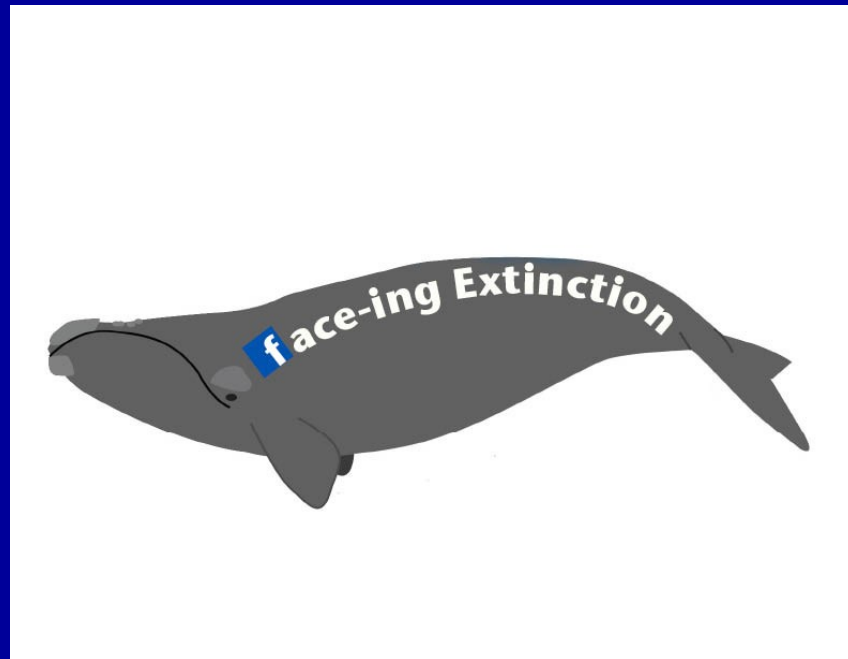
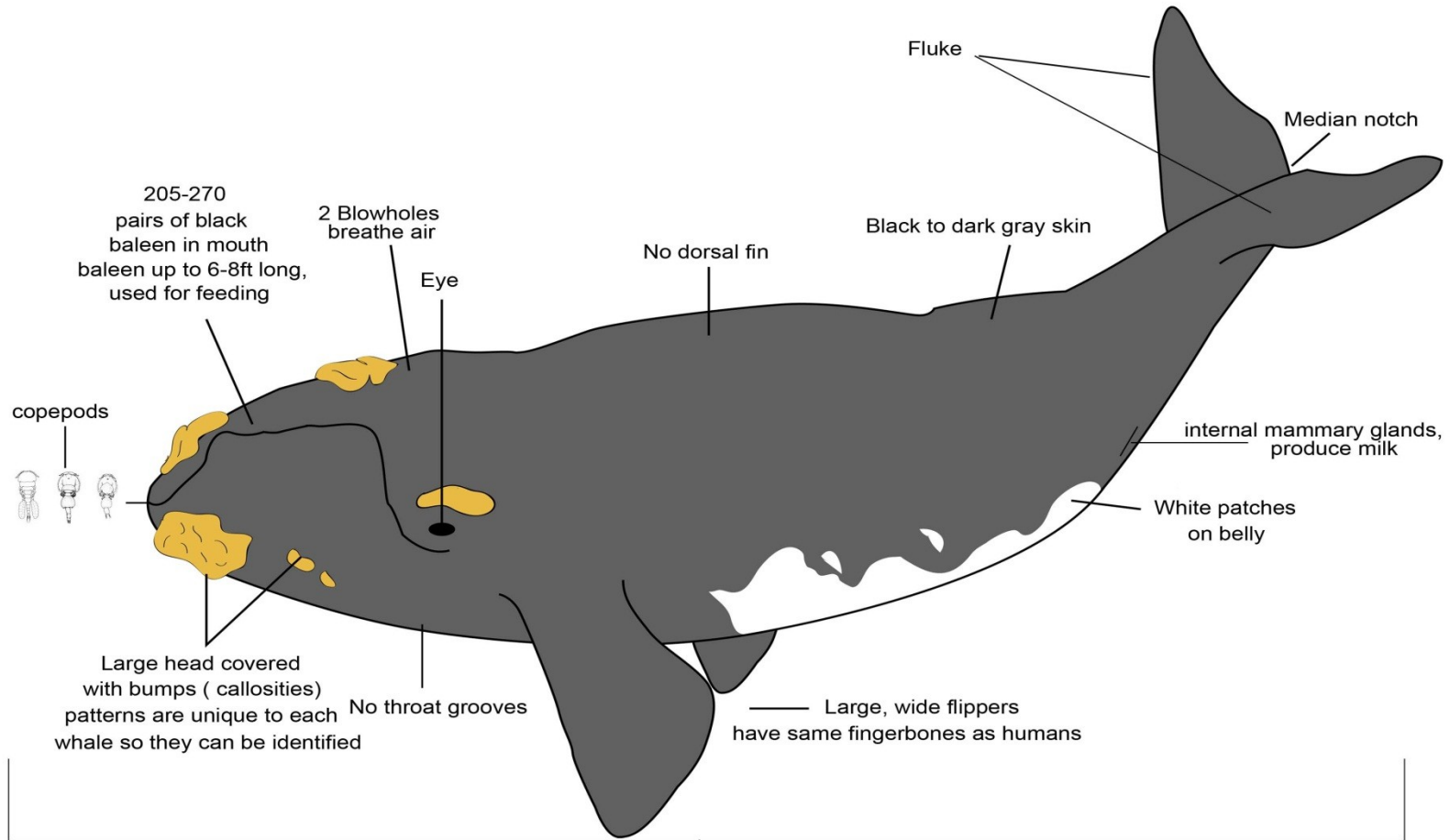


