35th European Cetacean Society conference
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Long-finned pilot whale (*Globicephala melas*)

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ECS-ASCOBANS workshop:
Protecting the lesser-known cetaceans of the NE Atlantic

*Speaker

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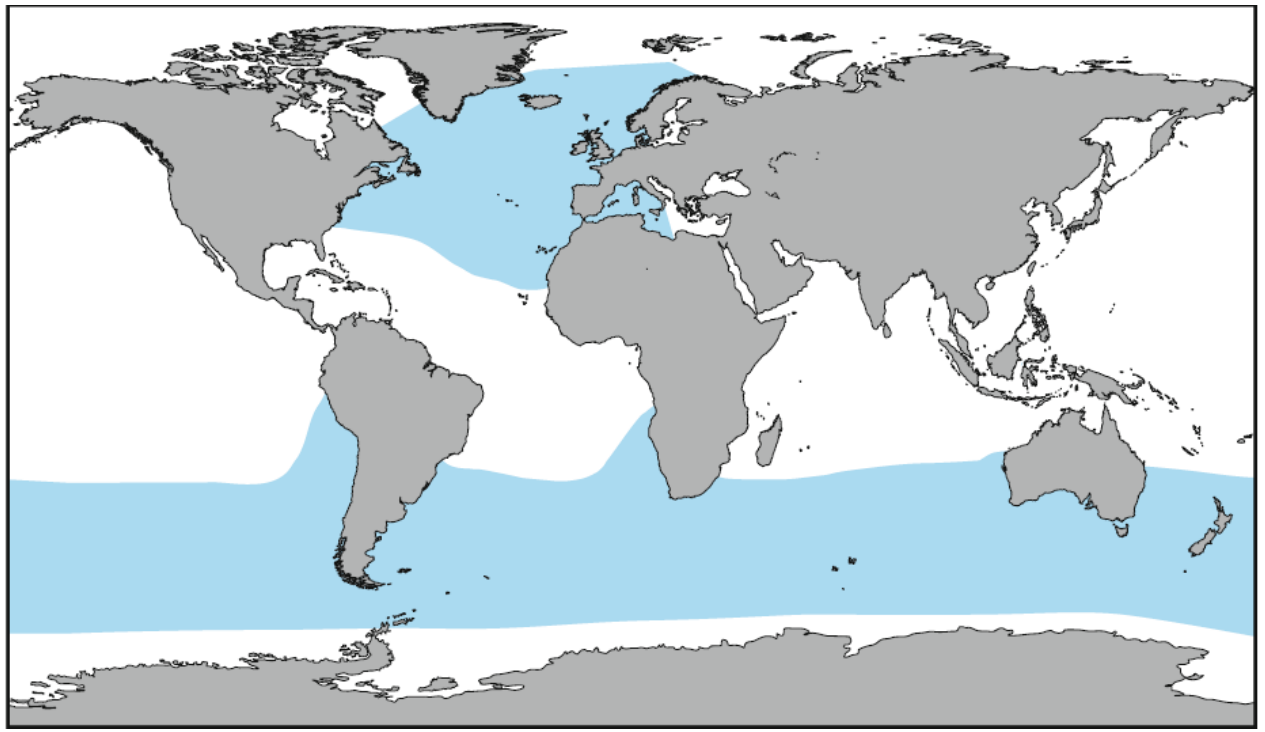
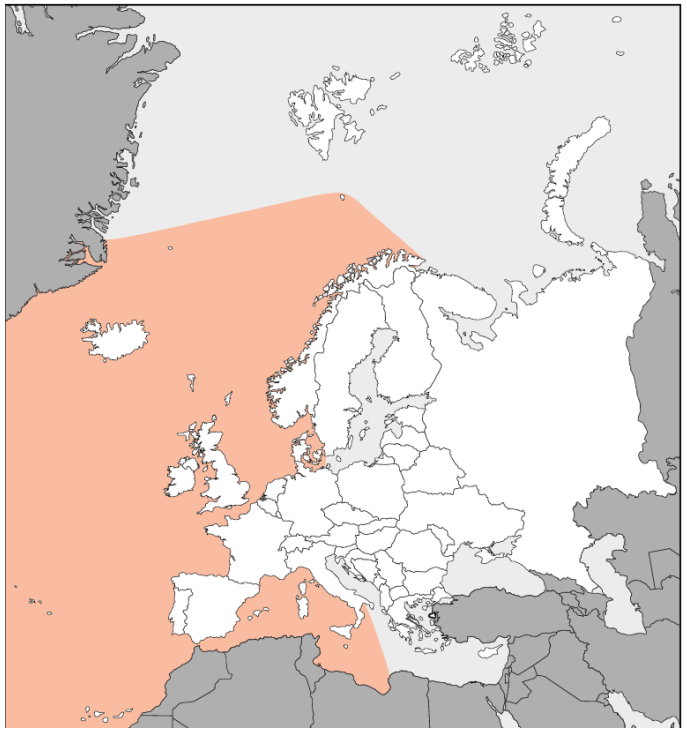
Introduction

