



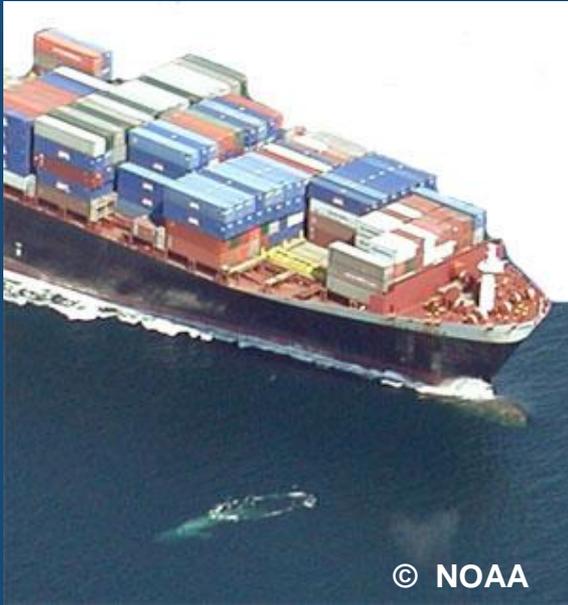
Collisions of Vessels with Cetaceans: How to mitigate an Issue with many Unknowns



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



How do collisions occur?



