



Collisions of Vessels with Cetaceans: How to mitigate an Issue with many Unknowns

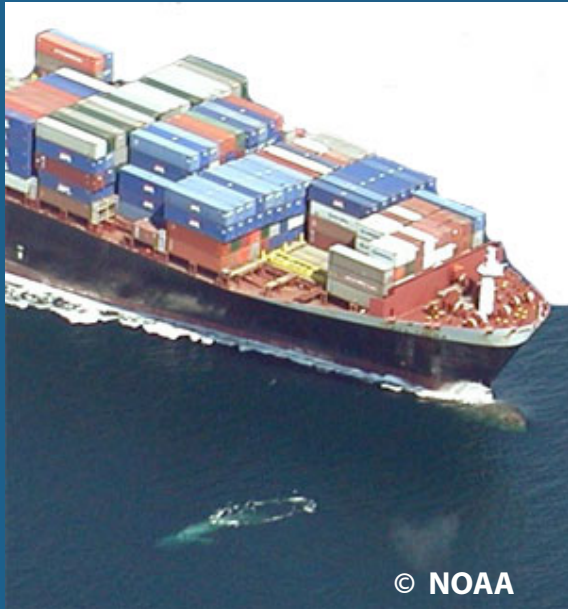


Fabian Ritter, M.E.E.R. e.V. / IWC ship strike data coordinator



Event - Location, Country - Date

How do collisions occur?



Vessel types involved



© Thomas Lesage



Species involved

Large whales

Small cetaceans



Why do collisions occur?

BEHAVIOUR OF CETACEANS

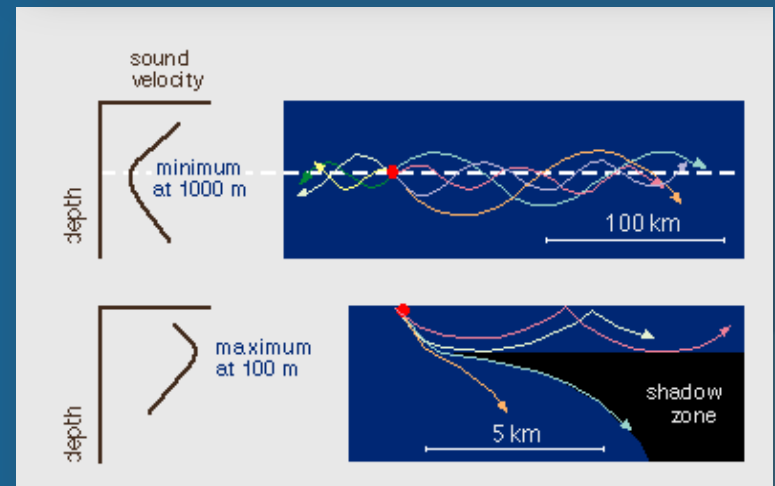
How do whales react? Or: why don't they react?

- Resting/sleeping
- Distraction by other behaviours
- Inter-species differences in responsiveness
- Reaction related to age/sex class or individuals
- Experience and learning
- Background noise, hearing damage (TTS, PTS)