- Based on: Verborgh P, Desportes G (2023) Long-Finned Pilot Whale *Globicephala melas* (Traill, 1809). In: Hackländer K, Zachos FE (eds) Handbook of the Mammals of Europe. Springer Nature Switzerland AG 2023, pp 1–30
- Offshore habitat
- Deep diver
- Frequent species in North Atlantic
- Lives in social groups
- “Easy” to identify the species

Distribution

- Based on data from large boat/aerial offshore surveys (e.g. SCANS, CODA, NASS, ObSERVE)
- Aerial surveys not best for deep divers
- Geographical limits defined from occasional reporting/stranding
- Present in all deep European waters

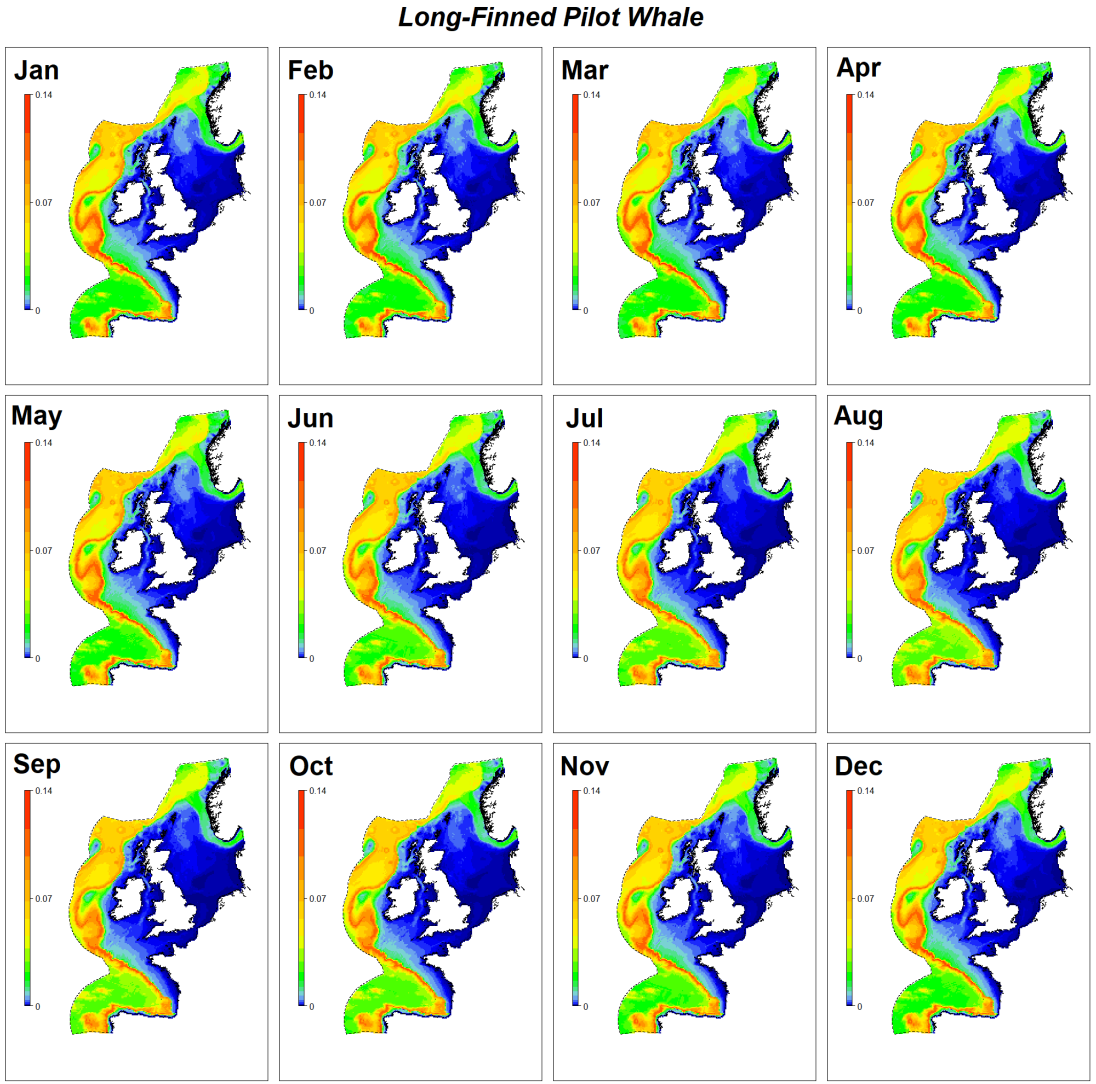




Verborgh and Desportes 2023

Distribution

- No apparent strong seasonal changes in presence and distribution



Waggitt et al. 2019

Population structure

- Samples from strandings and drive fisheries