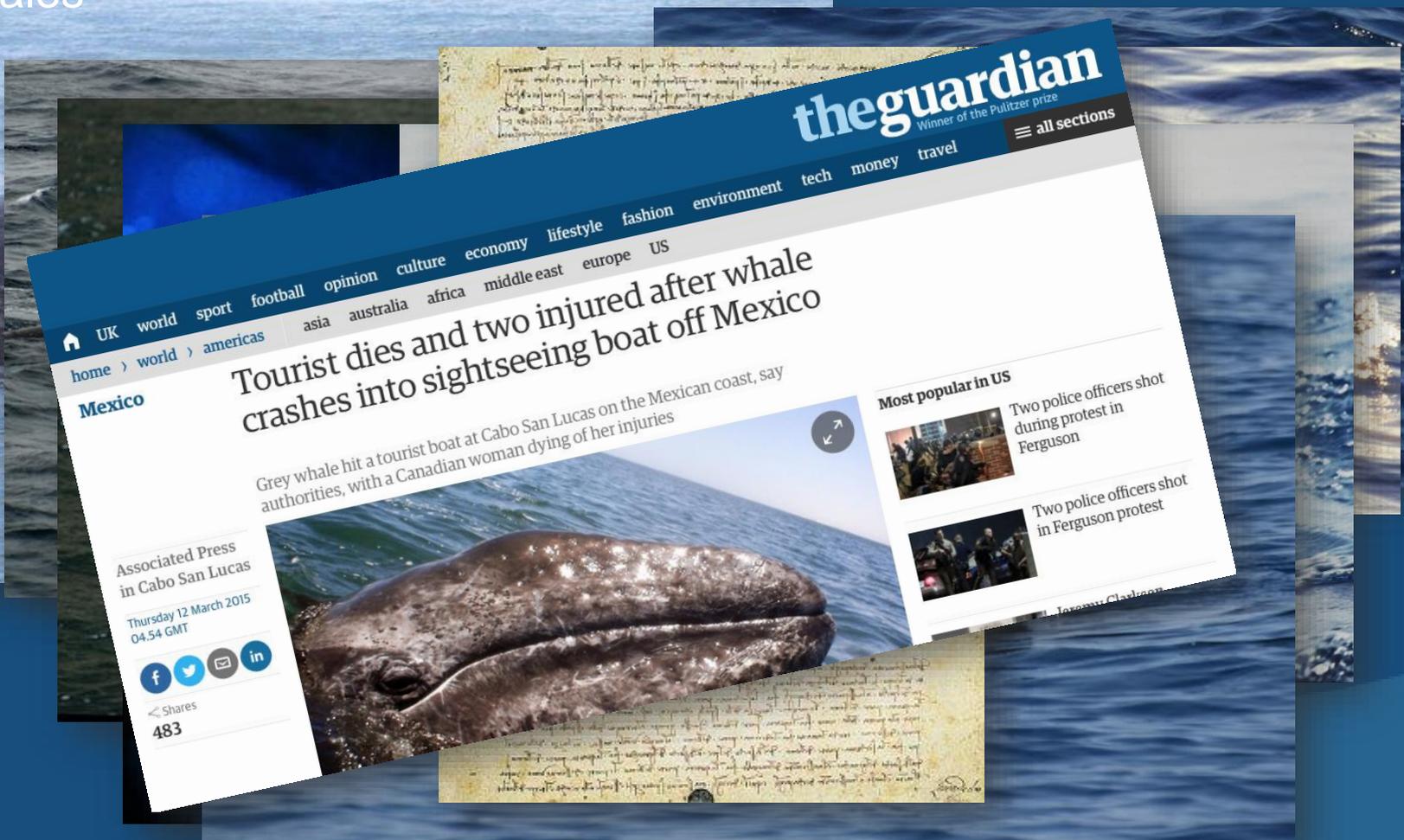
Vessel types involved



Species involved

Large whales

Small cetaceans



Cetacean images (except right whale): © MEER e.V.



Why do collisions occur?

BEHAVIOUR OF CETACEANS

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

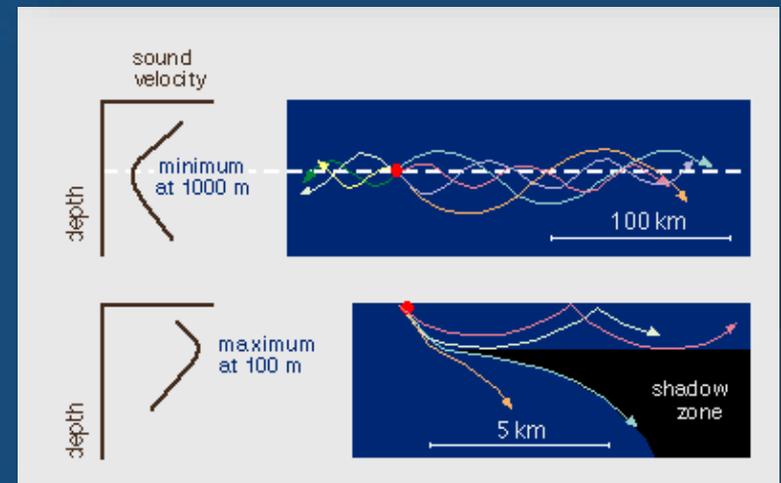
- Resting/sleeping
