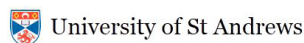


# Ship-Strike Workshop Report

18th and 19th April 2012

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# Contents

- 2 Attendees
- 3 Summary
- 4 Introduction: Whales in Biscay
- 5 The Workshop
- 6 Identifying recurring themes and issues
- 7 Turning ships
- 9 REPCET
- 11 Speed reduction
- 12 Moving whales
- 13 People
- 15 Attendees
- 16 Review of Day 1
- 17 Re-iteration on the goals of the workshop
- 18 Implementing the strategy map
- 21 References
- 22 Appendix 1. Recommendations associated with the use of REPCET

# Day 1

## Attendees

David Balston – British Chamber of Shipping  
Claire Bass – WSPA International  
Richard Bull – ORCA  
Jerome Couvat – Souffleurs d’Ecume  
Lucie Evans – WSPA International  
Jonathan Gordon – St. Andrews University  
Sally Hamilton – ORCA  
Phil Hill – P&O Ferries  
Sophie Isaacs – ORCA  
Dan Joynes – Brittany Ferries  
Russell Leaper – IFAW/Aberdeen University  
Nigel Lehman-Taylor – Maersk  
Katherine Mansell – WSPA UK

Pascal Mayol – Souffleurs d’Ecume  
Andrew McLeish – MARINELife  
Simon Panigada – Tethys  
Helen Skjaerlund – CMA CGM  
Claire Sneddon – Maersk  
David Smith – DF Clark Bionomique  
Chris Washington-Sare – Management Centre

### **Contributors who were unable to attend**

Regina Asmutis-Silvia – WDCS  
Peter Evans – Seawatch Foundation  
Alastair McFadyen – P&O Ferries  
Fabian Ritter – MEER

## Summary

The Bay of Biscay supports high densities of large whales, particularly in the summer. Coupled with a high density of maritime traffic, the Bay of Biscay has been identified as an area of high risk of fatal ship strike<sup>1</sup>.

Solutions to reduce the risk of ship strikes on large whales need collaboration between scientists, industry, industry policy makers and NGOs. The workshop held on the 18th and 19th April 2012 focused on the Bay of Biscay and had representatives from key stakeholders. Each stakeholder brought their own experience, expertise and view. Everyone worked constructively to identify a clear way forwards to address the risks of ship strike on large whales within the Bay of Biscay. The workshop focused on pragmatic and realistic solutions that industry could adopt and it was agreed that the primary streams for further work were to:

- 1. Engage with captains, unions and companies operating in the Bay of Biscay to increase awareness of the potential of ship strikes.**
- 2. Utilise an effective early warning system that is used by industry, which would be based on near real time ship to ship reporting of whale sightings to highlight risk zones.**
- 3. Produce an effective acoustic deterrent that is adopted by industry, which would encourage large whales out of a ship's path.**

The workshop also identified that there are three broad classes of vessel: Ferries and cruise liners; containers ships; and large bulk carriers or tankers. On all vessel types the primary focus of all ships masters and navigational staff is the safety of the vessel and their passengers.

Ferries and cruise ships could potentially take avoidance measures when a whale is sighted ahead of the ship because they are generally more manoeuvrable. A number of instances to support this were identified, where actions had been taken to avoid a collision by ferries.

Bulk carries and tankers generally travel slowly (13 knots) and so the risks of a lethal ship strike are reduced due to the slower speeds.

Container vessels are large and travel fast (18-19 knots). They are not able to take immediate avoidance measures nor can they slow down without forward planning due to tight timetables for berth slots, which if missed, could increase time and costs.

The increasing price of fuel is causing a natural tendency towards slower ships speed. However, unplanned speed reductions are not practical or pragmatic for ferries, cruise liners or container vessels.

## Introduction: Whales in Biscay

The Bay of Biscay supports a high abundance of whales and dolphins, of many different species. Some of these species occur at relatively high numbers, with abundance estimates suggesting that there are over 9,000 fin whales in the European Atlantic, with the highest numbers being in the Bay of Biscay<sup>2</sup>. In the same area, a high density of ships transit along major shipping routes from Northern Europe to the Mediterranean, Africa and Asia. This overlap of a high abundance of large whales and density of shipping makes the possibility of ship strikes in Biscay a real concern<sup>1,3,4</sup>.

Fin whales are one of the most abundant species in the Bay, particularly in August and September. They are found predominantly along the shelf edge, in the deeper waters and over the abyssal plain. They are sometimes sighted in shallower waters, but this is rare. Until recently, (2009) the recorded densities were high. Since then, the recorded density of fin whales has been less. The reasons for this change are unclear.

In general terms, the seasonal abundance of fin whales follows a similar pattern between years. There is a mini peak in late May, with a larger peak occurring between mid to late July and September. The theory being that fin whales are moving through the area on migration (spring) and feeding during late summer. There is also evidence that Fin Whale have given birth in the Bay, and mother – calf pairs have been seen on a number of occasions.

Minke Whales occur on the continental shelf edge near the Brest peninsula and the Northern Bay. Sperm whale numbers fluctuate, and can be relatively numerous in some years. In other years, numbers may be very low. Their peak seems to occur from July to September<sup>5</sup>.

Areas of presence differ between species and are generally associated with water depth and slope of the bathymetry. There does not appear to be a consistent pattern temporally, where whales are consistently seen in the same area at the same time between years, or even within seasons. More data analyses are needed to understand the temporal and spatial variability in whale presence and abundance.