- Structure between the eastern USA, the Faroe Islands, UK and the NW Iberian Peninsula:
  - mtDNA

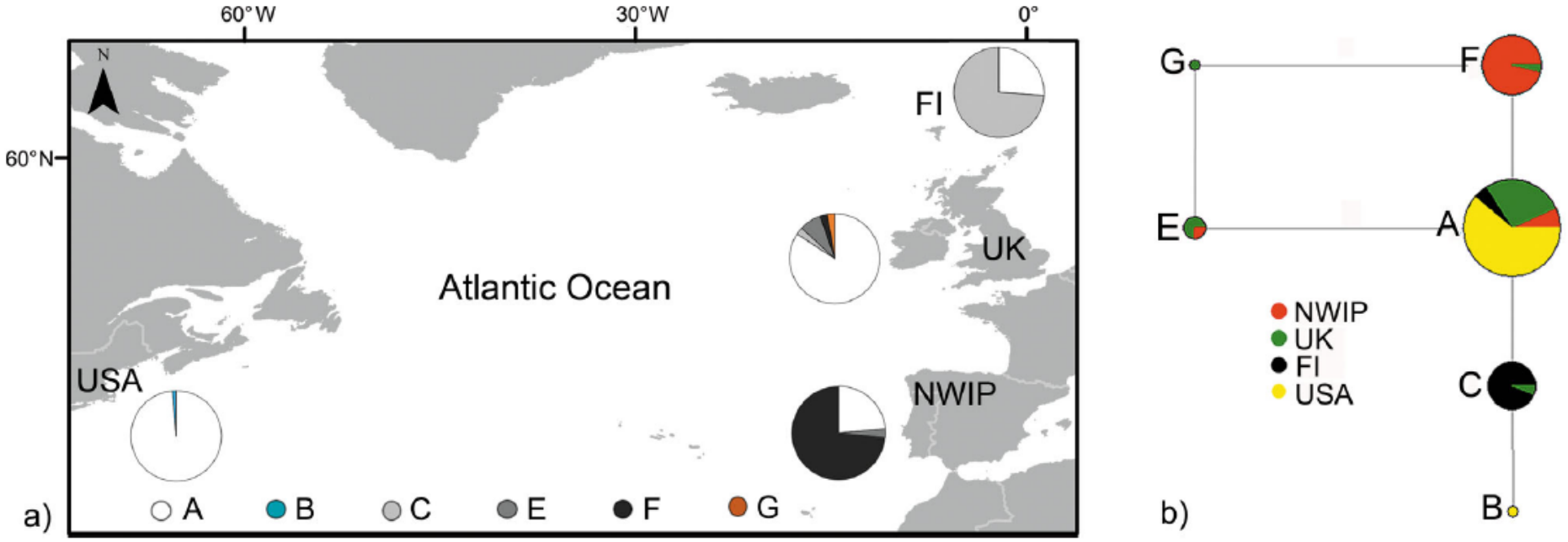


Fig. 1. (a) mtDNA haplotype frequencies of North Atlantic pilot whales analyzed in the present study; (b) median-joining network of the haplotypes of North Atlantic pilot whales, with different weights of transitions, transversions and insertions/deletions. Nodes are proportional to haplotype frequencies. All branches between haplotypes represent a single mutational step, unless stated otherwise (numbers). Haplotypes refer to those described in Table 2. Abbreviations are described in Table 1

Monteiro et al. 2015

Population structure

- Structure between the eastern USA, the Faroe Islands, UK and the NW Iberian Peninsula:
  - Fatty acids
  - Stable isotope