- Distraction by other behaviours
- Inter-species differences in responsiveness
- Reaction related to age/sex class or individuals
- Experience and learning
- Background noise, hearing damage (TTS, PTS)



© F. Ritter / MEER e.V.

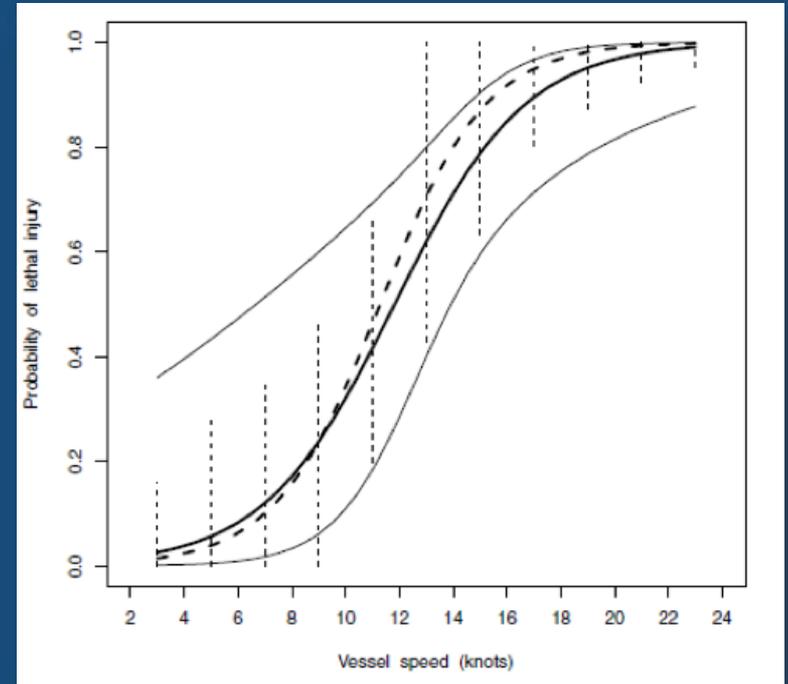
BEHAVIOUR OF SOUND IN WATER

- 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)



