

# **BERWICK BANK WIND FARM OFFSHORE ENVIRONMENTAL IMPACT ASSESSMENT**

## **APPENDIX 11.6, ANNEX E: SUMMARY OF APPROACH AND COLLATION OF IN- COMBINATION TOTALS**

**Document Status**

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## 1. SPECIES AND EFFECTS COVERED

1. In-combination totals have been collated for the SPA seabird colony populations relevant to the Proposed Development. These are for the populations of the following species in relation to the following effects:
  - Gannet – collisions and displacement/barrier effects
  - Kittiwake – collisions and displacement/barrier effects
  - Herring gull – collisions
  - Guillemot - displacement/barrier effects
  - Razorbill - displacement/barrier effects
  - Puffin - displacement/barrier effects
2. In addition, lesser black-backed gull has been considered in relation to potential collision effects. The SPA populations screened in for lesser black-backed gull are Forth Islands, Farne Islands and Coquet Island and potential effects of the Proposed Development are limited to the breeding season. No existing/consented/in-planning projects are considered to have effects on the Farne Islands and Coquet Island SPA populations during the breeding season. For the Forth Islands SPA population, there is potential for breeding season effects from the consented Forth & Tay projects (i.e. the Seagreen, Neart na Gaoithe and Inch Cape offshore wind farms). However, no estimates of effects are available from the assessments of the 2017 revised designs of these projects because the respective scoping opinion excluded consideration of the species. The most relevant information pertaining to effects on the Forth Islands SPA lesser black-backed gull population derives from the 2014 Marine Scotland Appropriate Assessment for the Forth & Tay projects. This states that a predicted effect of <0.1% decline in adult survival was identified on this SPA population as a result of the Neart na Gaoithe offshore wind farm and concludes no adverse effect on integrity. Therefore, it is assumed that existing in-combination effects are inconsequential on this species.
3. For all other species, in-combination totals have been collated for all relevant SPA populations for all UK North Sea and Channel offshore wind farms in operation, construction, consented or planning<sup>1</sup>. For populations from the Forth Islands, Fowlsheugh, St. Abb's Head to Fast Castle and Buchan Ness to Collieston Coast SPAs, separate in-combination totals are also provided for the Forth and Tay projects. For gannet and kittiwake, in-combination totals are collated separately for collisions only and collisions plus displacement/barrier effects. However, in all cases, only total mortality (collision and displacement) has been modelled.

### 1.2. SOURCES AND COLLATION OF COLLISION NUMBERS

4. Collision numbers have been collated for both breeding and passage / non-breeding periods, using the following sources:
  - Breeding season:
    - Collision estimates for each SPA are generally taken directly from the relevant submission documents or Appropriate Assessments (AAs) but for some older projects (e.g., the Aberdeen, Moray East and Kincardine wind farms) they may be derived from secondary sources (e.g., the HRA for the revised Inch Cape design, the Moray West HRA/Addendum or the in-combination totals in the recent East Anglia ONE North / TWO submissions). For the Flamborough and Filey Coast SPA, breeding season collision estimates are derived from the East Anglia ONE North / TWO submissions (specifically at Deadline 11 – [ExA.AS-3.D11.V1 EA2 & EA1N Deadline 11 Offshore Ornithology Cumulative and In Combination Collision Risk Update \(planninginspectorate.gov.uk\)](#)).

