Velocidad

Colisiones

Ruido

Centro Oceanográfico de Canarias

Tenerife. Islas Canarias. España

Natacha.Aguilar@ieo.csic.es

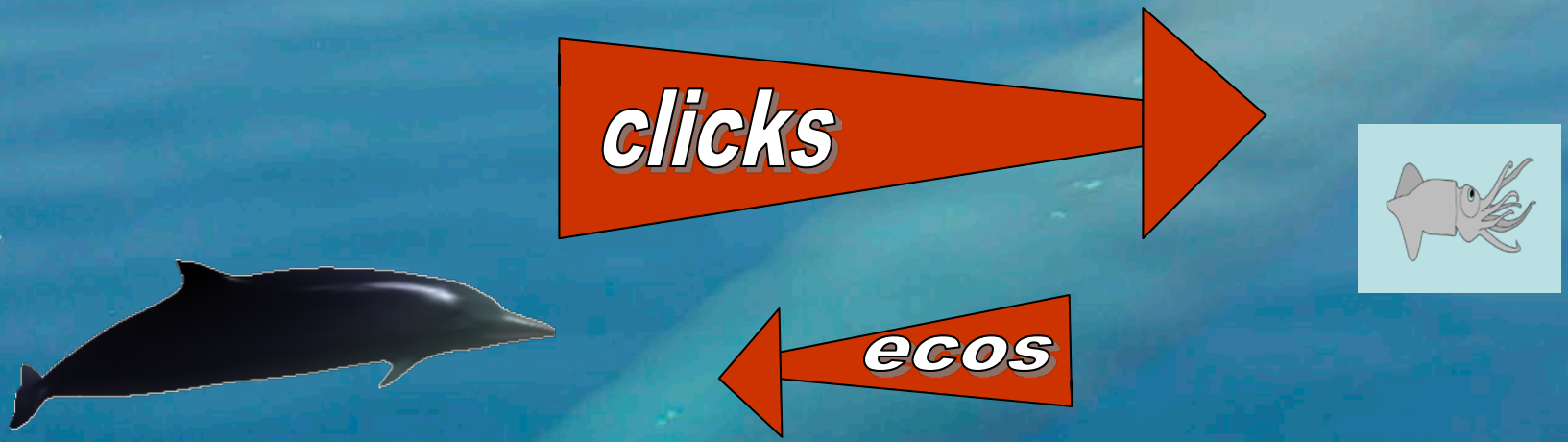
CSIC
Consejo Superior de Investigaciones Científicas

Instituto Español de Oceanografía 1914

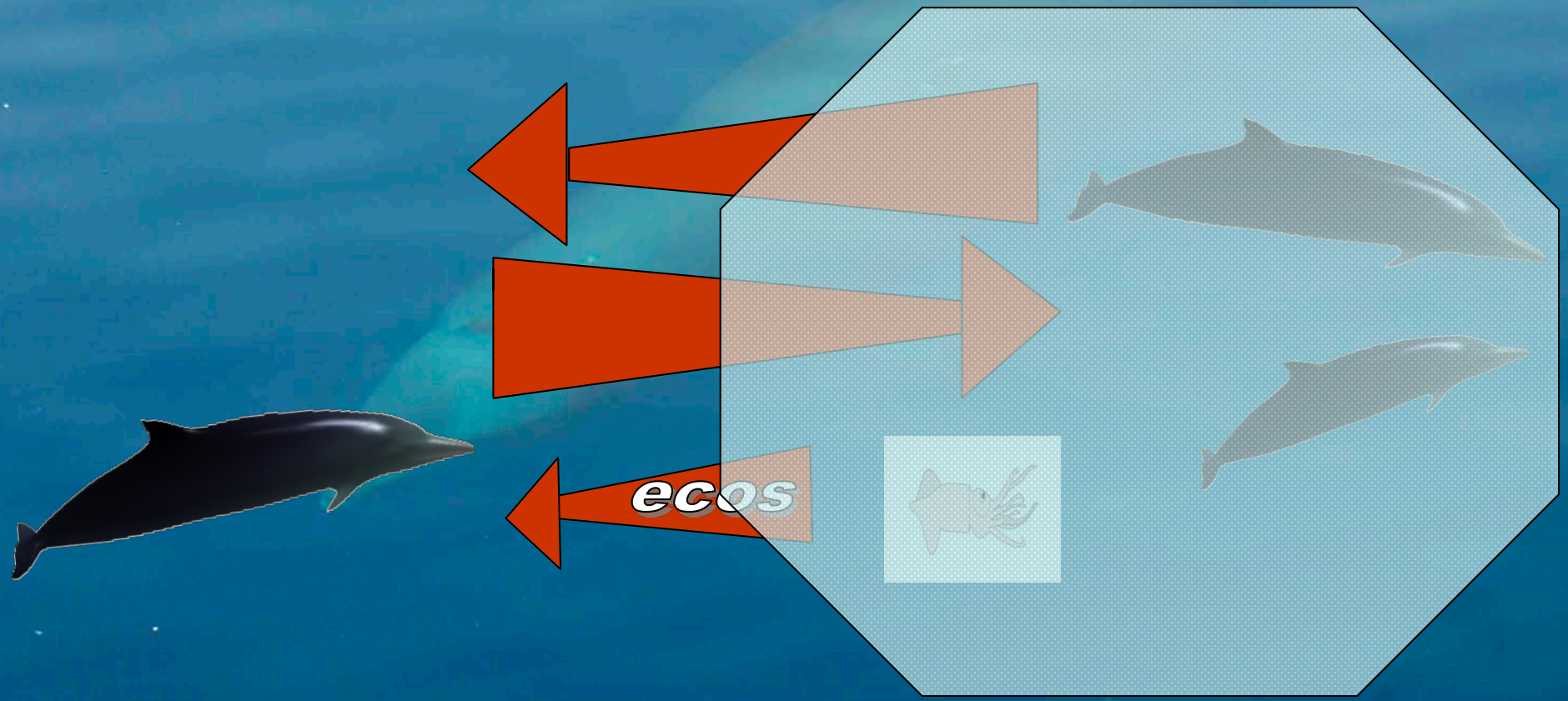
Comunicación

Photo: F. Pongiglione

Ecolocalización x búsqueda de presas



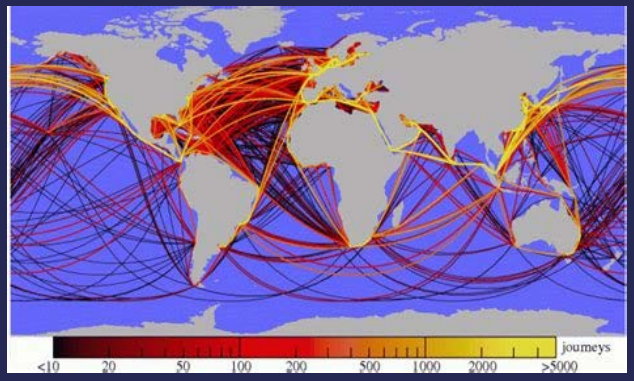
El ruido actúa como una niebla acústica



Ruido: enmascaramiento de señales biológicas

Pre-industrial

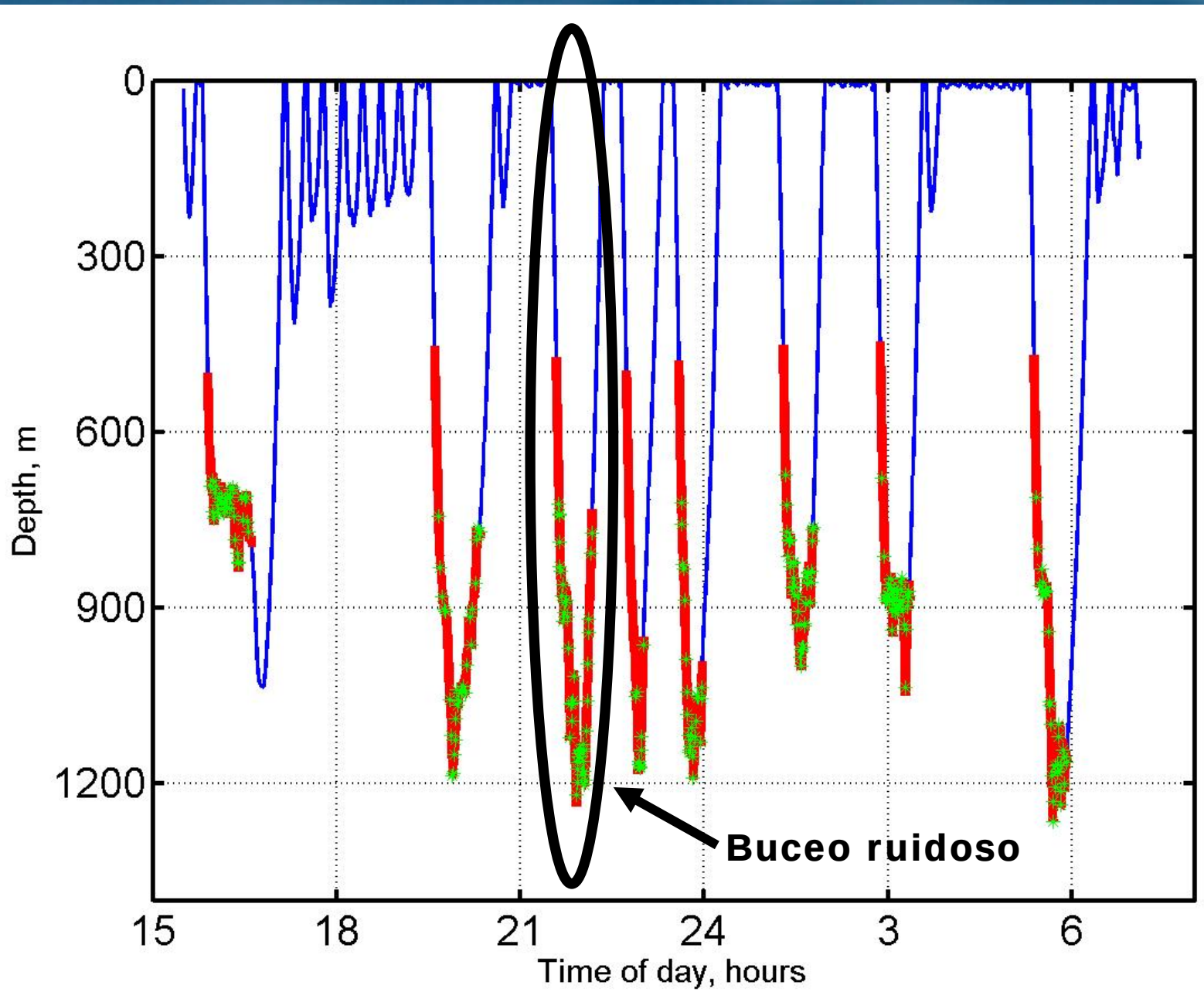
Actual

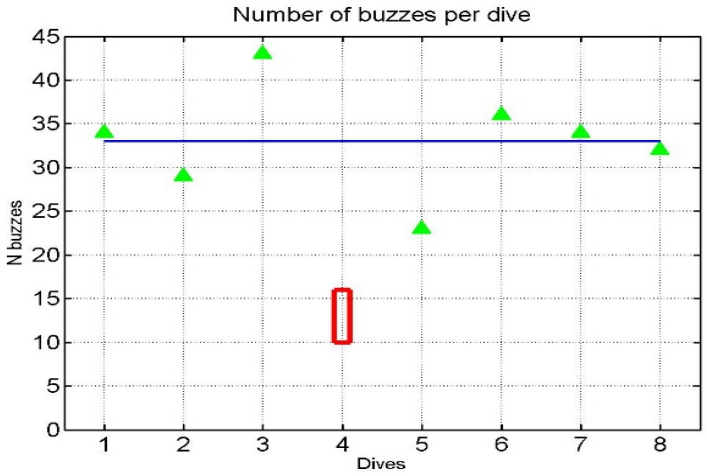


MARINE MAMMAL SCIENCE, 22(3): 690–699 (July 2006)

DOI: 10.1111/j.1748-7692.2006.00044.x

DOES INTENSE SHIP NOISE DISRUPT FORAGING IN DEEP-DIVING CUVIER'S BEAKED WHALES (*ZIPHIUS CAVIROSTRIS*)?


