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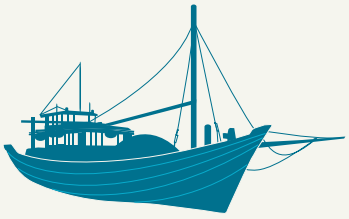
Ship strikes and Cetaceans: avoiding a collision course



CURRENTLY, THE ONLY PROVEN AND EFFECTIVE MITIGATION MEASURES ARE TO AVOID AREAS WITH KNOWN CONCENTRATIONS OF WHALES, AND TO REDUCE SPEED WHILE TRANSITING AROUND THOSE AREAS[38].

Maritime transport plays a role in roughly 90% of all world trade, including 60% of movement of the world's hydrocarbon products. The speed and size of the largest vessels have increased and marine vessel-based travel has also escalated, with fast-passenger ferries increasingly used in coastal areas[1]. In addition, there are an estimated 2.1 million engine powered fishing vessels around the globe[2]. Increased maritime trade (a 2014 growth rate of 3.4%[3]) is leading to the development of new or expanded port facilities around the world. Furthermore, retreating high latitude sea ice is opening previously inaccessible Arctic shipping routes[4-6] increasing risks to cetaceans in this part of the world.

Apart from the environmental risk this shipping traffic poses through its carbon emissions, underwater noise, and risk of oil spill, some of the world's busiest shipping lanes overlap directly with important whale habitat, resulting in a high risk – or actual incidence - of injury and mortality to whales that are often unable to effectively avoid vessels' paths due to high speeds or an inability to adequately take evasive action[7,8]. A variety of vessel types can be involved in whale collisions, including whale watching vessels, navy ships, yachts, high speed ferries and hydrofoils, but large ships such as container ships, general cargo or cruise ships, are most commonly implicated[7,9,10]. Ship strikes are known to be one of the leading causes of human–induced mortality for a number of whale populations around the globe, including many that are already threatened or endangered after decades of whaling[11].

High Risk Areas for Ship Strikes

The International Whaling Commission (IWC) has undertaken an analysis of published and unpublished literature to identify specific geographical areas where an overlap of heavy shipping traffic and high densities of whales leads to a particularly high risk of ship strikes. These areas should be targeted for mitigation efforts[12]:

1 North Atlantic right whales: With a population thought to be hovering around or under 500 individuals, ship strikes are a significant source of mortality for this endangered population. A number of mitigation measures are already in place and are proving effective for this population, offering examples of strategies for other high-risk areas[11,13-17].

2 Sperm whales in the Canary Islands: Mortality from ship strikes caused predominantly by high-speed ferries is thought to be unsustainable in this area with an abundance estimate of just over 200 whales[18,19].

