

SPATIO-TEMPORAL PATTERNS OF DISTRIBUTION & ABUNDANCE FOR CETACEAN SPECIES IN NORTH-WEST EUROPEAN SEAS

Peter G.H. Evans and James Waggitt

NERC/Defra Marine Ecosystem Research Programme

SUMMARY Understanding the mechanisms driving spatial and temporal variations in the abundance of cetacean species is a key question in ecology and conservation. Such understanding requires documentation of when and where cetaceans have been found over a wide range of years and seasons, and over a wide range of different regions and habitats. Realistically, this coverage cannot be achieved by individual surveys. Our research within the Marine Ecosystem Research Programme (MERP) has aimed to collate existing survey datasets to maximise coverage, and address key knowledge gaps.

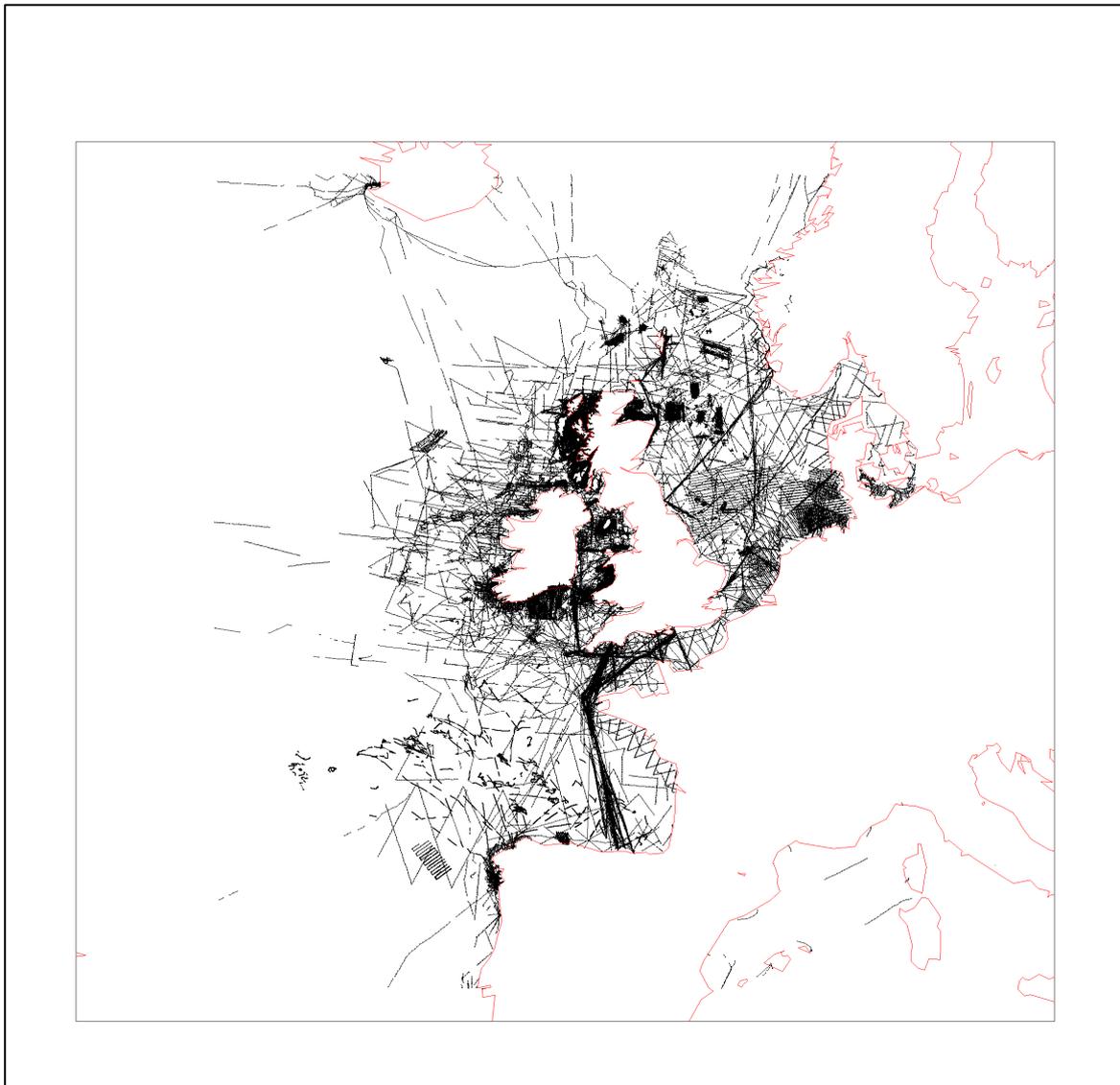


Fig. 1. Survey Effort

So far, we have collated 4.1 million kilometres of vessel and aerial surveys across the north-east Atlantic spanning from Portugal to Iceland, but concentrated largely upon NW European shelf seas (see Fig. 1). These surveys contain 225,000 hr of observation effort between 1978 and 2016, from over 40 different organisations and research groups.