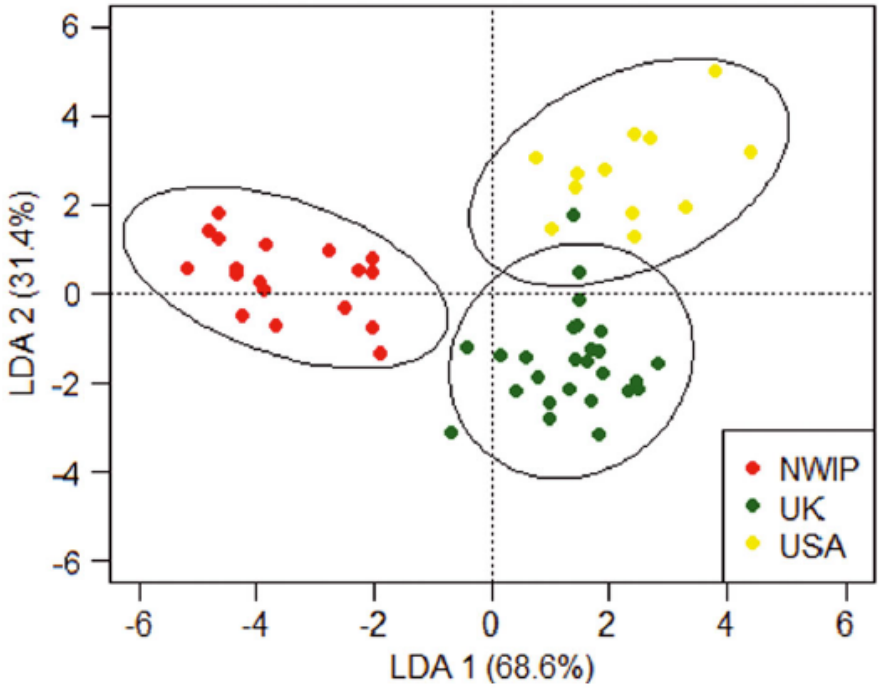


Fig. 3. Geographical differences in the fatty acid profiles from pilot whales from the North Atlantic based on linear discriminant analysis (LDA). Each dot represents a pilot whale, and ellipses represent 95% data point clouds. Abbreviations are described in Table 1

