterranean sub-population, is listed as data deficient by the IUCN.

❖ ACCOBAMS recommended in 2004 that high-intensity noise generating activities be avoided in areas where Cuvier's whales may occur in large numbers.

Cuvier's beaked whale has the deepest and longest known dives of any marine mammals, diving to nearly 1888m and staying underwater for up to 85 minutes.