



Aixa Morata

aixa@asociacionanse.org



SURVIVAL RATES OF LONG-FINNED PILOT WHALES IN SOUTHEASTERN SPANISH WATERS

Aixa Morata¹; José Luis Murcia¹; Pedro García¹; Philippe Verborgh^{1 2}

1. ANSE (Asociación de Naturalistas del Sureste). Plaza Pintor José María Párraga, nº 11, bajo. 30002 Murcia (Spain)

2. Madeira Whale Museum. Rua Garcia Moniz, 1, 9200-031. Caniçal, Madeira (Portugal)



BACKGROUND

Long-finned pilot whales (*Globicephala melas*) of the inner Mediterranean Sea were classified as an endangered subpopulation by the IUCN in 2021. This assessment was based on the high mortality mainly caused by a Morbillivirus epizootic that affected this subpopulation in 2006-2007 and during the following 3 years (1). This study aimed at estimating survival rates during the following decade to understand if the subpopulation has recovered since then.

MATERIALS AND METHODS

Various photo-identification surveys targeting pilot whales took place off Murcia, southeast Spain, between 2003 and 2023 (Figure 1) to identify individuals based on their dorsal fin features. Cormack-Jolly-Seber mark-recapture models were tested in the software MARK to estimate annual survival rate of pilot whale in that region. Goodness-of-fit (GOF) tests were first performed using U-Care to detect problems of transience and trap-dependence in the dataset (2). Although the general GOF test (Quadratic Chi²= 62.13, df = 53, p = 0.18) was not significant, some transience was detected and included in the modelling process.

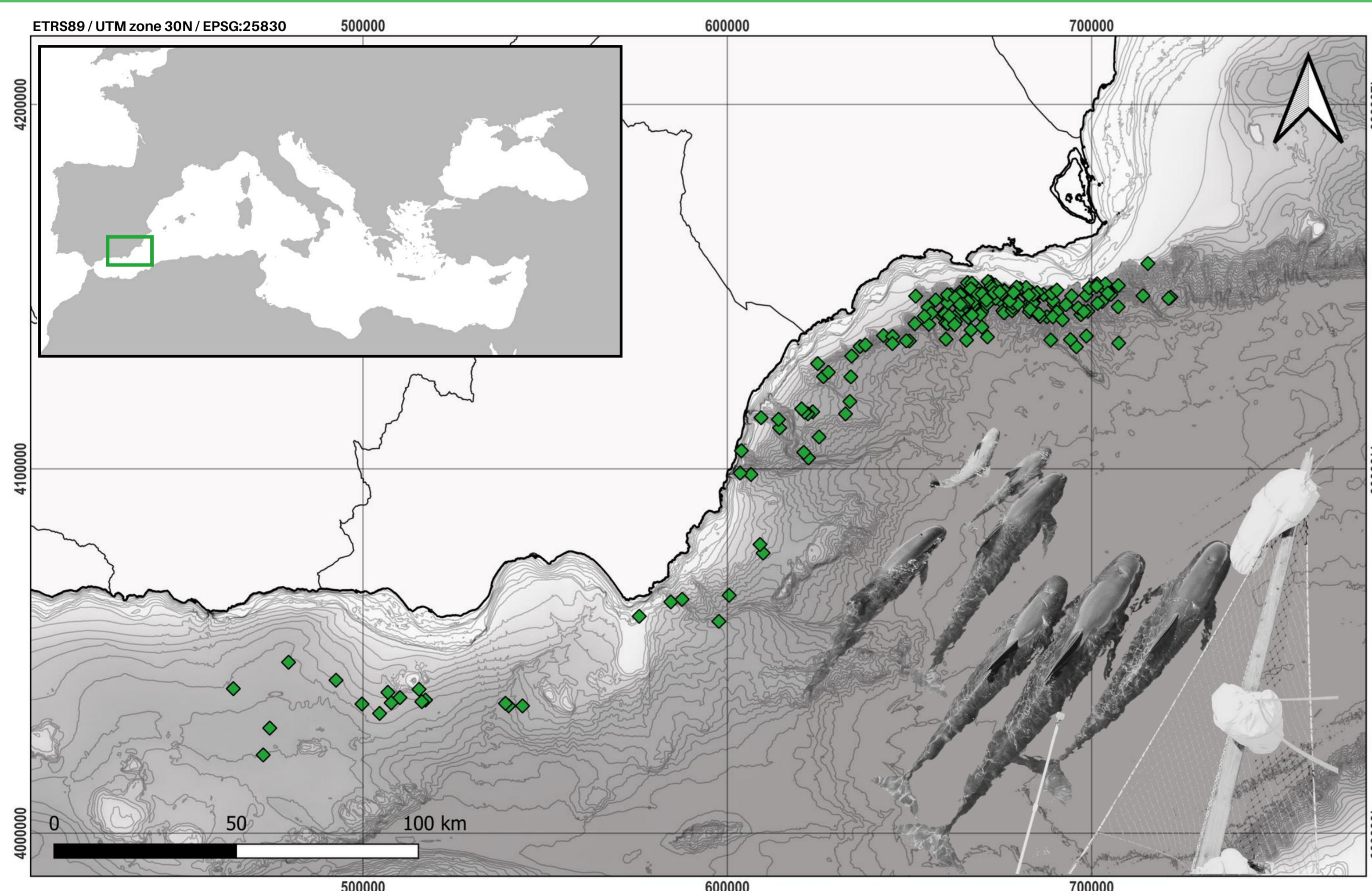


Figure 1. Sightings of pilot whales by ANSE between 2003 and 2023.

