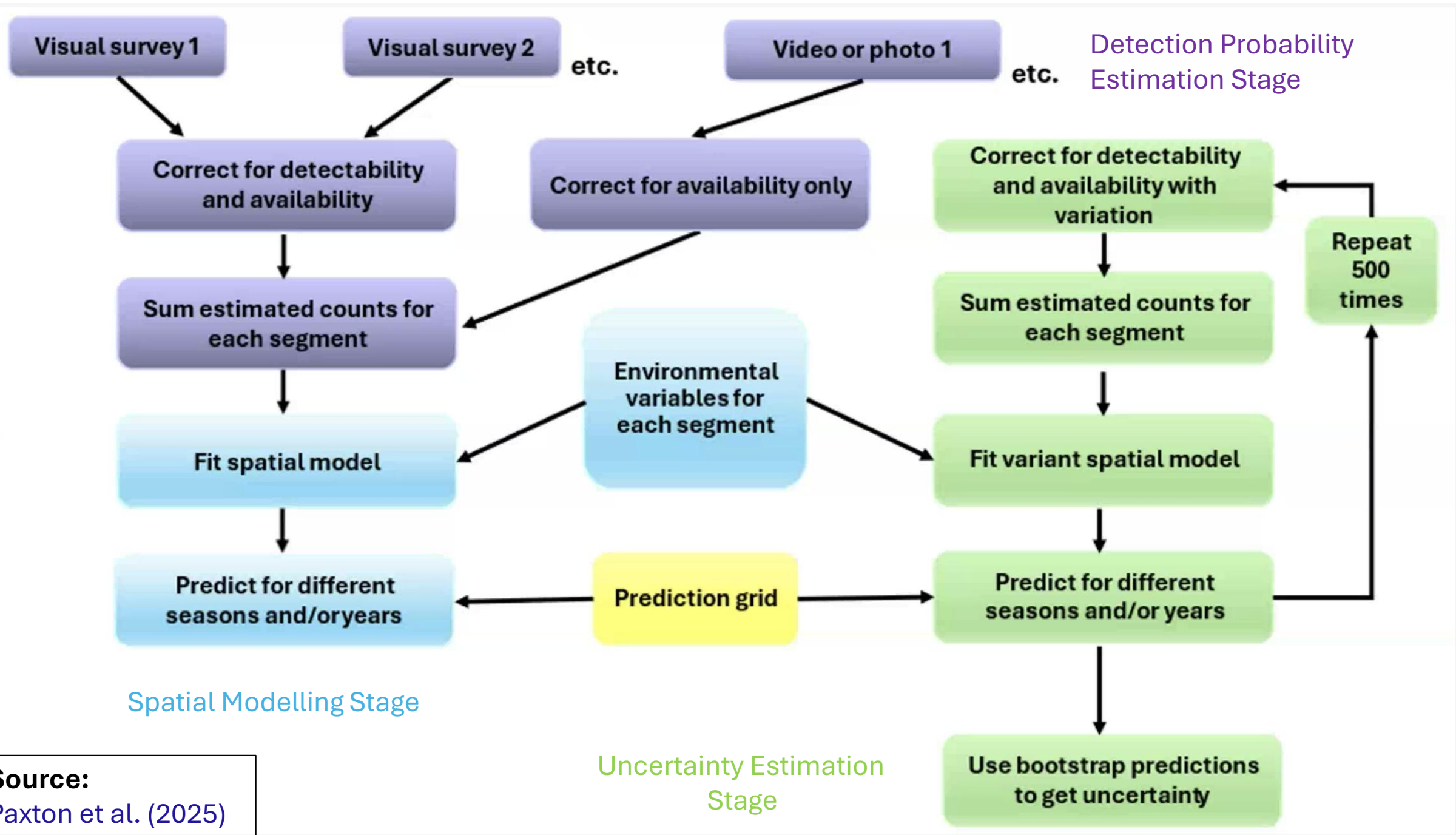


POSEIDON Project, 2023-25

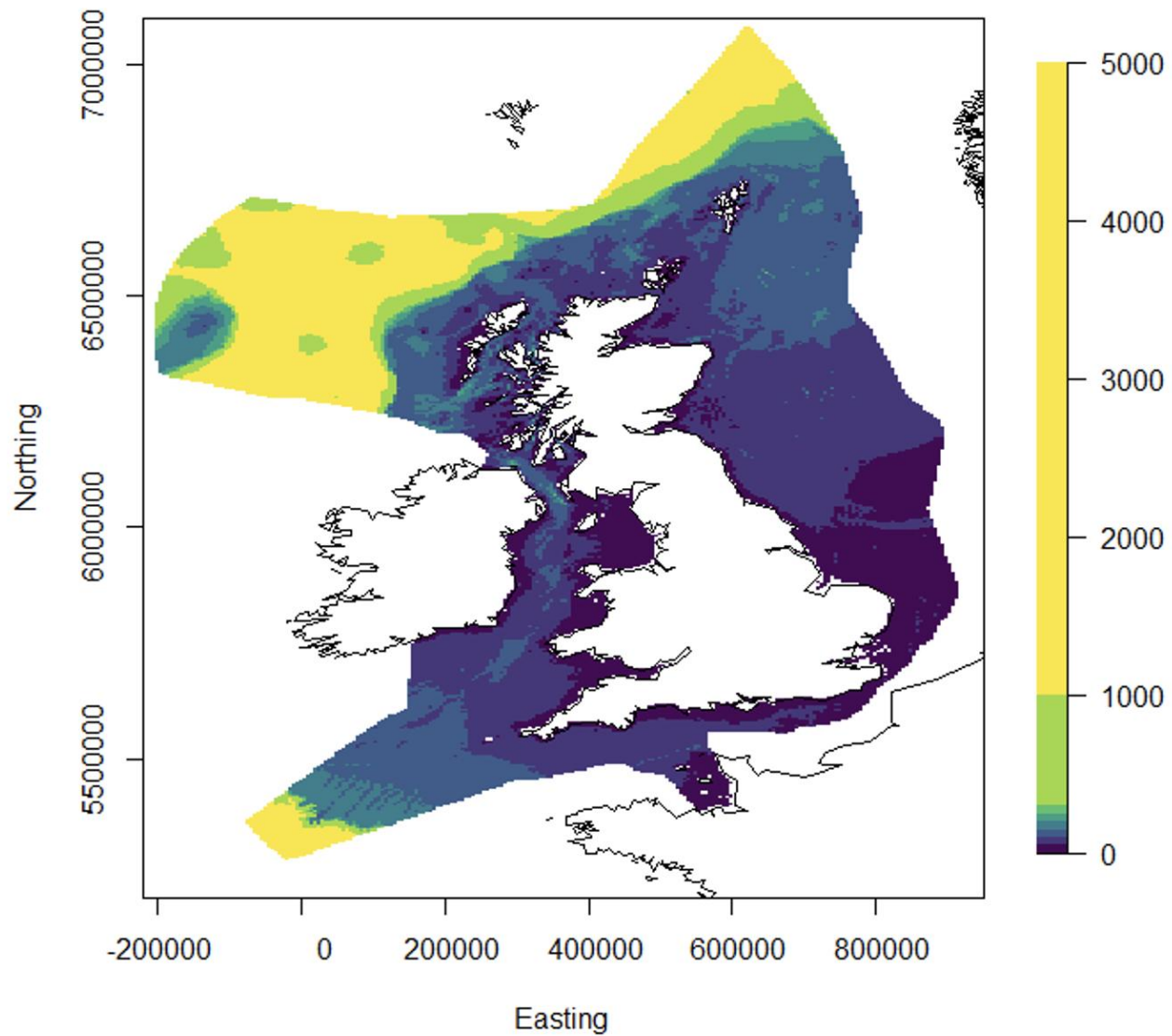


- Project led by Natural England in conjunction with Defra and the Crown Estate
- Partners include Bangor University (BU, lead organization), Centre for Research in Ecological and Environmental Modelling (CREEM), Centre for Ecology & Hydrology (CEH), Cefas, and Sea Watch Foundation (SWF)
- Collation of >700,000 km of survey effort on seabirds & cetaceans within UK EEZ
- Modelling by CREEM & BU; Sensitivity Scores developed by CEH & SWF