### Evidence of ship strike in the Bay of Biscay

Globally, fin whale is the species most often reported as struck and estimates of fin whale and shipping density suggest a high risk of collisions in the Bay of Biscay. To date, there is one known incident of a vessel hitting a fin whale in the Bay of Biscay and there is anecdotal evidence of more than five incidences of ferries turning to avoid hitting large whales (most commonly fin whale). However, there is currently little to no reporting of ship strikes in the Bay of Biscay. The lack of reported collisions from Biscay may be a function of the distance of the shipping lanes from shore, and prevalent wind and currents. Both make it unlikely that any carcasses will wash ashore before they sink.

### What needs to be done?

There needs to be a collaborative project where representatives from industry, government, navy, academia and NGOs can use their collective knowledge to produce practical and pragmatic guidelines for ships crews on large ships transiting the Bay of Biscay.

# The Workshop

## Establishing the objectives of the workshop

Group discussions identified the following objectives for the workshop:

- Shipping companies want to convey that they have a duty of care to whales
- To design collaborative programmes with the shipping industry for testing mitigation measures
- Produce guidelines that are practical and pragmatic to aid quick decision making where possible
- Produce cost effective industry workable measures that companies can implement immediately
- Have clarity about the way forward

## What the workshop wanted to avoid?

Group discussions identified what the workshop should avoid:

- Untested measures or seeing a single measure as competitive rather than complementary
- Not to get into the mind-set of “favourites”, everyone should keep an open mind
- Coming up with a “magic bullet”. Outputs need to be adaptable and testable, so that they can be improved over time.
- Duplication of other work that is also looking at the ship strike issue
- Disruption to business and cost or unforeseen knock-on effects
- Concentrating on just ferries; need to look at cargo vessels as well
- Industry does not want to be saddled with something that is too restrictive. There has to be a workable set of guidelines.

## What should the workshop outcomes be?

Group discussions identified what the outputs should be as a result of the workshop:

- A toolkit of guidelines and a communications strategy for mariners: “What to do if....” – for the ships’ masters.
- A document that could frame the guidelines; like an “elevator pitch”. Something that will allow representatives to describe the problem quickly and the benefits of the solutions to people outside of the workshop. For example, other shipping companies.
- A list of next steps – what would be the physical objectives that we ask delegates to deliver upon leaving, in order to develop a meaningful piece of work. It is important to know how any guidelines that come out will be enforced or implemented.

[At this stage it was agreed the outputs were not set in stone and it was agreed that they could evolve and develop during the workshop.]

## Identifying recurring themes and issues

A presentation to workshop attendees summarised the range of solutions that had been identified in the literature. A supporting document had been circulated in advance of this. Both identified the following potential solutions that have been identified by others:

### Detection measures

- People (training and awareness of bridge officers)
- Ship reporting systems, where ships have to report their location, speed and heading
  - Real Time Plotting of Cetaceans (REPCET)
- Technology to aid bridge crews to spot large whales
  - Sound Navigation And Ranging (SONAR)
  - Ambient Noise Imaging (ANI)
  - Towed Passive Acoustic Monitoring (PAMs)
  - Radio Detection And Ranging (RADAR)
  - Laser Detection And Ranging (LADAR)
  - Night Vision Cameras

### Mitigation measures

- Technology
  - Alarm sounds
  - Fixed PAMs
  - Whale Alert ipad application
- Ship speed reduction
- Turning ships to avoid animals
- Areas To Be Avoided (ATBA)
  - Alternative routing

### Further work

- Compulsory reporting of ship strikes to the International Whaling Commission database

### Framework for the guidelines

A rigorous discussion identified how to frame the guidelines. Four main themes were identified to be taken forward: Speed (slowing vessels down); moving ships away from whales (whether that be over short or medium time scales); moving whales by using a sound alarm to alert the whales of approaching ships; and training crew to give a better awareness of the ship strike issue. Four groups, each of which contained representatives from the shipping industry, academia and NGOs, discussed one of these themes and presented back to the delegates for discussion. Summaries of these presentations are as follows:

# Turning ships

## Introduction

Moving ship routes away from aggregations of whales is the most effective way of avoiding strikes. The recurring issue is that it is difficult to provide timely, relevant information to the ships, and then convince them to act on it.

On a more short term basis, the inertia of large tankers means they will keep moving in a straight line even if they try to turn quickly and so cannot respond to avoid sightings from the ship. However, ferries and cruise liners are more manoeuvrable, therefore modelling the hydrodynamic characteristics of individual ferries and smaller ships against sightings detection functions may make it possible to create guidelines on turning for these vessels.

## What should happen?

Ships should start to share information of whale locations; early detection is the key to avoiding them. The container industry needs real time information on whale density so that they can make course alterations in time to avoid concentrations of whales.

Education on the importance of avoiding ship strikes at management level is important. The crew need to be empowered to act on the information on whales received from other ships. Managers also need to give permission to captains to take avoidance measures if appropriate, so that if a ship arrives late there are no repercussions for the crew.

## Barriers

**Data:** There is a lack of understanding of when ships (ferries) should manoeuvre to avoid a whale or groups of whales. If they see a single whale in front of the ship, they may turn towards more animals. This question could be examined by producing a model based on the ORCA and MARINELife data. It is unlikely that predictable long term whale hotspots exist in Biscay. However, aggregations of animals may persist over a few days before they move on and therefore, the collection of real-time data on the locations of whales may be particularly important.

Not all ships are the same and at present it is clear a broad generic term for 'Ships' is not a workable definition. Ships covers too broad a spectrum to produce a one size fits all set of guidelines. For example: large ships such as tankers, bulk carriers or container ships cannot effectively avoid whales that they see by altering course. Smaller ships such as ferries are much more manoeuvrable and may be able to take avoiding action in response to a sighting. Therefore, there is potential for producing guidelines for ferries and cruise liners that addresses the circumstances when they should consider turning to avoid a collision.

**Advice for ferries:** The best advice is to turn away from the whale, taking into account the direction that the whale is travelling. However, further research/analysis is needed to establish whether or not shipping masters and navigation staff should react immediately, or wait to establish the whale's direction of travel and whether there are other whales nearby that they may turn towards.