Face-ing Extinction: The North Atlantic Right Whale



North Atlantic Right Whales: *Eubalaena glacialis*



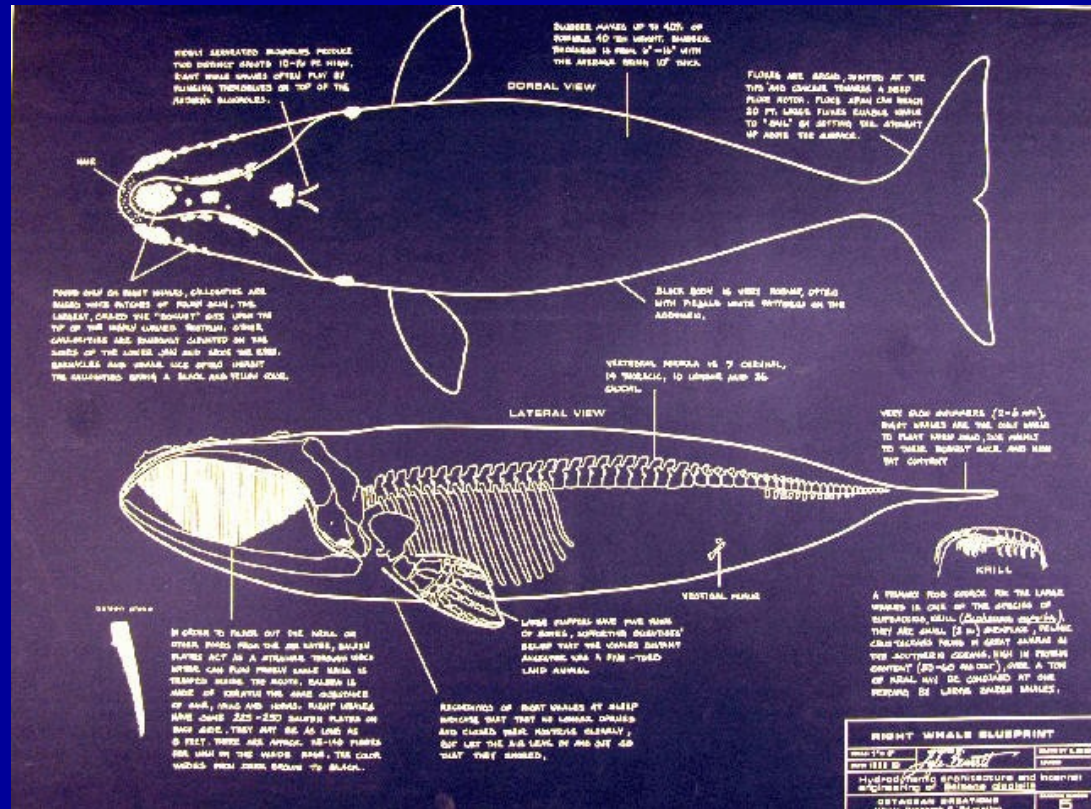
45-55 feet long; a school bus is only 40ft



Just Like Us

Mammals:

- Breathe air
- Give birth to live young
- Females produce milk
- Have hair
- Similar skeletal set-up, including finger bones and vertebrae
- 4-chambered heart
- Modified middle ear



Right Whale Blueprint, Lyle Bennett, 1980 NBWM Kendall Collection

Endangered, ~500 remain

- Life span less than 60 years
- Females are pregnant for 12 months
- Mothers give birth to a single offspring every 3 to 5 years.
- Begin reproducing around age 10.
- SE United States is the only known calving area
- Calves are born December-March and nurse for about 12 months



Photo: Florida Fish and Wildlife Conservation Commission/NOAA

Skim Feeding

- Baleen plates can be up to 9 feet long
- Skim feed along the surface
- Prey source is copepods- microscopic plankton
- During feeding season right whales will eat between 2,000-3,000lbs of copepods each day, which is about the weight of a VW Beetle