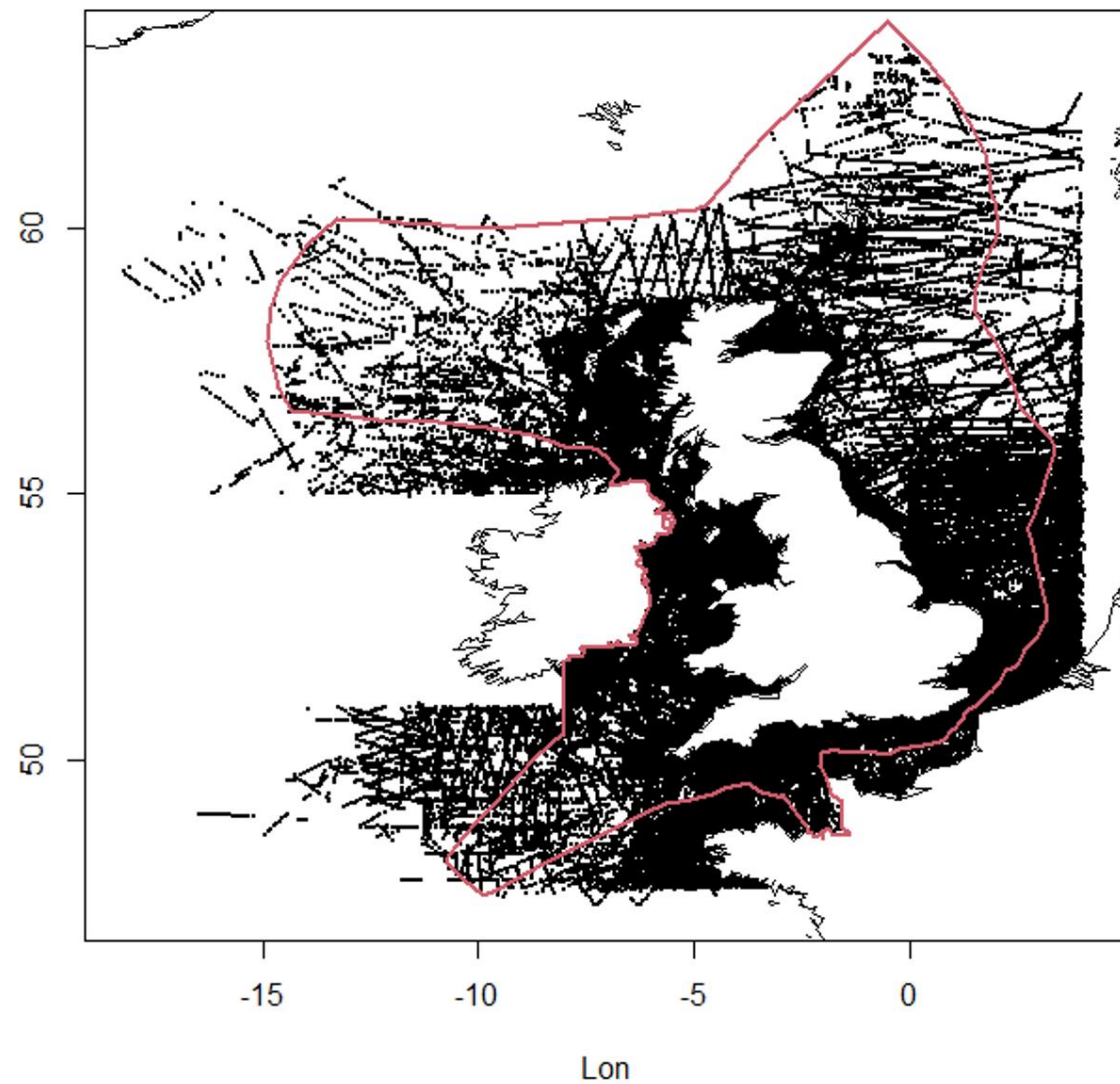


Source:
Paxton et al. (2025)

Survey Area: UK EEZ



Survey Effort: 2004-24

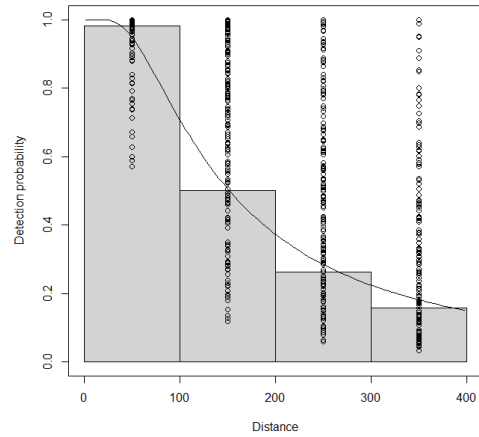


SPATIAL PREDICTORS INITIALLY CONSIDERED IN THE MODELLING

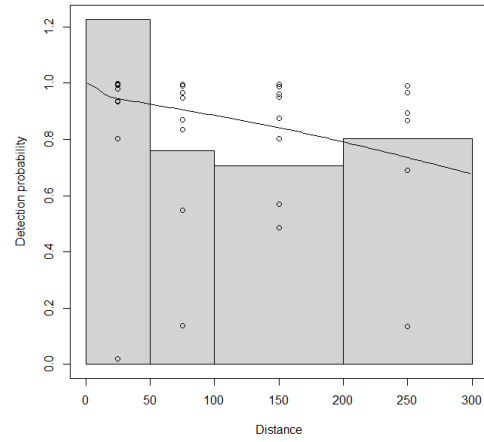
- Position Easting, Northing
- Day of Year Numeric day of year (day)
- Depth ETOPO (metres)
- Current Speed Mean surface current speed indicative of tidal stream environments
- Salinity Calendar month averages of surface salinity indicating freshwater influence
- Euphotic zone depth Calendar month averages of euphotic zone indicative of water column clarity & turbidity
- Mixed layer depth Calendar month averages of mixed layer depth where water is well-mixed
- Mixed layer depth gradient Horizontal gradient identifying tidal fronts (transition between mixed & stratified)
- Mixed layer depth gradient ratio MLD divided by depth indicative of relative strength of stratification
- Productivity Calendar month averages of surface chlorophyll
- Relative Productivity Productivity divided by maximum productivity indicating relative productivity at the time
- Sand % contribution of sand to seabed sediment
- Gravel % contribution of gravel to seabed sediment
- Mud % contribution of mud to seabed sediment
- Seabed Roughness Terrain Ruggedness Index (TRI) applied to depth