Will industry listen? Shipping industry have set timetables and vessels cannot be late. Ships do not tend to comply with voluntary guidance and do not always comply with mandatory regulations until enforcement action is taken. Compliance with International Maritime Organisation (IMO) guidance is generally higher than national regulations. The IMO is a respected institution, but implementing measures may take several years. It would also require a strong body of consistent evidence on whale distribution and abundance to move shipping lanes.

**Communication:** Ship to ship communication regarding issues not essential to navigation may not be a priority and not all ships have continuous internet, which makes real time information sharing difficult. Internet may also be distracting to navigational staff. Any communication system should utilise existing communications systems, rather than creating a new one that just focuses on exchanging information on the location of whales.

Any information sent and received by ships would need to be very specific. One potential option might be to use Navtex. Currently ships pay attention to piracy warnings, which go via the company Head Quarters who then sends an alert to all ships. Therefore, information sharing on whale density could be via Navtex, Sat-C or email via the company offices.

## Recommendations

### Short term:

Further analysis is needed to understand how long large whale aggregations persist in Biscay.

Create guidelines for ferries, cruise liners and other smaller ships that are more manoeuvrable, to aid them to avoid whales. More work is needed to establish when and under what circumstances it would be best to move away from a whale.

### Long term:

Cultivate relationships with shipping industry in order to place observers on their ships to gather more information on whale occurrence and abundance. A system is needed to encourage ships to report whale sightings and locations.

### Further recommendations

Ship to ship communication can be achieved using the REPCET system (see section below). It is also quite easy on local VHF channels.

The IMO has a lot of respect because their decisions are supported by a lot of input from industry, regulators and scientists. Therefore, the IMO should be involved with any initiative to add weight to recommendations. No guidelines should go to the IMO unless they have been rigorously tested first. Initially there may be an issue of gaining credibility for any guidelines produced.

Any guidance would need to convince managers and shipping masters before they would be adopted. Most shipping masters already use common sense and encourage their officers to make their own decisions. Instead of creating a set of guidelines, it would be better to produce a training document to be used in Toolbox Talks. A Toolbox Talk is where an officer produces a short talk on a given subject, for example the risks of ship strike. Simple background information is provided but it is up to the officer to create the talk. These talks can be done during the pre departure or pre arrival briefing.

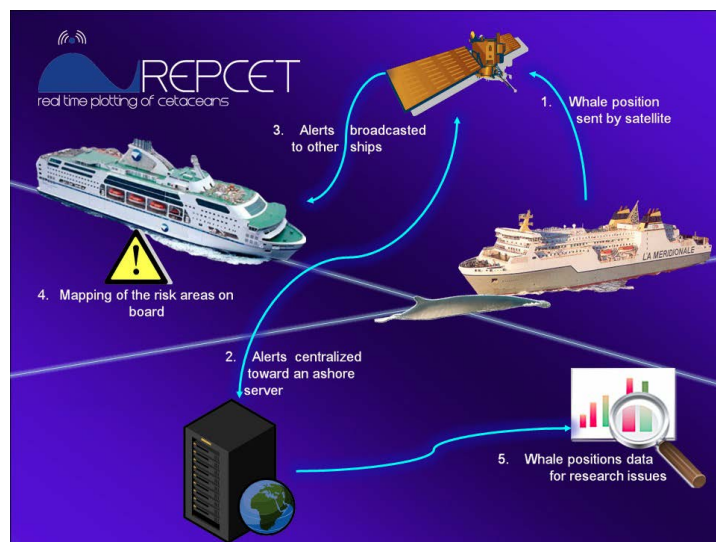


## REPCET

The REPCET system was highlighted as a potential component of providing near real time information on the location of whales. At the moment the system provides a risk-based ‘early warning system.’ On entering an area identified by the system as at risk, the crew of a ship may increase the number of people on watch. The workshop discussed the possibility of adapting and refining this. In particular, the principle that if whales were identified as being present in a given area; the possibility of providing a ship enough warning that it could make minor deviations in course to avoid the area. In order to investigate this, research is required to establish the proof of concept. However, assuming that it is possible to use real time information to predict where individual or aggregations of whales are, it should be possible to provide information to container vessels many minutes or even 2-3 hours in advance of them reaching an aggregation of animals. By attempting to adapt the system in this way, it avoids the complication that some vessels do not have the resources to provide extra people to watch in high risk areas.

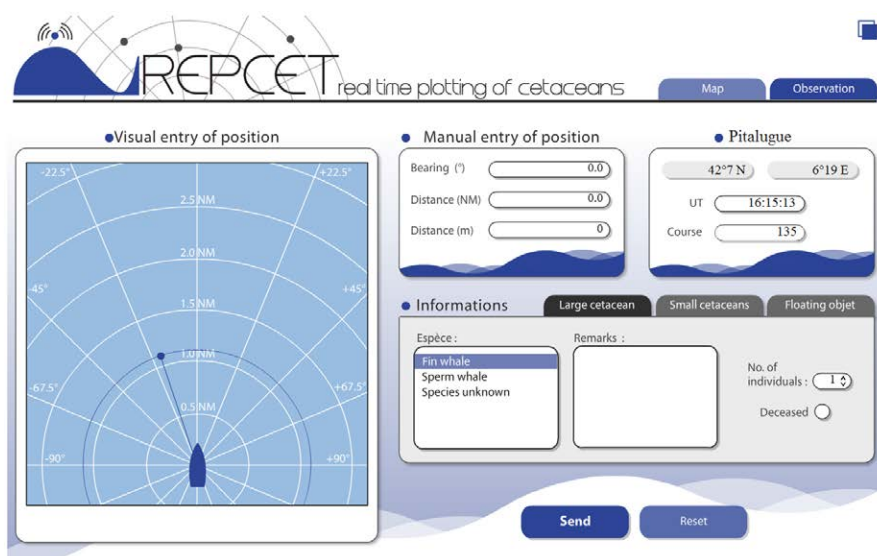
A brief description of REPCET was given by Souffleurs d’Ecume. The system is already in use in the Mediterranean Sea, and could be adapted for the Bay of Biscay.