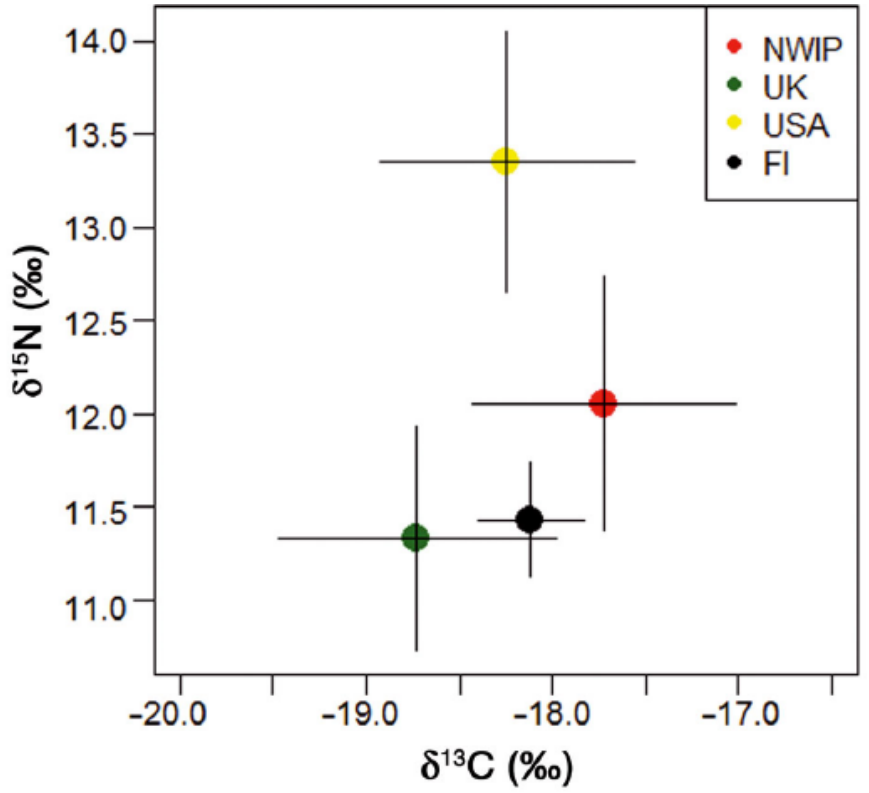
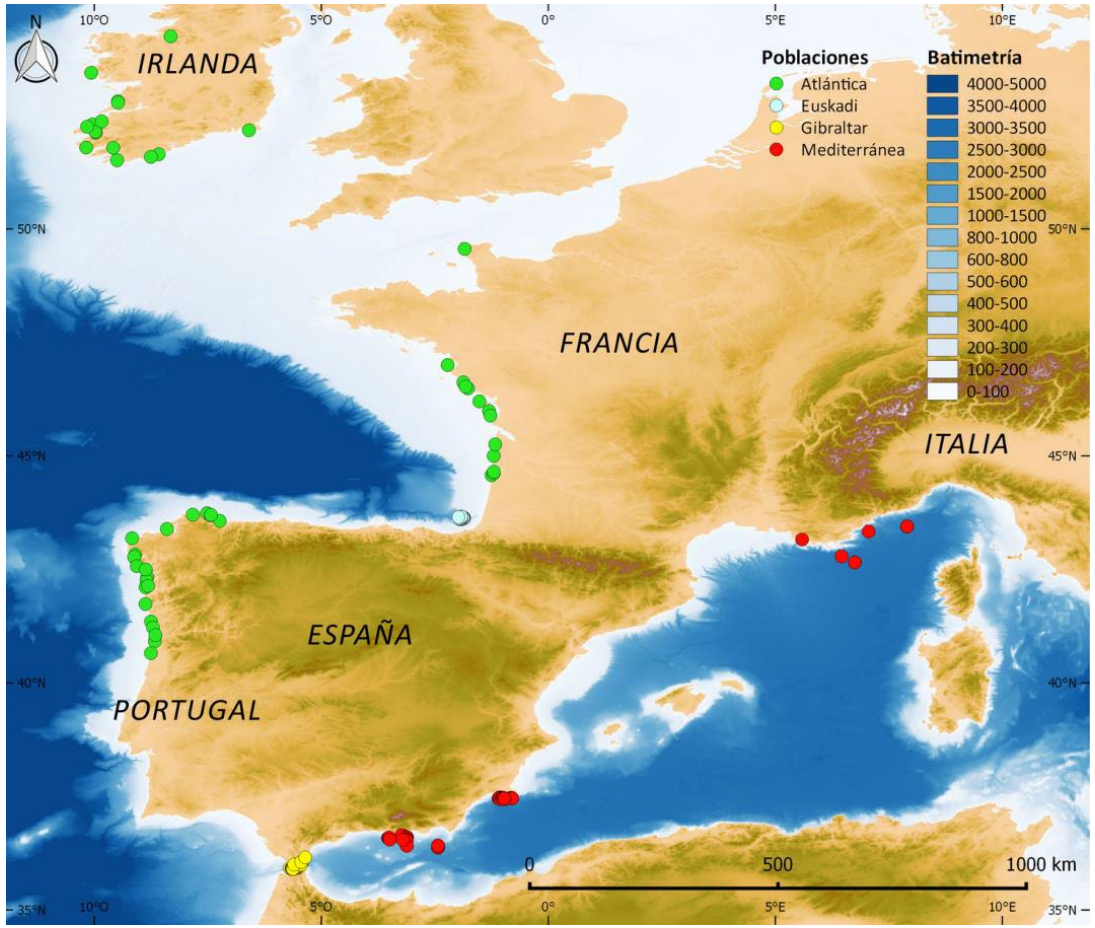


Fig. 4. Carbon ($\delta^{13}C$) and nitrogen ($\delta^{15}N$) isotope values (mean ± SD and ranges, ‰) in pilot whales from different regions of the North Atlantic. Abbreviations are described in Table 1

Monteiro et al. 2015

Population structure

- Samples from strandings and biopsies
- Mediterranean Sea subpopulations are isolated from Atlantic



Verborgh 2015

Abundance

- From large scale surveys
- ~385,000 individuals in European waters (minimum estimate, not all potential habitat surveyed)
- No negative trends detected 1987-2015 (Pike et al. 2019)

D. Alarcón

Demographic parameters

- Data from drive fisheries in the Faroe Islands (Bloch et al. 1993)
- Data from strandings in New Zealand (Betty et al. 2022)
- But not in Europe (>1000 strandings between France (Pelagis) and North of Spain (BEVACET).
- Photo-identification in the Strait of Gibraltar (Verborgh et al. 2021)

