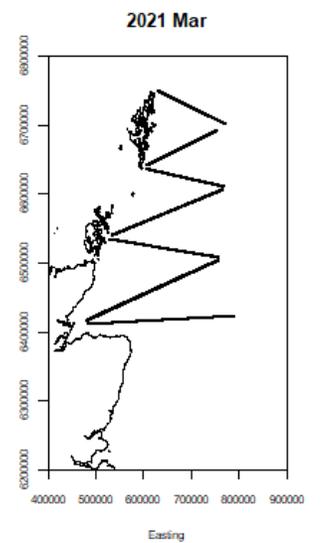
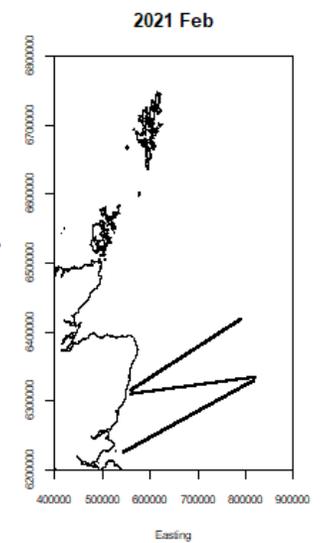
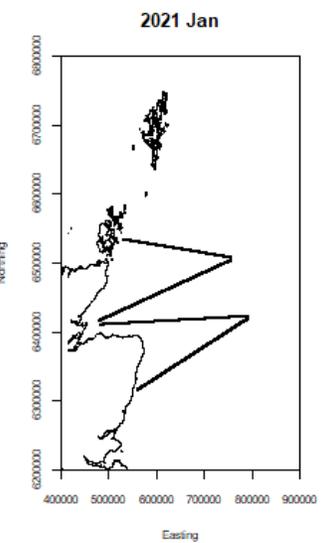
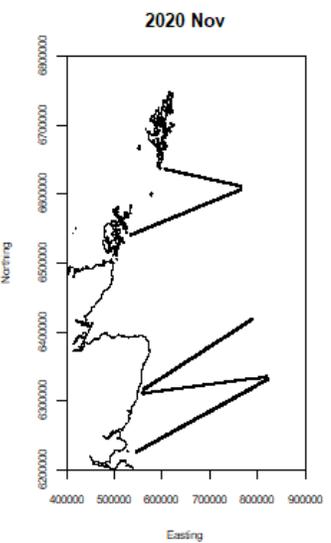
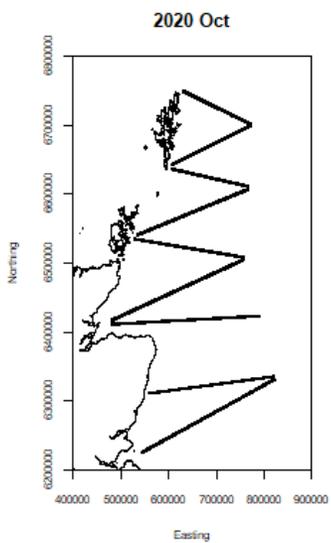
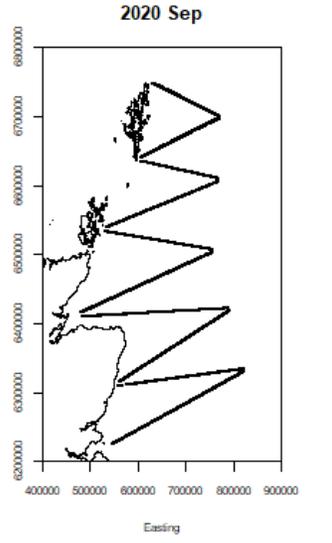