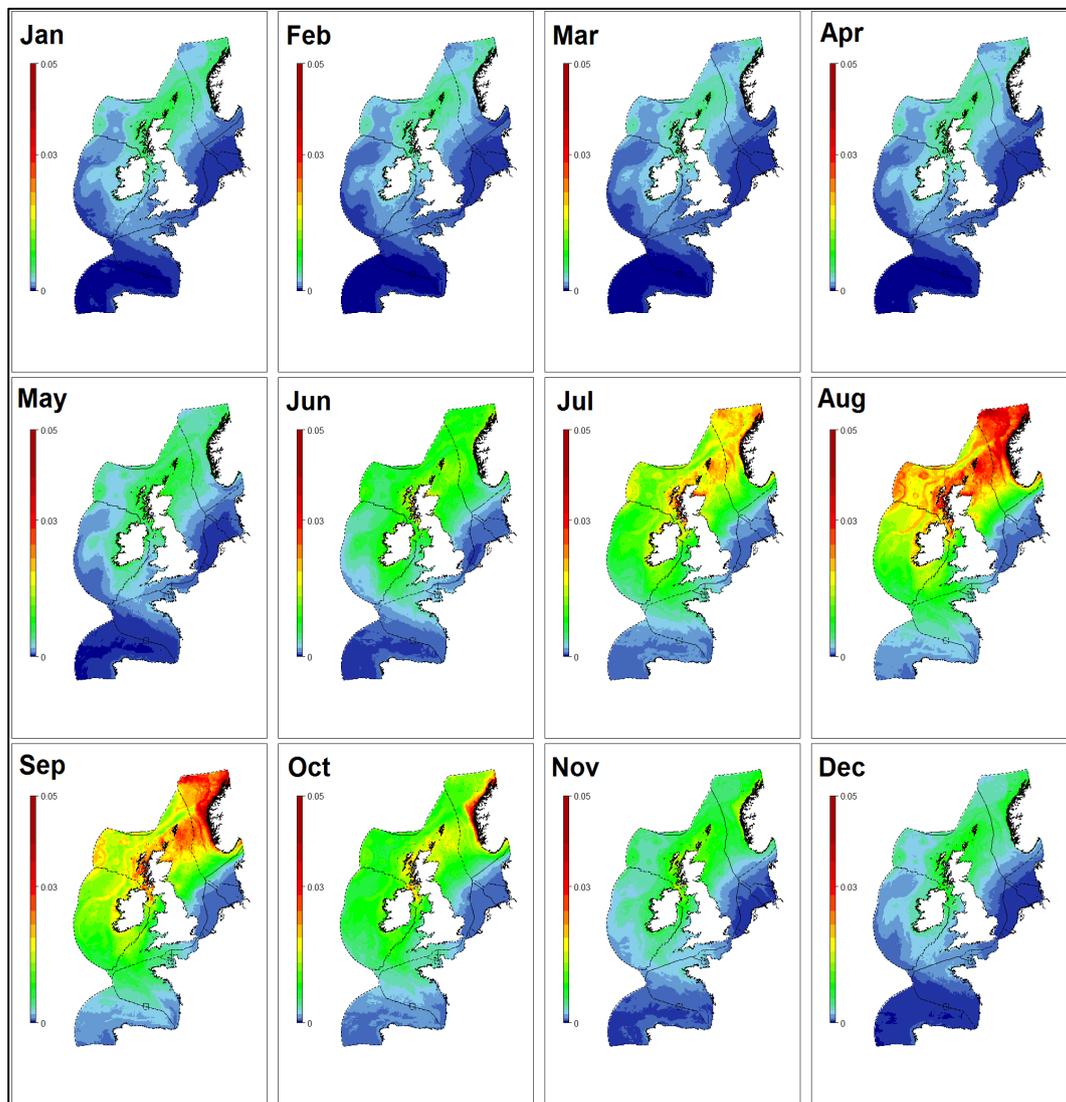


Fig. 2. Predicted average monthly minke whale densities

Collectively, these surveys are being used to test ecological questions/hypotheses using a variety of modelling approaches, and to generate potentially useful data products, most notably maps of absolute densities of the 10 most common species at monthly temporal and 10km spatial resolution across the past three decades (see general example in Fig. 2, and a regional example in Figs. 3 & 4). Our research is not constrained to cetaceans, and we have also assembled similar collations of data for seabirds. Although these are preliminary results, we consider our seasonal and spatial coverage relatively good. Nevertheless, we are still lacking extensive coverage in offshore and northern areas of the eastern North Atlantic which are important for our overall understanding of the distributions of certain species. Contributions from those surveying these areas would be particularly appreciated.

