NatureScot Scotland's Nature Agency
NàdarAlba Buidheann Nàdair na h-Alba

Guidance Note 3: Guidance to support Offshore Wind applications: Marine Birds - Identifying theoretical connectivity with breeding site Special Protection Areas using breeding season foraging ranges

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This document is part of a series of guidance notes available on Advice on marine renewables development - marine ornithology.

This guidance note sets out our advice to identify theoretical connectivity for breeding marine bird foraging ranges and breeding colony Special Protection Areas. Please see Guidance Note 1 - Guidance to support Offshore Wind Applications: Marine Ornithology which provides the context within which this guidance note is provided. Check the log of updates in guidance note 1 to ensure the most current version is being followed. We expect each and every developer to adhere to this guidance, including the recommended parameters to provide consistent and comparable results for all Scottish projects to be assessed as an individual project and cumulatively. This guidance note should be used in conjunction with the Cumulative Effects Framework (CEF).

Please note this guidance was written prior to the development of a NatureScot position on how to account for the ongoing Highly Pathogenic Avian Influenza (HPAI) mortality event within an impact assessment. We are currently developing this advice and we will provide updates and guidance as they become available. In the interim please contact marineenergy@nature.scot should you have any specific queries.

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1. Introduction

A key initial stage of a Habitats Regulations Appraisal (HRA) for a proposed offshore wind project is screening for Likely Significant Effect (LSE), which requires identifying potential connectivity between the marine bird qualifying features of Special Protection Areas (SPAs) and the project site. The SPA qualifying features are protected both within the SPA boundary and outwith it, which is why the connectivity to the SPA is so important. It is different for Sites of Special Scientific Interest (SSSI) notified features and or nature conservation Marine Protected Area interests. .

During the breeding season, seabirds and other breeding marine bird species, such as red-throated divers, are known as central-place foragers as they are fixed to a single geographical breeding location (the nest site) with a foraging range extending out to sea. The use of breeding season foraging ranges provides a suitable method for assessing geographical overlap, and thus theoretical connectivity, between SPA breeding sites and proposed offshore wind development sites. If connectivity is established, an HRA will, generally, need to be undertaken to ascertain whether there is Likely Significant Effect (LSE) and, if so, the potential for adverse effects on site integrity (AEOSI) of the SPA(s) concerned. Typically, this will require consideration of site characterisation survey results, information on impact pathways, and the sensitivity of the species to potential impacts. Further information on feature sensitivity, can be found at Marine Scotland's Feature Activity Sensitivity Tool (FeAST) . Please note the marine bird assessments are awaiting publication.

The qualifying features of an SPA are protected both within and outwith the SPA throughout the year, irrespective of the season for which they qualified as feature. As such, any HRA will require assessment of SPA populations both during the breeding and non-breeding season. During the non-breeding season, marine bird species are migratory or disperse away from the colony, tending to range more widely and are not fixed to a single geographical area.

This guidance provides details of a GIS based analysis of breeding seabird foraging ranges to assess connectivity of SPAs with breeding seabird qualifying features with proposed offshore wind sites in Scottish waters. It produces an initial long list of SPA qualifying seabird features which may be refined as the project progresses. Information on marine birds at the proposed development site (see guidance note 2 - Advice for Marine Ornithology Baseline Characterisation Surveys and Reporting) is also required to inform the HRA process. The method described here may also be used to assess connectivity to other protected seabird colonies for assessment under the Environmental Impact Assessment (EIA).

Please note that Guidance note 4 - Ornithology - Determining Connectivity of Marine Birds with Marine Special Protection Areas and Breeding Seabirds from Colony SPAs in the Non-Breeding Season addresses how connectivity in the non-breeding season should be assessed and how connectivity to marine Special Protection Areas is identified.

2. Advice

NatureScot advise that Woodward *et al*. (2019) is used as the evidence base for determining connectivity to a proposed offshore wind development. The Crown Estate Enabling Actions commissioned a review of seabird foraging ranges led by the BTO (Woodward *et al.* 2019). This review updates the Thaxter *et al*. 2012 review, which was widely used to define theoretical connectivity between colonies and development areas in previous marine renewable impact assessments. As stated in the Woodward *et al*. (2019) report, since the Thaxter *et al*. (2012) review was published, there has been a significant growth in seabird tracking studies with technological improvements making it possible to track a wider range of species. This resulting increase in the volume of data available – both in terms of the number of individual birds and the number of colonies from which tracking data originate – enables more robust and representative assessments of species' foraging ranges.

Woodward, I., Thaxter, C.B., Owen, E., Cook, A.S.C.P. 2019. Desk-based revision of seabird foraging ranges used for HRA screening. BTO Research Report 724.

Thaxter, C.B., Lascelles, B., Sugar, K., Cook, A.S.C.P., Roos, S., Bolon, M., Langston, R.H.W. & Burton, N.H.K. 2012. Seabird foraging ranges as a preliminary tool for identifying candidate Marine Protected Areas. Biological Conservation 156: 53-61.

Metrics have been compiled for great black-backed gull, which were not included in the original 25 species of Thaxter *et al*. (2012). As with Thaxter *et al*. (2012), in Woodward *et al*. (2019) the metrics include mean (the mean foraging range reported for each colony, averaged across all colonies), mean of maximums (mean max) (the maximum range reported for each colony, averaged across all colonies) and maximum (max max) (the maximum foraging range from all studies reviewed) metrics as 'generic' values for the species, as well as colony specific values where sufficient data exist. Note that the foraging ranges reported are limited to breeding season and predominantly the chick-rearing period only.

