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POSTER ABSTRACT

Different method different results: the importance of survey choice when estimating spatial overlap between deep-diving seabirds and tidal stream turbines

JAMES J. WAGGITT* & BETH E. SCOTT

Institute of Biological and Environmental Sciences, University of Aberdeen, Tillydrone Avenue,
Aberdeen AB24 2TZ, UK

*Email: r01jjw11@abdn.ac.uk

The risk of collisions between deep-diving seabirds such as auks *Alcidae* spp. and cormorants *Phalacrocorax* spp., and the blades of tidal stream turbines is a major concern. Despite this, it remains unknown whether collisions represent real and significant risks to these species. One component of assessing collision risks is identifying spatial overlap between the foraging distributions of vulnerable species and the locations favoured for tidal stream turbine installations. However, the importance of habitats characterized by high tidal currents as foraging locations remains largely unknown. To answer this question, we need to accurately record the distribution of foraging seabirds within these habitats. Here we present and compare the results from two different survey methods that were conducted at the European Marine Energy Centre (EMEC) test site in the Fall of Warness, Orkney, UK. These were (1) land-based surveys that have occurred almost daily for the previous 6 years and (2) ship-based surveys from a recent 2-day research cruise. We show interesting differences in the results of these two studies. Results from the land-based survey suggest that most species foraged primarily within areas characterized by eddies and shallow water at the edge of main tidal currents; these areas are unsuitable for tidal stream turbines. In contrast, the sea-based surveys suggest that most species forage intensively in areas characterized with strong and mostly unidirectional currents in deep water: areas that are more suitable for tidal stream turbines. We suggest that interactions between bathymetric features and strong water currents within areas suitable for tidal stream turbines create rough and uneven water surfaces, and that this reduces seabird detectability from the more distant land-based observation points. Consequently, land-based surveys may underestimate seabirds' use of these areas. This study highlights the importance of method choice for answering key questions. We suggest that land-based surveys conducted on a regular basis may be best suited for understanding seasonal and annual changes in the abundance and species of seabirds within these habitats. However, ship-based surveys may be needed to determine the fine-scale distribution of these species therein.