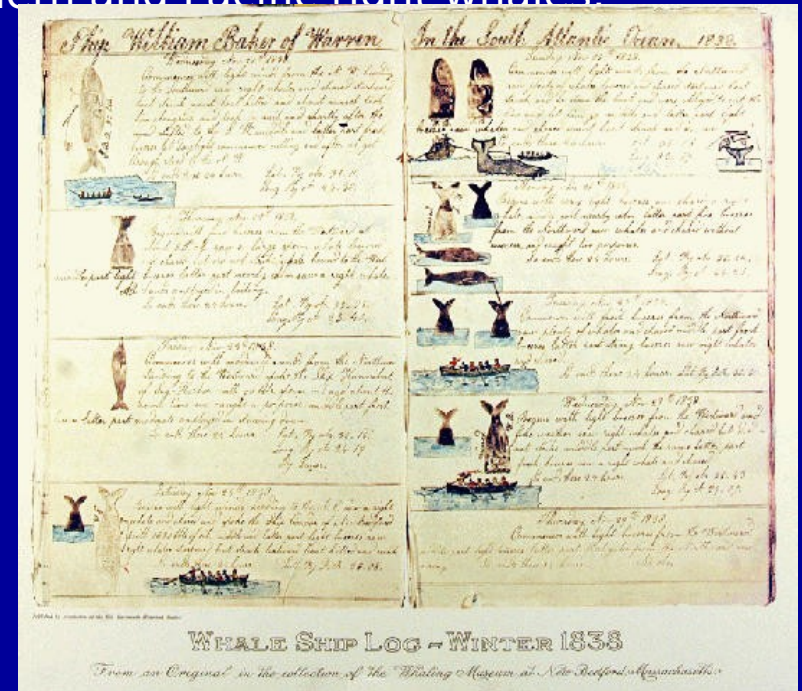


Hunting Right Whales

- Vikings and Basques (from coastal Spain) were the first to hunt right whales, along the shore. Basques later sailed after their prey.
- Dutch, French and British whalers hunted them in the 15th, 16th and 17th centuries.
- Commercial hunt for the North Atlantic right whale (NARW) effectively ended around 1750. Very few log books in the New Bedford Whaling Museum (NBWM) collection mention NARWs.
- Efforts were then put into hunting Southern and Pacific right whales.



Peche de la Baleine Garneray, A.L. 1835 NBWM collection



Example of a log book entry Kendall Collection: NBWM

Historical Uses of Whale Products



The capture of each whale was marked in the ship's log with a stamp and the relevant details.



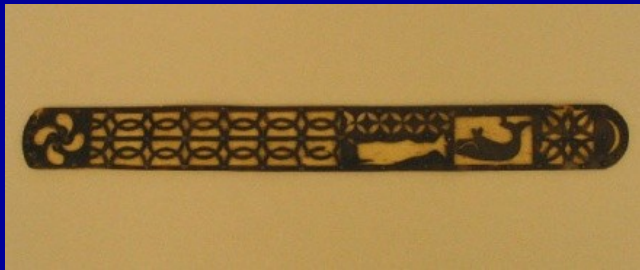
Snow goggles and eyeglass frames could be made using whale baleen.



Frames of parasols were made with baleen.



Baleen was pressed to create decorative sculptures



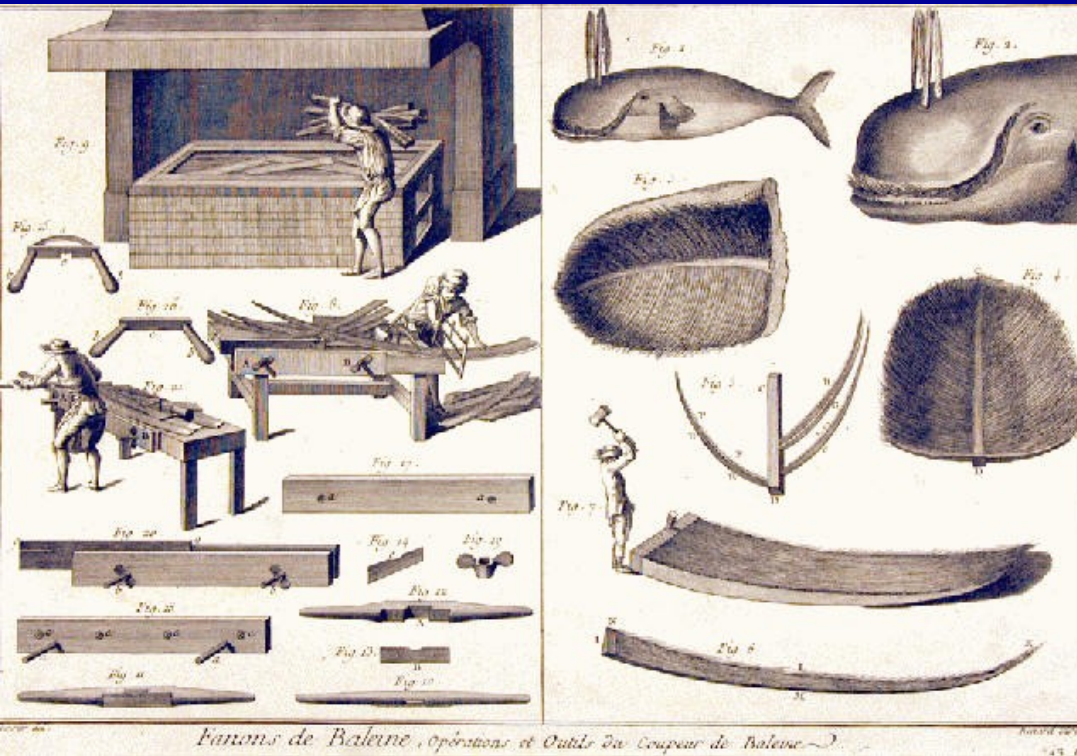
Corset busk made from baleen



Whale oil was used to light lamps

*All objects from New Bedford Whaling Museum

Whale Products



A depiction of the process of making products from baleen.

Advertisement for corsets made from baleen

WE KEEP THE BEST
And Most Popular Makes of
CORSETS,
Including the Famous
Delsarte Corsets, Waists and Shoulder Braces.
If you do not like the ready made, come and be measured for
the best
Custom Corset in America.
WARRANTED ALL WHALEBONE.
Only Agent for **HER MAJESTY'S CORSET**, the Strongest and Best
Corset Made.
We are the only agents for *Deoderant Powder*, which removes the disagreeable odor caused by perspiration. *Morning Dew* is used by ladies and gentlemen for Sunburn, Tan, Pimples, Freckles, and Rough and Oily Complexions. (Clear as Crystal and Guaranteed Harmless.)
Sold only at the LADIES' CORSET ROOM.
R. R. ANDREWS, 168 UNION STREET.