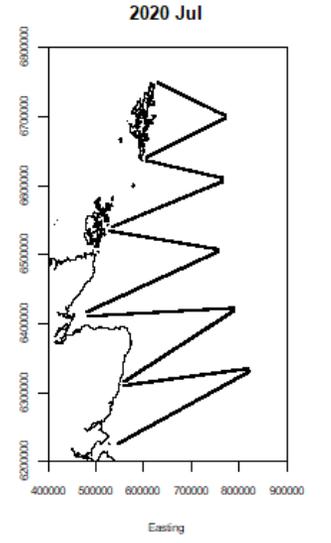
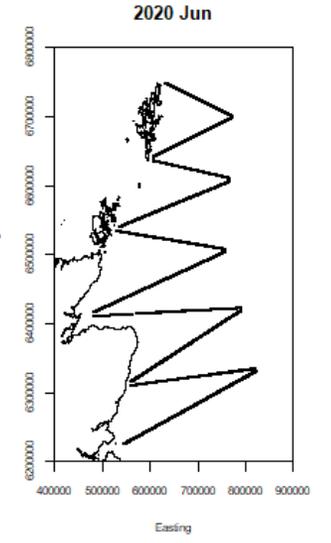
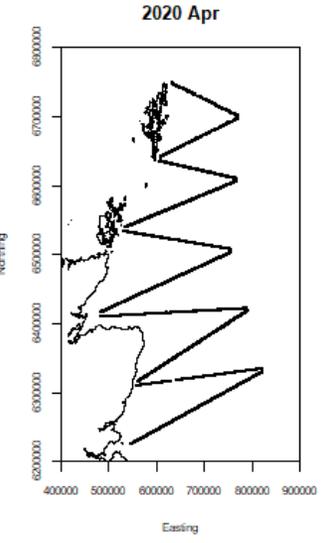
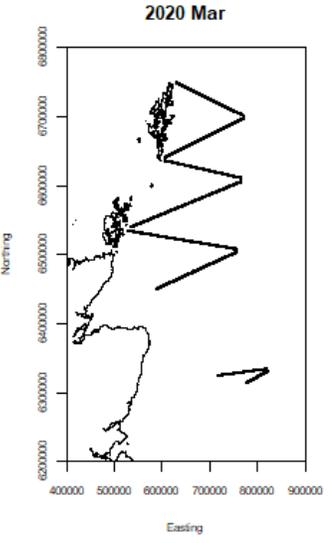
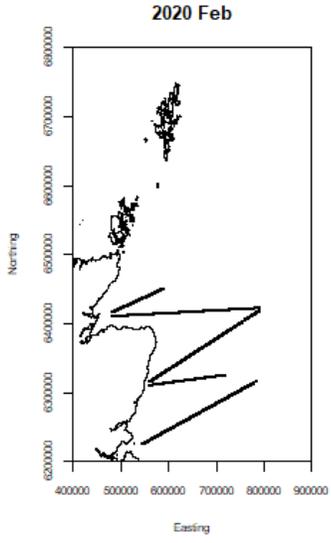


