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POSTER ABSTRACT

A review of the potential use of sonar to observe the underwater behaviour of diving birds near tidal energy devices

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The aim of this feasibility study was to review the functionality of the relevant sonar technology, review examples of its use in the scientific literature and consider the results from current trials. The study includes:

- A review of relevant and available sonar (and underwater video camera and strain gauge) technologies, considering benefits and limitations, availability, cost and methods of attachment.
- A summary of past examples from the scientific literature of the use of sonar to observe the underwater behaviour of diving birds.
- A summary of current trials in the use of sonar for biological monitoring near tidal devices.
- A description of the underwater conditions characterizing high-energy tidal currents, waves, turbidity and air bubbles, and how these variables will affect the use of sonar.
- A review of scientific literature relating to the underwater behaviour of diving bird species occurring around the Pentland Firth and Orkney Islands, with an emphasis on dive depth, dive duration, dive profile and swimming speed, to aid in the potential classification of birds' sonar signatures.

RPS undertook a trial to assess the possible applications and limitations of using boat-mounted Echoscope sonar to track the underwater movements of diving birds. The Echoscope is a sonar device capable of producing real-time three-dimensional images of underwater environments. This trial was undertaken on the Forth Estuary and tracked the underwater movements of two Razorbills *Alca torda*.