Vessels that are equipped with REPCET report all their sightings of large whales via satellite to a server based on land (fig. 1). An alert of these sightings is then sent out to other vessels equipped with REPCET that are likely to be in an area of risk of ship strike. These alerts are displayed to the crew on a digital map via a dedicated screen on the bridge. One of the benefits of this system is its simplicity: Vessels become information providers (identifying animal locations) and information receivers (gaining all the sightings made by other subscribers).



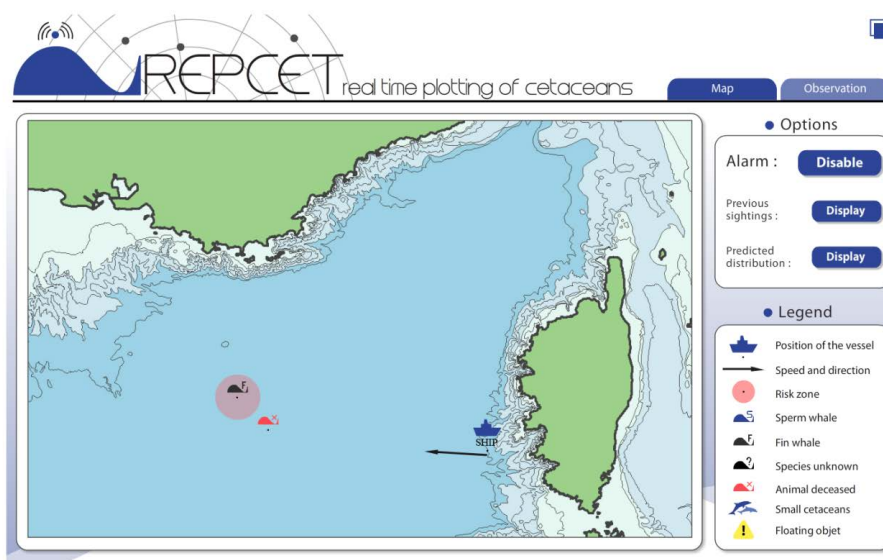
**FIGURE 1:** Schematic of how the REPCET system transfers whale sighting data from ship to shore to ship (From Gambaiani, 2010).

When a whale is detected, one click on a touch screen by ship’s crew automatically records the longitude and latitude of that animal (fig. 2). Ships that have access to REPCET are alerted to the whales in the area. A risk zone is created on the map that radiates from the point of observation (fig. 3). As time increases from the initial sighting, the risk zone increases because uncertainty of the whale location increases. This risk zone slowly expands to a 5,000 metre radius over 185 minutes before disappearing. This is depicted on the map by a gradually increasing circle. There is a set of voluntary guidelines that comes with the REPCET package (see Appendix 1), and these could be adapted to suit different areas, regions or circumstances.



**FIGURE 2:** Screen shot of the REPCET interface. One click of the mouse on the left diagram automatically records a set of basic data (e.g. name and position of the ship, distance and bearing of the animal) species and number of individuals can also be added on the right (From Gambaiani, 2010).

REPCET currently cost around €300 a month, per ship. The cost to employ an extra observer is likely to be significantly more (£70,000+ per annum, per ship).



**FIGURE 3:** Cartographical representation of observations. Risk areas, or Areas of Potential Presence, appear in red, more or less merging with the map's background colour according to the age of the observation (bright red=recent observation; pale red=old observation) (From Gambaiani, 2010).

The overall feeling from shipping representatives was that REPCET or a system similar to it would be very useful, particularly if it could be adapted from its current use to one that provides an early warning system to enable large containers to turn many minutes (30+) or hours before entering an area with whales. An early warning system (if it could be shown to work) would also fit in with the recommendations of previous ship strike workshops that real time information on whale locations is important.

## Speed reduction

Three main categories of vessel were identified. Ferries, which are fast (working speeds over 20 knots) and manoeuvrable; container vessels, which are relatively fast (working speeds approximately 18-20 knots) but cannot change direction quickly; bulk carriers and tanker that are slower (working speeds approximately 13 knots), but not very manoeuvrable.

In general terms for industry, changing course is preferable to slowing down. For container ships, bulk carriers and tankers it is too late to slow down by the time a whale is spotted. For example, a container ship travelling at 18 knots will take approximately 5-6 miles to slow down to 15 knots, by which time the ship would have passed the whale.

### Issues for business:

Shipping is a global industry and any regulations affecting international waters need to be passed by the IMO. There are strong commercial and logistical pressures from passengers and customers. For example, time slots for berths or to transit the Suez Canal, are very strict. If a vessel is late, many hours could be wasted waiting for the next slot. This is very costly and could increase carbon emissions. If restrictions are voluntary, it is unlikely one company would act unilaterally because reduced speeds on their vessels is likely to pass on a competitive advantage to other companies that do not reduce the speeds of their vessels.

### The way forward for business:

Average vessel speeds are likely to reduce over the next few years due to commercial pressures of increasing fuel costs. Bulk carriers and tankers already travel relatively slowly at approximately 13 knots and may have flexibility in their time tables to reduce speed further without significant commercial impacts. Ferry and container vessels however, have no room for flexibility in the operating speeds of their vessels.

Any speed restrictions at this stage would have to be voluntary and not mandatory. In the USA there were decades of research on cetacean vulnerability and 10 years of discussions with the industry before reductions in ships speed limits were implemented. Given this and the above, a mandatory speed restriction in the Bay of Biscay is either unrealistic or decades down the road.