# Harbour Porpoise Populations in Northwestern North Sea

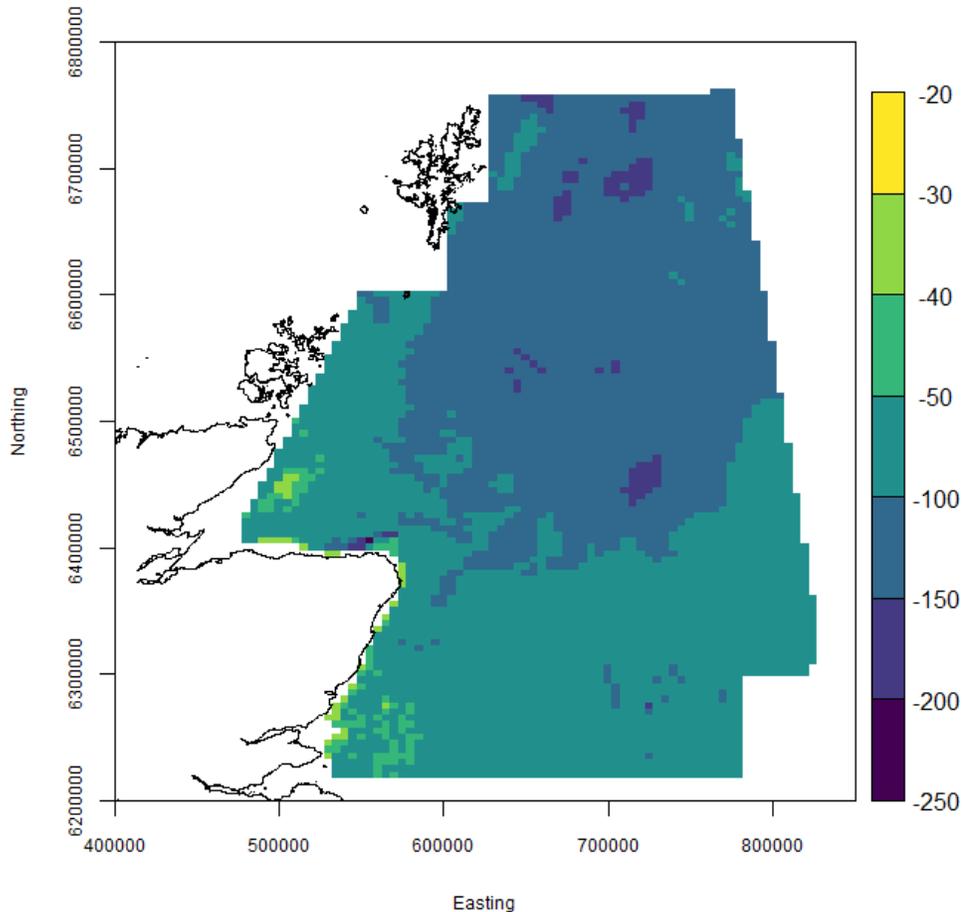
- Eleven digital aerial surveys for marine mammals and birds were undertaken by APEM Ltd offshore (>12 nm) East of Scotland, Feb 2020 – Mar 2021
- APEM's camera system was fitted into a twin-engine P68 Ravenair aircraft. The plane surveyed at a height of 2,000 ft and ground speed of 120 knots
- Data collected c. 2 cm ground sample distance digital still images; transect swathe was 960 m and abutting images were collected continuously; image sea surface area covered was 194 km<sup>2</sup>, representing 1.5% coverage of the wider surface area. Flights were made in sea states <4 on Beaufort scale.