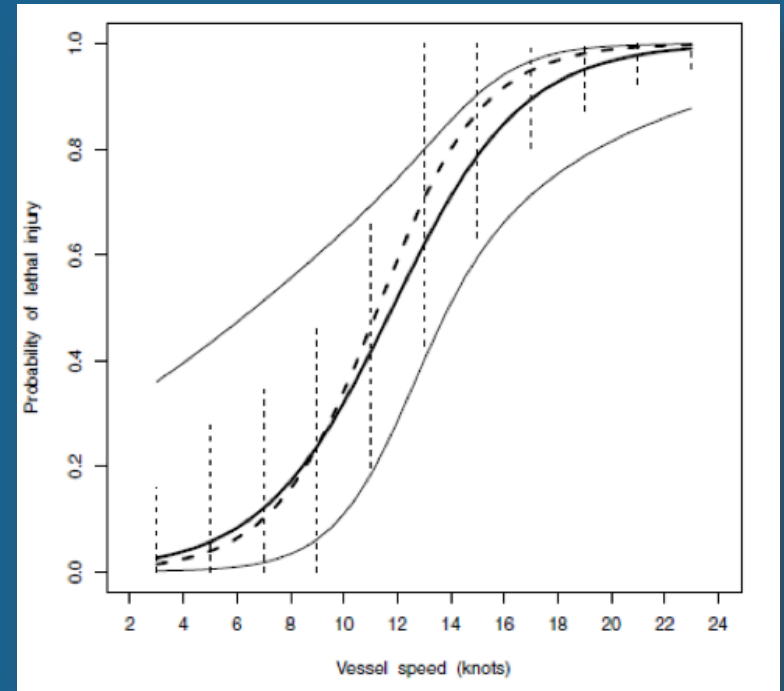
BEHAVIOUR OF SOUND IN WATER

- Refraction, bending, absorption
- Effects of bubbles, sound shadows, sound shielding
- Lloyd Mirror Effect, near field effects
- Cumulative noise from several sources



Speed and size of vessel matter

- The great majority of collisions leading to severe injury or death happened at speeds of 14 knots or more
- Most lethal or serious injuries are caused by large ships (80m length or more)
- 40 knots / whale at 600 m -> max. time for reaction = 30 seconds
- Large vessels might not be able to manoeuvre



from Vanderlaan & Taggart (2007)



- Collisions may go unnoticed
- Injuries may not be identified at sea
- Collisions (purposely) may not be reported
- Animals may drift away and sink
- In stranded animals, collision may not be properly identified



Dark number

???



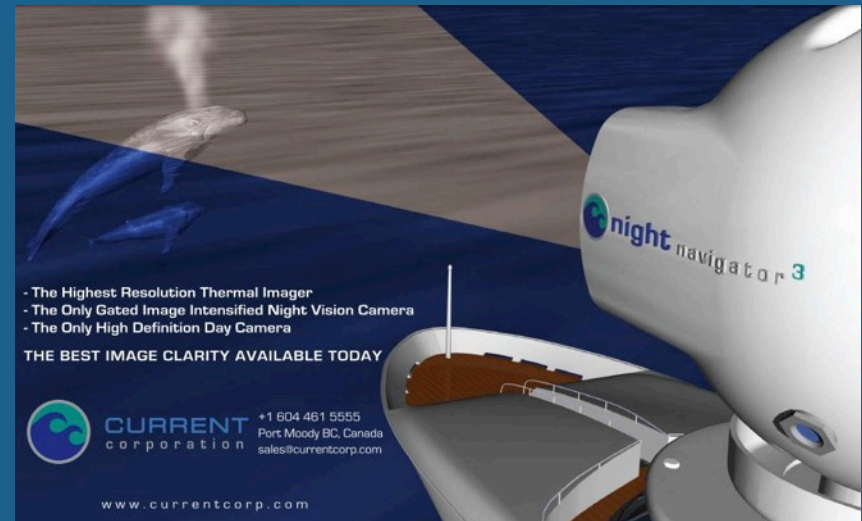
Photos: Courtesy David Matilla © NOAA



Technical mitigation measures

- SONAR *Only short range, additional source of noise*
- Acoustic Warning Devices *Additional source of noise, effectiveness?*
- Propeller guards, etc. *Technical & economic constraints*
- Night vision / Infrared systems / Thermal imaging