DETECTION FUNCTIONS FOR HARBOUR PORPOISE

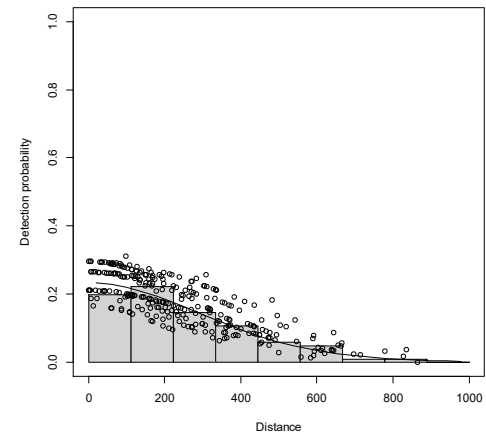
A. Non-binned visual vessel surveys



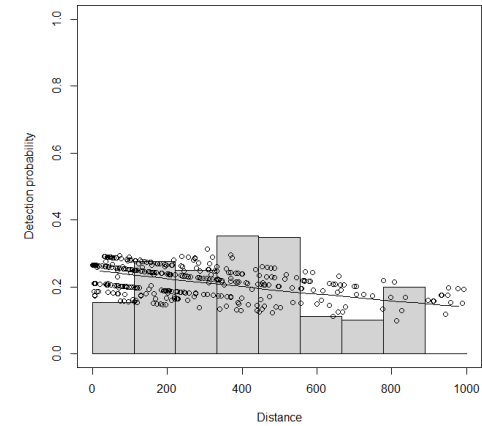
B. Binned visual vessel surveys



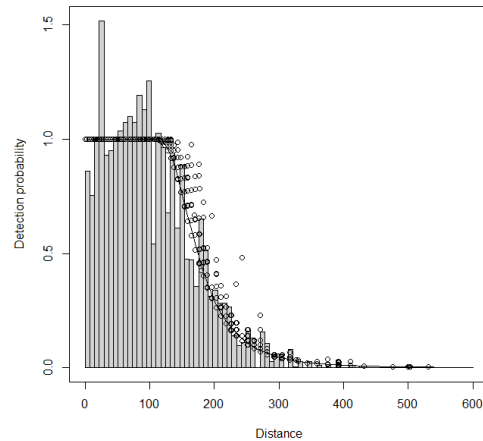
C. Visual vessel surveys
1^o observers in double platform surveys



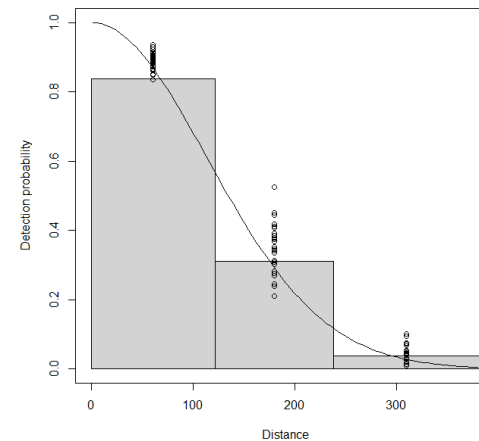
D. Visual vessel surveys
Conditional probability of detection