That Was Then, This Is Now

Pre-whaling:

10,000

Low:

100 (1935)

Current:

450-500

Total Hunted:

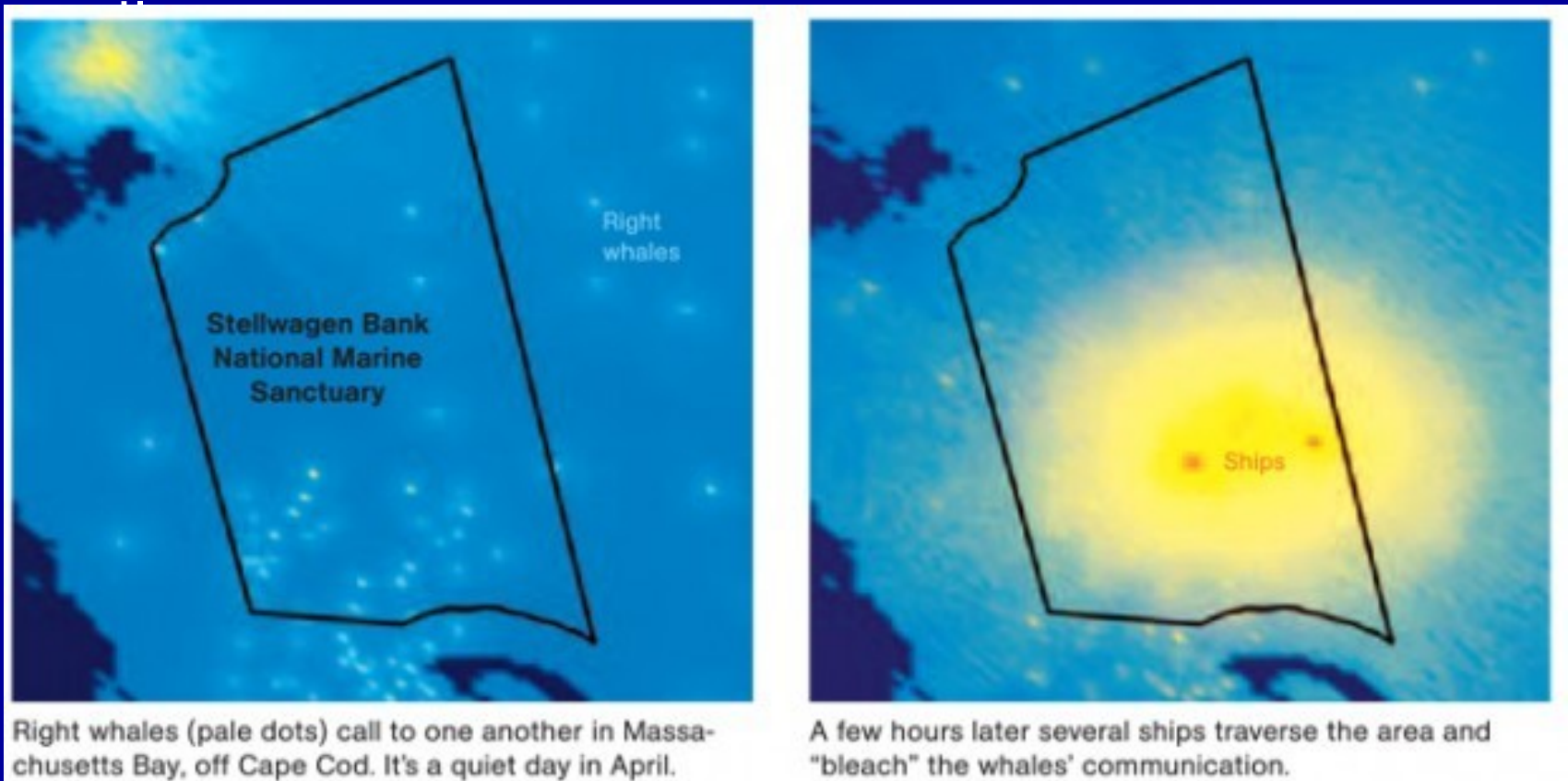
10,000



*The figures presented in this panel are estimates based on the best scientific data available at the time of publication. It is not possible to account for every whale hunted, nor is it possible to count every living whale.

Habitat Invasion

- Noise pollution threatens the survival of the species.
- The sounds of a ship can mute whale calls for