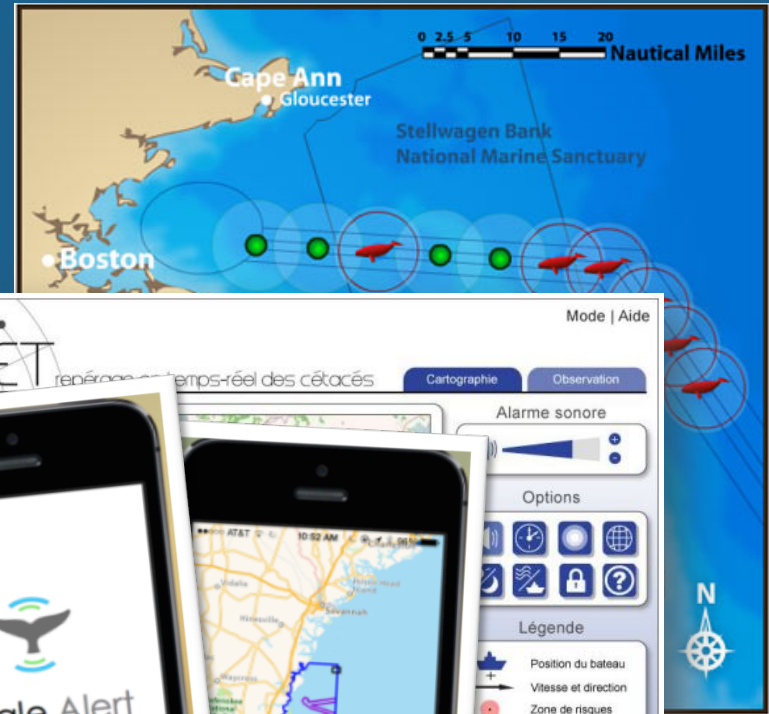
Limited range/effectiveness under adverse conditions



Mitigation: Technological Approaches

Alerting Tools

Passive acoustic monitoring off Boston (USA)



REPCET
Mediterranean Sea

Whale Alert APP

Onboard observers

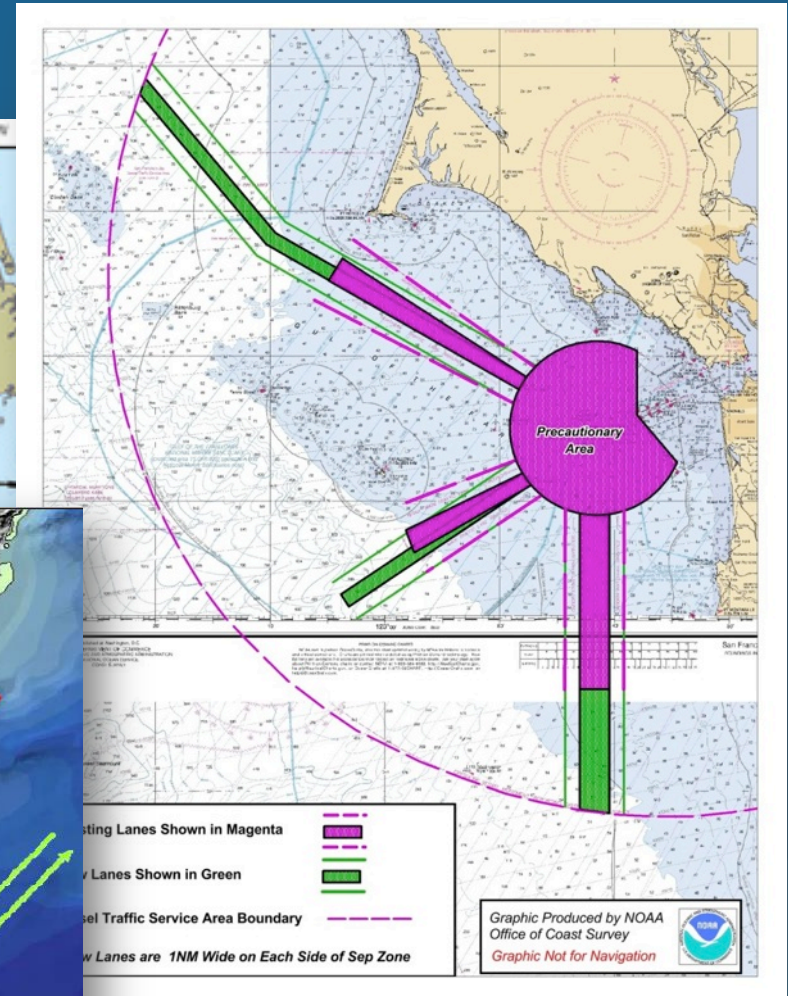
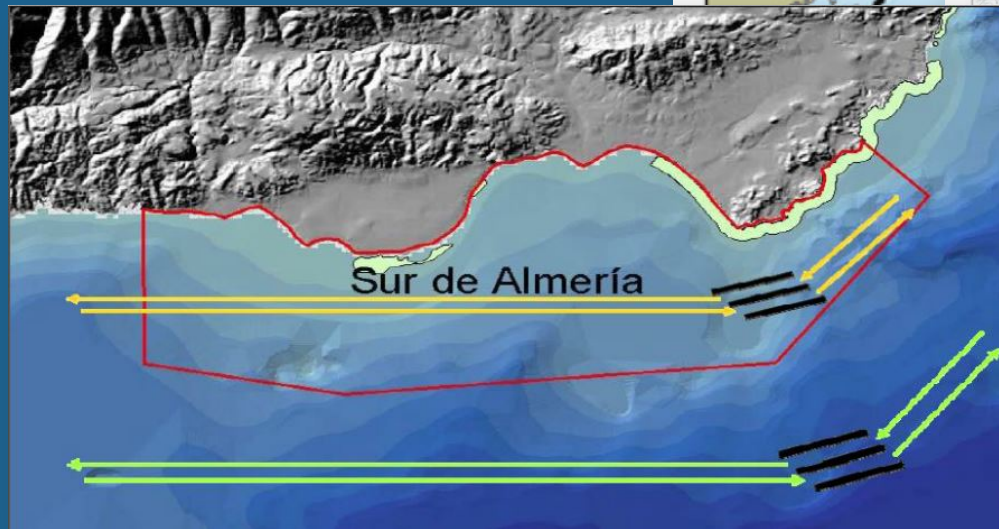