0
300
600
900
1200
Depth, m
15
18
21
24
3
6
Time of day, hours
Buceo ruidoso



Buceo ruidoso:

Mitad de intentos de captura de presas

Máximo rango sin ruido

Ecolocalización **42 %**

+ 15 dB

18 %

Comunicación

Aguilar de Soto et al. 2006

Saturn

Developing Solutions for Underwater Radiated Noise

Reducir velocidad reduce ruido

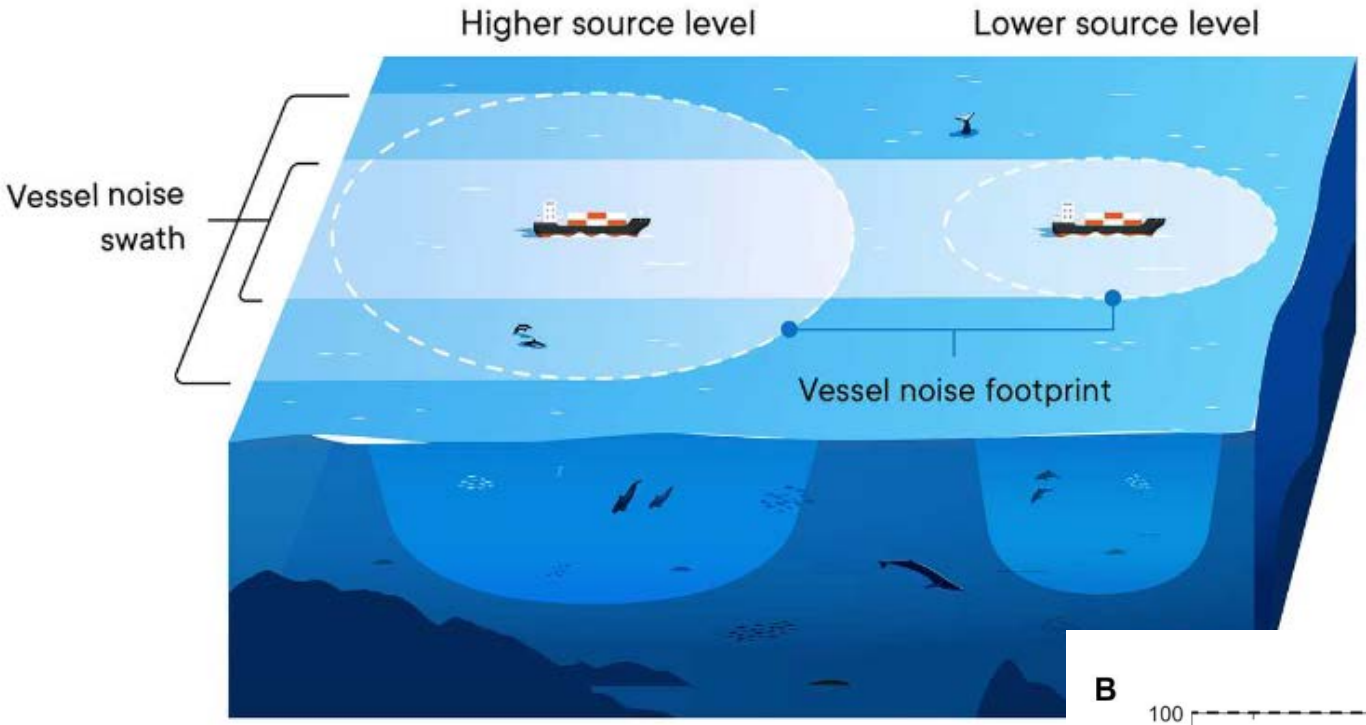
SCIENCE ADVANCES | RESEARCH ARTICLE

APPLIED ECOLOGY

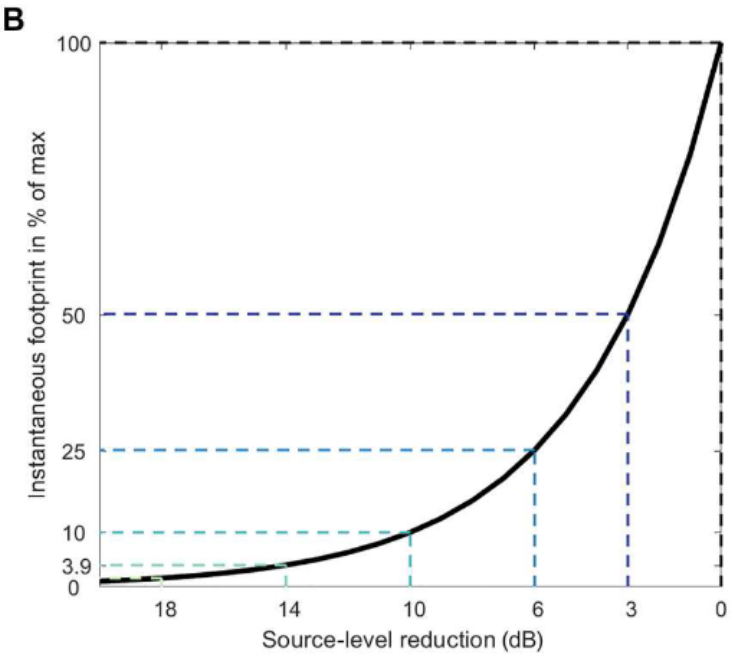
Small reductions in cargo vessel speed substantially reduce noise impacts to marine mammals

Charlotte R. Findlay[1]*, Laia Rojano-Doñate[1,2], Jakob Tougaard[2], Mark P. Johnson[1], Peter Teglberg Madsen[1]

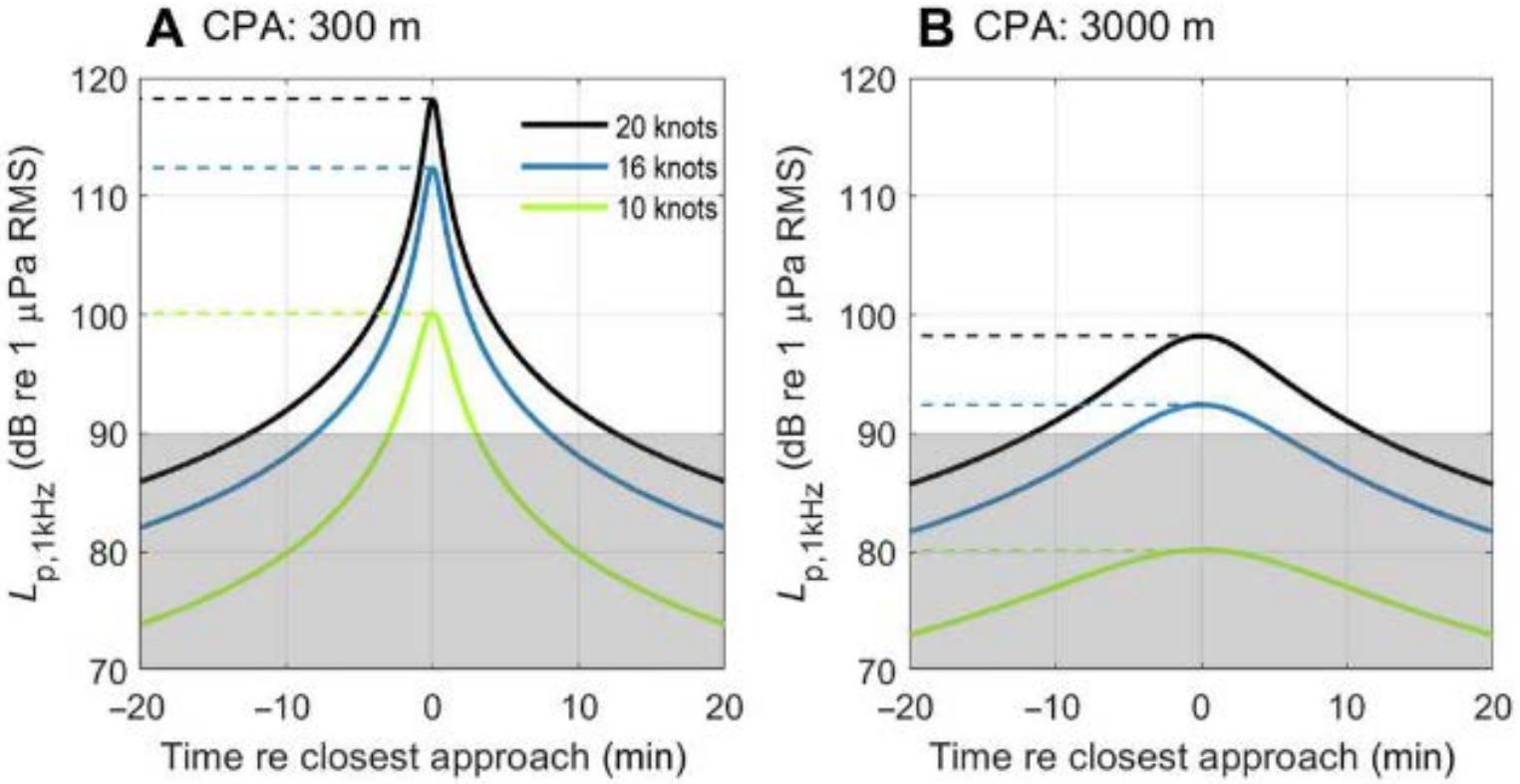
Global reductions in the underwater radiated noise levels from cargo vessels are needed to reduce increasing cumulative impacts to marine wildlife. We use a vessel exposure simulation model to examine how reducing vessel source levels through slowdowns and technological modifications can lessen impacts on marine mammals. We show that the area exposed to ship noise reduces markedly with moderate source-level reductions that can be readily achieved with small reductions in speed. Moreover, slowdowns reduce all impacts to marine mammals despite the longer time that a slower vessel takes to pass an animal. We conclude that cumulative noise impacts from the global fleet can be reduced immediately by slowdowns. This solution requires no modification to ships and is scalable from local speed reductions in sensitive areas to ocean basins. Speed reductions can be supplemented by routing vessels away from critical habitats and by technological modifications to reduce vessel noise.