E. Aerial surveys (un-binned)



F. Aerial surveys (binned)

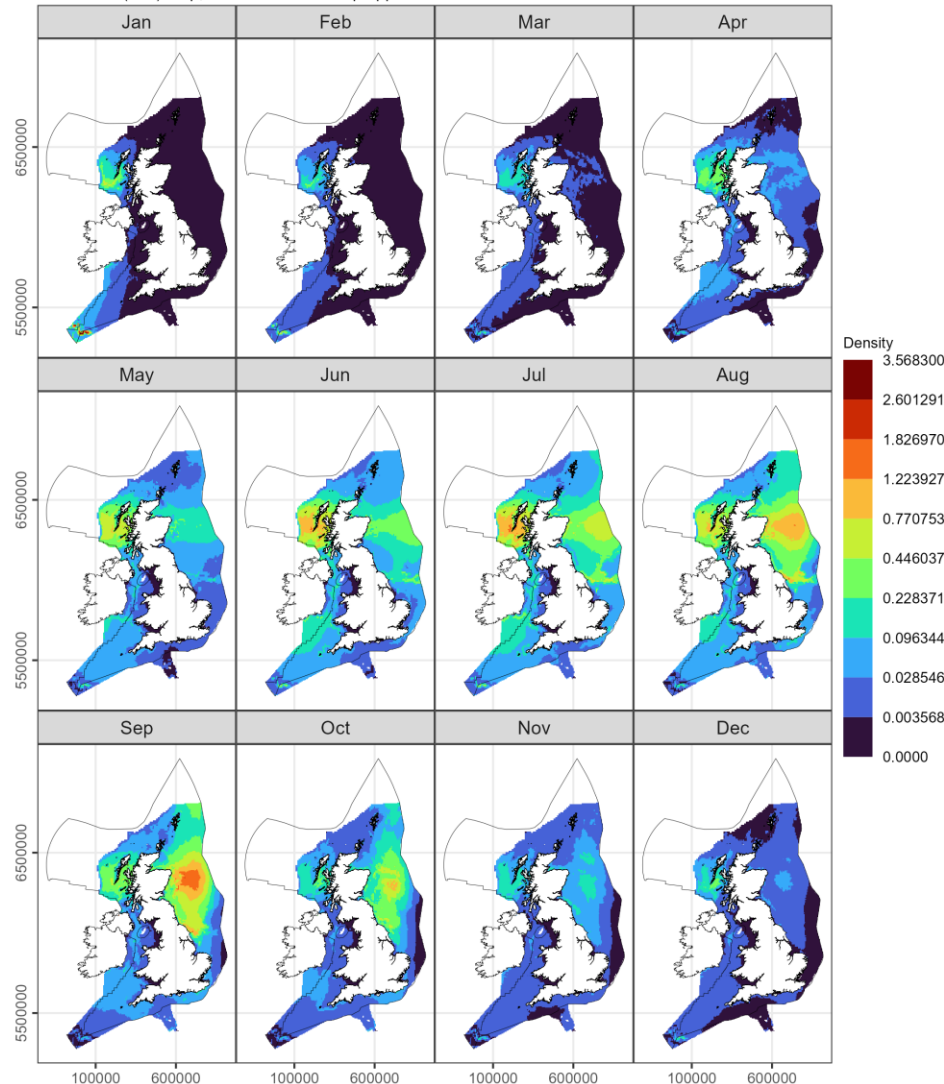


Mean monthly densities:

