Investigating methods to estimate harbour porpoise (*Phocoena phocoena*) density off West Anglesey

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RATIONALE:

The density of animals estimated using boat-based Distance Sampling techniques in a given area is a typical metric used in environmental impact assessments (EIA) of industrial, including tidal-stream energy developments. In tidal coastal regions, survey conditions can be challenging and are often undergone using small vessels to negotiate shallow waters, strong currents and keep costs down. This often limits observer capability resulting in estimates of relative rather than absolute density, which does not correct for detection probability (g(0)) in the sampling process and is thus generally less accurate. This project undertook two years of boat-based surveys with adaptations both in field and analysis techniques to estimate absolute density of the harbour porpoise (*Phocoena phocoena*) using a small vessel in a high flow environment.

OBJECTIVE:

- Use a combined visual and acoustic approach to estimating absolute density of harbour porpoises off Anglesey.

METHODS:

- Two years of approx. monthly boat-based surveys were conducted from a 11m vessel, using Distance Sampling methodology.
- Primary observers recorded marine mammal sightings in conjunction with a towed hydrophone array which recorded animal vocalisations. Independent observers, also recording marine mammal sightings were present for 44% of surveys.
- Mark Recapture Distance Sampling (MRDS) was used to estimate detection probability on the track line (g(0)), and absolute density of harbour porpoise, using both visual and acoustic approaches.

OUTCOME:

This study has explored adaptions to surveying in high flow coastal areas and using a small vessel, to estimate absolute density and produced the first direct comparison density using visual and acoustic methods.

This work has produced the first absolute estimates of harbour porpoise in region, that are directly used to support EIAs for tidal energy projects.

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