Mitigation: Operational Measures

Operational mitigation measures

Relocation of shipping lanes /
Traffic Separation Schemes

(IMO designation)



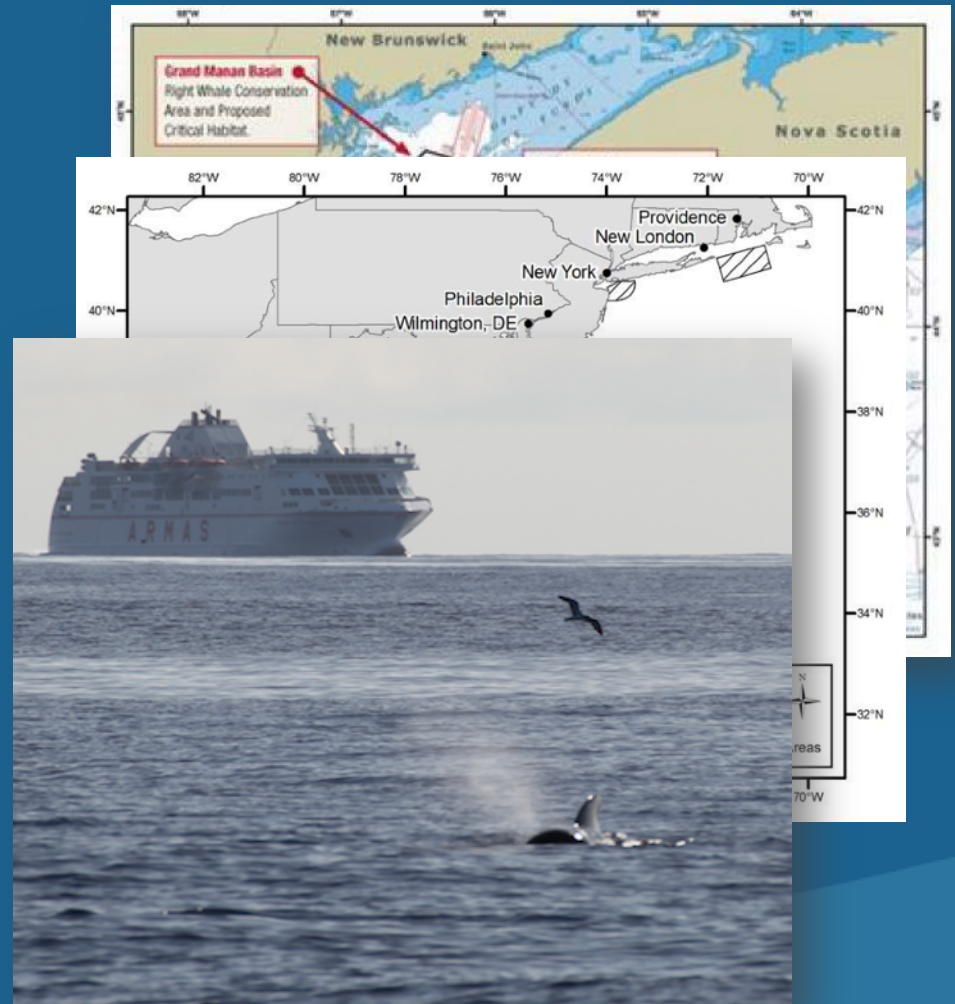
Mitigation: Operational Measures

Areas to be avoided, ATBAs
(IMO designation)

Recommended / mandatory
speed reductions
(e.g. Strait of Gibraltar, Alaska,
East coast US)

Mandatory reporting

Avoidance manoeuvres (?)



Mitigation: Educational Measures

- Training & education resources
- Courses, curricula
- Websites / Brochures / Signposts, et al.

The screenshot shows the M.E.E.R. e.V. website. The header features the organization's logo and navigation links: Mammals, Encounters, Education, and Research. A search bar and other links (Partner, Links, AGBs, Kontakt) are also visible. The main content area is titled 'Collisions' and contains the sub-heading 'Vessel-whale collisions: an underestimated problem'. The text discusses the threats to dolphins and whales from shipping traffic and noise. A sidebar on the left lists various website sections, with 'Collisions' highlighted.

The brochure features a teal header with the text 'Reducing risk of collisions with whales'. The main title is 'WHALES: avoiding collisions prevents damage to ships, and injuries to passengers, crew and whales.' It includes an inset photograph of a large cargo ship at sea and a large image of a whale breaching the water. Logos for 'be' and 'SNCM' are visible at the bottom. The date '10 mars 2006' is printed on the right side.



- Ship Strike Working Group
- Scientific Committee
- International Workshops:
 - 2010 – Beaulieu sur Mer (F)
 - 2014 – Panama