- Non-breeding periods:
  - For the gannet and kittiwake passage periods, the collision estimates for other wind farms as presented at Deadline 11 for the East Anglia ONE North / TWO submissions (reference as above) provide the primary source of data, with these estimates being amended for individual projects where the information was not considered to be the most up-to-date or accurate (e.g., for the Forth & Tay revised designs and Moray West wind farm). These collision numbers are provided according to both consented and 'as-built' designs, with 'corrections' for the latter as determined in MacArthur Green (2017). Where possible estimates for passage periods are extracted according to the seasonal periods as advised by NatureScot (e.g., for the Forth & Tay projects, Moray West and Moray East) but for many projects they are available only for the Furness (2015) defined seasonal periods (based on either full or migration-free breeding seasons). In these cases, estimates are adjusted according to the length of the relevant passage period as defined by NatureScot relative to that defined by Furness (2015), following the approach used in the HRA for the revised Inch Cape design. Passage collisions are then apportioned to SPA populations according to the BDMPS calculations, as outlined in Furness (2015) and (for gannet) the East Anglia THREE submissions.
  - For herring gull, the approach and data sources were as for the breeding period, given the Scoping Opinion advised that during the non-breeding period SPA breeding populations should be assumed to remain within the 'region' of the breeding colony (as defined by the mean maximum plus 1 SD breeding season foraging range – Woodward *et al.* 2019).
  - For lesser black-backed gull, no in-combination estimates were derived due to absence of collision effects being identified by assessments for relevant projects.

### 1.3. SOURCES AND COLLATION OF DISPLACEMENT / BARRIER EFFECT MORTALITY

5. Mortality estimates from displacement / barrier effects (subsequently termed displacement mortality) have been collated for both breeding and passage / non-breeding periods, with the in-combination displacement mortalities adjusted so that they are presented for the range of displacement and mortality rate scenarios encompassed by the Scoping and Developer Approaches used in the assessment for the Proposed Development. The approaches and sources used are outlined below:
  - Breeding season:
    - For kittiwake, guillemot, razorbill and puffin estimates for each SPA are generally taken directly from the relevant submission documents or AAs, as described above for collisions. As with collision estimates, for some older projects (e.g., Moray East, Beatrice, Kincardine) they are derived from secondary sources (e.g., the Moray West HRA/Addendum).
    - For gannet, Scottish projects have not previously been required to estimate displacement mortality. Therefore, for the breeding season estimates, the mean peak breeding season population sizes for the wind farm areas plus 2km buffers were extracted for each of the Inch Cape, Seagreen and Neart na Gaoithe wind farms and breeding season displacement mortality then calculated for these projects. The most recent HRAs / AAs for the Moray Firth projects conclude no connectivity with SPA gannet populations (so that no displacement mortality estimates are produced for these projects), whilst displacement mortality of gannet in the breeding season is not considered for several smaller Scottish projects (e.g. the Aberdeen, Hywind and Kincardine wind farms). For the Flamborough and Filey Coast SPA, displacement mortality is estimated on the basis of the in-combination totals presented at Deadline 11 for the East Anglia ONE North / TWO submissions (reference as above).

<sup>1</sup> For projects in planning, this is limited to those which had quantitative estimates of effects publicly available at the time of the data collation (April 2022).

- Non-breeding periods:
  - For razorbill and gannet, the numbers from which displacement mortality is estimated were derived from the in-combination totals presented at Deadline 11 in the East Anglia ONE North / TWO submissions (reference as above). The effects are apportioned to relevant SPA populations as outlined in Furness (2015) and (for gannet) the East Anglia THREE submissions.
  - For guillemot, the approach and data sources were as for the breeding period, given the Scoping Opinion advised that during the non-breeding period SPA breeding populations should be assumed to remain within the 'region' of the breeding colony (as defined by the mean maximum plus 1 SD breeding season foraging range – Woodward *et al.* 2019).
  - For kittiwake, no existing collation of numbers from the UK North Sea wind farms was available because non-breeding season displacement has not previously been identified as a concern for this species (for Scottish or English projects). As agreed at RoadMap meeting 6, consideration was therefore limited to those projects within the main development zones in the UK North Sea. Seasonal abundance estimates were collated for these projects and displacement mortality estimated from these abundance estimates for each of the autumn and spring passage periods (but noting that it was not possible to derive the mean peak seasonal abundance (as based on at least two years of baseline data) from all projects, so that alternative measures of seasonal abundance were sometimes used).
  - For lesser black-backed gull, totals were derived from information provided at Deadline 11 in the East Anglia ONE North / TWO submissions (reference as above).