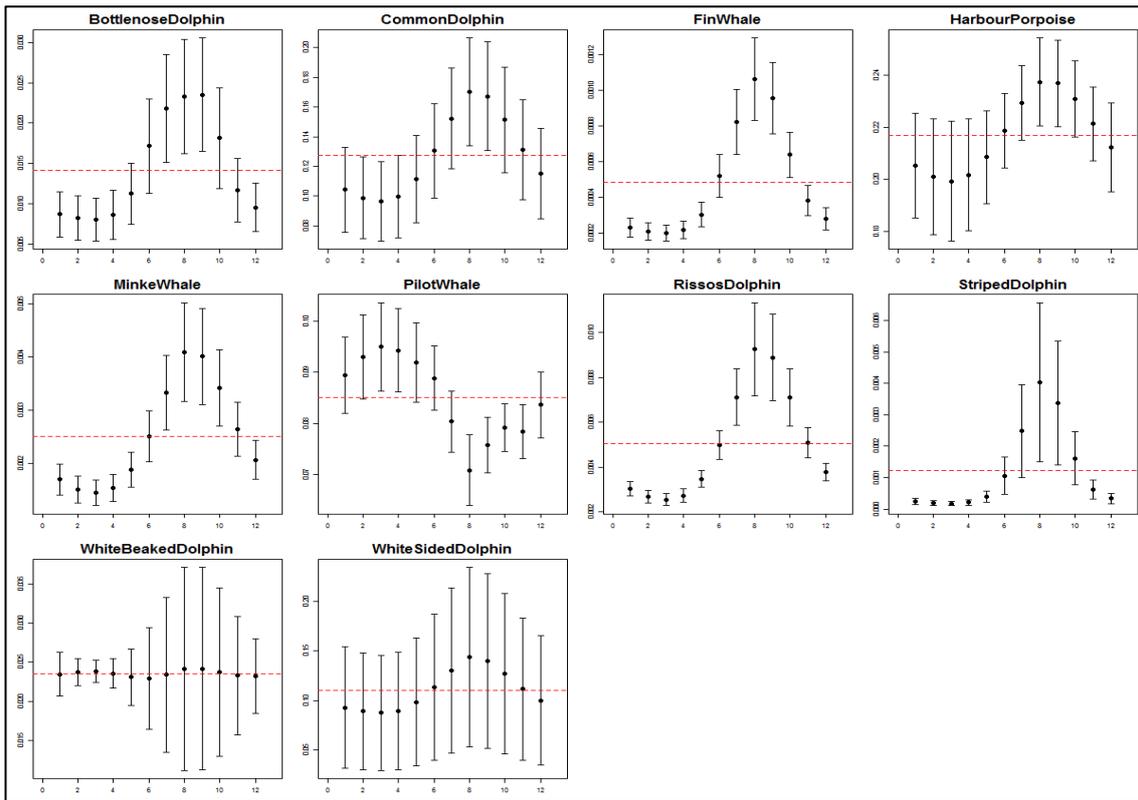


Fig. 3. Sample regional seasonal trends for selected species: Scottish Hebrides