Menor velocidad
Menor ruido
Menos animales impactados



Findlay et al. 2023

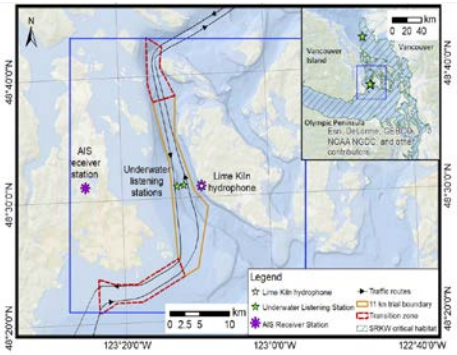


Aunque a menos velocidad el buque pase más tiempo en el área, el modelo muestra como el menor ruido emitido implica menor afección a la fauna marina

Findlay et al. 2023

frontiers in Marine Science

ORIGINAL RESEARCH
published: 26 June 2019
doi: 10.3389/fmars.2019.00344



Potential Benefits of Vessel Slowdowns on Endangered Southern Resident Killer Whales

Ruth Joy[1,2], Dominic Tollit[1], Jason Wood[1], Alexander MacGillivray[3], Zizheng Li[3], Krista Trounce[4] and Orla Robinson[4]*

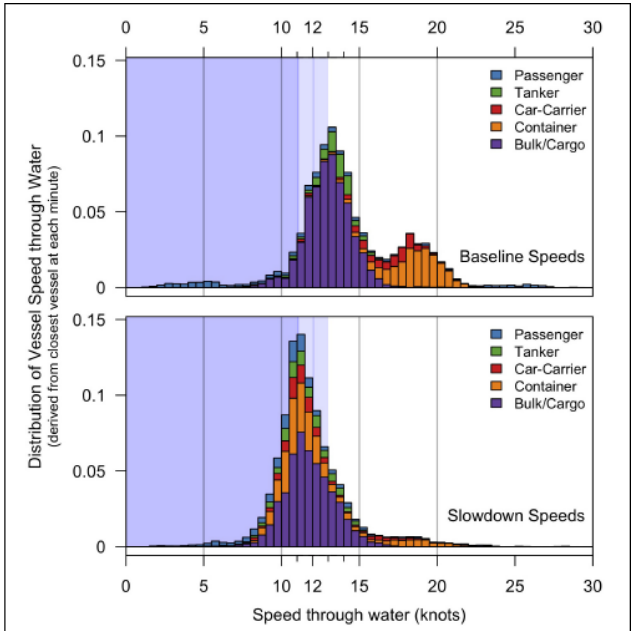
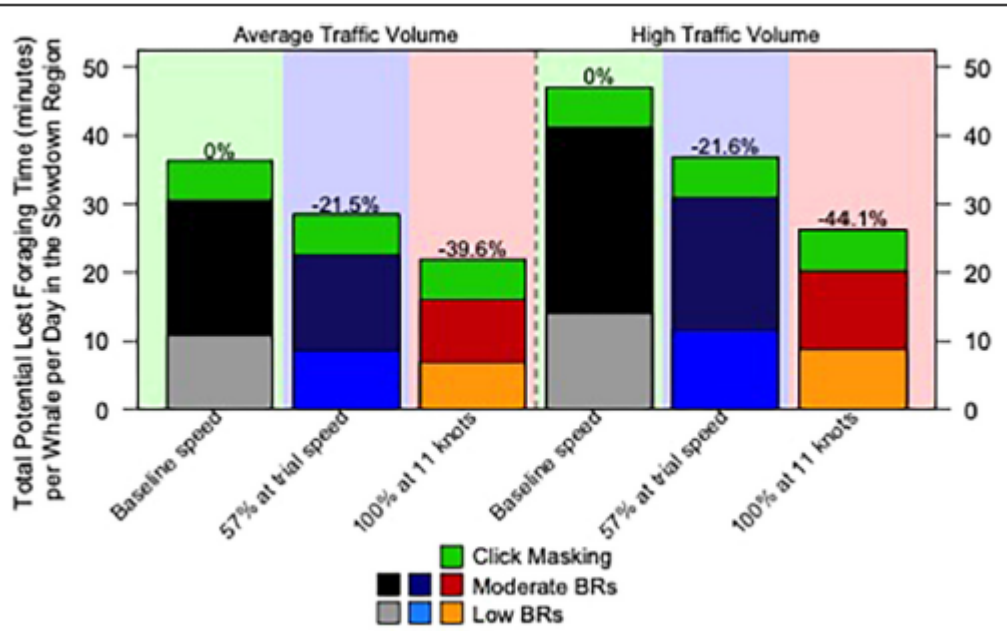


FIGURE 4 | Stacked plot of commercial vessel speeds through water at baseline **(Top)**, and during the slowdown trial period **(Lower)**, by vessel type. For the slowdown participation levels, the target vessel speed through water was set at 11 knots, and AIS-calculated speeds within 1 knot and 2 knots are assessed in the panels relative to *x*-axis ticks at 12 and 13 knots.




DIRECTOR & PRODUCER PHILIP HAMILTON DIRECTORS OF PHOTOGRAPHY SCOTT WILSON and
FRANCIS PEREZ ORIGINAL MUSIC ARMAND AMAR
COLLISION

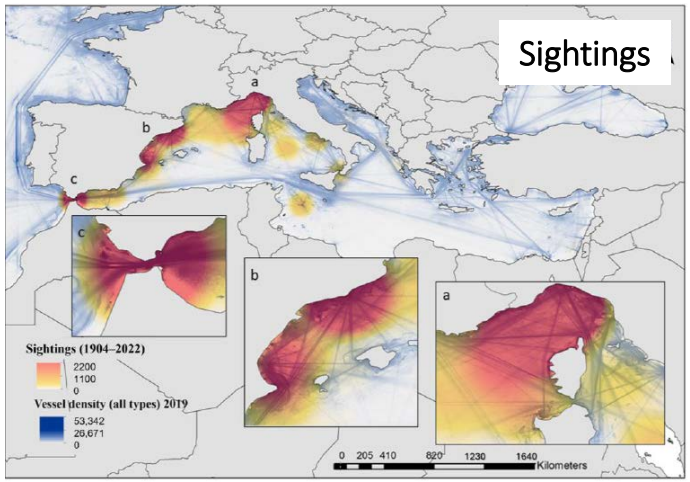
environments

MDPI

Review

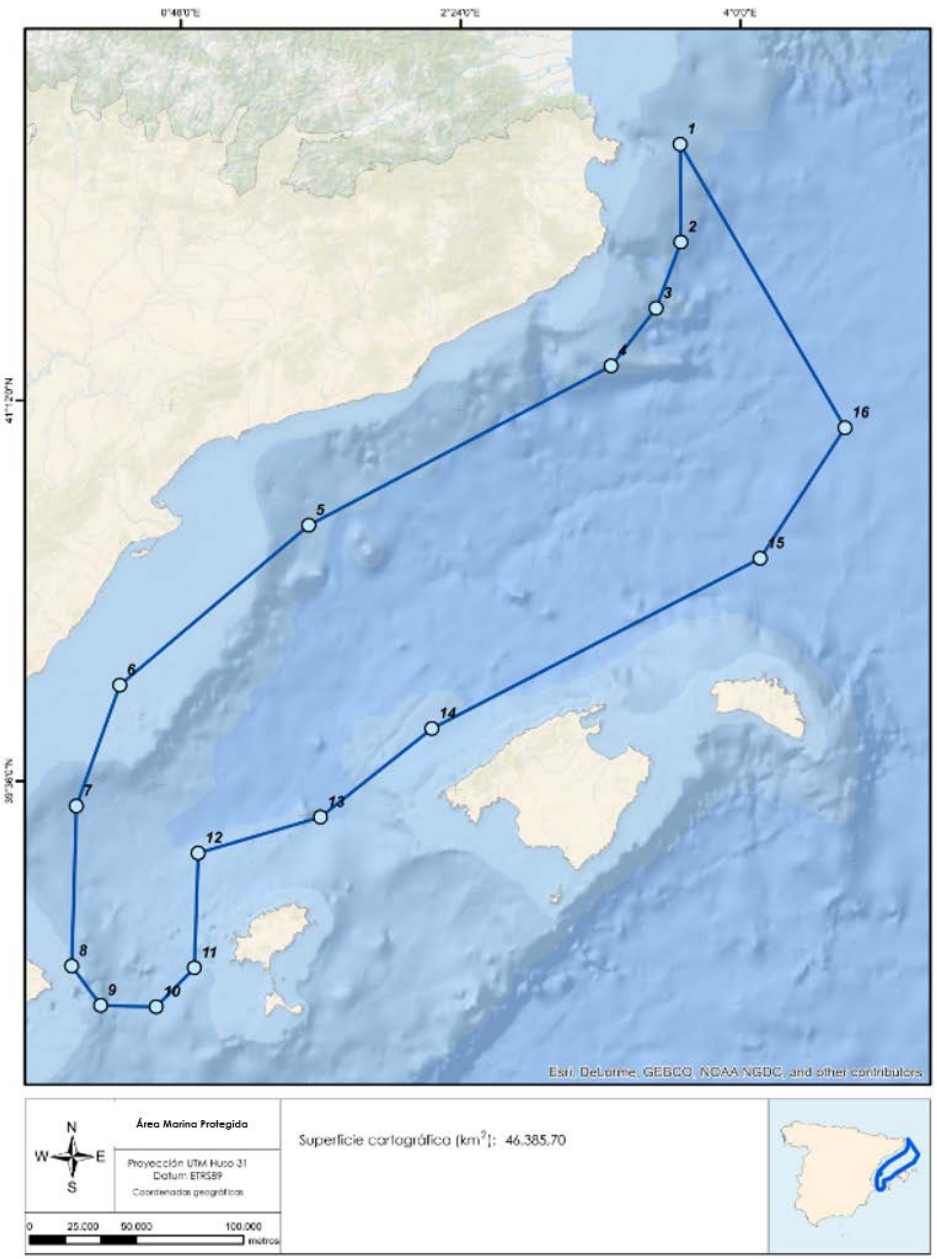
Fin Whale *Balaenoptera physalus* Historical Sightings and Strandings, Ship Strikes, Breeding Areas and Other Threats in the Mediterranean Sea: A Review (1624–2023)