### Recommendations

Ships cannot slow in response to a whale sighting. The workshop decided that at this point, speed restrictions were not a realistic and pragmatic solution in the Bay of Biscay and discussions focused on other potential solutions.

## Moving whales

### The Problem:

Whales cannot always perceive a ship, or may not move out of a ship's path even when they detect it.

### The change that needs to take place:

There should be a way of alerting each species of whale in an appropriate way to allow them to move a safe distance from the ship.

Sound alarms tested in the USA on North Atlantic right whales had little success, for example the whales did not generally appear to respond to the sound alarms. On one occasion, there was a recorded response where whales responded by swimming straight to the surface (or just below) and remained motionless. However, evidence from whaling ships suggested that noises have been used to change the behaviour of whales in a predictable way by instigating flight behaviour in response to a given sound.

Although there are ethical and noise pollution considerations with an acoustic deterrent, it may be possible to develop signals with minimal harmful effects that significantly reduce whale deaths due to collisions. Carefully implemented noises could benefit whales if they are employed from the front of the ship to divert an animal out of harm's way.

### What needs to happen?

A programme of work is needed to provide proof of concept. A formal and collaborative programme should identify various deterrent sounds that could be used by ships, and the potential effects they have on different whale species. In addition, work needs to be conducted on how deterrent devices can be fitted to new and existing ships. Following this, experiments and pilot tests need to take place to examine their use and effectiveness in the field.

### Barriers

There may be a perception that a new technology might be prohibitively expensive because of the cost associated with attaching a product to a ship's hull. However, this could be a less expensive solution compared to changing shipping routes (so that they are longer) or reducing speed for shipping. Furthermore, it is likely to be cheaper to attach any new device to newly built ships.

There are risks that spending on a technological solution could detract from other equally important potential solutions and / or that an acoustic deterrent raises other ethical concerns associated with the use of noise in the ocean environment.

Finally, the proof of concept work is likely to take time and be costly.

### Resources needed to succeed

The ideal partnership to test/demonstrate the solution would be:

- An unbiased acoustic manufacturer, willing to share technology and knowledge
- A marine mammal field research group with a background in acoustics and telemetry
- A ferry company that runs regularly in Biscay that is willing to test the devices
- A group that can take the results and run with them

All aspects would need to be funded and would take time to implement. This potential solution would be difficult to implement without the support of at least one large company running ships. It is not realistic to expect all funding to come from the shipping industry.

### Guidelines/recommendations

Research is needed to clarify the environmental disturbance implications on other species, to ensure compliance with the Habitats Directive. The device would have to project forward, be directional and should have a limited range to minimise the impact on other marine wildlife. At the same time it needs to provide whales enough of a warning to move away from the ship. Work will be needed to examine what effect this may have on other marine species.

To gauge interest in the sound device, a punchy statement needs to be created that describes the project and enables the issue to be discussed at the correct level to motivate political will.

If a suitable device were created, there must be an incentive for industry to use it. A mandatory system would be very difficult to police and hard to instigate, because it would have to be an international system.

### Questions and Observations

Industry representatives were unimpressed with most technological solutions but felt that a sound deterrent could have serious potential. There are risks associated with this, including the potential of excluding whales from important feeding areas. Therefore, the benefits of potentially reducing impact risk would have to be weighed up against the displacement problems.

Experiments could examine whether any sounds elicit a change in whale behaviour in a way that would reduce the chance of a ship strike. If possible, trials on ferries would be ideal because it would be possible to quickly replicate the experiment. Visual observers would track whale movements and identify whether there are differences between what's happening when a vessel uses the device and when it does not.

## People

**The problem:** The issue of ships striking whales is not well known by crews or operation teams ashore. Few people know what they can do to avoid a ship strike. There are public relation considerations for shipping companies should one of their vessels strike a whale and it enters port carrying an animal on the bulbous bow. There is also a lack of awareness that the International Whaling Commission (IWC) ship strikes database exists, so the incidences of strikes are underreported.

**The Change:** Companies and crews of large vessels crossing the Bay of Biscay are equipped with the appropriate knowledge to take action to effectively avoid ship strikes, and provide information to allow better monitoring of strikes.

**To bring about change:** Initially there simply needs to be an increase in awareness amongst shipping masters, navigation staff and companies that ship strike is a potential issue that they should consider. To start this process, efforts should be focused on working with companies that are likely to be the most approachable. For example, large companies with good corporate social responsibility (CSR) policies. Establish good contacts with CSR departments to understand their needs, so that they will help drive the solutions. Create a memorandum of understanding with companies to agree to pilot the project for several years, to monitor ship strikes in Biscay.

**The training materials:** Create a basic training package (via a webex link or utilising the toolbox talks) for crews to include the geography of the Bay of Biscay and how this relates to large whale species; basic whale biology information; identification materials; how to track the swim direction of whales; basic species specific whale behaviours, including what species are most susceptible to strikes; what to do when a strike is imminent (turn/hold course – possibly only possible for ferries at this stage); information on the IWC ship strike database and how to report to it.

**Following training:** Maintain communications with companies and remind them when the peak season of whale abundance starts so that the ships can be extra vigilant in Biscay. Following the first season, revisit crews and companies to see how they used the training and what improvements could be integrated. Potentially lobby national governments and other appropriate bodies (European Union or IMO) to create legislation that makes reporting a ship strike mandatory. Once major companies are using the training materials and reporting strikes, further outreach to short-haul ships ('tramps') that frequent Biscay should be implemented.

**Barriers to implementation:** Corporate engagement. Shipping companies (especially smaller ones) have other cost driven priorities that take precedence over the ship strike issue. Crews may also lose interest in the issue if they are not always seeing animals; therefore their expectations need to be managed. There are costs associated with creating a training package and managing relationships with companies.

