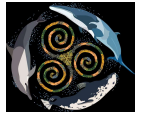




Social networking; Bottlenose Dolphin *Tursiops truncatus* and White-beaked Dolphin *Lagenorhynchus albirostris* population size and structure in NE England, 2010-2023

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1.) Introduction

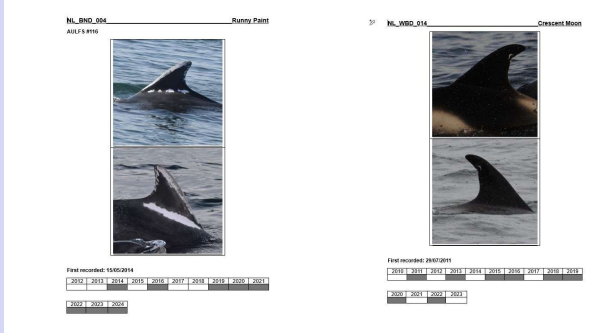
In North East England, white-beaked dolphin *Lagenorhynchus albirostris* is a seasonal visitor to inshore/nearshore waters (Brereton *et al.* 2020), whereas bottlenose dolphin *Tursiops truncatus* has an increasing presence year-round, despite being a scarce visitor before 2012 (Hackett *et al.* 2020). Designation of any marine protected areas or impact mitigation schemes to conserve these species requires evidence based determination of population size. This study aimed to generate population estimates, assess social structure, and create photo-ID catalogues, for both species.

2.) Methods

7120 images of *L. albirostris* (193 identifiable individuals) off the coast of Northumberland and County Durham, were obtained in 107 encounters between 2010-2023, almost exclusively from small boats. 3690 images of *T. truncatus* (74 identifiable individuals) were accumulated from 38 small boat trip encounters, and photographs taken by members of the North East Cetacean Project Facebook group from land between the Scottish Border and the river Humber, between 2011-2023. Data was pooled, then divided into two time periods for each species, before estimating absolute abundance using the Chapman modification of the Lincoln-Petersen capture-mark-recapture model (Chapman 1951). Sociograms for both species were created using SOCPROG2.9 (Whitehead, 2009). Photo-ID catalogues were created for both species (example pages in Figure 2.1, <https://marine-life.org.uk/north-east-cetacean-project/>).

Figure 2.1

Catalogue pages for NL_BND_004 'Runny Paint' and NL_WBD_014 'Crescent Moon'



4.) Discussion

- Only 16% of *L. albirostris* were resighted, compared to 91% of *T. truncatus*.
- This reflects the differing nature of the two populations (widely dispersed and seasonal v. inshore resident/semi-resident).
- *L. albirostris* was frequently encountered in well-dispersed groups, potentially reducing the recapture rate.
- Wider movement and seasonal distribution of *L. albirostris* beyond the core study area is still uncertain.
- Increasing occurrence of some *T. truncatus*, and the identification of 'new' individuals subsequent to the study period, suggests a gradual shift of the East Coast population from Scotland into North East England.



Thank you to: NECP volunteers (survey and photo-ID effort, managing the NECP Facebook group), Natural England (for funding, and ongoing support), Chief Fisheries Officer Mark Southerton and officers of the Northumberland Inshore Fisheries and Conservation Authority (for hosting our survey teams), A. Skinner and M Skinner (skippering the JFKTWO during pelagic wildlife trips), the members and admin teams of the Berwick Dolphin Watch and Dolphin Spotting NE Facebook groups, Stuart Baines/Scarborough Porpoise. Dr B. Cheney, and C. Phillips, are thanked for useful discussions and comments.

3.) Results

3.1 Population size.

- Discovery curves suggest an approaching plateau of new identifications for *T. truncatus* but not *L. albirostris* (Figure 3.1, Figure 3.2).

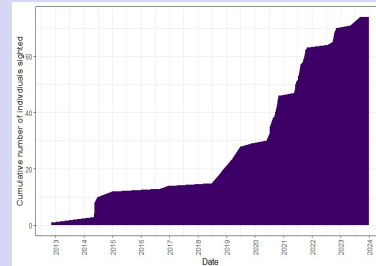


Figure 3.1

Discovery curve for bottlenose dolphin off North East England 2013-2023

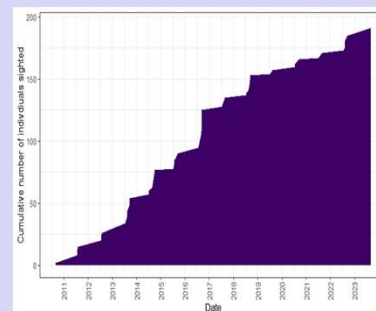


Figure 3.2

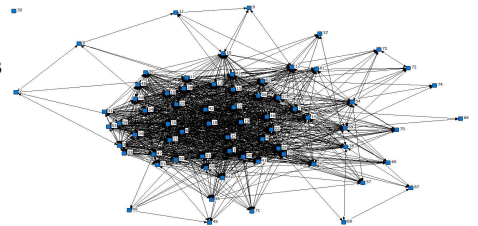
Discovery curve for white-beaked dolphin off North East England 2010-2023

- *T. truncatus* population size was estimated to be 78+/-5 using the modified Lincoln/Chapman method, and 124 using a simple scaling method.
- *L. albirostris* population size was estimated to be 668+/-269 using the modified Lincoln/Chapman method, and a crude calculation correcting for group size, marking rate and recapture rate estimated a population of 582.

3.2 Social structure.

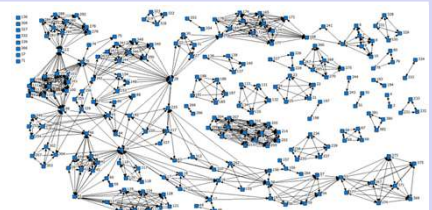
- The *T. truncatus* population consists of one large interconnected unit, with only one animal that was identified but never recorded with other identifiable animals (Figure 3.3). Several of the subunits within this population appear to be stable over periods of several years, and subunits recorded towards the end of the study period, and subsequently, are additional arrivals from the east coast of Scotland.

Figure 3.3
Bottlenose dolphin sociogram 2013-23



- 23 *L. albirostris* population units were identified, and eight individuals were seen in groups where no other animal could be identified. When plotted on a sociogram (Figure 3.4), one large social network became apparent, with many links between smaller units.

Figure 3.4
White-beaked dolphin sociogram 2010-2023



Brereton, T. *et al.* (2020). Temporal and spatial analysis of Marinlife and ORCA white-beaked dolphin data from Northumberland and adjacent sea areas Natural England Commissioned Report NECR289.
Chapman, D.G. (1951). Some properties of the hypergeometric distribution with applications to zoological sample censuses. UC Publications in Statistics. University of California Press.
Hackett, K. J. *et al.* (2023). Bottlenose Dolphin in North East England 2002-2023. Spatial and temporal distribution and changes evidenced by citizen science. Report to Natural England.

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