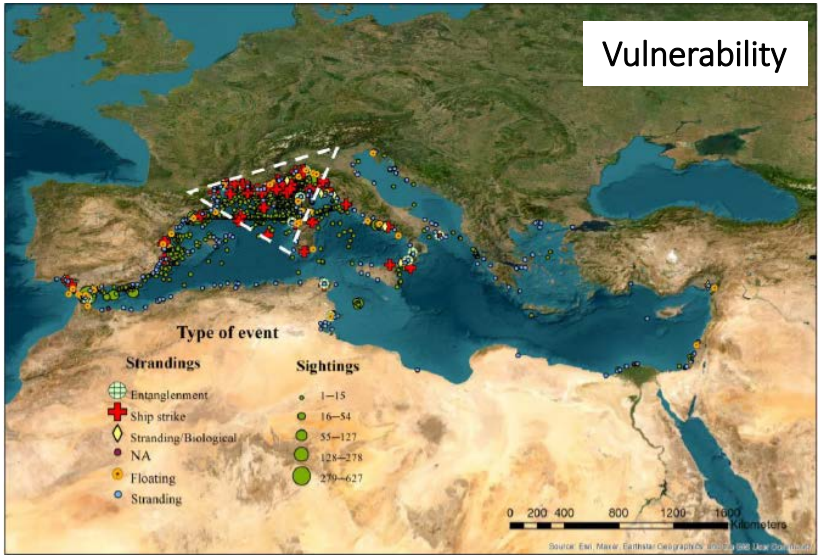
Rocío Espada [1,2,*], Adrián Camacho-Sánchez [1], Liliana Olaya-Ponzone [1,3], Estefanía Martín-Moreno [2], Daniel Patón [4] and José Carlos García-Gómez [1,3,*]

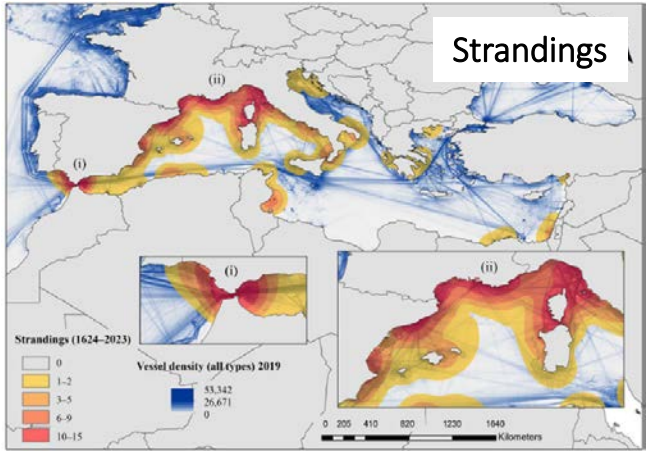


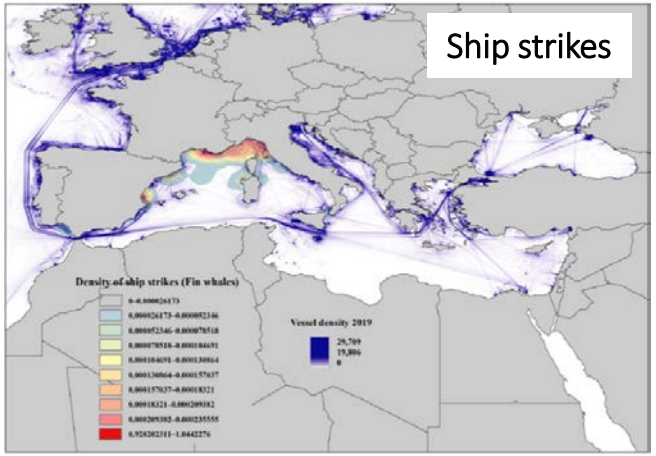
GOBIERNO DE ESPAÑA · MINISTERIO DE AGRICULTURA Y PESCA, ALIMENTACIÓN Y MEDIO AMBIENTE

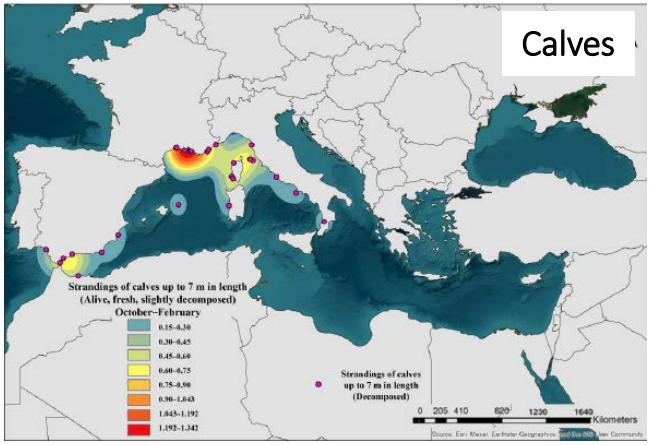
ÁREA MARINA PROTEGIDA (AMP)
"CORREDOR DE MIGRACIÓN DE CETÁCEOS DEL MEDITERRÁNEO"




Vulnerability
Type of event
Strandings
Entanglement
Ship strike
Stranding/Biological
NA
Floating
Stranding
Sightings
1–15
16–54
55–127
128–278
279–627
0 200 400 800 1200 1600
Kilometers


Strandings
(i)
(ii)
Strandings (1624–2023)
0
1–2
3–5
6–9
10–15
Vessel density (all types) 2019
53,342
26,671
0
0 205 410 820 1230 1640
Kilometers


Ship strikes
Density of ship strikes (Fin whales)
Vessel density 2019
29,709
19,806
0


Calves
Strandings of calves up to 7 m in length
(Alive, fresh, slightly decomposed)
October–February
0.15–0.30
0.30–0.45
0.45–0.60
0.60–0.75
0.75–0.90
0.90–1.043
1.043–1.192
1.192–1.342
Strandings of calves
up to 7 m in length
(Decomposed)
0 205 410 820 1230 1640
Kilometers

Colisiones con grandes barcos nacionales o internacionales

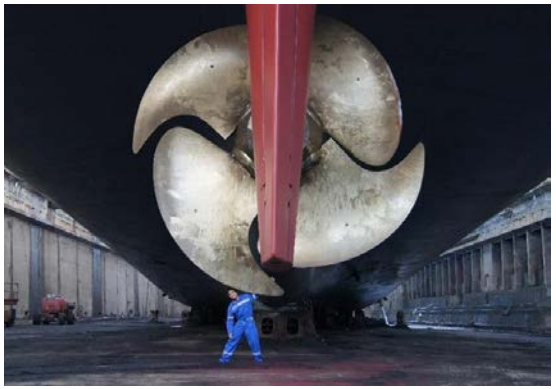
cachalote.La Gomera.2010

cachalote. Fuerteventura.2005

Cortes por hélices de gran tamaño (paralelos)

Cortes consistentes con proas afiladas capaces de seccionar un gran cuerpo

Golpes contusos consistentes con proas de bulbo



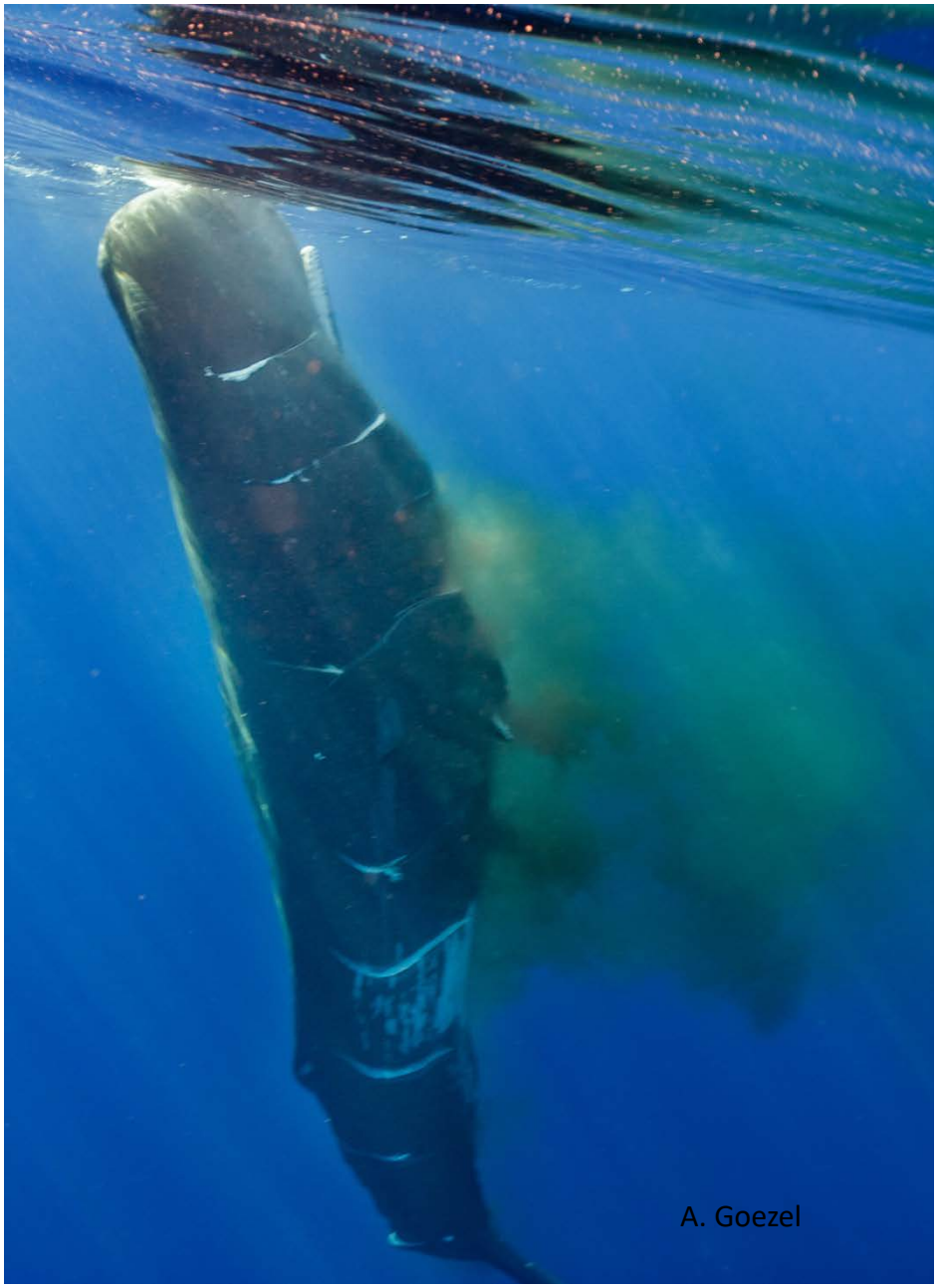
Imágenes colisiones: Canarias Conservación (M. Carrillo)

MARINE MAMMAL SCIENCE, 17(1):35–75 (January 2001)

COLLISIONS BETWEEN SHIPS AND WHALES

DAVID W. LAIST

Los varamientos infraestiman la mortandad real porque muchos animales no llegarán a la costa, y los que llegan y no son analizados por veterinarios podrían haber sufrido trauma contuso (no observable externamente). Este trauma es el 70-90% de los casos en rorcuales y cachalotes varados en EEUU, Sudáfrica y Francia (Laist et al 2001).