Mediterranean

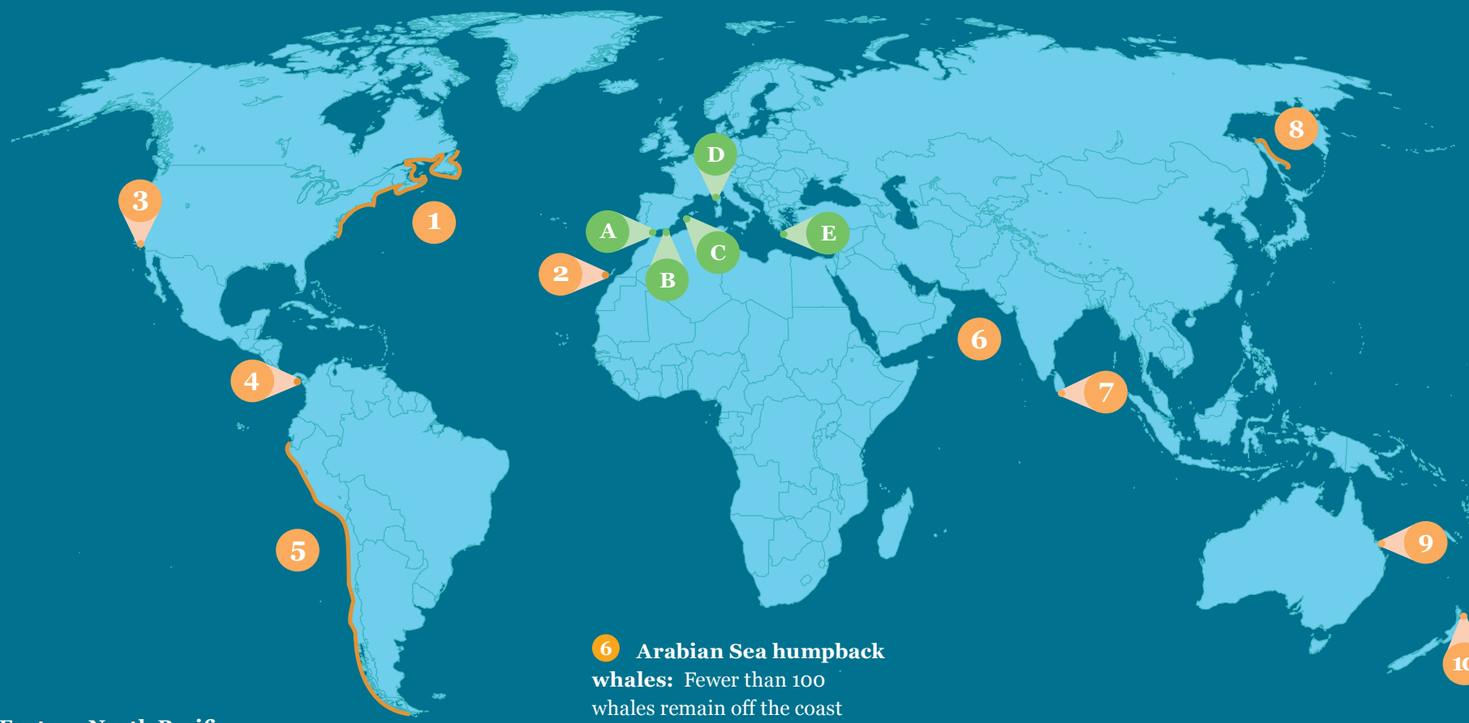
A Sperm whales in the Strait of Gibraltar: More than 90.000 ships cross the Strait annually in an important feeding ground[20].

B Cetaceans in the Alboran Sea: This is one of the main cetacean hotspots in Europe and the Mediterranean[21] – particularly for fin and sperm whales and vessel traffic is exponentially increasing – particularly ferry and fastferry lines.

C Fin and sperm whales around the Balearic Islands: Both occur around these islands together with high levels of shipping and fast ferry traffic[21].

D Fin and sperm whales in the Pelagos Sanctuary: Both of these isolated and endangered populations are at risk of collision with cargo vessels, tankers and particularly high speed passenger ferries throughout the sanctuary[22,23].

E Endangered sperm whales in the Hellenic Trench, Greece: These deep waters of Greece are an important feeding ground, but also host some of the Mediterranean's busiest shipping routes[24,25].



3 Eastern North Pacific blue whales: Fatal collisions with vessels is a known source of mortality for this population[8].

4 Humpback whales in the Gulf of Panama: Analysis of AIS data (shipping tracks) and movements of 15 satellite tagged whales indicated that 8 individuals had 98 encounters within 200m of 81 different vessels in just 11 days[26]. This study was able to help convince authorities to move the shipping lane to an area with lower whale densities.

5 Southern Pacific right whales: Collisions with vessels and entanglements in fishing gear are the leading causes of human-induced mortality of this critically endangered population of around 50 individuals.[27]

6 Arabian Sea humpback whales: Fewer than 100 whales remain off the coast of Oman after illegal Soviet whaling in the 60's[28] and the construction of new ports causes concern in this region which hosts some of highest densities of oil tankers and other types of cargo transport in the world[29].

7 Blue whales in the Northern Indian Ocean: Distinct from those in the Southern Hemisphere, their core habitat overlaps directly with busy shipping lanes[30,31]. Routing measures have been proposed but not yet adopted.