# Transects flown for each surveyed month in Northwestern North Sea



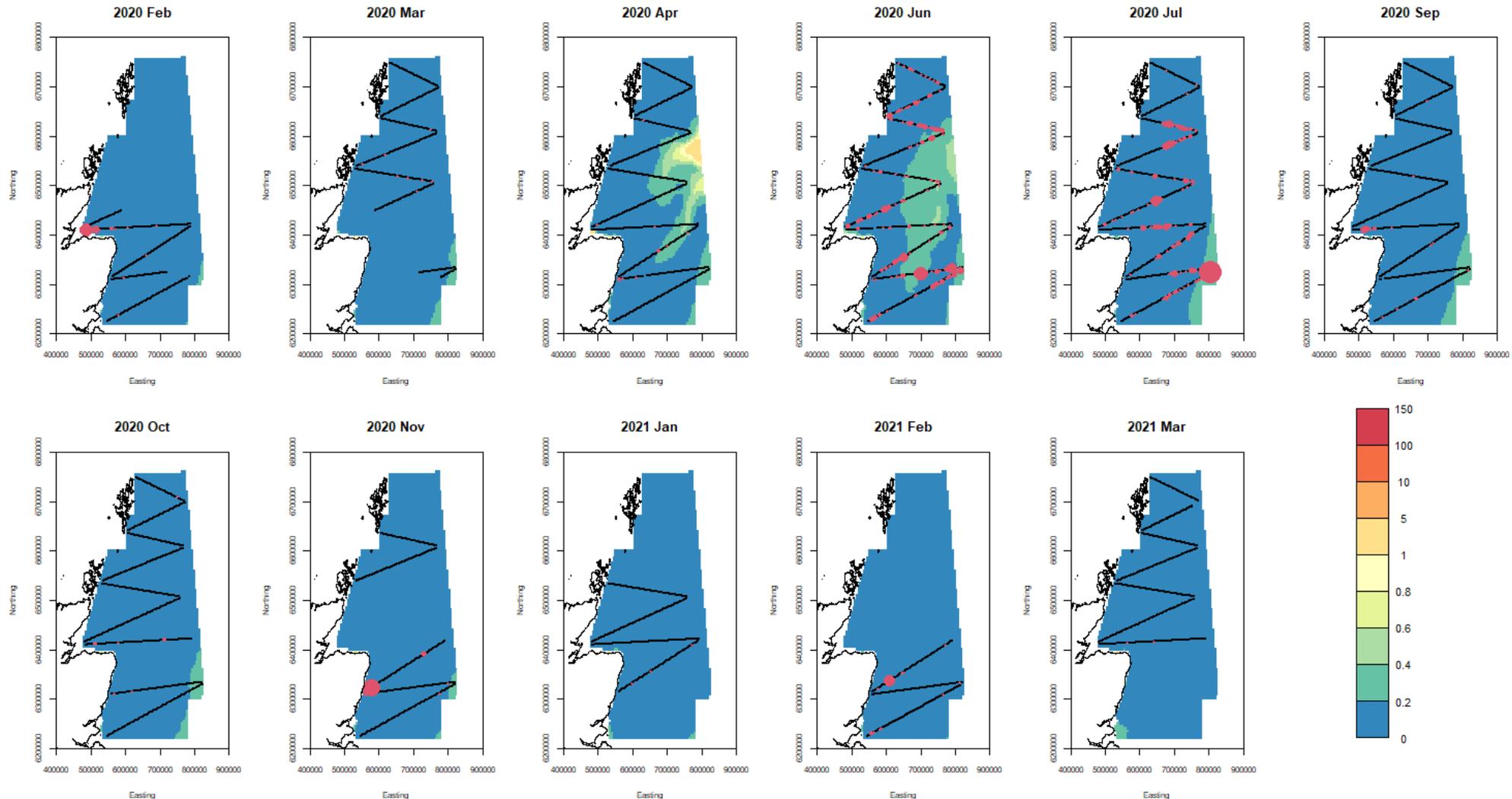
# Environmental Predictors Used in Modelling