A. Goezel

MARCO LEGAL EXISTENTE
ORGANIZACIÓN MARÍTIMA INTERNACIONAL

- En 2006, el Comité reconoció la **competencia de la OMI**, como autoridad competente para resolver la problemática de las colisiones e invitó a las delegaciones a enviar propuestas para la minimización de los riesgos de colisiones entre buques y cetáceos para su consideración (MEPC 55/23, párrafo 22.15).

- En 2009, la OMI aprueba el **Documento Guía para reducir al mínimo el riesgo de colisión entre buques y cetáceos** (MEPC.1/Circ.674 31).

  - Principios Generales a tener en cuenta:

    - la seguridad marítima es el objetivo primordial;

    - toda medida que se tome debería tratar de lograr el objetivo biológico de reducir al mínimo el riesgo de colisión entre buques y cetáceos, teniendo también en cuenta los efectos adversos para el sector naviero y otras entidades interesadas;

ORGANIZACIÓN MARÍTIMA INTERNACIONAL
4 ALBERT EMBANKMENT
LONDRES SE1 7SR

Teléfono: 020 7735 7611
Facsímil: 020 7587 3210

OMI

S

Ref.: T5/1.01

MEPC.1/Circ.674
31 julio 2009

DOCUMENTO GUÍA PARA REDUCIR AL MÍNIMO EL RIESGO DE COLISIÓN ENTRE BUQUES Y CETÁCEOS

Nueva Zelanda

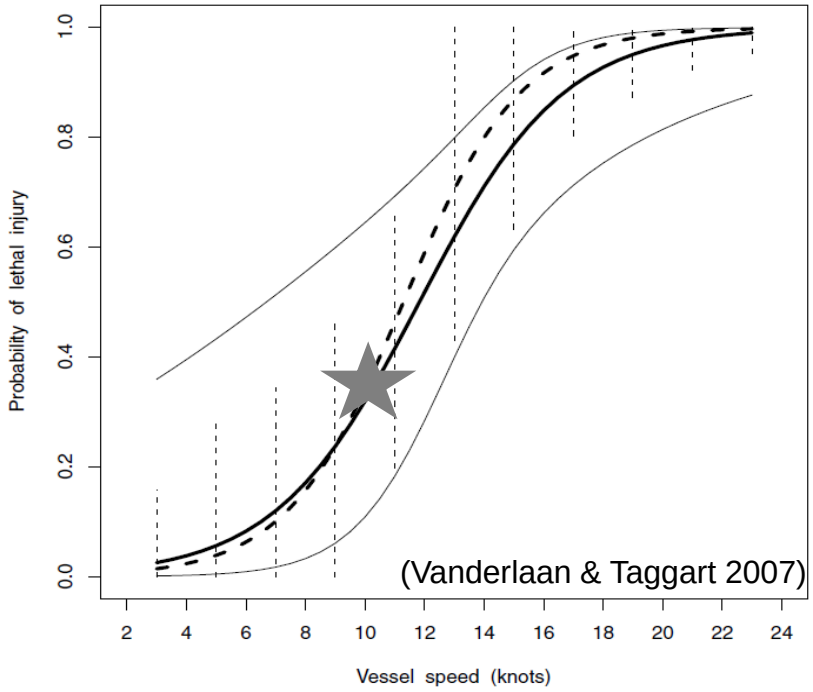
Rorcual tropical residente en el Golfo de Auckland.

2 colisiones anuales pre-2012

ULL colaboró: marcaje para investigar comportamiento y diseñar medidas de reducción de colisiones.

No había: los rorcuales tienen movimientos impredecibles, vocalizan poco y pasan >90% tiempo a profundidades coincidentes con el calado de los grandes buques. (Constantine et al. 2015)

R. Constantine photo



La probabilidad de choque mortal aumenta con la velocidad del buque. El Grupo de Trabajo de Colisiones (navieras internacionales, gobierno, academia y maoris) aprobó por unanimidad un protocolo de mitigación de Puertos de Auckland, con reducción voluntaria de velocidad a **10 nudos** para buques internacionales. Desde entonces, no ha habido más varamientos con signos de colisión en el Golfo de Auckland

The port of Auckland is located on the east coast of New Zealand's North Island in a nationally significant maritime area called the Hauraki Gulf, an area with Marine Park status.

The Hauraki Gulf is one of the few places in the world with a semi-resident population of Bryde's whale. The local whale population is small, estimated at less than 200, and is listed as critically endangered in New Zealand.

It is believed that around two Bryde's whales a year are killed after being struck by a vessel, which is a threat to the local population's long-term survival. That is why Ports of Auckland (POAL), the shipping industry, New Zealand's Department of Conservation (DOC), and Auckland University, are leading efforts to find ways to reduce the risk of colliding with a whale.

This protocol is part of that effort. It outlines steps Masters should take when planning their passage to and from Auckland, and what to do while transiting the Hauraki Gulf.

Your help in protecting our local whales is greatly appreciated.

Terry Gibson

Reducing the risk of collisions with whales

1 Passage planning

Minimising the risk of collisions with whales should be a regular part of planning a passage. The best way to reduce risk is to avoid areas with the most whales. If it is not possible to do this, then where possible plan to slow down in these areas. There is good scientific evidence that the risk to whales is substantially less from ships travelling at 10 knots compared to 15 knots or more.

Vessels should approach and depart from the port of Auckland using the recommended route as outlined in the *New Zealand Annual Notices to Mariners, Section 10: Shipping routes around the New Zealand coast*. Adherence to this routing will narrow the area of the Gulf transited by large vessels and so help reduce the risk of collision with a whale.

When planning your route to and from Auckland, where possible allow for your vessel to reduce speed when transiting the Hauraki Gulf.

2 Keeping watch

Watch officers should be aware of what action to take if whales are seen. Large whales can often be seen at distances of several miles and seeing one whale is often a strong indication that there are others in the area. Modest course alterations away from sightings can reduce collision risk. Having a dedicated observer scanning ahead with binoculars will help to detect whales at greater distances.

Hauraki Gulf Marine Park

Para la ballena franca del Atlántico Norte (esta foto es la ballena franca del Sur), las colisiones son la primera amenaza de extinción de la especie.

Aviso de detecciones: áreas dinámicas de protección: **10 nudos**
Reducción riesgo en un 60%. Población recuperándose

Science, Service, Stewardship

NOAA FISHERIES SERVICE

Compliance Guide for Right Whale Ship Strike Reduction Rule (50 CFR 224.105)

ATTENTION: All vessels greater than or equal to 65 ft (19.8 m) in overall length and subject to the jurisdiction of the United States and all vessels greater than or equal to 65 ft in overall length entering or departing a port or place subject to the jurisdiction of the United States.

YOU MUST SLOW TO SPEEDS OF 10 KNOTS OR LESS IN SEASONAL MANAGEMENT AREAS

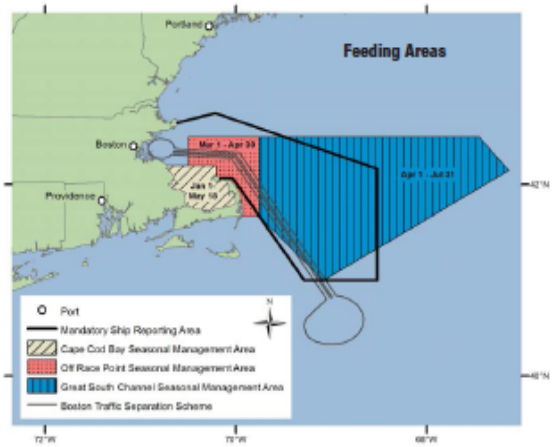
Mandatory speed restrictions of 10 knots or less are required in Seasonal Management Areas along the U.S. East Coast during times when right whales are likely to be present. The purpose of this regulation is to reduce the likelihood of deaths and serious injuries to these endangered whales that result from collisions with ships.

Vessels may operate at a speed greater than 10 knots only if necessary to maintain a safe maneuvering speed in an area where conditions severely restrict vessel maneuverability as determined by the pilot or master.

If a deviation from the 10 knot speed restriction is necessary, the following information must be entered into the logbook:

- Reasons for deviation
- Speed at which vessel is operated
- Latitude and longitude at time of deviation
- Time and duration of deviation
- Master of the vessel shall sign and date the logbook entry

Northeast U.S. Seasonal Management Areas



Feeding Areas

Cape Cod Bay	Off Race Point	Great South Channel
January 1 - May 15	March 1 - April 30	April 1 - July 31
Includes all waters of Cape Cod Bay with Northern Boundary of 42°04'56.5"N, 070°12'W to 42°12'N, 070°12'W then due west back to shore.	Waters Bounded by: 42°04'56.5"N 070°12'W 42°12'N, 070°12'W 42°12'N, 070°30'W 42°30'N, 070°30'W 42°30'N, 069°45'W 41°40'N, 069°45'W then due west back to shore.	Waters Bounded by: 42°30'N, 069°45'W 42°30'N, 067°27'W 42°09'N, 067°08'24"W 41°00'N, 069°05'W 41°40'N, 069°45'W then back to starting pt.

The rule does not apply to waters inshore of COLREGS lines.