- Regular reports
- Guidance documents
- Collaborations

IWC/65/CCRep07
CC Agenda Item 4.2

WATCH OUT FOR WHALES VOLVO OCEAN RACE 2014/15

The route 2014/15 (distances are given in nautical miles)

Areas where cetaceans are most likely to be present

START Abu Dhabi, United Arab Emirates

FINISH Gothenburg, Sweden

Large whales (fin and sperm), pilot whales, dolphins

Sperm, pilot and beaked whales; dolphin species

Humpback and sperm whales... possibly others

21 cetacean species including blue and Bryde's whales and many dolphins

Humpback whales; many toothed cetaceans

Blue and sperm whales

Southern right whales; many dolphin species

1: 6,457 nm

2: 6,125 nm

3: 4,670 nm

4: 6,264 nm

5: 6,110 nm

6: 6,778 nm

7: 2,800 nm

8: 5,010 nm

9: 850 nm

Several dolphins and harbor porpoises, sperm whales

Sperm, beaked and baleen whales

North Atlantic right whales: 8: 547 nm

North Atlantic right whales

Sperm and baleen whales

Bryde's and other baleen whales; sperm whales

Possible sperm whale encounters

Possible sperm whale encounters

Possible sperm whale encounters

Small text boxes:

- 01 01 13** A fin whale, with characteristic black except for a band of its rostrum as the "pygmy head of the sea".
- 01 01 14** The pilot whale is one of the largest and more social of the oceanic dolphins - and particularly prone to stranding.
- 01 01 15** The minke is the smallest and fastest of the baleen whales, only 8 metres long and capable of reaching 25 kilometres per hour.
- 01 01 16** The smallest of the porpoises at barely a metre, the harbor porpoise stays close to coastal areas or river estuaries.