3. Consideration of Metrics

We have reviewed the Woodward *et al*. (2019) report including the site-specific foraging ranges, calculating the coefficient of variation around the mean max to consider the variation round the value. We also undertook a calculation which has determined that the use of mean max + 1 standard deviation (SD) encompasses all core foraging ranges for all designated sites (for the purposes of HRA and EIA) and species (i.e. the site-specific mean foraging ranges).

The mean max +1SD also encompasses almost all site-specific maximum values, with the exception of single SPAs for northern fulmar, Manx shearwater, black-legged kittiwake, common tern, Arctic tern, common guillemot and razorbill and three SPAs for northern gannet.

Woodward *et al*. (2019) identify that there are concerns that the maximum values may not reflect the conditions typically faced by birds at a given breeding colony, e.g. if local food supplies are depleted or if the colony includes failed breeders. They recommend, when determining whether to incorporate such data into assessments, that it is important to consider how regularly species at an SPA may experience depleted local food conditions, and whether other SPAs may be experiencing similar conditions. We have therefore considered two exceptions where site specific data presents a more robust evidence base:

1. Tracking on Fair Isle showed foraging distances are greater than those of all other colonies, for both common guillemot and razorbill. This may relate to poor prey availability during the study. However, trends for seabirds in the Northern Isles indicate this may be becoming a more frequent occurrence. We therefore recommend for common guillemot and razorbill:

- Use of mean max+1SD, including data from Fair Isle for all Northern Isles designated sites, as presented in Woodward et al. 2019.
- For all designated sites south of the Pentland Firth (i.e. excluding the Northern Isles, use of mean max+1SD discounting Fair Isle values, as presented in Woodward et al. 2019.

2. In the case of gannet, where three separate sites have exceeded the mean max, we advise a more bespoke screening approach – see below in section 4.

3. For the other 24 species there is no current change to using the mean max +1SD, noting that we will continue to review foraging range studies and any relevant tracking studies and update this guidance as and when evidence becomes available.

4. Recommended foraging ranges used to assess theoretical connectivity

We advise mean max + 1SD should be used to screen in connectivity to SPAs with the following exceptions:

1. **For gannet** we recommend using mean max +1SD for all colonies without site specific maximum values. However, for the SPA colonies where site specific evidence exceeds this value (509.4km), namely:

- Forth Islands (Bass Rock),
- Grassholm and
- St Kilda

then the site specific maximum should also be used

2. For species with insufficient data to calculate mean max +1SD then the closest metric is to be used in the following order of preference:

- Mean Max (MM),
- Max,
- Mean.

5. Recommended Foraging Ranges

Table 1. Recommended foraging ranges derived from Woodward et al. 2019 and which metrics are advised for use in determining connectivity.

Species	Recommended Foraging Range (km)	Metric	Confidence
Common eider	21.5	MM	Poor
Red-throated diver	9	Max/MM	Low
European storm petrel	336	Max/MM	Poor
Leach's storm petrel	657	Mean	Moderate
Northern fulmar	1200.2	MM+SD	Good
Manx shearwater	2365.5	MM+SD	Moderate
Northern gannet	509.4	MM+SD	Highest
European shag	23.7	MM+SD	Highest
Cormorant	33.9	MM+SD	Moderate
Black-legged kittiwake	300.6	MM+SD	Good
Black-headed gull	18.5	Max/MM	Uncertain
Mediterranean gull	20	Max/MM	Uncertain
Common gull	50	Max/MM	Poor
Great black-backed gull	73	Max/MM	Low
Herring gull	85.6	MM+SD	Good
Lesser black-backed gull	236	MM+SD	Highest
Sandwich tern	57.5	MM+SD	Moderate
Little tern	5	Max/MM	Moderate
Roseate tern	23.2	MM+SD	Moderate
Common tern	26.9	MM+SD	Good

Species	Recommended Foraging Range (km)	Metric	Confidence
Arctic tern	40.5	MM+SD	Good
Great skua	931.2	MM+SD	Uncertain
Arctic skua	2.7	Mean+SD	Poor
Common guillemot excluding data from Fair Isle	95.2	MM+SD	Highest
Razorbill1	122.2	MM+SD	Good
Black guillemot	9.1	MM+SD	Moderate
Atlantic Puffin	265.4	MM+SD	Good

6. Exceptions to recommended foraging ranges

Species	Exception Applied	Recommended Foraging Range (km)	Metric
Northern gannet	Forth Islands SPA	590	Max
	Grassholm SPA	516.7	Max
	St Kilda SPA	709	Max
Common guillemot	All Northern Isle SPAs	153.7	MM+SD
Razorbill	All Northern Isle SPAs	164.6	MM+SD

Should any further exceptions result from continued tracking work and analysis, this advice note will be updated accordingly.

7. Likely Significant Effect (LSE) Screening

Our GIS screening tool can be used to produce an initial long list of SPA qualifying seabird features with foraging ranges that spatially overlap with a particular offshore wind project site. We recommend inclusion of the pdf output from the tool as part of the HRA screening, including details of the version used. If any outputs are amended or altered this needs to be highlighted and NatureScot and Marine Scotland notified. Please note that guidance note 4 provides advice on assessing connectivity with marine SPAs (as distinct from seabird colony SPAs).

Once the initial list of SPA qualifying features with theoretical connectivity is produced, it can be refined further - firstly by considering at-sea distances and then by assessing the potential for LSE as baseline studies are undertaken and site specific project data are collected. Species impact pathways, and sensitivity to an impact will also inform decisions on LSE. Agreement on the refinement of the long list should be discussed as part of scoping workshop and HRA screening process with NatureScot

Contact

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