8 Western gray whales: This small remnant population may be showing slow signs of recovery, but its low numbers (latest estimate is 174) mean that it cannot sustain any additional mortality from ship strikes - a risk in this region where oil and gas extraction occurs in the population's only known feeding ground[11,32].

9 Humpback whales around the Great Barrier Reef: While humpback whales off both coasts of Australia are showing strong recovery after whaling, conservative estimates predict a doubling of shipping traffic in the region by 2025, posing a mounting threat to these whales in their breeding grounds[33].

10 Bryde's whales in the Haruaki Gulf: 85% of deaths for which a cause of mortality could be determined, were caused by vessel-strike; unsustainable for this endangered year-round population[9].

Mitigating the risk

WWF fully endorses the recommendations made in the International Whaling Commission's newly drafted Ship Strikes Strategic Plan[12], as well as recommendations and measures put in place through regional agreements such as ACCOBAMS (see MOP6 Draft Resolution 6.20) and ASCOBANS.
These recommendations are summarized below:

1. **Wherever possible, re-route shipping lanes to eliminate or decrease the level of co-occurrence with important whale habitat.** This approach has been successfully implemented through a traffic separation scheme for right whales off the East coast of the United States[34] and an Area To Be Avoided (ATBA) off Canada's East coast. Similar measures have been partially implemented for blue whales off the coast of California[35].

2. **Where avoiding co-occurrence is not possible, introduce and enforce speed limits in (seasonally) critical whale habitat.** **Reduced vessel speeds have been shown to reduce the risk of collisions and associated mortality by up to 90%** [36] and have been effective in Seasonal Management Areas (SMA) for North Atlantic right whales[37]. Research demonstrates that a navigation speed threshold between 10 and 13 knots (11 to 15 mph) significantly reduces the risk and consequences of collisions. Such speed reductions can be promoted as being advantageous to shipping companies as they result in fuel savings[22,29].

3. **Maintain, expand, and improve the International Whaling Commission's global database of collisions between ships and cetaceans.** In order to reduce mortality from ship strikes, we need to know as much as possible about where, when and how they occur. Efforts should be made to raise awareness amongst port authorities, shipping companies, and navigation-related professional organisations of the importance of reporting all ship strike incidents. **https://iwc.int/ship-strikes**

4. **Continue to identify High Risk Areas through analysis of overlap between areas of high vessel traffic density and critical whale habitat.** This process should include detailed analysis of the precise nature of the vessels and routes that present the greatest risk in order to most effectively tailor effective mitigation strategies. This process should also include continual monitoring of particularly small, at risk populations of large whales to determine the extent to which ship strikes are contributing to a lack of recovery.

5. **Promote the development and implementation of new technologies to reduce the magnitude of ship strikes.** There are a number of rapidly developing technologies designed to reduce the risk of ship strikes, such as REPCET, which allows commercial vessels real-time access to the positions of whales last seen on their navigation route to reduce the risk of collisions in the Mediterranean[22]. Whale Alert is an APP which is currently being used on the East and West coasts of the United States to disseminate information about whale locations using acoustic data from sonar buoys and real-time reports from vessel captains[34]. These technologies are evolving to include smart phone and tablet applications that are less costly and easier to install than previous systems.

6. **Increase public and industry awareness about the risk of ship strikes, and encourage adoption of the above mitigation measures.** Even the most advanced technologies will require awareness and training efforts to ensure that vessel captains and bridge crew increase their interest and knowledge about whale identification and basic ecology to know how to respond to whale presence (e.g. slowing speed or altering course). WWF is already providing guides and trainings to this end, but this requires more outreach and collaboration with the shipping industry and its regulatory bodies- particularly the International Maritime Organization, which plays a vital role in regulating vessel traffic worldwide and has proven an effective partner in measures to reduce ship strikes[39].

7. **All of the above are best achieved through improved collaboration between relevant intergovernmental organisations, as well as nongovernmental organisations that can assist with implementation and public awareness raising.** These include the IMO, the IWC, CMS and its regional agreements ACCOBAMS and ASCOBANS, as well as NGOs.

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