U.S. Department of Commerce | National Oceanic and Atmospheric Administration | National Marine Fisheries Service

Science, Service, Stewardship

Migratory Route

November 1 through April 30

Vessel speed is restricted in the following areas:

- Block Island Sound waters bounded by:
  40°51'53.7" N 070°36'44.9" W
  41°20'14.1" N 070°49'44.1" W
  41°04'16.7" N 071°51'21.0" W
  40°35'56.5" N 071°38'25.1" W
  then back to starting point.
- Within a 20-nm (37 km) radius of the following (as measured seaward from the COLREGS lines):
  - Ports of New York/New Jersey:
    40°29'42.2"N 073°55'57.6"W
  - Entrance to the Delaware Bay (Ports of Philadelphia and Wilmington):
    38°52'27.4"N 075°01'32.1"W
  - Entrance to the Chesapeake Bay (Ports of Hampton Roads and Baltimore):
    37°00'36.9"N 075°57'50.5"W
  - Ports of Morehead City and Beaufort, NC:
    34°41'32.0"N 076°40'08.3"W
- Within a continuous area 20 nm from shore between Wilmington, NC, to Brunswick, GA, bounded by the following:

Point	Latitude	Longitude
A	34°10'30"N	077°49'12"W
B	33°56'42"N	077°31'30"W
C	33°36'30"N	077°47'06"W
D	33°28'24"N	078°32'30"W
E	32°59'06"N	078°50'18"W
F	31°50'00"N	080°33'12"W
G	31°27'00"N	080°51'36"W

and west back to the shore.

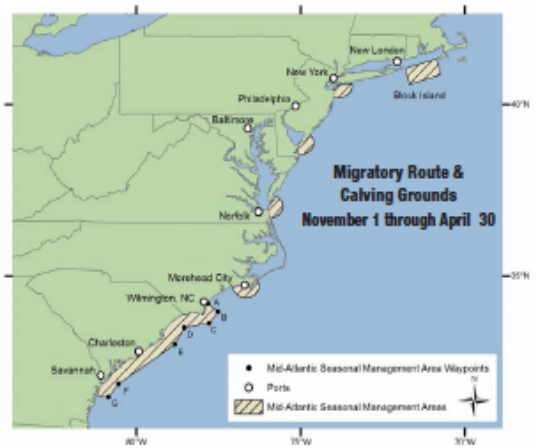
Calving and Nursery Grounds

November 15 through April 15

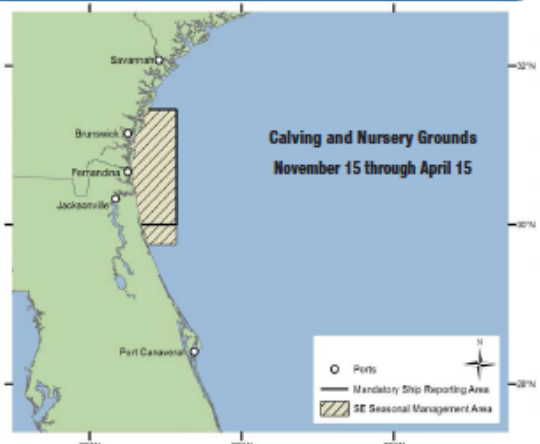
Vessel speed is restricted in the area bounded to the north by latitude 31°27'N; to the south by latitude 29°45'N; to the east by longitude 080°51'36"W.

For more information, visit:
http://www.nmfs.noaa.gov/pr/shipstrike
http://nero.noaa.gov/shipstrike
http://rightwhalessouth.nmfs.noaa.gov

Mid-Atlantic U.S. Seasonal Management Areas



Southeast U.S. Seasonal Management Area

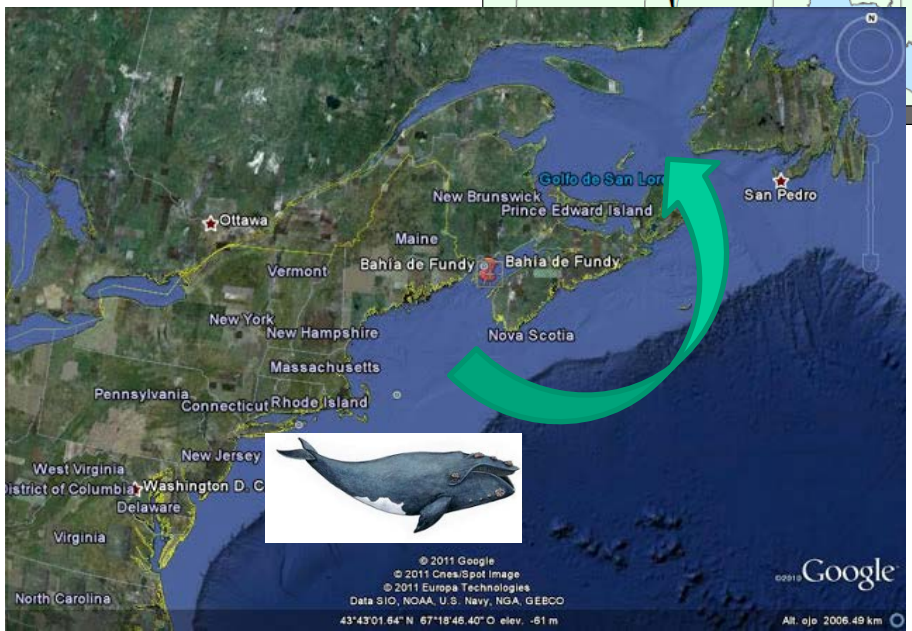


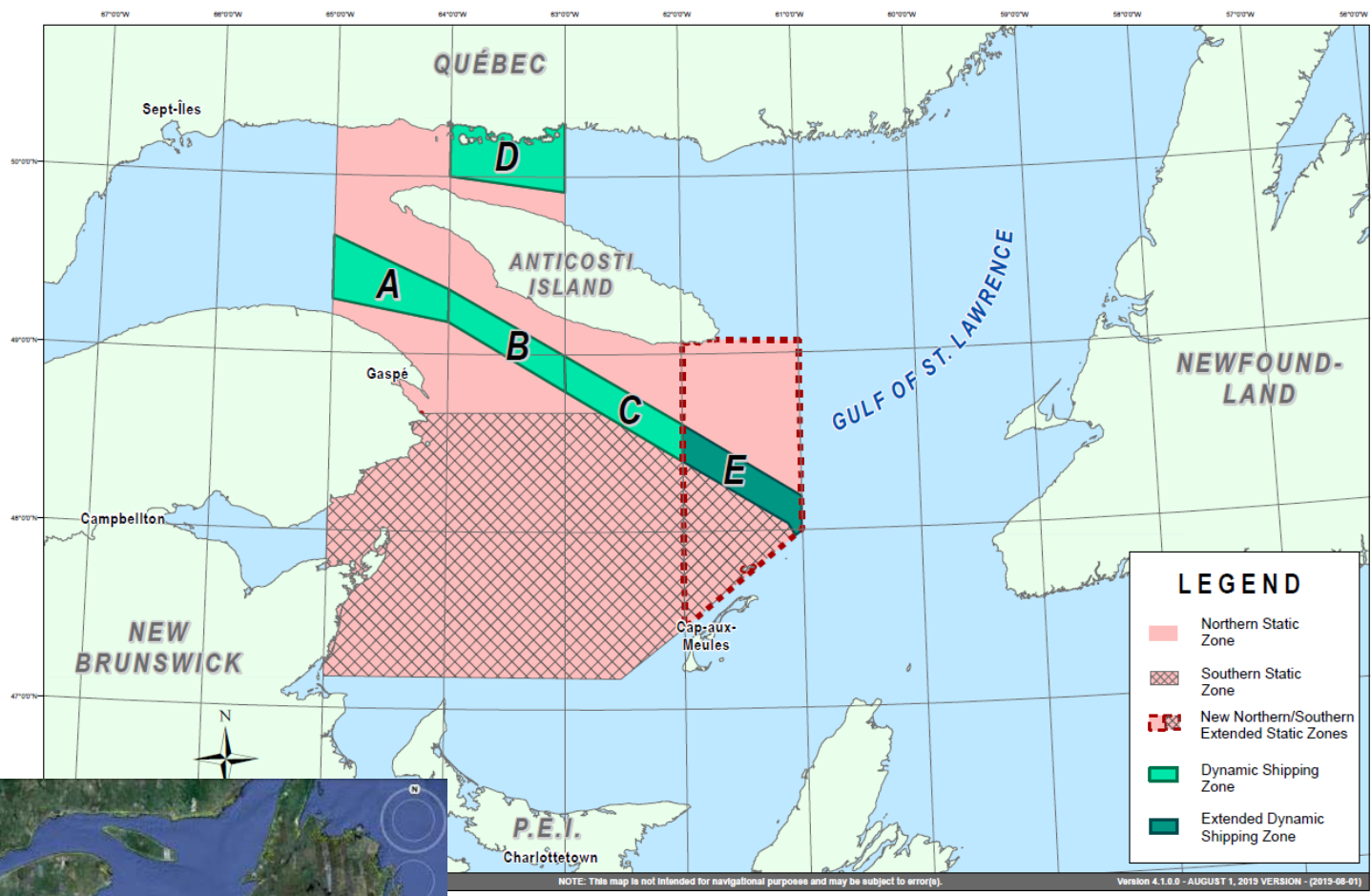
The rule does not apply to waters inshore of COLREGS lines.

Voluntary Dynamic Management Areas (DMAs) may also be established by NOAA Fisheries Service. Mariners are encouraged to avoid these areas or reduce speeds to 10 knots or less while transiting through these areas. NOAA Fisheries Service will announce DMAs to mariners through its customary maritime communication media.

This serves as NOAA's small entity compliance guide. OMB Control #0648-0580

U.S. Department of Commerce | National Oceanic and Atmospheric Administration | National Marine Fisheries Service





Cambios en la distribución de las ballenas francas del Atlántico Norte han requerido medidas urgentes en Canadá, que legisla cambios en el tráfico marino y actividades pesqueras desde 2017

https://www.tc.gc.ca/en/services/marine/navigation-marine-conditions/protec

Français

Government of Canada | Gouvernement du Canada

Search Canada.ca

MENU

Home > Transport and infrastructure > Marine transportation > Navigation and marine conditions

Protecting North Atlantic right whales from collisions with ships in the Gulf of St. Lawrence

From: Transport Canada

Transport Canada is committed to the protection and recovery of the endangered North Atlantic right whales. We are taking actions to protect this species in the Gulf of St. Lawrence.