Knowledge Gaps

- 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



Mitigation: Technological Approaches

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

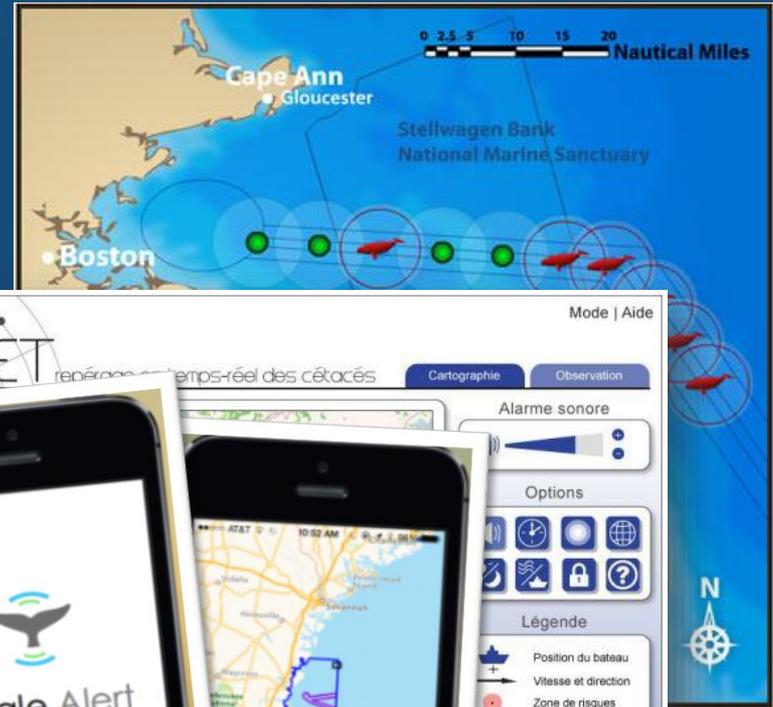
Limited range/effectiveness under adverse conditions



Mitigation: Technological Approaches

Alerting Tools

Passive acoustic monitoring off Boston (USA)



REPCET
Mediterranean Sea



Whale Alert APP

Onboard observers

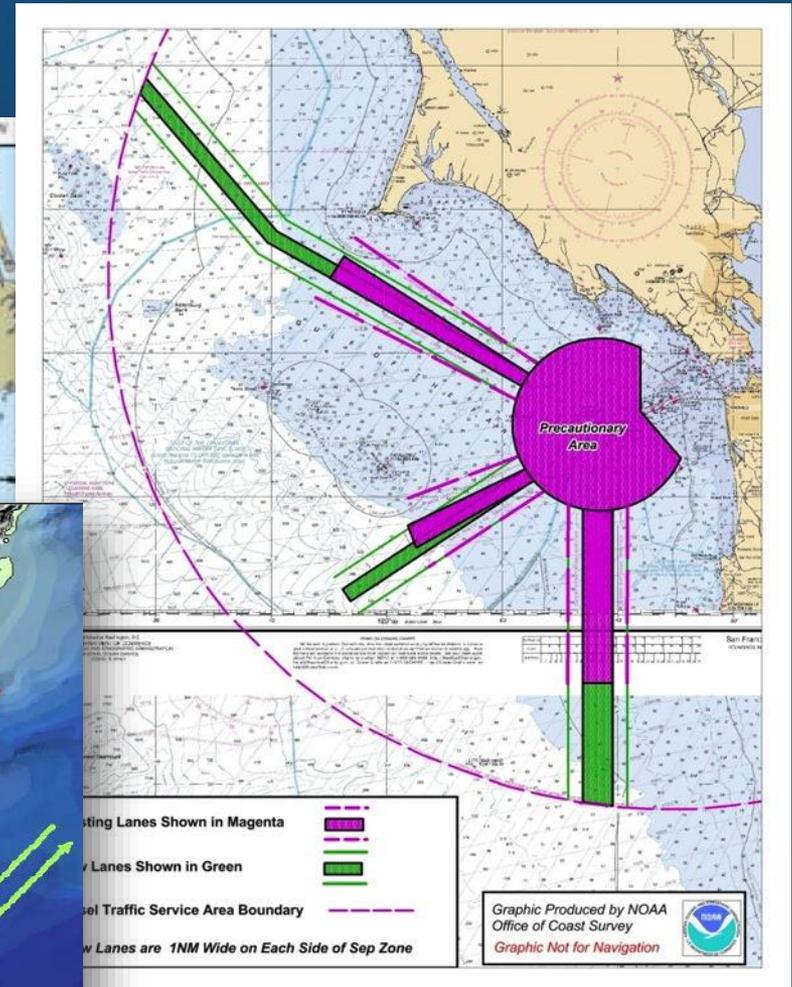
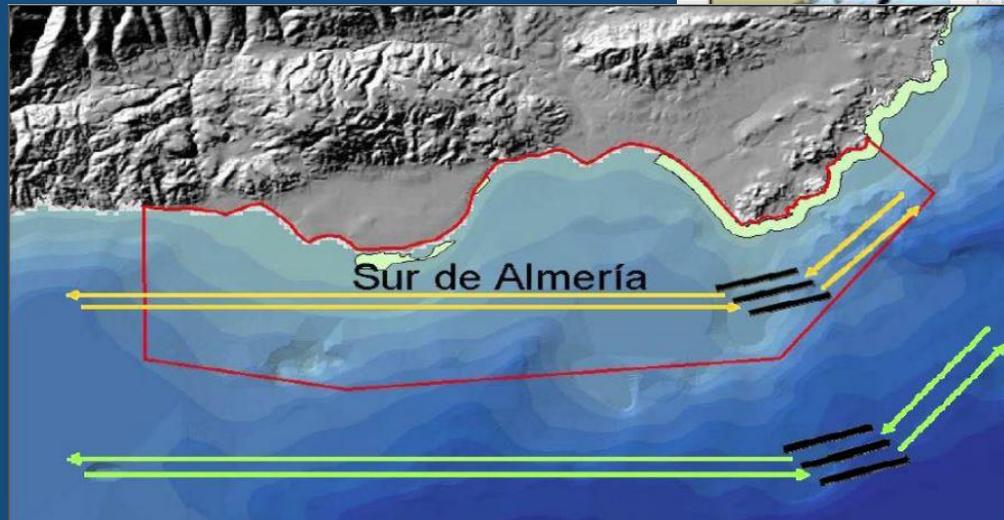