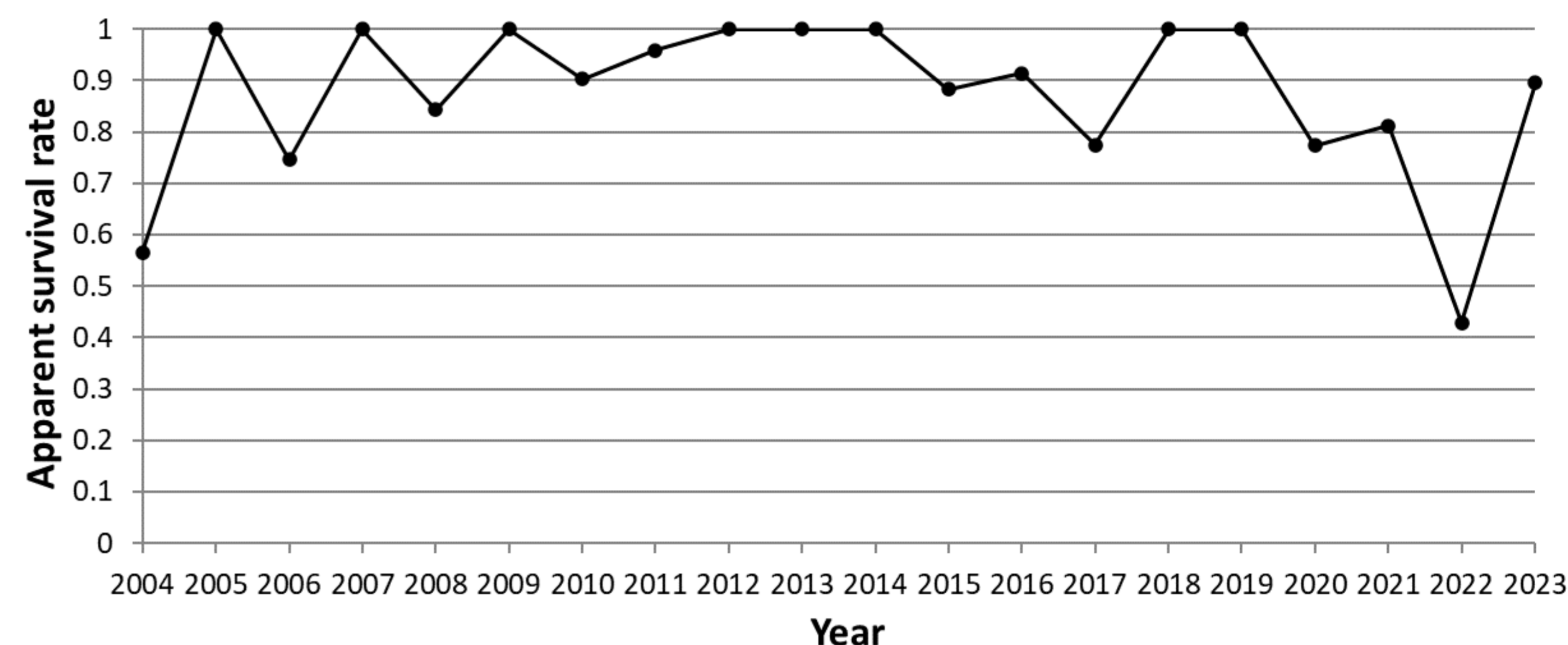


Figure 2. Apparent annual survival rate estimates of long-finned pilot whales (*Globicephala melas*) from the southeast of Spain.

RESULTS

For the 846 individuals identified, the best model found a low constant survival rate of 0.929 (SE= 0.020; 95% CI: 0.878 - 0.960) between 2003 and 2023. However, the time-varying model estimated even lower values for certain periods (Figure 2). Lower survival rates were first found in 2006-2007, which matches the morbillivirus epizootic previously described both in the nearby Strait of Gibraltar (3) and Alboran Sea that caused mortalities of 20% and up to 37% for some social groups respectively (1). Low values were also observed in 2010-2011, 2015-2017 and 2020-2022.

DISCUSSION

The causes of these low survival rates are currently unknown but could be due to a combination of the following potential threats: new or recurrent epizootics, high levels of pollutants, an observed increase in maritime traffic overlapping with their distribution, disruption of the social network that could reduce the survival of dependent individuals, a general reduction of carrying capacity in the western Mediterranean Sea or movement to regions outside of the study area (4). A greater effort is needed to better understand the causes of this apparent decline in Mediterranean populations, as well as adequate management of the species in the area of highest density in the Mediterranean Sea.

ACKNOWLEDGEMENTS: Work carried out with the support of the LIFE Project LIFE02 NAT/E/008610 (2003-2005), the Spanish Government through the Biodiversity Foundation (Ministry for the Ecological Transition and the Demographic Challenge) (2008, 2015, 2012-2022) and CaixaBank (2023). Special thanks to all the partners who collaborated with our association and all the volunteers involved that make it possible to continue data collection.

REFERENCES: (1) Wierucka et al. (2014) Effects of a morbillivirus epizootic on long-finned pilot whales *Globicephala melas* in Spanish Mediterranean waters. *Mar Ecol Prog Ser* 502:1–10. (2) Choquet et al. (2009) U-CARE: Utilities for performing goodness of fit tests and manipulating CAPture-REcapture data. *Ecography* 32:1071–1074. (3) Verborgh et al. (2019) Epizootic effect and aftermath in a pilot whale population. *Aquat Conserv Mar Freshw Ecosyst* 29:820–828. (4) Verborgh et al. (2016) Conservation status of long-finned pilot whales, *Globicephala melas*, in the Mediterranean Sea. In: *Advances in Marine Biology* 75: Mediterranean Marine Mammal Ecology and Conservation, Academic P. Elsevier, Oxford, pp 173–203