**Positives:** Working with people is inexpensive and it might be possible to ask bridge crews to voluntarily collect data that can be used for research purposes. This could be attractive to shipping companies to help fulfil some of their CSR obligations. Crews might be willing to collect data because it is an activity that provides them with something to do during long voyages. However, it should not distract from their main obligations to keep the vessel safe at all times.

### Collecting data on close encounters and ship strikes

It is relatively easy to record data when a ship has taken avoidance action to avoid a ship strike. It is less easy to record a ship strike because it is not always clear a vessel has struck an animal. It is difficult to define a close encounter because it will vary between ships, depending on their manoeuvrability. One solution may be to rely on the navigator to use their judgement when they feel that the ship got close to a whale. The reporting procedure needs to be simplistic and easy to use. This work should engage with the IWC to identify what data would be useful. This information should then be included in the training package, with basic information about whales, so that they know what to do and when.

To motivate ships crews, it is important to thank them for their work. This may simply be providing a big tin of roses with a thank you note on a regular basis.

# Day 2

## Attendees

Claire Bass – WSPA International

Richard Bull – ORCA

Jerome Couvat – Souffleurs d'Ecume

Lucie Evans – WSPA International

Jonathan Gordon – St. Andrews University

Sally Hamilton – ORCA

Phil Hill – P&O Ferries

Sophie Isaacs – ORCA

Russell Leaper – IFAW/Aberdeen University

Nigel Lehman-Taylor – Maersk

Katherine Mansell – WSPA UK

Pascal Mayol – Souffleurs d'Ecume

Andrew McLeish – MARINELife

Simon Panigada – Tethys

Helen Skjaerlund – CMA CGM

David Smith – DF Clark Bionomique

Claire Sneddon – Maersk

Chris Washington-Sare – Management Centre



## Review of Day 1

During the course of day 1 it became clear that the idea of producing ‘Guidance’ changed to focus on a course of action, rather than a specific set of guidelines. Four main areas were discussed: Moving ships; moving whales; slowing down and training and raising awareness. Table 1 summarises the conclusions from day 1 and was presented at the time to illustrate potential ways forwards or where uncertainty on this still existed.

Training and education were consistent themes throughout day 1. As a consequence this was one of the favoured work streams to take forwards. Any recommendations should be split for ferries, container vessels and bulk carriers/ tankers.

Slowing down as a short term corrective action is possible on ferries, but was not commercially practical. Large container vessels are built with “slow speed engines”, which take a long time to reduce speed and therefore slowing down in response to a sighting was not possible. Reductions in ships speed over a transit of the trip, or large sections of it, were also not commercially practical. As a consequence all solutions involving ships speed were dropped from further discussions.

**TABLE 1:** Summary of the workable short term solutions for shipping industry

	<i>Large Vessels</i>	<i>Smaller Vessels (ie ferries)</i>
<b>Moving Ships</b>	Not possible to avoid whales	Possible but need location data
<b>Moving Whales</b>	Not currently possible	Not currently possible
<b>Slowing Down</b>	Not possible to avoid whales	Possible but not practical
<b>Training and raising awareness</b>	Possible	Possible

**TABLE 2:** Possible ways forward

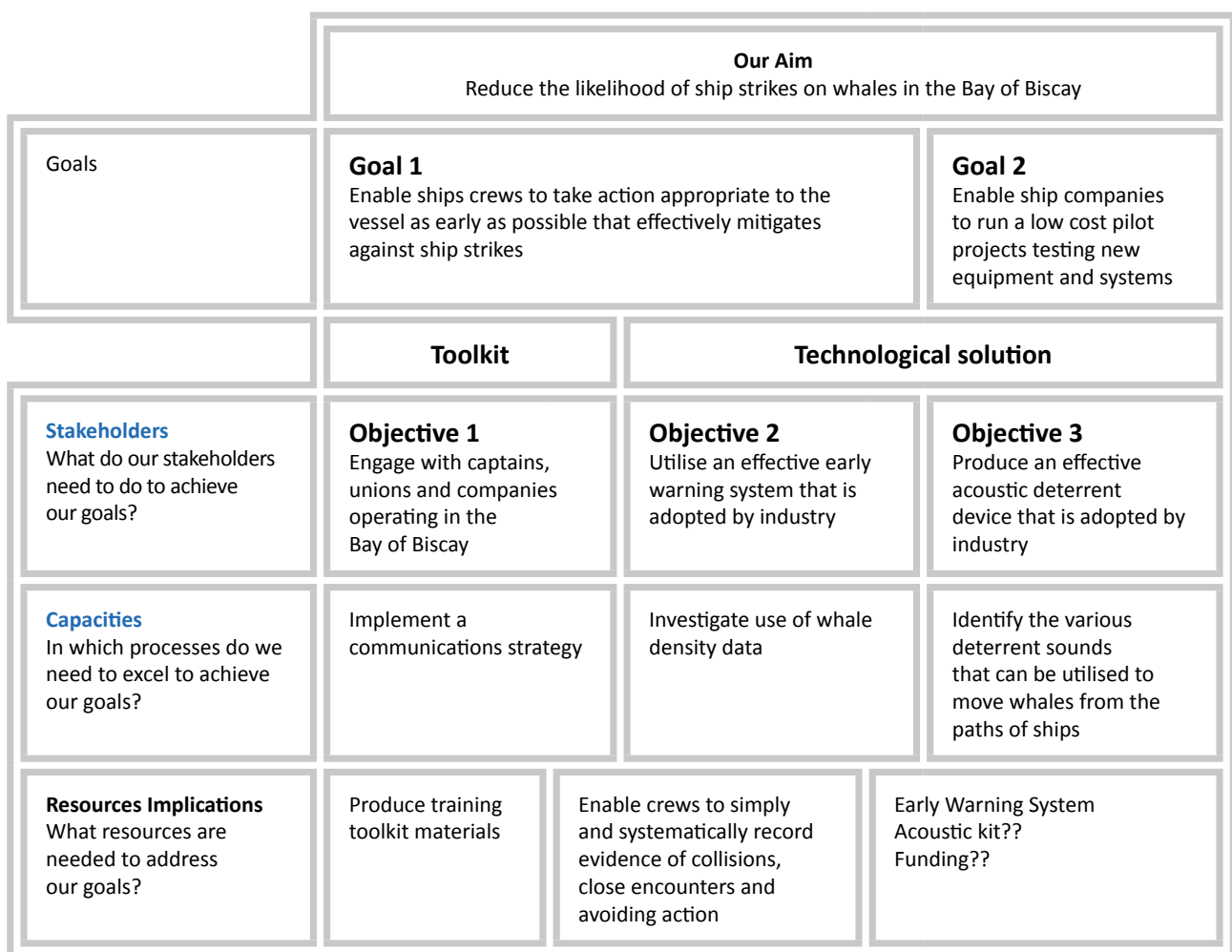
	<i>Large Vessels</i>	<i>Smaller Vessels (ie ferries)</i>
<b>Moving Ships</b>	?	Investigate use of RepCet
<b>Moving Whales</b>	Develop and implement “sound” research project	Develop and implement “sound” research project
<b>Slowing Down</b>	?	?
<b>Training and raising awareness</b>	Develop and implement training program supported by use of RepCet	Develop and implement training program supported by use of RepCet



