Changing offshore survey methods for seabirds and marine mammals: the need to calibrate

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1. Abstract

Major development of offshore wind power in Europe is being undertaken to meet the commitments to renewable energy targets. In UK, Germany and elsewhere, high resolution digital still aerial surveys are increasingly used over traditional boat-based or aerial visual surveys to determine the abundance and distribution of seabirds & marine mammals in relation to offshore development. Due to Health & Safety concerns, from January 2014 digital surveys will be required for German built windfarms. Digital still aerial surveys have been widely used for 5 years in the UK.

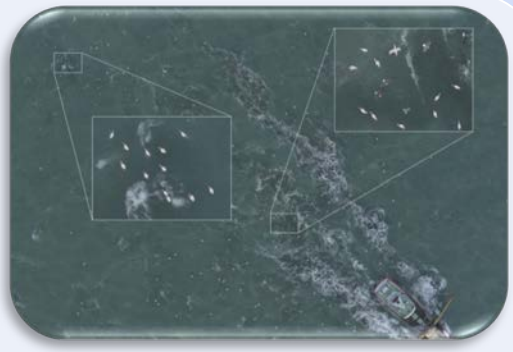
2. Objectives

Before switching to digital aerial surveys, calibration studies are needed to determine whether existing boat-based or aerial visual data can be reliably compared to digital still data and used as a continuous dataset to inform Environmental Impact Assessments (EIAs) or post-construction monitoring.

Fundamental differences between the methods are likely to lead to differences in the resulting datasets, even with surveys undertaken on the same day using identical transects. The implications of these differences are discussed.

3. Benefits of aerial digital surveys

- A consistent methodology for pre- & post-construction monitoring of offshore wind farms, as flights are above potential rotor swept height.
- As large areas are covered quickly short periods of good weather enough for survey.
- Imagery can be checked by many observers to reduce, measure & control for observer effects.
- Imagery stored for later reanalysis to answer new questions.
- Boat-based surveys may record more behavioural data and more diving animals due to their slower speed. However, dive times can be used to correct for diving animals in digital aerial data.



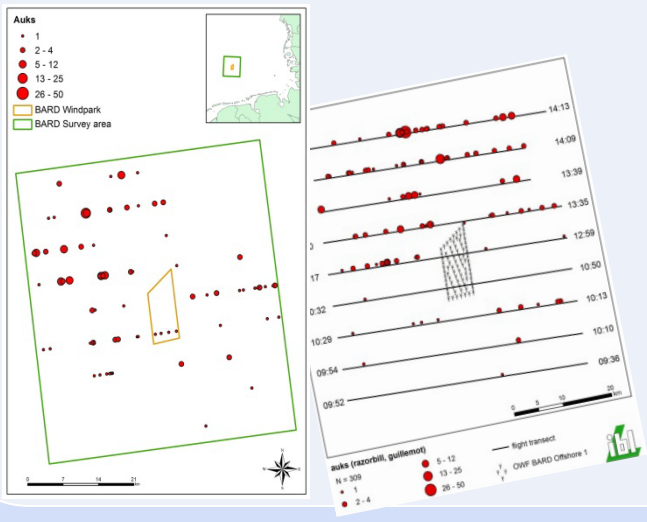
- DISTANCE modelling to control for lower detectability away from observer is not required, as seabirds & marine mammals have an equal chance of detection in all parts of an image
- Disturbance of marine wildlife by survey aircraft is minimal, providing a good method for detecting shy species such as divers & scoters. Bias associated with attraction to and repulsion from the some survey platforms is eliminated.

4. Calibration methods

Two possible calibration methods can be used to compare data collected during concurrent surveys carried out using different methods:

1. Qualitative methods
• Visual comparison of population estimates and associated confidence limits
• Visual comparison of density distribution

2. Quantitative methods
• Require raw count data from concurrent boat / aerial visual & digital aerial surveys
• Raw count data split into equivalent survey areas
• Population estimates generated using the method relevant to each survey
• Statistical comparison of population estimates & confidence limits



Calibration results from BARD offshore windfarm, Germany

An aerial digital survey of the windfarm (figure on left uncorrected for effort) was flown two hours before an aerial visual survey (on right). The surveys recorded similar numbers of guillemots & razorbills & recorded many more birds in the north of the survey area.

5. Conclusions

Ideally the same methodology should be used for both pre- & post-construction monitoring to make it easier to detect any post-construction impacts. However, qualitative and quantitative calibration helps make it possible to change methods.

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