

Birds: Wave & Tidal Energy in the Pentland Firth



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Wave & Tidal

- Welcome contribution – in the right place
- Strategic approach to development
- Marine spatial planning
- SEA important first step
- Identification of marine SPAs
- Ensure that deployment compatible & sustainable
- Monitoring & (collaborative) research
- (Wind farm) Sensitivity Index (Garthe & Hüppop 2004)



Priority Bird Species

Breeding seabirds

Species	% Biogeog
Manx Shearwater	> 90 %
Northern Gannet	59 %
<i>European Shag</i>	> 40 %
Great Skua	60 %
L Black-backed Gull	> 65 %
<i>Common Guillemot</i>	> 30 %

Non-breeding waterbirds e.g.

Species	% Europe
<i>Red-throated Diver</i>	> 30 %
<i>Great Northern Diver</i>	> 50 %

Other species of international importance

Priority areas

Mitchell et al. 2004, Birdlife International 2004

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Is there a problem?



- Potential vulnerability
 - Collision risk for diving birds
 - Loss of foraging opportunity
- Cumulative & in-combination impacts
- Effects on individuals v populations
- Proximity to primary locations
- Infrastructure





What are the risk factors?



- Species
- Time of year
- Foraging strategy
- Status
- Weather



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What are the questions?

- Clear objectives
- Repeatable, standardised methods (BACI)
- Which species & when? Abundance, distribution, timing
- Why are they present?
- Diurnal/nocturnal, tidal cycle, weather conditions
- Focal species and seasons
- Targeted studies
- Where do these birds come from?
- What risks? Collision? Displacement? So what?
- Identify best tools for the task





Useful information

COWRIE REPORTS (www.offshorewindfarms.co.uk):

- **Camphuysen et al. 2004.** Aerial & boat survey methods
- **King et al. 2009.** CIA
- **Maclean et al. 2007.** PVA
- **Maclean et al. 2009.** Review of assessment methodologies
- **Thaxter & Burton 2009.** High definition aerial techniques
- **Walls et al. 2009.** Remote techniques
- **Others in prep.**

RSPB Research Report: Langston *in prep.*

Acknowledgements

Thanks to Ian Mitchell & Andy Webb JNCC,
Hannah Arcaro CE, David Fouracre RSPB

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