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WHALES AND SHIPS: A FATAL RELATIONSHIP?

The great whales of the Mediterranean Sea: fin whales and sperm whales

The sperm whale is a deep-diving whale (even to depths of over 1,500 m.), whereas the fin whale is mostly recognised for its long migratory routes where it faces multiple hazards. Both species can live more than 70 years, however, like most marine mammals their reproductive strategy (high age at first maturity, long gestation periods, long lactation) makes their populations more vulnerable to various threats as they have limited ability to recover.

How many sperm whales and fin whales are left in the Mediterranean?

In recent decades, the populations of fin and sperm whales in the Mediterranean Sea have been on a downward trend. If in the 1990s there were estimated to be 3,500 fin whales in the region, the number had dropped to 1,800 in the period 2018-2019, according to the results of the latest ACCOBAMS Survey Initiative (ASI).

In its latest assessment in December 2021, the International Union for Conservation of Nature (IUCN) maintained the sperm whale categorised as "endangered" in its Red List, whereas the fin whale was reclassified from "vulnerable" to "endangered". This is the penultimate category before these species go extinct.

How dangerous are collisions for whales?

A ship strike refers to a collision of any kind of vessel, from large boats to jet skis, with a marine animal. Various species are affected, especially large whales and sea turtles, many of which are endangered.

Sperm whales need to surface to breathe after their prolonged deep dives to feed. Once at the surface, they repose and doze, leaving them very vulnerable to being rammed by a ship. Fin whales, for their part, tend to migrate or rest close to the surface, making them frequent victims of collisions.

For these two species, collisions with boats are the main cause of human-induced deaths in the north-western Mediterranean, an area with a high and increasing intensity of maritime traffic. When marine mammals and turtles are struck by boats, they are often severely injured or killed.

WHEN EVERY SURFACING BECOMES A DEADLY TRAP.

Whales are the largest animals in the world. But if you compare them to a transport ship, they are tiny. In a collision, the animals have hardly any chance of survival. Yet they have to come to the surface regularly to breathe.



Megamax-class cargo ship

Length: 400 m

Weight: 283 000 tons

Average speed: 19 knots

Cargo ships of this class have an incredible draught of 16 metres and an engine power of over 82,000 hp. There are 220,000 ship movements per year in the Western Mediterranean alone.



Fin whale

Length: 16–20 m

Weight: 48 tons

Even the world's second largest animal species is much smaller than a cargo ship. In the early 1990s, the population of fin whales in the Mediterranean was estimated at 3,500 animals. Today, only about 1,830 fin whales survive in there. Collisions with vessels are one of the main reasons for this decline.



Sperm whale

Length: 12–20 m

Weight: 15–45 tons

Sperm whales are deep-diving specialists. They dive up to twenty times a day to depths of up to 1500 metres. At the surface, where they rest and socialise, and must come to breathe, the constantly high noise level in the Mediterranean may make it difficult for them to locate dangers, including fast approaching vessels.

Such collisions can occur anywhere ships encounter marine life, but the risk is greatly increased in areas of high ecological value where wildlife must endure a high intensity of shipping traffic. Marine animals are not always easily visible from the deck of a ship, making it difficult for a vessel operator to spot them, and even if they are sighted, there may not be enough time to avoid the collision due to the vessel's inertia.

Ship strikes with sperm whales and fin whales contribute significantly to the continuing decline in the numbers of these two species, and may be the deciding factor in their disappearance from this marine region.



Why slow down to avoid collisions?

To meet the growing demand for trade, there has been a rise in the number of ships that are larger and faster. In the event of a collision between a ship and a whale, the survival chances of the whale depend primarily on the ship's speed.

The only effective measures to avoid serious injury or death of cetaceans from collisions with ships are, on the one hand, to divert their route to avoid navigating in areas or times with a high density of whales (including the establishment of traffic separation schemes or no-sailing zones) and, on the other hand, to reduce speed in such areas or times by reducing the speed of vessels to less than 10-12 knots, as set out in Resolution 7.12 of the Agreement on the Conservation of Cetaceans of the Black Sea, Mediterranean Sea and Contiguous Atlantic Area (ACCOBAMS).