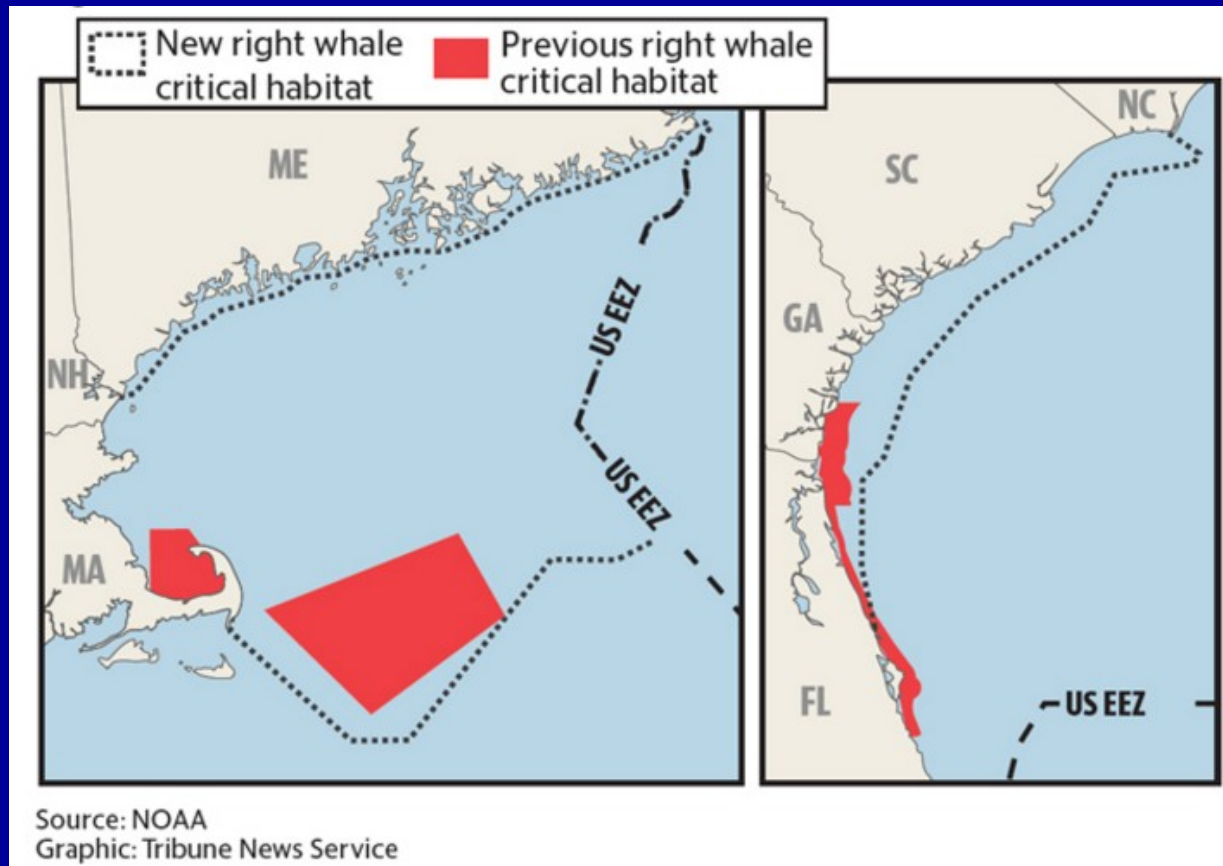
Habitat Degradation

Chemical pollution and offshore development may be hazards



Provincetown Center for Coastal Studies.
Taken under NOAA permit 14603.

Habitat Protection



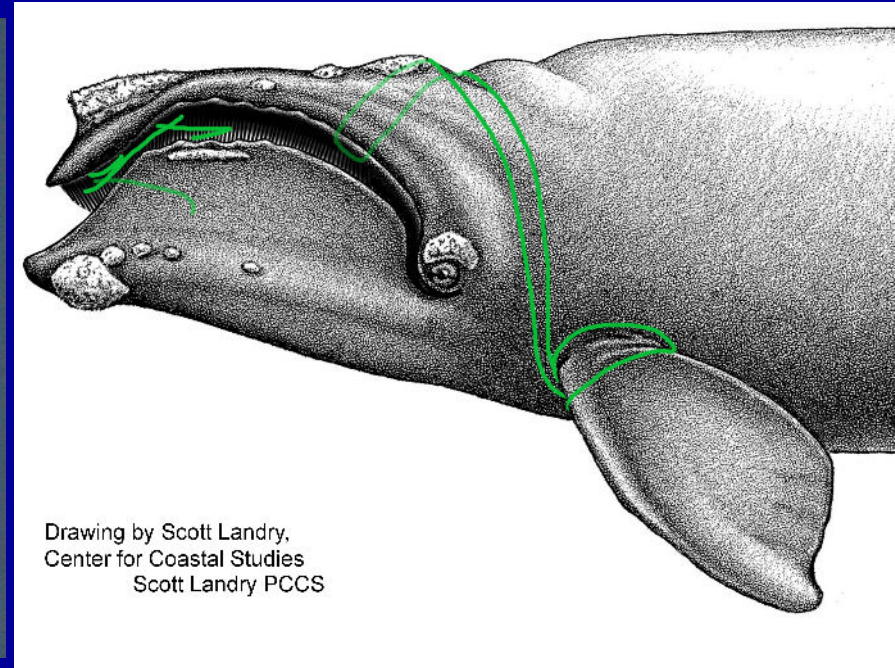
- Conservation groups petitioned to increase federally protected habitat along the eastern seaboard.
- Expanded in 2016 to cover almost 40,000sq. Nm.

