Marine Management Organisation

Evidence requirement R006:

Bird collision risk and avoidance of renewable energy devices above and below water

1. Requirement overview:

Requirements	Improved understanding of seabird collision risk and avoidance of marine renewables energy devices during flight or whilst diving
Requirement detail	Bird mortality from collisions is a major ecological concern associated with marine renewables. Collisions with wind turbines during flight has been the main focus of interest although the interaction of diving birds with submerged renewables is also of interest. Data on the factors influencing collision risk and bird fatality are sparse with collision risk models are highly sensitive to avoidance rates. To inform collision analyses, the Marine Management Organisation (MMO) seek evidence of avoidance behaviour at different spatial scale eg avoidance of developments, individual structure or of moving parts. When specific evidence is lacking 98% avoidance rates (for flight) are assumed . For diving birds collision with submnerged structures, potential for collision relies on diving depths and patterns. The MMO is interested in evidence relating to all bird species experiencing collision mortality impacts. It particularly seeks evidence to improve on the best available data for underwater collision risks for terns, divers, puffins, gannets, guillemots, razorbill and flight collision risks forkittiwake, gannet and black backed gulls.
MMO use	**Marine Licensing:** Collecting the necessary data is challenging, but required for the decision-making process and development and implementation of effective mitigation. This evidence would feed into better definition of precautionary 'thresholds' currently limiting exploitation of marine area by offshore wind farms thus potentially allowing more activities within an area within safe environmental limits. **Marine Planning:** Improved understanding of collision risks for seabirds from off-shore renewable energy devices will inform the development of marine plans by providing comprehensive understanding of spatially specific issues and supporting the development of more spatially specific plan policies.

External interest	Natural England, Joint Nature Conservation Committee
Delivery target	Ongoing for licensing, Q1 2019 for Marine Planning to inform in the 3rd iteration of marine plans

2. Aims and objectives

Aim:

To improve understanding of seabird collision risk and avoidance of marine renewables energy devices during flight or whilst diving

Objectives:

- to collate, sysnthesise and integrate exisiting collsion risk infomation
- improve understanding of the scale at which avoidance occurs
- define avoidance rates / collision risk during flight or diving for seabirds generally and species of particular interest
- to inform future consenting processes and post-consent mitigation and monitoring requirements

3. Existing evidence

MMO	MMO1034 produced a Geographic Information System tool, SeaMaST (Seabird Mapping and Sensitivity Tool), to provide evidence on the use of sea areas by seabirds and inshore waterbirds in English territorial waters, mapping their relative sensitivity to offshore wind farms.
	MMO1009 provides a summary of the sensitivity of key environmental receptors, including birds, arising from construction and operation of offshore wind farms, particularly in East of England marine plan areas. The report summerises collision risk issues as part of the evidence on cumulative effects but did not provide species specific data.
	MMO1093 produced a database of ornithological impacts of offshore wind for cumulative impact assessment for consenting. This was a collaborative project headed by the Department of Energy & Climate Change Coping Strategy group.
	MMO1031 included a review of all Offshore Wind Farm monitoring conducted up until 2014 including ornithological monitoring. The review focuses on the efficacy of monitoring and proposes collision risk monitoring, but adds no new data.
Academic	After extensive literature review Marques et al (2014) identified factors influencing bird collisions and available mitigation strategies. Collision risk was found to result from complex interactions between multiple factors thus mitigation strategies would be case specific and may involve a combination of

	more than one measure, adapted to the specificities of each site, wind farm and species.

Green et al (2017) critiqued current procedures for collecting empirical data, modelling effects on bird per capita additional mortality rates and translating those effects into projected impacts of offshore wind farms on seabird populationsconclusind that better estimate of effects of wind farms on seabird demographic rates more reliably.

Offshore wind farms have species specific attraction or displacement effects that modify collision risk but also inform on energetic consequences of extended fight, and reduced areas for foraging (Dierschke 2016). |
| Other | British Trust for Ornithology has been progressing this requirement, eg assessing avoidance rates of collision between birds and offshore turbines (Cook et al 2014). The study focussed on northern gannet, black-legged kittiwake, lesser black-backed gull, herring gull and great black-backed gull, whose behaviour and distribution make them particularly prone to collision with offshore turbines

The Strategic Ornithological Support Services group brought together expert stakeholders to identify key ornithological issues that through five projects:

1) identified weaknesses in existing survey methods and displacement studies, and recommended improvements
2) provided a tool and guidance to standardise the way collision risk modelling is used and the way results are presented in Environmental Statements
3) investigated potential methods and survey design requirements to monitor collisions (or avoidance) of birds at existing offshore wind farm sites
4) explored cumulative impact of all existing and consented offshore wind farms on UK gannet populations
5) reviewed available information on over-sea migration routes, timings and the flight heights of migrating seabirds, how these vary eg weather conditions, and how this information should be used in EIA process.It also recommends further work

Offshore Renewables Joint Industry Programme has a programme of research for marine mammal collision with wave and tidal current sectors ongoing. The MMO will explore co-ordinated data collection potential and whether any evidence parallels may be transferable |

4. Current activity

Post consent ornithological monitoring is an expected requirement and licence condition on most renewable energy projects. Following the [MMO1031](#) monitoring review, monitoring has become more bespoke; both the species being monitoring and the method of monitoring.

The MMO is influencing bird tagging studies as studies exploriong new technology to monitor collisions. Results of these studies could be included where available, however, due to the temporal scale of these monitoring plans the full results will not be available for several years.

5. Associated evidence requirements

Ref	Title
R005	Marine Species Migration Pathways
R007	Seasonal bird density and key foraging areas

More information on these evidence requirements is available [here](#)

6. Potential delivery route

The MMO will look to **partner** with organisations of relevance to widen the potential impact of any work undertaken in this area. The MMO will also explore opportunities to **influence the research** of others to gather evidence that can be applied within a marine management context. **Knowledge exchange** is required throughout the duration of this requirement and not limited to when delivery is complete.

See table 1 for timescales.

7. Contact
For more information or to add further research to the existing evidence list please email evidence@marinemanagement.org.uk

Table 1: Delivery timescales 2017 to 2020

Delivery Route	2017				2018				2019				2020			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Knowledge Exchange	■	■	▮	▮	▮	▮	▮	▮	▮	▮	▮	▮	▮	▮	▮	▮
Partnering	■	■	▮	▮	▮	▮	▮	▮	▮	▮	▮	▮	▮	▮	▮	▮
Influencing the research of others	■	■	▮	▮	▮	▮	▮	▮	▮	▮	▮	▮	▮	▮	▮	▮