		SoG	Faroe Islands
Sexual maturity	Females		5–15 years
	Males		11–22 years
Gestation			12 months
Suckling			3-4 years
Birth interval		4.5 years	5.1 years
Survival rate	Adults (M-F)	0.984	0.945-0.969
	Juveniles (M-F)	0.869	0.886-0.947
	1st year	0.629	0.862

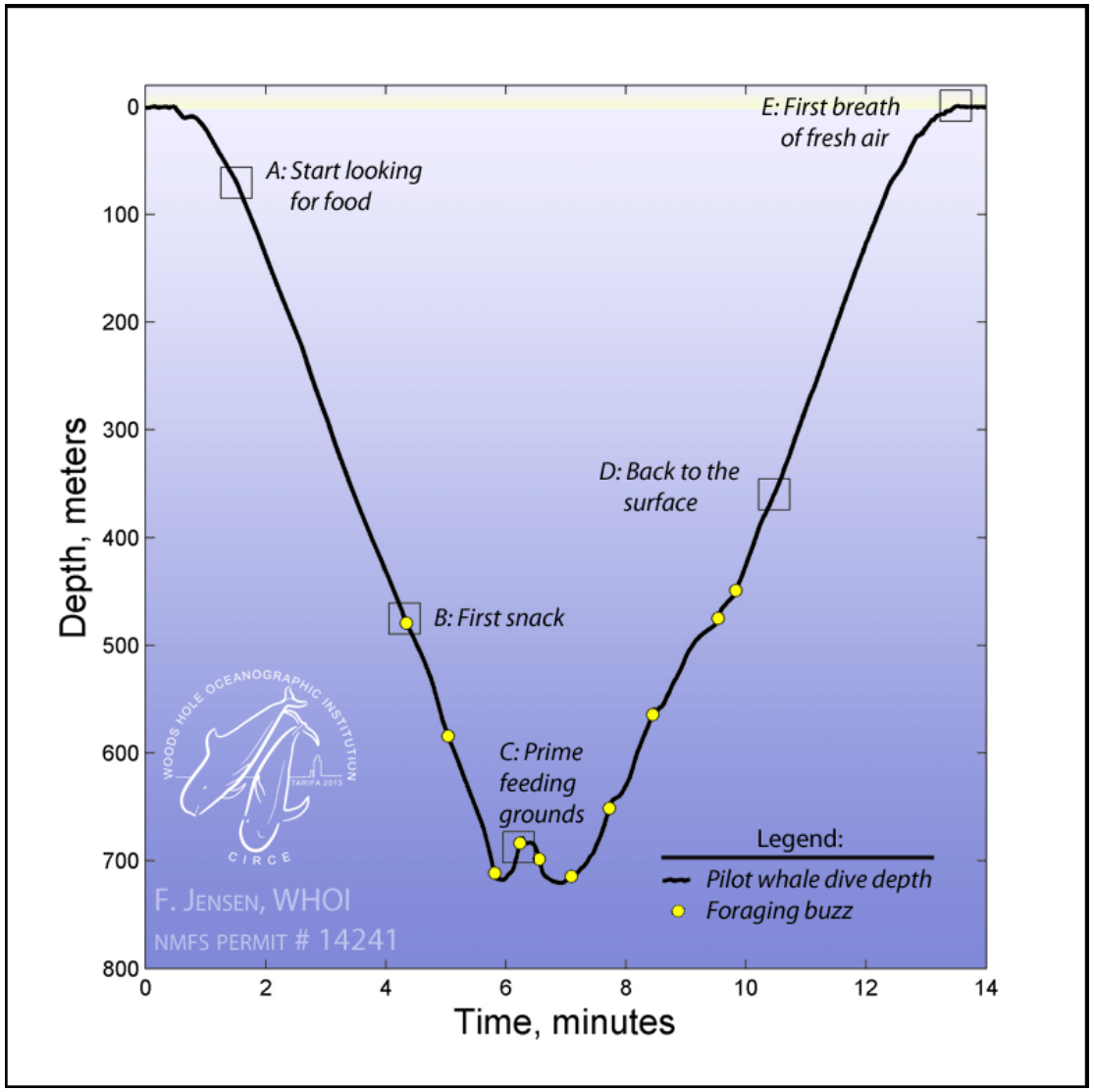
Habitat

- Data from surveys and satellite tag
- Coastal to offshore
- Long-range movements
- Potential for identification of foraging areas

Mikkelsen 2020

Dive behaviour

- Data from satellite tags, TDR or DTAGs
- Norway and SoG



https://pilotwhales.blogspot.com/

Diet

- Data from strandings and drive fisheries
  - Stomach content
- Data from biopsy samples
  - Fatty acids
  - Stable isotope
- Feed mainly on squid (European flying squid in FI; northern shortfin and lesser flying squid in NWIP) and fish (greater argentine and blue whiting), will shift in function of abundance (Desportes and Mouritsen 1993, Spitz et al. 2011, Santos et al. 2014).