Depths in metres across survey region



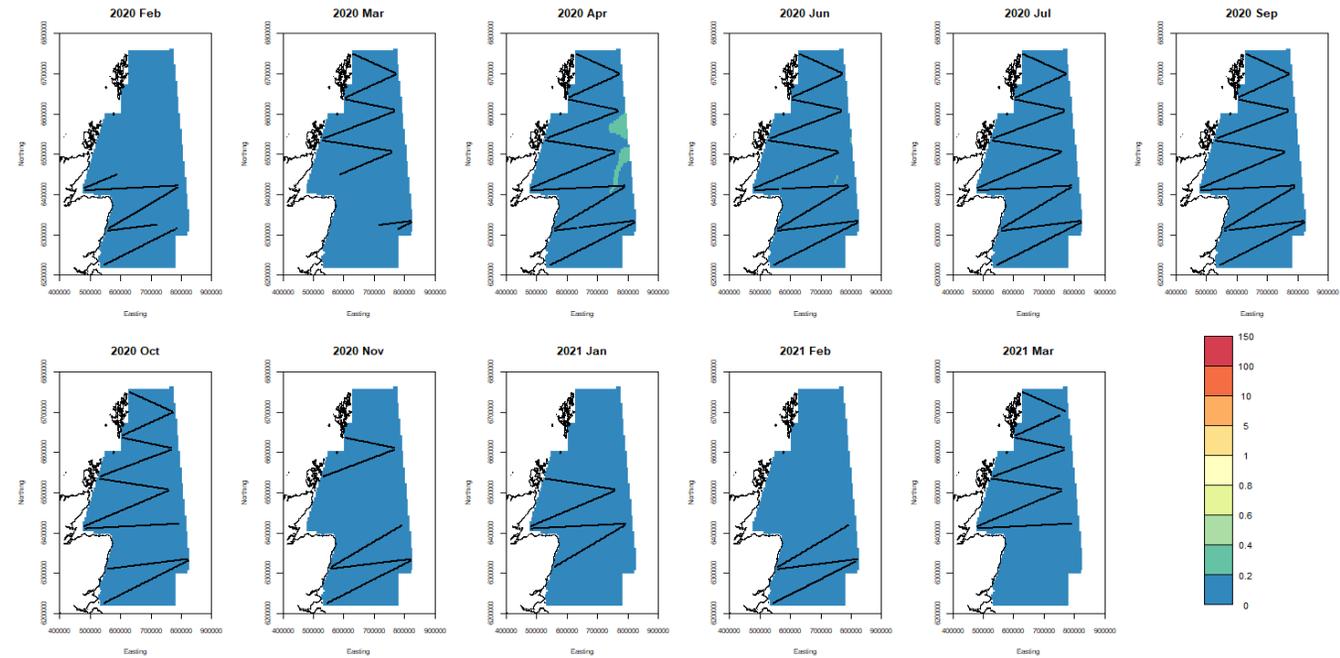
- Position
- Day of Year
- Depth
- Monthly Sea Surface Temperature (SST)
- Seabed Roughness
- Simpson Hudson Stratification Index
- Monthly SST Range
- Monthly Mean Salinity
- Monthly Mean Salinity Range
- Mean Surface Current Speed