Canadá dicta emergencia ambiental por las colisiones con ballenas

Áreas dinámicas de protección: límite de velocidad

10 nudos

siempre que lo permita la seguridad marítima

Compliance update

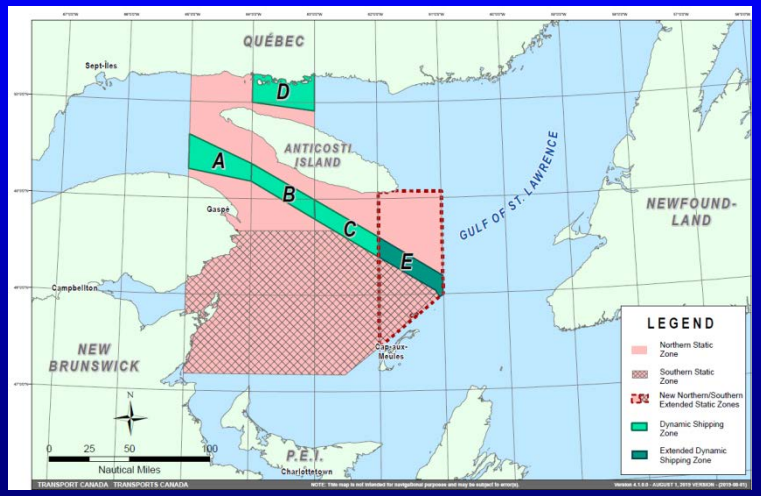
Transport Canada takes the speed restriction very seriously and examines all potential cases of non-compliance. Out of 400 cases reported between April 28 and September 20, 2019, 13 penalties were issued and 75 cases are under review. All other cases have been closed. Approximately 3929 vessel transits occurred during the period.

Total number of vessel transits monitored in the speed restriction zone: **3929**

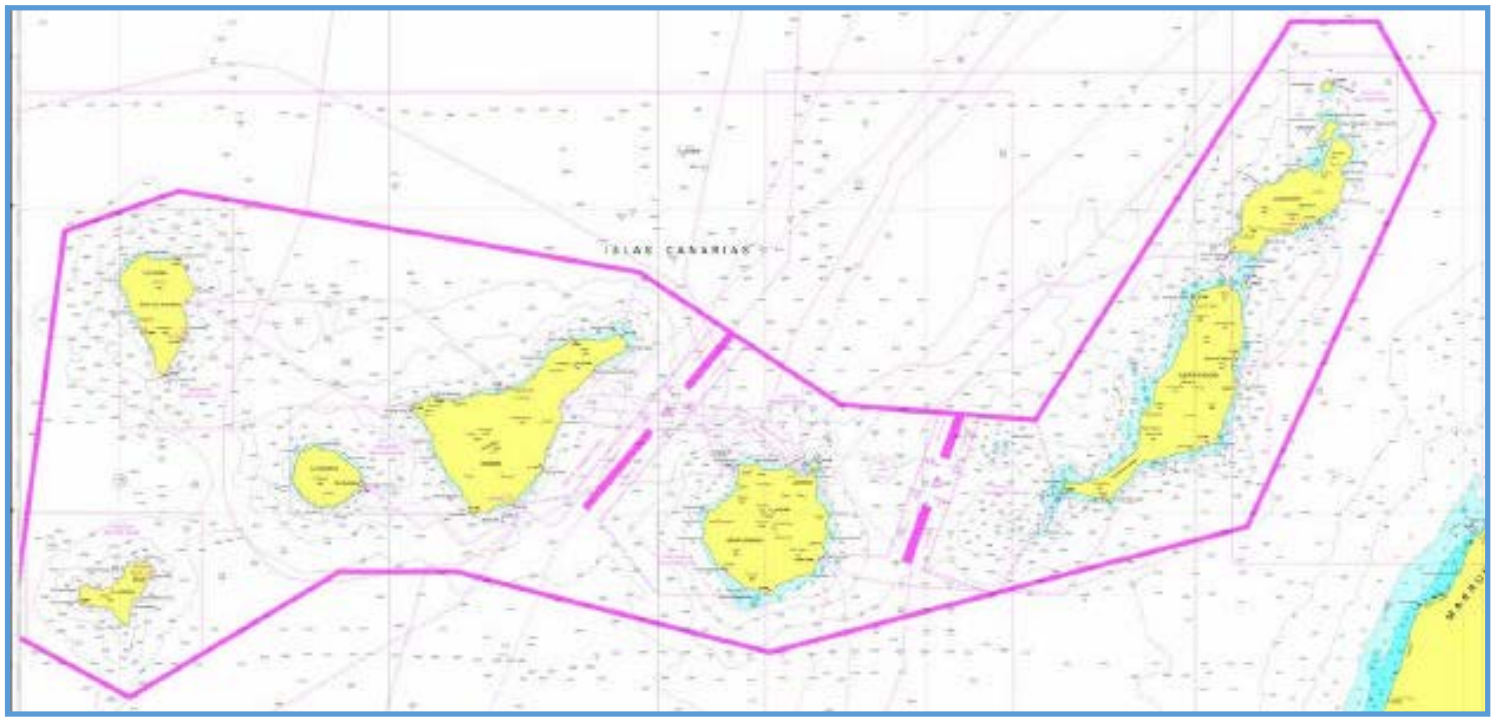
Total number of vessels with speed recorded above 10 knots: **400**

Compliance Statistics

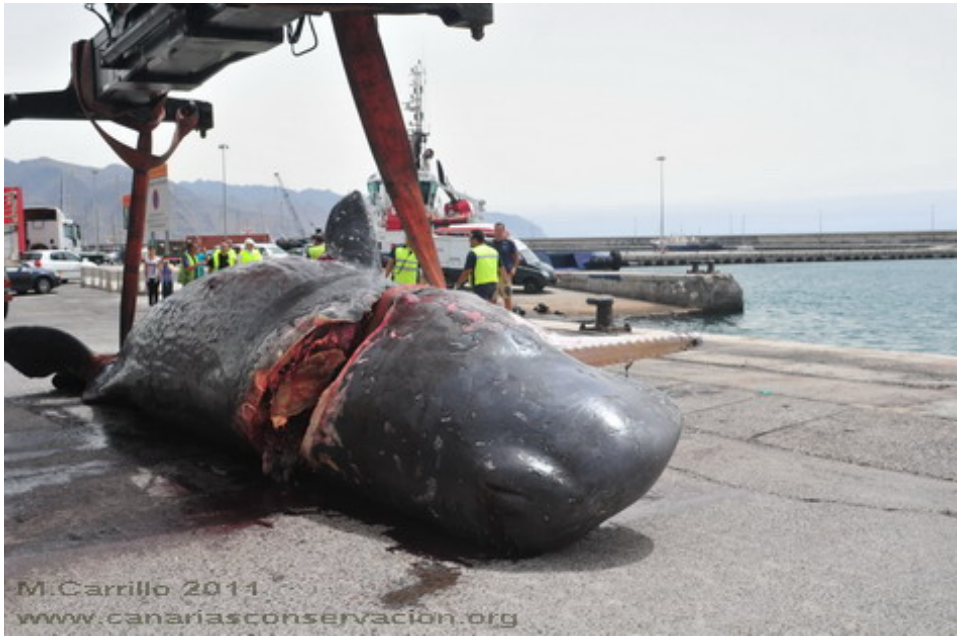
Status	Number of Vessels
Closed	312
Penalties Issued	13
Under Review	75
Total	**400**



COLISIONES EN CANARIAS



Zona Marina Especialmente Sensible (ZMES) de Canarias, declarada por la Organización Marítima Internacional (OMI)



Imágenes de Canarias Conservación (M. Carrillo)
Red de Varamiento de Cetáceos de Canarias

CANARIAS

OMI ORGANIZACIÓN MARÍTIMA INTERNACIONAL

S

COMITÉ DE PROTECCIÓN
DEL MEDIO MARINO
69º periodo de sesiones
Punto 10 del orden del día

MEPC 69/10/3
12 febrero 2016
Original: INGLÉS

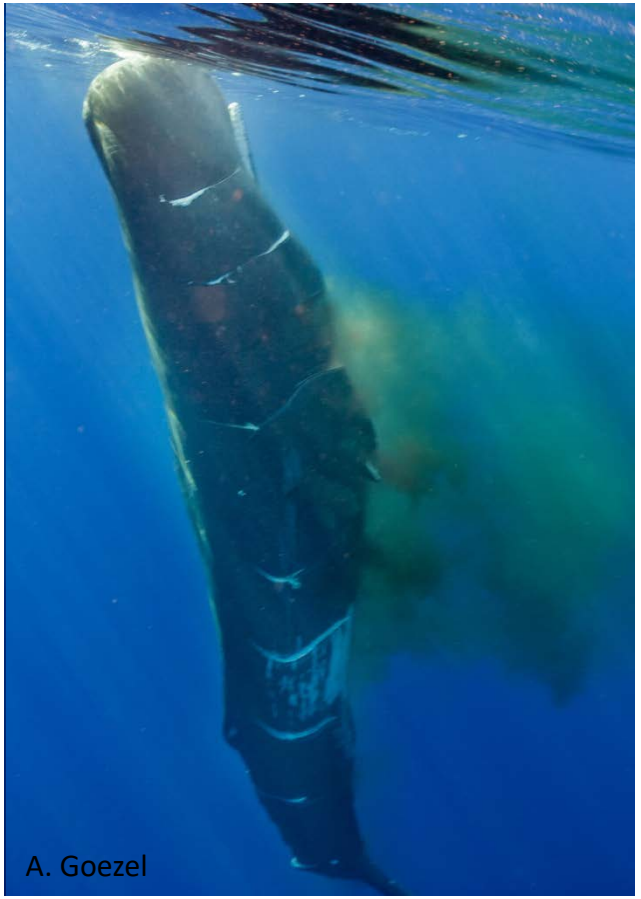
DETERMINACIÓN Y PROTECCIÓN DE ZONAS ESPECIALES Y DE ZONAS MARINAS ESPECIALMENTE SENSIBLES

Información sobre los recientes resultados relacionados con la reducción al mínimo del riesgo de colisión entre buques y cetáceos

Nota presentada por la Comisión Ballenera Internacional

Islas Canarias, cachalotes

21 En 2014 se constituyó un grupo de trabajo para la prevención de las colisiones con buques alrededor de las Islas Canarias. Las colisiones con cachalotes plantean particular preocupación aunque también se ven afectadas algunas otras especies. La ZMES de las Islas Canarias quizá facilite la implantación de medidas de mitigación de las colisiones con buques. El sistema de notificación obligatorio para buques que entran en la ZMES podría servir de mecanismo para trasmitir la información y las directrices pertinentes a los buques. Estas medidas podrían coordinarse mediante la creación de un plan regional de gestión de la conservación de los cachalotes en las Islas Canarias.