Entanglements

About 3/4 of the population bears scars from entanglement in fishing gear



NEFSC



Drawing by Scott Landry,
Center for Coastal Studies
Scott Landry PCCS

Long Term Impact



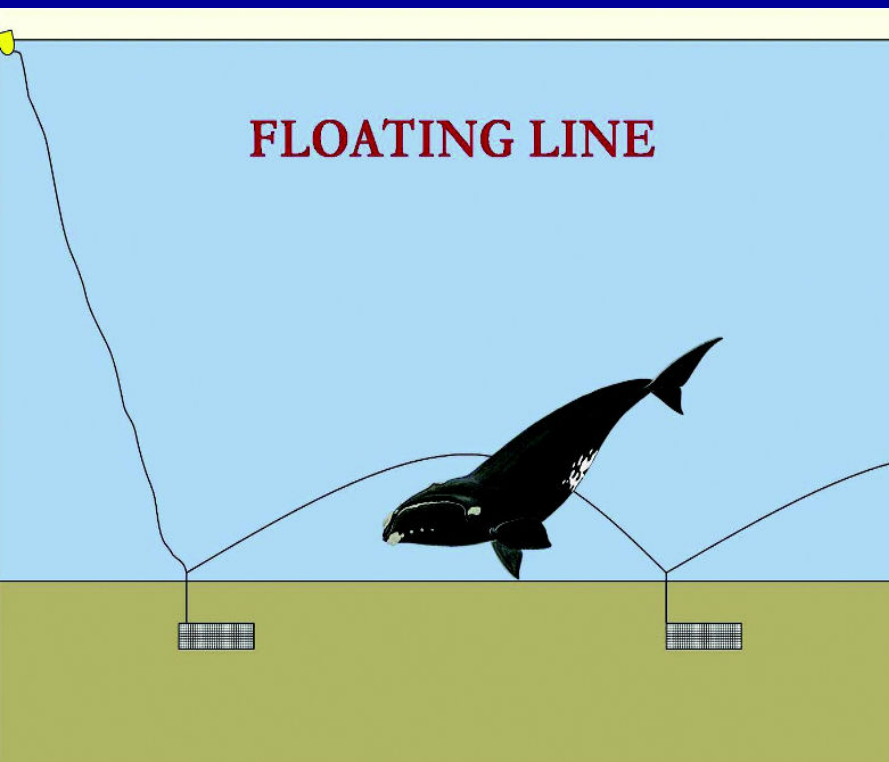
Some whales can be seen trailing fishing gear for days, weeks, months, or even years.

Credit: Florida
Fish and
Wildlife
Conservation
Commission

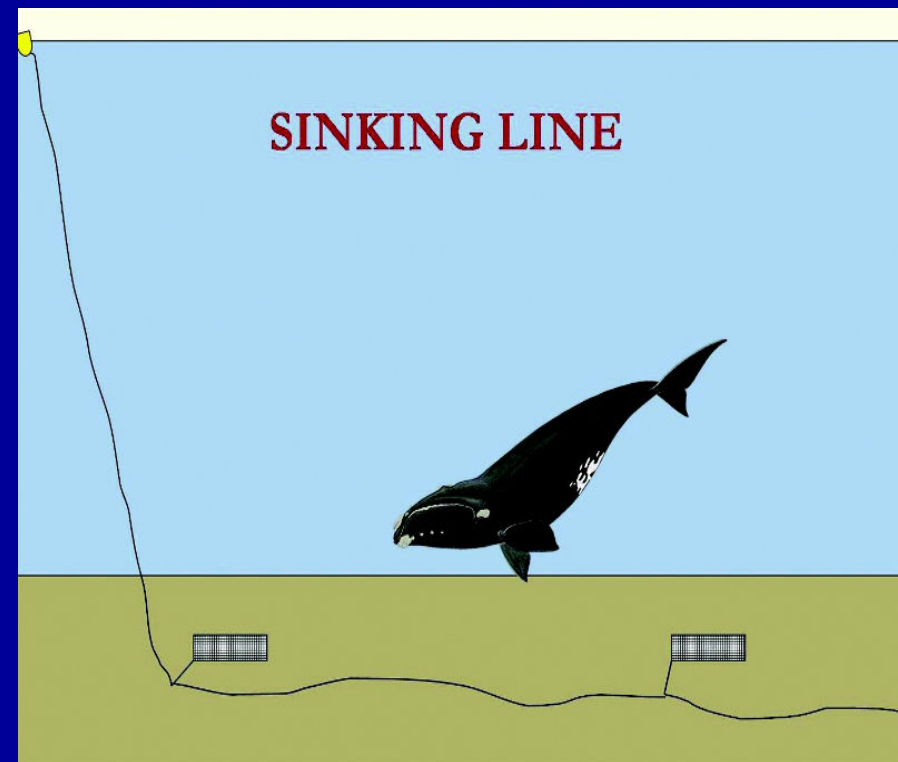
Sinking Ground Line

- Line between lobster pots sinks instead of floating, making it safer for the whales.

Before:



After:



Hunting

- Last confirmed *hunting* in the US of a North Atlantic right whale was the calf of *Eg1045* in 1935.
- Last sighting of *Eg1045* was in 1995 east of Cape Cod, critically wounded by a ship strike. She was probably at least 70 years old.
- Can this accidental removal of whales from the population, by human activity, still be