There is broad scientific consensus that vessel speed, rather than shape or size (weight, volume), is the most relevant factor in determining the risk of a collision having a lethal effect on the struck animal (ACCOBAMS Resolution 7.12). **In this regard, the best available scientific data show that the probability of a collision having a lethal effect on a whale is very low when the speed of the vessel does not exceed 10 knots.**



Are there no alternative solutions, possibly technological ones?

The effectiveness of other measures, such as alerting skippers about the presence of whales in the area through on-board observers or technological tools (cameras, sensors, etc.), is currently very limited.

Why can't voluntary measures solve the problem?

In areas where vessel speed reduction measures have been implemented, it has been found that voluntary measures are rarely enforced or successful. A recent study of eleven ship speed reduction programmes in different parts of the world showed that the compliance rate of voluntary measures was between 9% and 41%, whereas the mandatory measures had a compliance rate exceeding 80%. **In other words, to ensure effectiveness, speed reduction measures must be:**

- **mandatory**, and
- **must be applied to all ships without exception.**

In addition, strict monitoring of mandatory speed limits is essential to ensure compliance.

One of the great advantages of mandatory vessel speed reduction is that it creates a level playing field for all shipping lines. This ensures that all shipping lines are subject to the same restrictions and that compliance does not place them at a competitive disadvantage, this level playing field cannot be achieved by mere recommendations or voluntary measures, as reflected in ACCOBAMS Resolution 8.17.

What other impacts does shipping have on biodiversity and the environment?

While shipping is often considered as the backbone of international trade, it is indisputably a sector with a growing negative impact on the environment, climate, biodiversity and also public health. The following aspects should be highlighted:

- **Atmospheric pollution**

Maritime transport is responsible for the emission of air pollutants such as sulphur oxides (SO_x), nitrogen oxides (NO_x) and black carbon. All of these have serious implications for the human health of coastal populations and terrestrial and marine biodiversity.

- **Greenhouse gas emissions**

Shipping is a sector with high greenhouse gas (GHG) emissions, due to its high dependence on fossil fuels. If it were a country, it would be the world's sixth highest emitter of GHGs, with more than 1 Gigatonne of CO₂-eq emissions, according to data from the International Maritime Organisation. Decarbonisation of this sector is therefore necessary and urgent to tackle the climate crisis.

- **Underwater noise**

Underwater noise of caused by human activities has been recognised in numerous scientific studies as a critical pollutant negatively affecting global marine ecosystems.

Negative impacts of underwater noise have been documented on some 150 marine species, ranging from marine mammals (47 species) to fish (66 species) and invertebrates (36 species), with even tiny organisms like zooplankton being affected.

Globally, commercial shipping is a major contributor to underwater noise, especially as around 80% of global trade (by volume) is conducted by sea. Between 2014 and 2019, underwater noise emissions doubled in all European seas. The underwater noise produced by shipping creates a permanent and constantly increasing acoustic "fog". This fog masks natural sounds and alters the behaviour of marine animals. It can interfere with the frequencies used by various types of whales, dolphins, seals, fish and other marine animals in their vital activities, such as the call of a mate, or detecting prey or predators. All these impacts, together with stress, displacement from important habitat and panic, can affect reproduction and growth rates, in turn influencing the long-term welfare of the population.



What are the benefits of reducing speed?

Reducing the speed of shipping, in addition to reducing the risk of collisions with cetaceans, leads to fuel savings and, consequently, a reduction in CO₂ emissions as well as air pollutants (SO_x, NO_x and black carbon). CO₂ emissions could be reduced by around 13% and 24% if ships reduced their speed by 10% and 20% respectively.

This measure also makes it possible to reduce the level of underwater noise emitted by ships in the vast majority of cases. Specifically, current data show that a 10% reduction in ship speed across the world fleet could reduce shipping noise by 40%. Regarding collisions, a 10% decrease in speed would result in a 50% reduction in risk, while a 20% decrease in speed could accomplish a 78% decrease in collision risk.

In summary, among the various operational measures available, reducing ship speed is the most cost-effective way to reduce the environmental impact of shipping. It is an immediately applicable measure and does not require technological modifications.