FAO

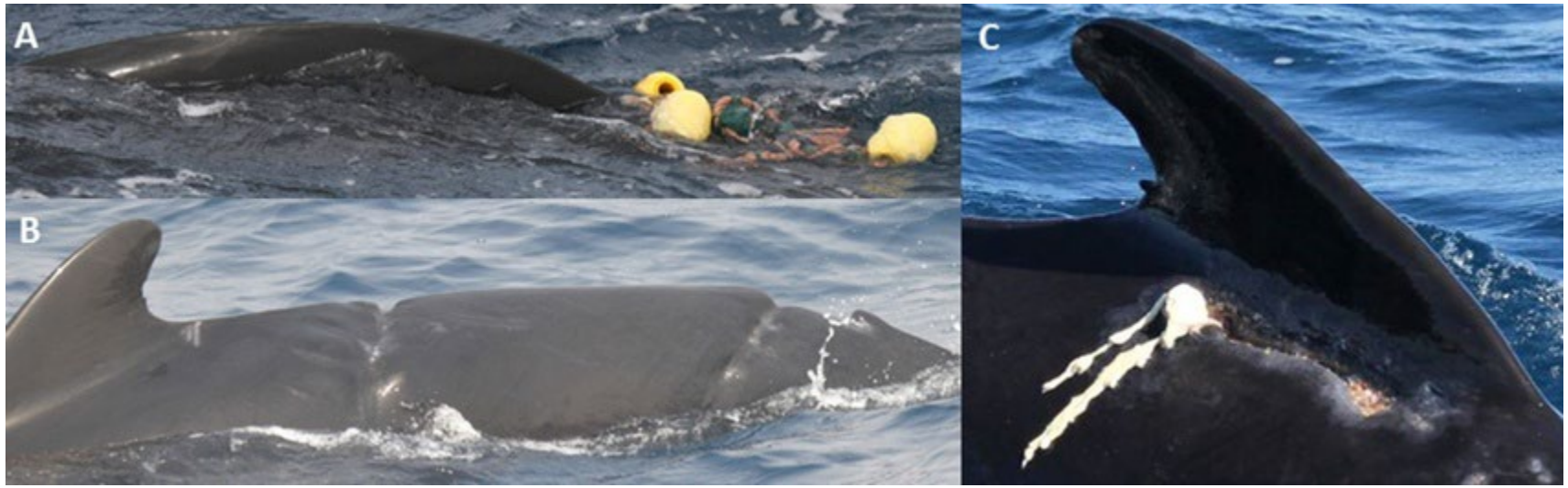
Threats

- **Direct catch:**
  - Hunted in the Faroe Islands takes ~850 individuals per year,
    - No detectable declines in abundance.
    - However, impact on genetic diversity/culture, by the removal of entire pods, should be investigated.
  - Hunt off East Greenland, increased from a few to ~ 100 animals/year (2016-2021). Potential different population (Fullard et al. 2000)

Threats

- **Incidental mortality from fisheries**
  - Subject to entanglement, hooking, and other forms of bycatch in:
    - Long lines,
    - Gillnet
    - Driftnet
    - Purse seines
    - Midwater and bottom trawls
  - Current bycatch levels likely not of concern (ICES 2019)