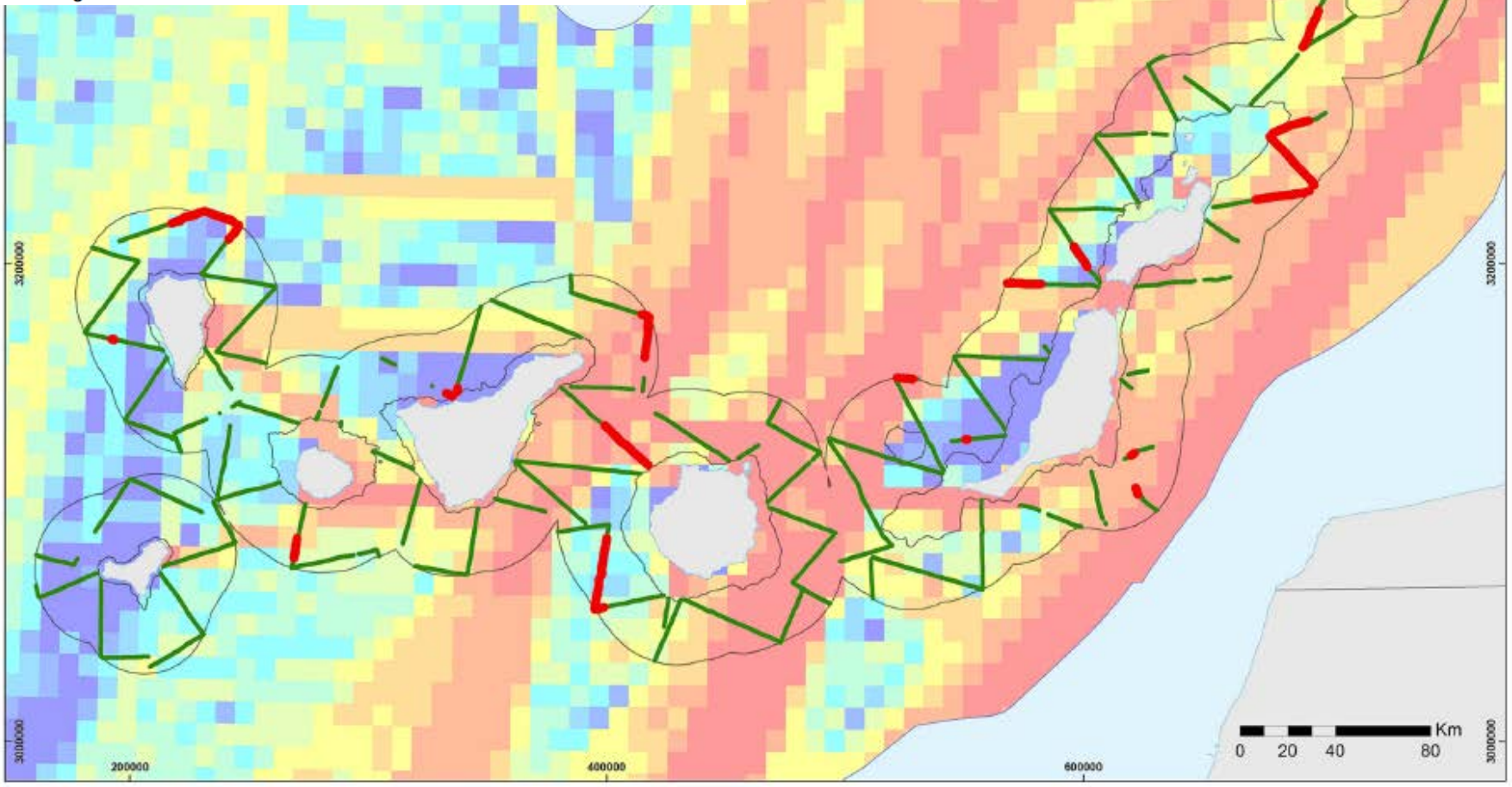
A. Goezel

PLOS ONE

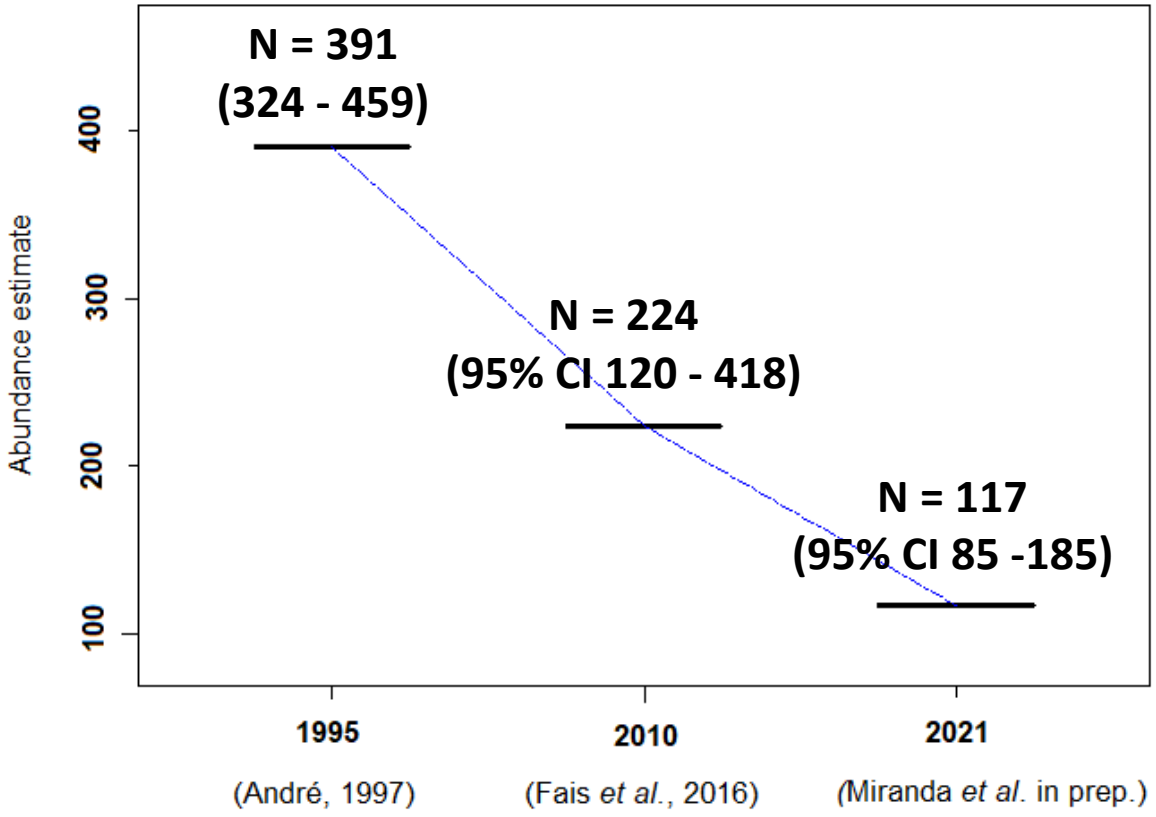
RESEARCH ARTICLE

Abundance and Distribution of Sperm Whales in the Canary Islands: Can Sperm Whales in the Archipelago Sustain the Current Level of Ship-Strike Mortalities?

Andrea Fais[1¤]*, Tim P. Lewis[1], Daniel P. Zitterbart[2,3], Omar Álvarez[1,4], Ana Tejedor[5], Natacha Aguilar Soto[1,6]



Reducción de abundancia



Gracias por su atención

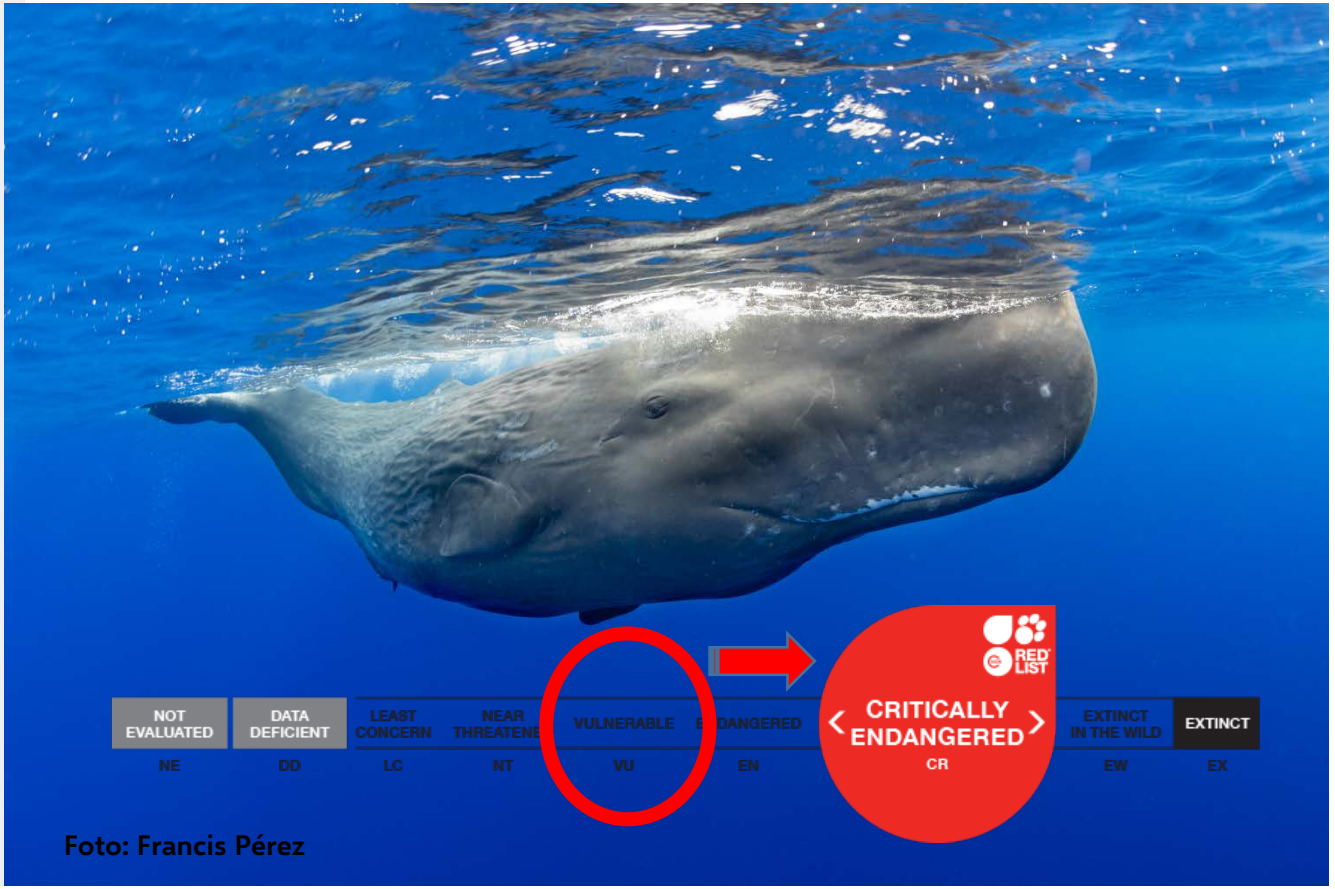


Foto: Francis Pérez

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MINISTERIO PARA LA TRANSICIÓN ECOLÓGICA Y EL RETO DEMOGRÁFICO

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