Positive effects of applying speed reduction to the global fleet				
Decrease in:	CO ₂	NO _x , SO _x and black carbon	underwater noise	risk of collision with whales
Speed reduction in:				
10%	13%	13%	40%	50%
20%	24%	24%	67%	78%

What is the situation for cetaceans in the Mediterranean Cetacean Migration Corridor?

Vessel movements in the north-western Mediterranean are around 220,000 per year, with average speeds ranging between 14 and 20 knots for merchant vessels or even up to 35 knots for ferries. According to the analysis of navigation data (AIS), approximately 75% of the total distance travelled by commercial vessels sailing in this area is at average speeds exceeding 10 knots.

The "Mediterranean Cetacean Migration Corridor" in Spanish waters of the northwestern Mediterranean, with an area of 46,385 km², is located between the regions of Valencia, Catalonia, and the Balearic Islands. It was declared by Spain as a Marine Protected Area (MPA) in 2018 and shortly afterwards, in 2019, as a Specially Protected Area of Mediterranean Importance (SPAMI) by the Barcelona Convention (UNEP/MAP).



The Cetacean Migration Corridor is an area of crucial importance for fin whale migration to and from the Ligurian Sea. It is also important for the conservation of other cetacean species such as the sperm whale, bottlenose dolphin, striped dolphin, common dolphin, pilot whale, Risso's dolphin and Cuvier's beaked whale, as well as for sea turtles such as loggerhead turtles, sharks and seabirds.

Scientific studies have concluded that the presence of sperm whales and fin whales is widespread in the north-western Mediterranean Sea. In other words, **in this part of the Mediterranean it is not possible to predict the areas where these large whales are present at any given time, so the option that ships could divert their routes to avoid colliding with them is not feasible.**

Intense vessel traffic at speeds of more than 10 knots in the Cetacean Migration Corridor jeopardises the good condition of this site and its species. **This is why the current shipping practices in this area are not compatible with the conservation and protection objectives of this protected marine area due to the high speeds at which they are carried out.** Consequently, maritime traffic should be regulated by Spain through a compulsory speed limit, in order to achieve an adequate

reconciliation of this activity with the imperative protection of biodiversity in the area and to effectively address the decline of the fin whale and sperm whale population caused by ship strikes.

The management plan for the Mediterranean Cetacean Migration Corridor, currently under development by the Ministry for Ecological Transition and Demographic Challenge, **is the appropriate instrument to introduce a binding speed limit of 10 knots**. This measure ensures the compatibility of the shipping activity with the objective of safeguarding cetacean species, which are in a concerning state of conservation. There are currently no other less restrictive measures for navigators yet equally effective and efficient, especially in the short term.



Is there a legal foundation for implementing a mandatory 10-knot limit in the Mediterranean Cetacean Migration Corridor?

Implementing a mandatory speed limit of 10 knots in the Cetacean Migration Corridor would ensure that Spain complies with its international and regional commitments to protect the marine environment, its endangered species and their habitats. These commitments include the United Nations Convention on the Law of the Sea (UNCLOS) (arts. 192, 194), the Convention on Biological Diversity (art. 8, 22.1), the Convention on the Conservation of Migratory Species of Wild Animals (art. 3.4), ACCOBAMS and the ZEPIM Protocol to the Barcelona Convention (arts. 6, 11), in addition to the European framework obligations under the Habitats Directive (art. 12) and the Marine Strategy Framework Directive (descriptors 1, 4, 11). Furthermore, it would be an important contribution to the Sustainable Development Goals (SDGs) of the United Nations, especially SDG 14 (conserve and sustainably use the oceans, seas and marine resources for sustainable development).

In addition, the implementation of a mandatory speed limit as the currently only effective measure in this area would enforce Spanish national laws that apply to the Economic Exclusive Zone (EEZ) with the aim of safeguarding biodiversity. Specifically, the Royal Decree 1727/2007 aims to protect cetaceans from any disturbance or physical harm caused by vessels. Therefore, it is important to

consider that collisions with cetaceans and also, in certain cases, the emission of underwater noise, may involve a violation of the measures established in Royal Decree 1727/2007.



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