# Point estimates of harbour porpoise densities for each surveyed month from February 2020 to March 2021

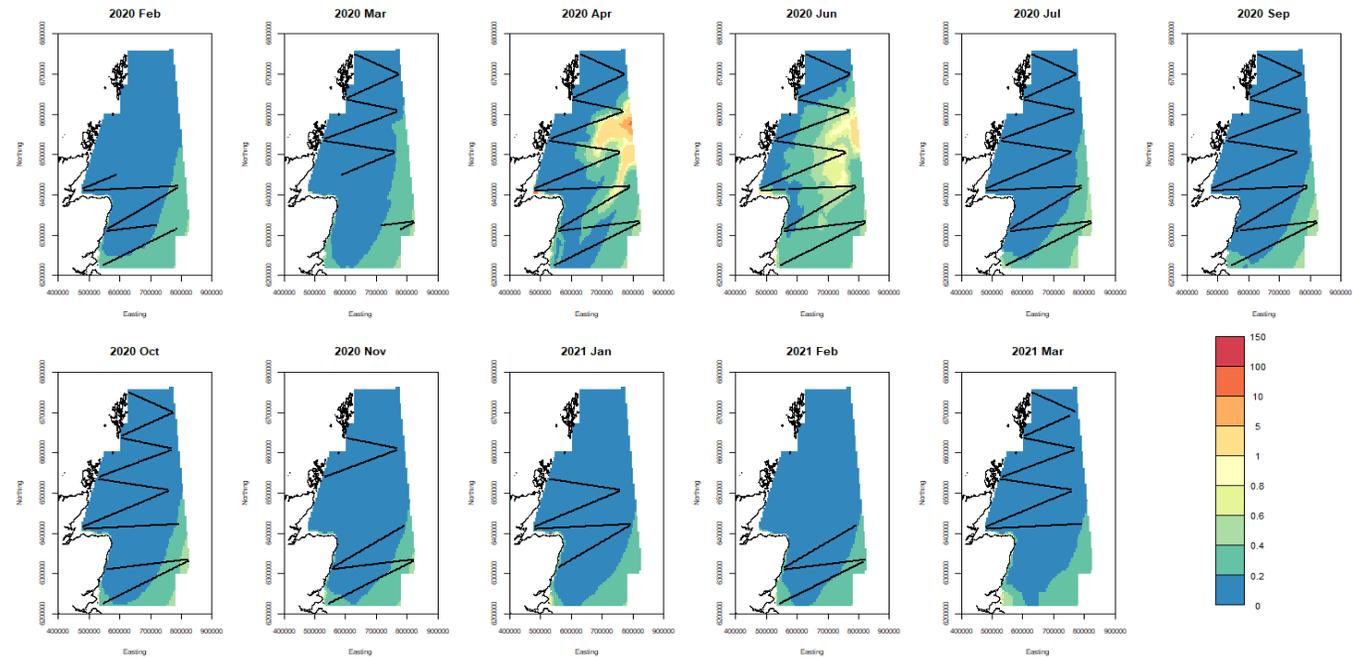


Colours represent estimated densities per km<sup>2</sup>. Black lines indicate sampling locations in that month. Red dots indicate observed numbers of porpoises with size proportional to observed number.

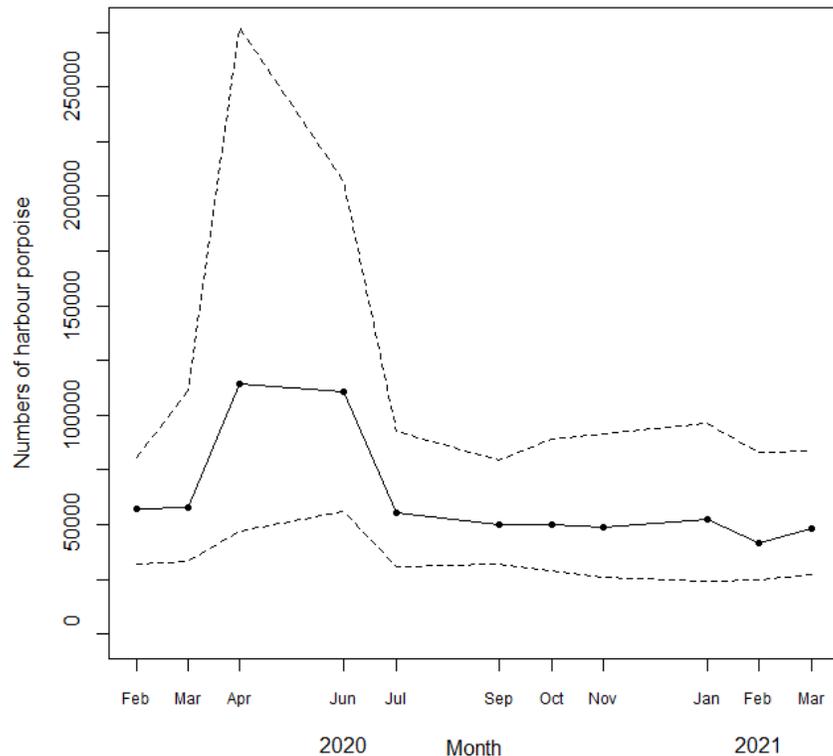
Lower confidence bound estimates (2.5%) of harbour porpoise densities for each surveyed month from February 2020 to March 2021



Upper confidence bound estimates (97.5%) of harbour porpoise densities for each surveyed month from February 2020 to March 2021



# Harbour Porpoise abundance estimates and densities for each surveyed month from February 2020 to March 2021



- The APEM surveys yielded an overall abundance estimate of around 55,000 animals for the survey area through most of the year except April to June when it increased to c. 120,000 animals.
- Point estimates of densities over the region varied from 0 to 5 animals/km<sup>2</sup>, with progressively higher densities occurring in the south of the survey area.
- An instantaneous availability of 0.123 was used.

**Source:** Paxton et al. (2022)