Mitigation: Operational Measures

Operational mitigation measures

Relocation of shipping lanes /
Traffic Separation Schemes

(IMO designation)



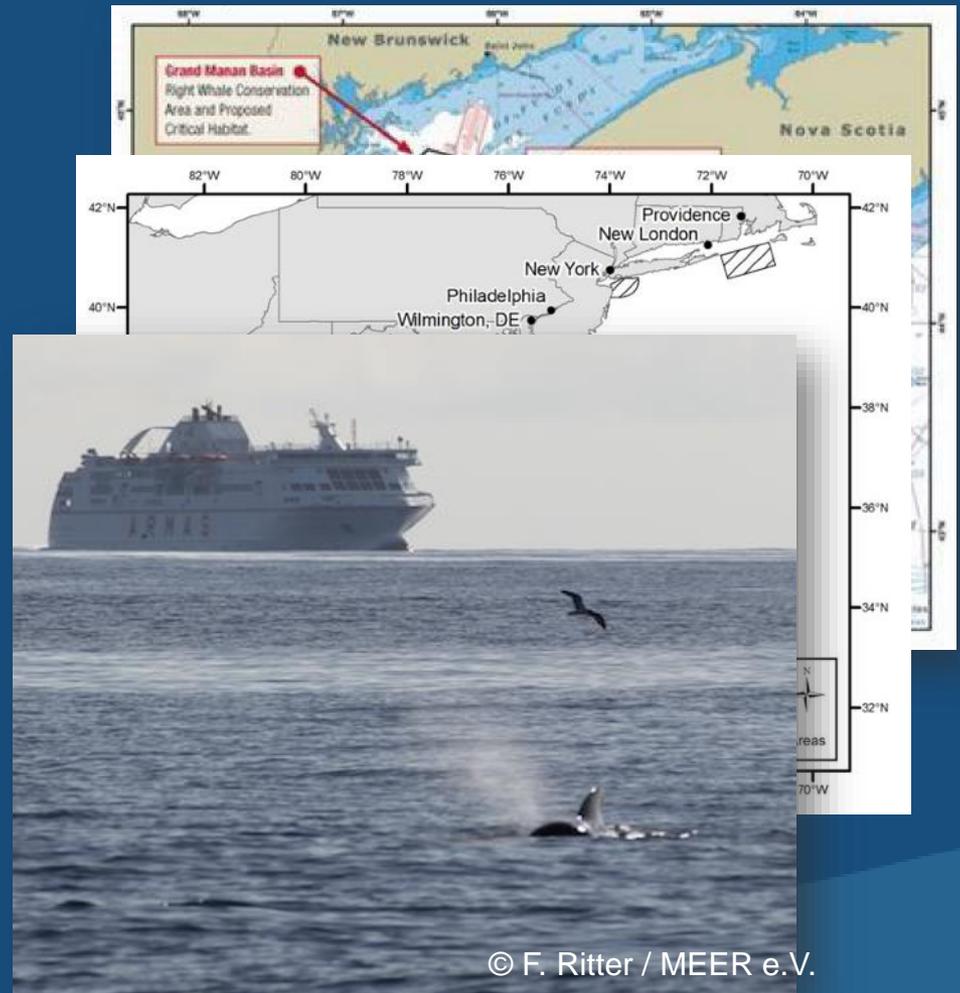
Mitigation: Operational Measures

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 website for M.E.E.R. e.V. (Marine Environmental Education Research). 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 following text:

Collisions

Vessel-whale collisions: an underestimated problem

Dolphins and whales are **threatened globally** by pollution, habitat degradation, overfishing and ocean noise, and unsustainable whale watching tourism. Many thousands are killed annually as bycatch in nets and through direct hunts. For a few years it has been known that **growing shipping traffic** is adding another serious threat. Besides the ever increasing noise levels in the oceans produced by maritime traffic, ships can also physically hit whales and dolphins.

It is well known that the number of such ship-whale collisions ("ship strikes") is rising worldwide. Today

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. The brochure also displays logos for 'be' and 'SNCM', and the date 'mars 2006'. At the bottom, there is contact information for the 'Association la conscience écologique agréée pour la protection de l'environnement'.



The Role of IWC

- 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 routes 2014/15 (distances are given in nautical miles)

Areas where cetaceans are most likely to be present

START Alicante, Spain

FINISH Gothenburg, Sweden

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

Sperm, pilot and beaked whales; dolphins species

Humpback and sperm whales; possibly others

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

Humpback whales; many toothed cetaceans

Cape Town, South Africa

Southern right whales; many dolphin species

Abu Dhabi, United Arab Emirates

Sperm and humpback whales

Sanya, China

Humpback and sperm whales; many small cetaceans

Sperm and baleen whales; many small cetaceans

Many toothed cetaceans (including sperm whale)

Blue and sperm whales

Bryde's and other baleen whales; sperm whales

Auckland, New Zealand

Possible sperm whale encounters

Possible sperm whale encounters

Possible sperm whale encounters

Several dolphins and harbor porpoises; some minke whales

Sperm, beaked and baleen whales

North Atlantic right whales: 8,547 mi

7,280 mi

North Atlantic right whales

Sperm and baleen whales

8,880 mi

9,880 mi

8,010 mi

6,578 mi

1: 6,487 nm

2: 6,125 nm

3: 4,670 nm

4: 5,264 nm

5: 6,010 nm

6: 6,778 nm

1 A fin whale, with characteristic black except for, gives a hint of its reputation as the "pygmyhead of the sea".

2 The pilot whale is one of the largest and more social of the oceanic dolphins – and particularly prone to stranding.

3 The minke is the smallest and fastest of the baleen whales, only 8 metres long and capable of reaching 35 kilometres per hour.

4 The smallest of the porpoises at barely 2 metres, the harbor porpoise stays close to coastal areas or river estuaries.

5 A sperm whale's head checks like a hammer on the water's surface, a behavior common to many whales.

6 A breaching humpback whale can be identified by its particularly long necked fin and knobby head.

Southern right whales have calluses on their heads and lower jaws that are unique to each individual, the fingerprints.

The pygmy blue whale – at a maximum of 24 metres long – is more likely to be seen around Sri Lanka than its larger cousin.

Common dolphins can live in groups of hundreds or even thousands. They are fast swimmers and very agile.

Bryde's whales can be somewhat erratic, surfacing at irregular intervals and unexpectedly changing direction.

The surface-skimming North Atlantic right whale is highly endangered by ship-strikes, and its numbers are already very low.

At 15–20 metres in length, sperm whales are the largest of the toothed whales and have the biggest brain of any animal.



Reporting is essential !

IWC global ship strike data base

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



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
... and counting

Report a ShipStrike

Just so we only ask you relevant questions, please tell us a bit about the ShipStrike.

Where are you reporting from?

Other

Where did the incident or discovery happen?

At Sea On Land

Are you reporting details about a collision event, or a whale that was believed to have been struck by a vessel?

Details about a collision A whale observed at sea

Did the whale become stuck on the ship?

The whale became stuck The whale did not stick to the vessel

Save and Continue →



Recommendations

- ✓ Separate vessels from whale
- ✓ Reduce speed in whale area
- ✓ *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!