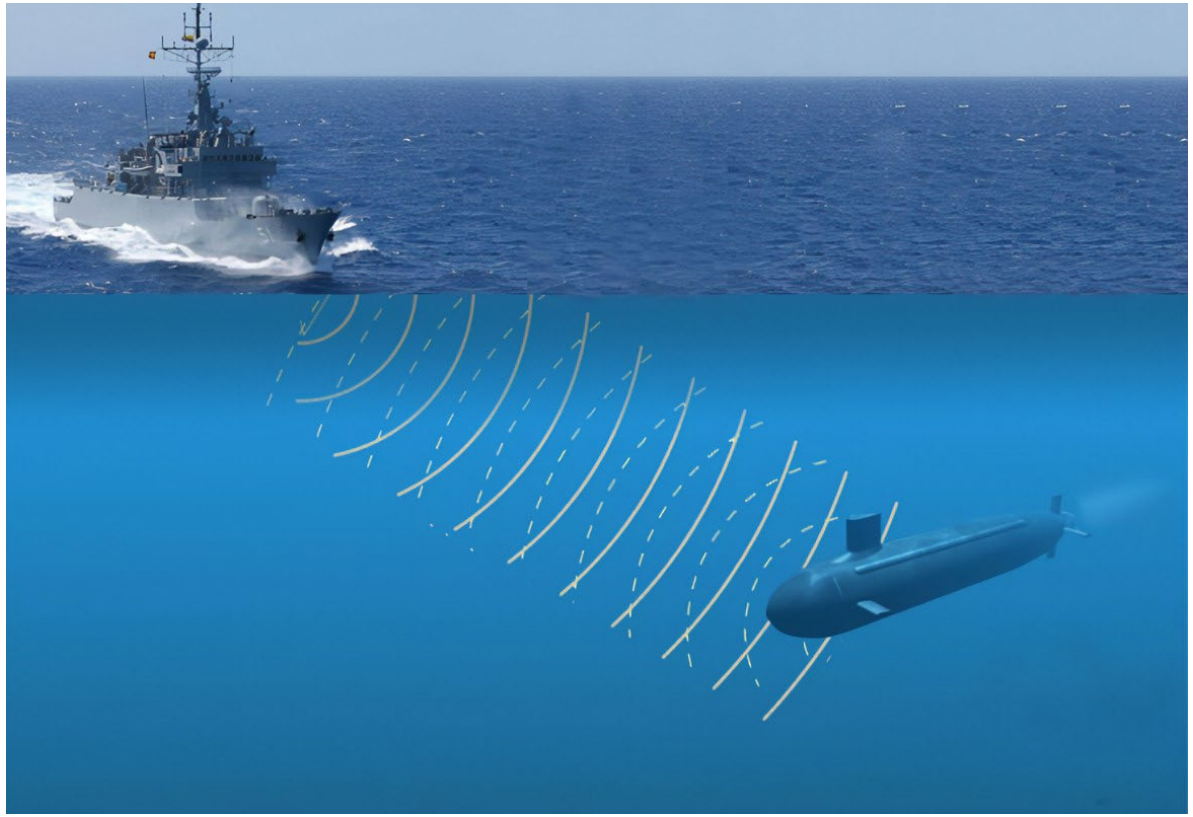
  - Potential prey depletion from squid fisheries mainly in Portugal and Norway (Desportes and Mouritsen 1993, Santos et al. 2014).



Verborgh et al. 2016

Threats

- **Anthropogenic sound**
  - Military sonar
    - Behavioural response (Antunes et al. 2014)
  - Seismic surveys



Threats

- **Contaminants**
  - Higher levels in North than in South Atlantic (Borrell and Aguilar 1993, Dam and Bloch 2000, Méndez-Fernandez et al. 2014)
  - but much lower than Mediterranean (Praca et al. 2011; Lauriano et al. 2014; Pinzone et al. 2015).
  - Below thresholds for PCBs and DDTs (Méndez-Fernandez et al. 2014).
  - High levels of mercury (Caurant et al. 1993, Méndez-Fernandez et al. 2014)
  - Not recommended for human consumption (Weihe and Debes Joensen 2012)

- **Epizootics**
  - Mainly Mediterranean Sea morbillivirus (Fernández et al. 2008)

Threats

- **Climate change**
  - Changes in distribution, range, abundance, and/or migration patterns are expected either directly or through changes in prey availability (Fielding 2010)
  - Squids are very sensitive to temperature and ocean acidification (Lacoue-Labarthe et al. 2016).

Threats

- All these factors may be causing declines in abundance that may have gone undetected in areas which have been poorly, infrequently, or never surveyed.
- E.g. subpopulations of the Strait of Gibraltar (Critically Endangered) and the Inner Mediterranean Sea (Endangered)

Conservation status

- **IUCN Least Concern** at European level
  - Potential subpopulations not assessed separately (not enough information to distinguish them)

Gaps

- Better understand if there is further genetic structure
- What is then the geographic extent of each subpopulation
- Reassess abundance/trend and importance of threats based on that new information.
- Complex because of individual long distance movement, general habitat shift and offshore habitat.
- Offshore areas of Bay of Biscay not comparable between large scale surveys.

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MARINE MAMMALS AND HUMAN ACTIVITIES
CATANIA, ITALY

Thank you