Other text boxes:

- Large whales (fin and sperm), pilot whales, dolphins
- Sperm, pilot and beaked whales; dolphin species
- Humpback and sperm whales... possibly others
- 21 cetacean species including blue and Bryde's whales and many dolphins
- Humpback whales; many toothed cetaceans
- Blue and sperm whales
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- Possible sperm whale encounters
- Possible sperm whale encounters
- Possible sperm whale encounters

Small images and captions:

- 01 01 17** A Sperm whale's head whale checks first by spilling, a behavior common to many whales.
- 01 01 18** A breaching humpback whale can be identified by its particularly long pectoral fins and knobby head.
- 01 01 19** Southern right whales have calluses on their heads and lower jaws that are unique to each individual, like fingerprints.
- 01 01 20** The pygmy blue whale - at a maximum of 24 metres long - is more likely to be seen around Sri Lanka than its larger cousin.
- 01 01 21** Common dolphins can live in groups of hundreds or even thousands. They are fast swimmers and very agile.
- 01 01 22** Bryde's whales can be somewhat erratic, surfacing at irregular intervals and unexpectedly changing direction.
- 01 01 23** The surface-skimming North Atlantic right whale is highly endangered by ship-strikes, and its numbers are already very low.
- 01 01 24** At 15-20 metres in length, sperm whales are the largest of the toothed whales and have the biggest brain of any animal.



Reporting Collisions : The IWC Global Data Base

Reporting is essential!

IWC global ship strike data base

International Whaling Commission

Home > Conservation & Management > Ship Strikes

In this section

Conservation & Management

- Conservation & Management
- Whaling
- Revised Management Procedure
- Animal welfare issues
- Ship Strikes
- Entanglement of Large Whales
- Environmental concerns
- Conservation management plans
- Sanctuaries and MPAs
- Whalewatching
- Small cetaceans
- Infractions

Sperm whale calf following collision with a fast ferry

WHALES AND SHIP STRIKES: A PROBLEM FOR BOTH WHALES AND VESSELS

Approx. 1,200 incidents

Summary available as download

International Whaling Commission

WHALE STRIKE DATABASE

What happened to the whale

Even if you saw the collision please try to list everything that might have given an indication that a collision had occurred. This is important for trying to establish whether a collision occurred in other cases which were not witnessed. Knowing the circumstances under which whales received particular injuries also helps to work out what happened to whales that are stranded ashore.

This whale was found at sea

- 1 Describe the whale's injuries**
Please describe what you saw and the part of the whale that appeared injured

[Further Help](#)
- 2 Was there any evidence that the whale hit the propeller?**
(for example visible injuries to the whale or an effect on the vessel's engine)
- 3 Was there any indication that the whale may have been dead before the collision?**

[Further Help](#)

Save and Home Save

[Whale Strike Home Page](#)

HELP - Windows Internet Explorer

http://data.iwcoffice.org/help.aspx?ID=88

Was there any indication that the whale may have been dead before the collision?

Please note any unusual smell or if there was any indication that the whale had been floating upside down

Internet 80%

<http://iwc.int/ship-strikes>



Introduction > Reasons & Causes > Mitigation Measures > IWC Data Base



Recommendations

- ✓ **Separate vessels from whales**
- ✓ **Reduce speed in whale areas**
- ✓ ***Place on-board observers***
- ✓ ***Train crew & personnel, inform yourself***
- ✓ ***Report to IWC data base: <http://iwc.int/ship-strikes>***





SLOW DOWN !!!



Thank You! Merci! Gracias! Grazie! Dankeschön!