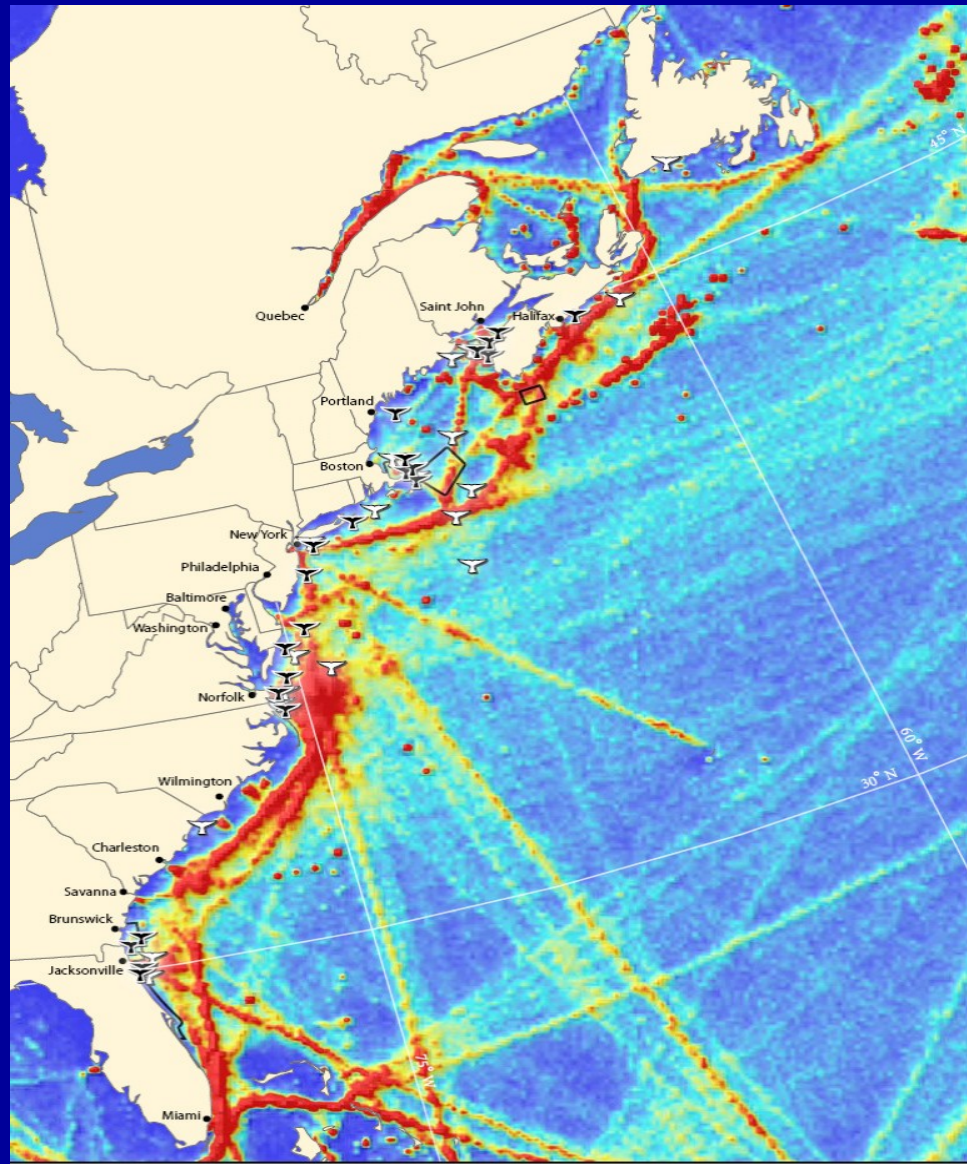
Ship Strike

The right whale skeletons in the New Bedford Whaling Museum are from a 15-year old female named Reyna and her fetus that were accidentally killed by a ship's propeller in November 2004, in the mouth of Chesapeake Bay.



Modern Threats - Urban Life

- NARW is called the “Urban Whale” because its migration between calving and feeding grounds, and its other activities, take place within 50 miles of the coast
- Whales swim through high densities of fishing and shipping activity
- Colored lines on the graph indicate shipping traffic
- Bay of Fundy, Scotian Shelf, Cape Cod Bay, Great South Channel: North Atlantic feeding grounds
- Florida and Georgia coasts: only known calving grounds



Right Whale Mortalities
(1970 - 2005)