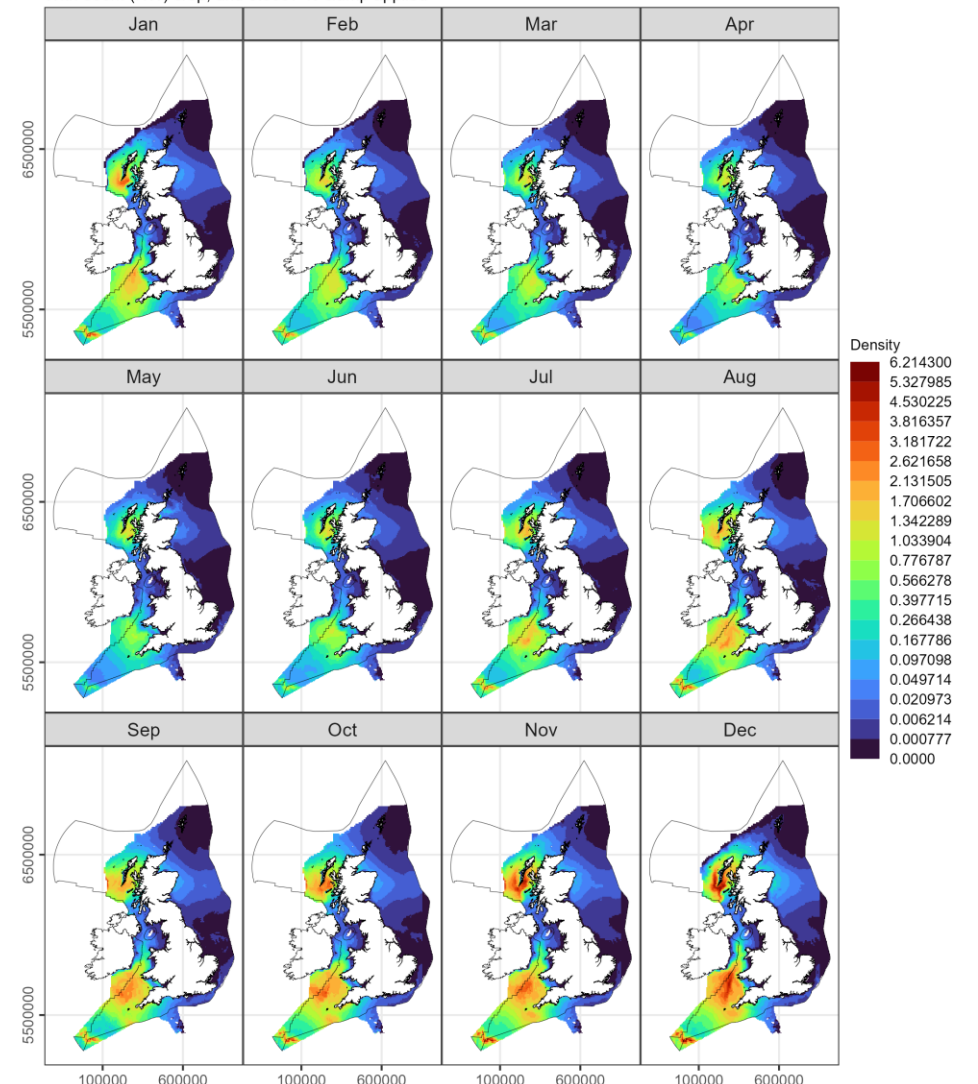


Planning
Offshore Wind
Strategic
Environmental
Impact
Decisions

Minke whale



Common dolphin



Source:

Paxton et al. (2025)