## Re-iteration on the goals of the workshop

It was agreed that the overarching aim of the workshop was to reduce the likelihood of ship strikes on whales in the Bay of Biscay. Rigorous discussion resulted in the agreed goals, which were 1: To enable ships crews to take action appropriate to the vessel as early as possible, which effectively avoids ship strikes; 2 – Enable shipping companies to run low cost pilot projects, which test new equipment and systems. To develop these goals further, a strategy map was created (fig. 4).

The strategy map provided a clear, holistic approach to ship strike in the Bay of Biscay. It is accepted that a lot of further work is required to achieve the second goal, because research is needed to prove concepts and test pilots.



**FIGURE 4:** Strategy map to identify the goals, objectives, stakeholder input, capacities and resources needed to reduce the incidences of ship strikes in the Bay of Biscay.

## Implementing the strategy map

During group discussions, the activities required to achieve the overarching goals were discussed. These were divided into three main objectives: Engage with captains, unions and companies operating in the Bay of Biscay; utilise an effective early warning system that is used by industry; and to produce an effective acoustic deterrent that is adopted by industry.

### Objective 1.

#### Engage with captains, unions and companies operating in the Bay of Biscay

##### Creating a communications strategy.

An effective communications strategy with the shipping industry is needed. This strategy needs to be developed and would consider the differences between the three vessel types identified – ferries, container ships and bulk carriers/tankers.

The communications strategy should engage with shipping masters and their navigation staff, companies (CSR departments, managers etc), unions and the chamber of shipping.

Masters and navigational staff could be provided with materials, articles, lectures and identification training to support their toolbox talks. These should be translated into several key languages to ensure materials are available in the first language of shipping masters and navigational staff.

The strategy should aim to change behaviours on ships and increase the awareness. If we can increase awareness, even if it does not lead to an action, this will be a positive step forwards and is the first step towards changing behaviour.

Some representatives felt that something is needed to drive regulatory change because although training materials were nice, change will not be adopted by the masses. Other industry representatives felt that regulations should not be implemented and that a softer approach would be more effective. Some felt there is a risk that companies may only engage in reaction to an event, for example if one of their vessels enters port with a whale slumped on the bow. However, the communication strategy could highlight the benefits of engaging in the issue before this and the best ways to respond to press questions.

##### Producing training materials

It was agreed that it is necessary to produce training toolkit materials that can be used by bridge officers.

The toolbox talks would highlight how to watch animals carefully to understand their behaviour and then what to do when a whale is spotted (for manoeuvrable ferries only). In general the toolbox talks should also highlight when whale abundance is greatest so crews are more alert and perhaps are able to tweak planned routes to avoid high risk areas. Whilst the primary objective of crew is always the safety of the vessel and her passengers, it is still possible for ships crews to be sensitive to the issue.

Industry would like a chart that shows the ‘hotspots’ in the Bay of Biscay and the times of year to avoid them. ORCA and MARINELife data could be used to predict the presence of large whales in the Bay of Biscay. This could be printed and rolled out to all the ships transiting the Bay of Biscay. This has to be backed up by some form of delivery/engagement with crew and companies. Work will be needed to ensure the information on whale occurrence and abundance remains timely and relevant. If ships and their companies know about the highest risk areas and times of the year, then it may be possible to change routes at the voyage planning stage.

The Government of Belgium, IWC and IFAW (the International Fund for Animal Welfare) have already distributed a leaflet giving advice on avoiding ship strike. This could be supplemented with more specific advice on the Bay of Biscay. Many industry representatives had not seen the leaflet. Developing an effective distribution plan for leaflets requires a lot of work and can be costly. This is why it is important to engage with industry to get insights into what they would find useful and plan a carefully targeted communication strategy that maximises engagement.

### **Enable crews to simply and systematically record evidence of collisions, close encounters and avoiding action.**

Bridge crews are not there to look for marine life; their main priority is to maintain a safe watch at all times. However, if a large whale is sighted, then they may be able to take action if they think it is necessary.