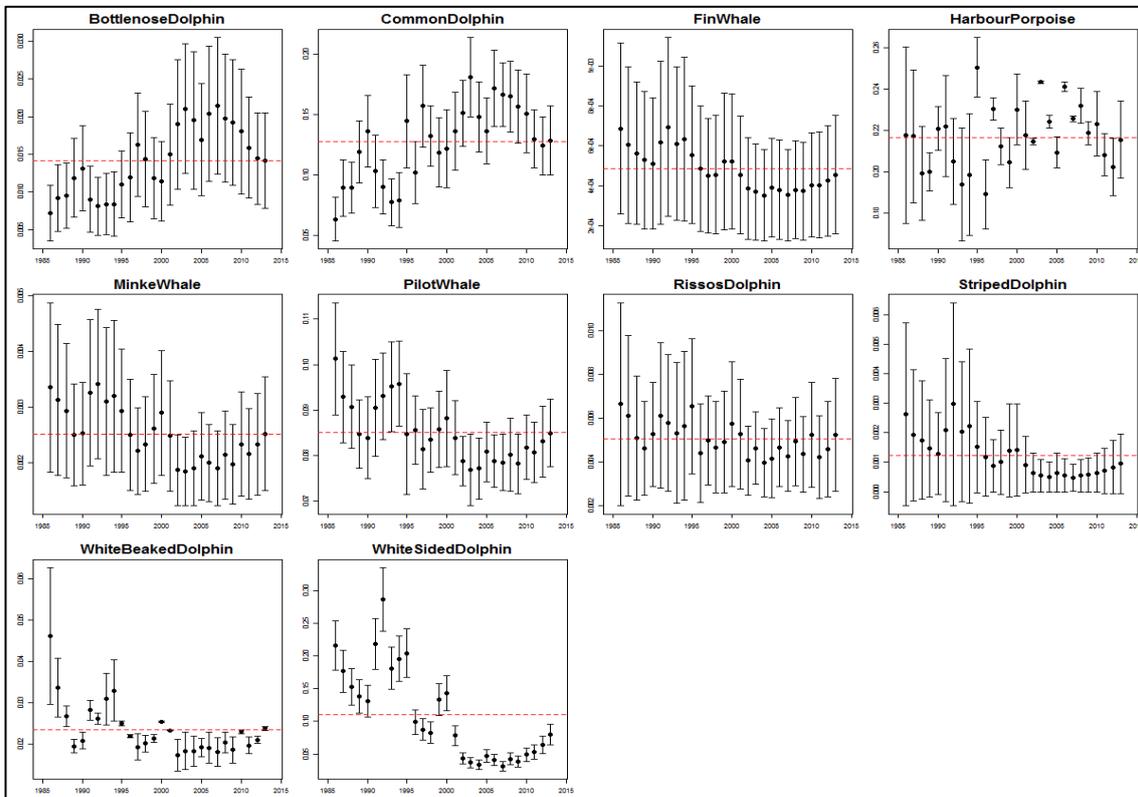


Fig. 4. Sample regional inter-annual trends for selected species: Scottish Hebrides