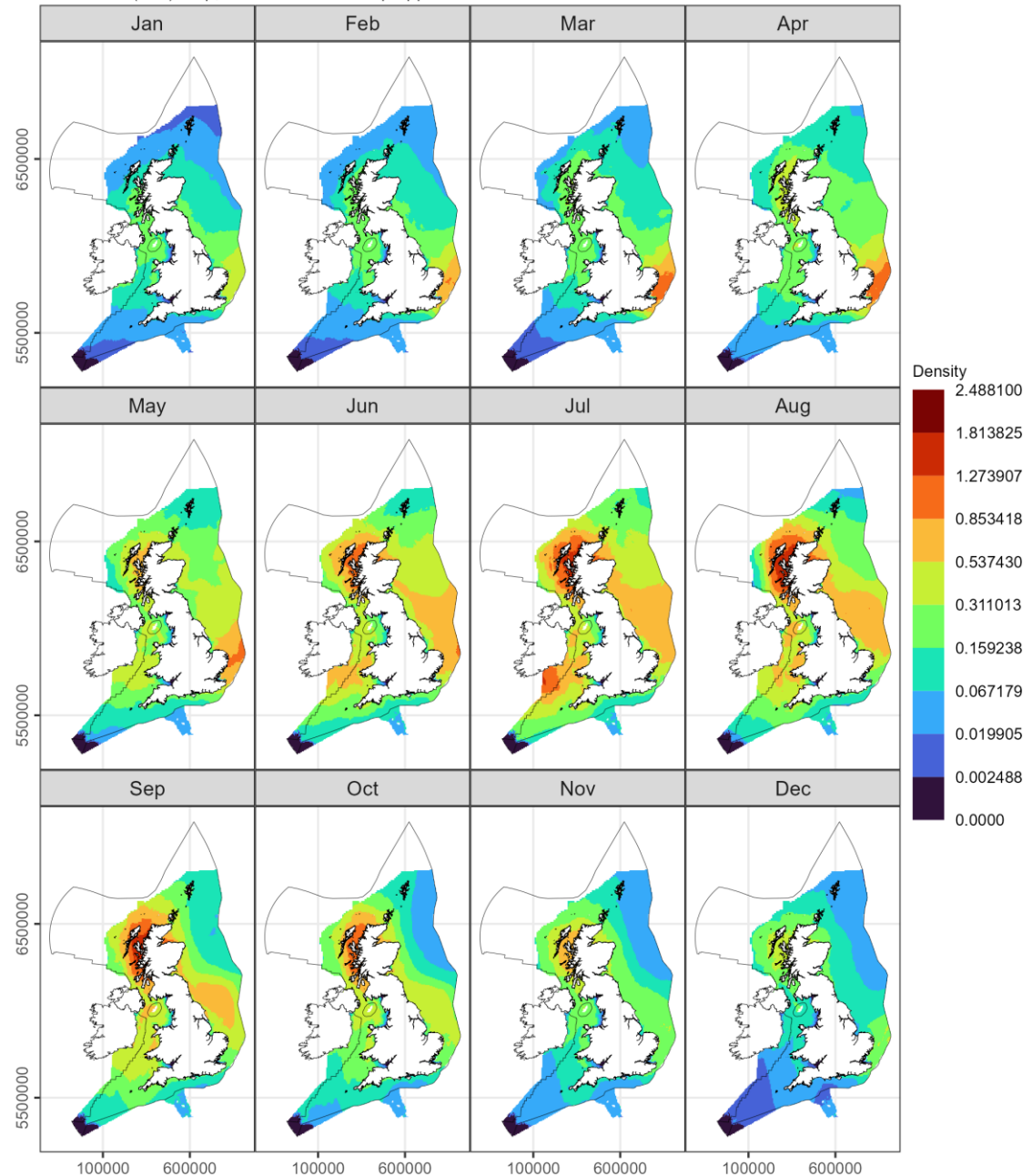
© POSEIDON (Paxton,C, Burt,M.L, Waggitt,J, Evans,P, McNie,F, Banks,A, Harwood,A, Owen,C, et al,2025).
CP2 data from <https://www.data.gov.uk> (OGL). Plots FMc.2025-09-15.
NOT TO BE USED FOR NAVIGATION. CRS = EPSG:32630.

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NOT TO BE USED FOR NAVIGATION. CRS = EPSG:32630.

Harbour Porpoise Monthly Densities: 2004-24



Harbour Porpoise DSM Monthly Medians (2004 - 2024)
With 300m (NW) crop, and 0.9997 % clamp applied



Source: Paxton et al. (2025)

POSEIDON deliverables package

Marine Data Exchange 

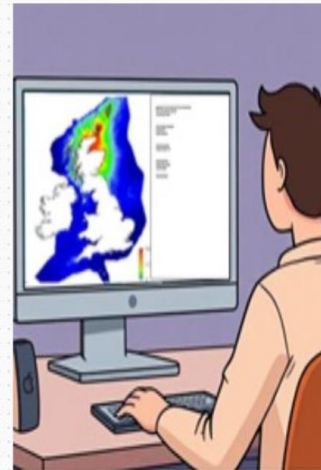
POSEIDON tool

POSEIDON funded survey data

POSEIDON Map layers

- Highly Mobile Species
- Benthic
- Integrated (HMS + Benthic)

Integrated risk map



what is the reason for the risk shown in the area I am interested? **Bird, marine mammal or benthic risk?**

Is this consent risk or wider ecological risk?

what is the confidence / uncertainty? (what gaps might I have to fill with my own surveys?)

POSEIDON user guidance

- Technical Report
- Non-Technical Summary
- Application guidance (*how to use POSEIDON in spatial planning*)
- Tool user guide

Handover to TCE

- Future recommendations
- Owner's Manual