As a first stage simple observations of whale sightings are of limited value. As a consequence, a detailed sightings system for ship's crew is not the first priority. However, given the lack of information, it would be useful to collect data on ship strikes, the number of occasions avoidance action was taken and the incidence of 'near misses'. Although there is difficulty in defining a near miss, a common sense approach would be the initial first step where crews made their own judgement. Further work and engagement with the International Whaling Commission would be needed to identify the criteria for defining a near miss. A feedback loop would be needed to ensure continued engagement by companies and ships crews.

To bring forwards a recording system, the quickest and easiest way would be to adapt an existing system, such as REPCET. An electronic system could be adapted to use categories defined by the IWC and reporting could be automatic.

Training on how to use the ship strike reporting system would be provided in the toolbox talks.

## **Objective 2.**

### **Utilise an effective early warning system that is adopted by industry**

Representatives from Industry felt that avoidance action by container vessels was possible if there was a way of providing enough warning that an aggregation of whales was in the path of the vessel. To be effective the information would need to be in near real time and provide enough warning for a vessel to change its course.

Container ships already make slight course alterations to aid the running of the ship. An example was provided where a shipping master could avoid rain showers whilst the ship was being painted. Given that the principle exists, the question that needs addressing is whether a system like REPCET could be adapted to provide an early warning that ships could then respond to.

The efficiency of any system will depend on a sufficient number of ships reporting sightings and the data processing that is needed to convert these into practical routing advice. It may not reduce risk just to avoid areas with sightings; risk reduction will be achieved by avoiding areas with higher than average densities. Given that industry prefers to adjust ships course than reduce speed there may be an inbuilt incentive to record whale sightings.

#### **Proof of Concept: Investigating the use of real time whale sightings information**

Can real time information be used in a robust way? The ORCA and MARINELife data may provide an opportunity to test the concept of an early warning device by examining sightings data from different ships. Investigation of these data would identify if they can be used to predict whale occurrence over the short term (minutes and hours).

### Objective 3.

#### **Produce an effective acoustic deterrent device that is adopted by industry**

Ethical considerations were identified, because the goal is to find a sound or sounds that cause whales to move away from a ship's path. There may be undesired short and long term effects and these need to be investigated. Once research has established the proof of concept and shown that the potential benefits of saving whales from being hit outweigh any adverse effects; more work will be needed before the technology could be implemented.

Ways forward: Scientists, NGOs and industry should work together to test this idea and deliver the technology if it is appropriate. Capacities to include: Funding, research by academics and work by shipping engineers will be needed. A pathway should be created detailing what actions are required and the resources needed to deliver them.

## Report Recommendations

A holistic approach that examines all three work columns is critical.

- Discussions with industry are needed to understand what information they need to take this process forward.
- Working groups including representatives from industry, scientists and NGOs from the workshop should be created to take the different work aspects forward. Where appropriate, external expertise should be invited to join these groups. Any suggestions of external contacts should be sent to Richard Bull.
- A map showing the density of large whales (baleen and sperm whales) and shipping in the Bay of Biscay, to highlight the issue of ship strikes in this area.
- Comparable large whale density data (or nearest suitable data) is needed to clearly and effectively highlight why the ship strike issue in the Bay of Biscay needs attention.
- Modelling the hydrodynamic characteristics of individual ferries and smaller ships against sightings probabilities to try and create guidelines on turning for these vessels.
- Engage with shipping masters, navigational crew, companies and unions about ship strike in the Bay of Biscay.
- Producing a toolkit (including materials) for three different ship types: a) ferries and cruise ships; b) container vessels; and c) tankers and bulk carriers.
- Investigate the implementation of an electronic system (most likely based on REPCET) that enables ships crews to simply and systematically record evidence of a collision, avoidance action and close encounters.
- Producing business plans for the two other technological based solutions, i.e. An early warning system (which is particularly important for container ships) and b) an acoustic deterrent.
- Work with the IWC to identify what data could be collected for the reporting of near misses and ship strikes.
- Disseminate the findings of the workshop to ASCOBANS and the IWC ship strike working group to gain their support.
- Clarifying the legal position regarding the implementation of any potential solutions that address marine issues (including ship strike), with particular focus on powers within international waters, the continental shelf; the 200nm Exclusive Economic Zone (EEZ), Contiguous Zone (up to 24nm); Territorial Waters (up to 12nm) and any other spatial zone that may be of importance.

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## Appendix 1.

### Recommendations associated with the use of REPCET

#### A. When your ship enters a risk zone:

**Reduce your speed** to 13 knots

Objectives:

- Increase the probability of detection of the animal
- Reduce the probability of collision
- Reduce the severity in case of impact

**Perform an intense visual watch** with the naked eye on a 180-degree angle and over a large distance (up to 3 nautical miles). A regular scan of the horizon with binoculars can complete the watch.

**Increase visual effort** with one or two additional people to the officer already on shift. Ideally, the angle of watch should be split between the different people on watch (60 degrees each for 3 people).

Objectives:

- Increase the probability of detection of the animal
- Avoid collision by detecting the animal as far as possible to increase the time available to analyse the situation

NB: Do not change course to avoid a risk zone; you might sail towards an undetected animal.

#### B. When you visually detect an animal:

**If the animal is detected in the long distance**, take time to analyse the situation (heading, number of animals, other animals in the area, distance to ship...). In the case of a collision course, manoeuvre in an appropriate way to avoid the collision.

**If the animal appears in a distance requiring an emergency measure** and seems to be on the course of the ship, change direction to the seemingly best heading to avoid the collision and/or reduce your speed as much as possible.

#### C. Report a large cetacean:

Once the risks of a collision are avoided, report your sighting via REPCET. This requirement also applies for a sighting within a risk zone:

- It could be an undetected animal occurring in the risk zone of a sighted animal
- If the animal was already sighted, your new sighting will improve the accuracy through the overlap of the two risk zones



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