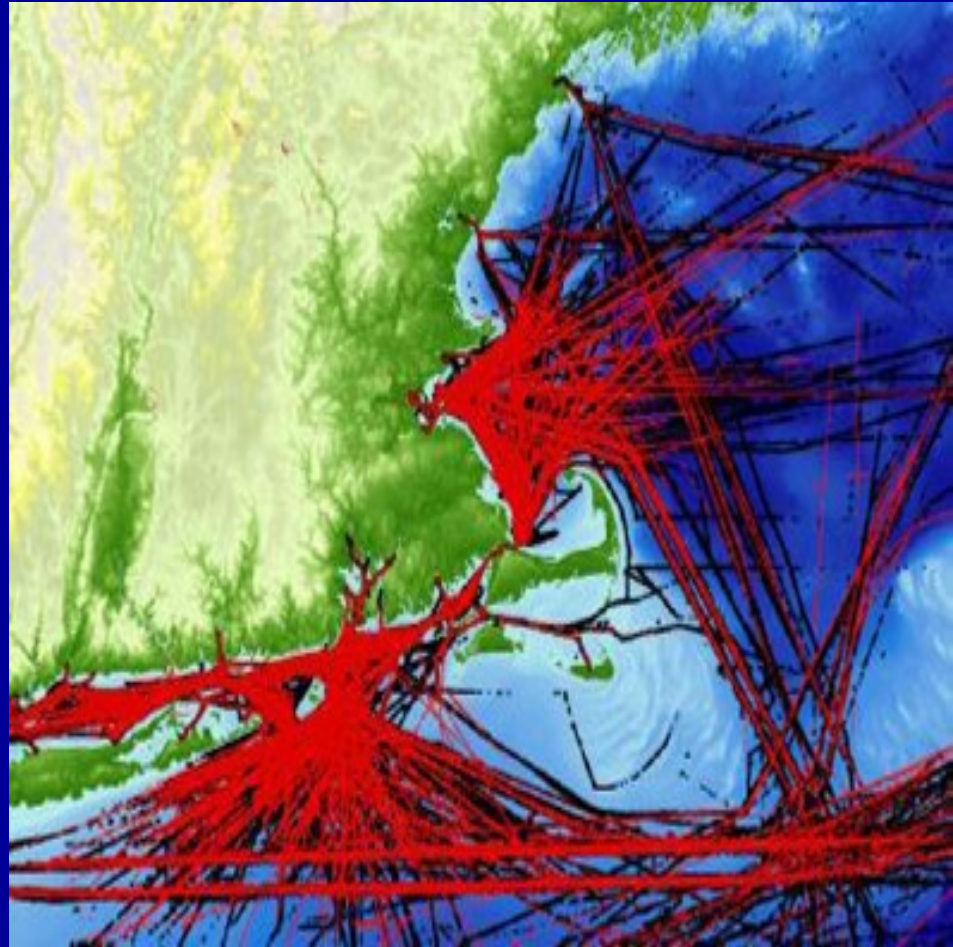
Number of Vessel Calls
1983 - 2002



0 5,000 10,000
Kilometers

Shipping

- Ship strikes are the leading cause of injury and mortality to the species.
- Red lines represent a busy highway of ship traffic in and out of the Northeast
- Image depicts traffic over a 1 month period



Who Has the Right of Way?

- Along a crowded coastline, who has the right of way- ships or whales?
- It takes a fully loaded supertanker 14 min and ~2 mi to crash stop; realistic stop would take at least 20 min



How to Solve the Problem?

- Ship Strike Rule (2009): Requires large ships to reduce speeds to 10 knots in areas where the whales feed and reproduce, as well as along migratory routes. This was a 5 year rule.
- Combining reduced speeds with recommended routes reduces the probability of right whale mortality from ships by 71.9%. ¹
- Compliance rates jumped when rule was made mandatory.
- According to an economic analysis report done by the Woods Hole Oceanographic Institution, the cost of the ship strike rule would equate to only \$1/cruise ship passenger. ²
- The Ship Strike Rule was made permanent in December of 2013.



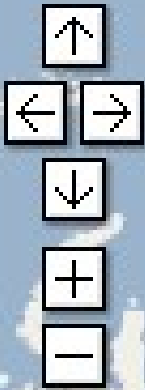
1. Lagueux KM, Zani MA, Knowlton AR, Kraus SD (2011) Response by vessel operators to protection measures for right whales *Eubalaena glacialis* in the southeast US calving ground. *Endang Species Res* 14:69-77

2. Kite-Powell, H. (2005) Economic Implications of Possible Reductions in Boston Port Calls due to Ship Strike Management Measures. 1-18

Benefits of Reducing Speed

- Shenzhen, China is the source of many electronics we have in the U.S.
- If a container ship traveled at 10 knots while shipping a product from Shenzhen to Boston, it would add 3 weeks to the travel time
- Would use less fuel and create less noise
- Reduce the chance of striking a whale





Asia

North America

Boston

Atlantic Ocean

Shenzhen

23 knots

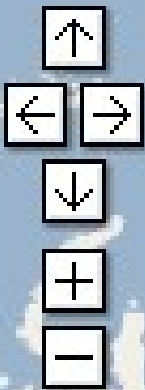
20 days,
12 hours

Indian Ocean

Australia

Pacific Ocean

South America



Asia

North America

Boston

Atlantic Ocean

Shenzhen

**47 days,
4 hours**



10 knots

Indian Ocean

Australia

Pacific Ocean

South America

What Can You Do?

Keep trash off the streets and out of the ocean.



Buy Whale Friendly Products

- Buy a door mat
 - Formerly used floating rope is recycled and turned into colorful door mats and dog leashes by a company called Custom Cordage.



- Eat a Massachusetts lobster
 - Mass lobstermen use 3,000 miles of sinking line, which is safer for whales, to catch their lobster and voluntarily mark them with a green band.



Adopt A Right Whale

- The New England Aquarium supports a right whale adoption program
- Choose from 6 different whales and 4 different sponsorship levels
- Information can be found at www.neaq.org

Starry Night (adult male)



Piper (adult female)



Shackleton (male born in 1994)



Snowball (adult male)



Phoenix (female born in 1987)

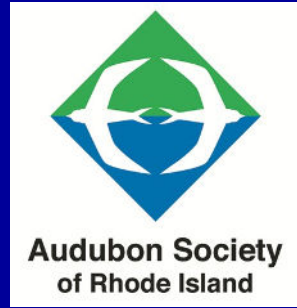


Calvin (female born in 1992)



Face the Facts

- NARWs are endangered, with only ~500 individuals remaining.
- Human activity both on land and on the water are threats to ocean life.
- You CAN get involved and make a difference.
- Slower shipping speeds would help prevent collisions with right whales.
- Mitigations are constantly being tested to determine the most efficient ways to protect NARWs.
- Write or call your legislators encouraging them to support measures protecting the North Atlantic right whale.



Sue Rocca/WDCS

To learn more, find us on Facebook:
Face-ing Extinction: The North Atlantic Right Whale