

MONA OFFSHORE WIND PROJECT

Environmental Statement

Volume 6, Annex 5.5: Offshore ornithology apportioning technical report

F02 Clean

NRW MLT Application Reference: ORML2429T

Document Reference: F6.5.5 F02

Document Number: MOCNS-J3303-RPS-10077

13 November 2024

F02



Image of an offshore wind farm

MONA OFFSHORE WIND PROJECT

| Document status | | | | | |
|-----------------|--------------------------|-----------------------------|------------------------|------------------------|-------------|
| Version | Purpose of document | Authored by | Reviewed by | Approved by | Review date |
| F01 | Application | RPS | Mona Offshore Wind Ltd | Mona Offshore Wind Ltd | Feb 2024 |
| F02 | Examination - Deadline 2 | RPS | Mona Offshore Wind Ltd | Mona Offshore Wind Ltd | Aug 2024 |
| Prepared by: | | Prepared for: | | | |
| RPS | | Mona Offshore Wind Limited. | | | |

MONA OFFSHORE WIND PROJECT

Contents

| | | |
|----------|---|----------|
| 1 | OFFSHORE ORNITHOLOGY APPORTIONING TECHNICAL REPORT | 1 |
| 1.1 | Introduction | 1 |
| 1.1.1 | Background | 1 |
| 1.1.2 | Aim of report..... | 1 |
| 1.1.3 | Colonies considered | 1 |
| 1.2 | Consultation | 3 |
| 1.2.2 | Evidence Plan process | 3 |
| 1.3 | Methodology | 8 |
| 1.3.1 | Screening species for assessment | 8 |
| 1.3.2 | Seasonality and regional populations | 9 |
| 1.3.3 | Age composition | 9 |
| 1.3.4 | Apportioning of impacts during the breeding period | 11 |
| 1.3.5 | Apportioning of impacts during the non-breeding period | 12 |
| 1.4 | Results | 13 |
| 1.4.1 | Common guillemot | 14 |
| 1.4.2 | Razorbill | 22 |
| 1.4.3 | Northern gannet | 35 |
| 1.4.4 | Black-legged kittiwake..... | 43 |
| 1.4.5 | Herring gull | 63 |
| 1.4.6 | Lesser black-backed gull..... | 71 |
| 1.4.7 | Great black-backed gull..... | 87 |
| 1.4.8 | Manx shearwater | 92 |
| 1.5 | Discussion | 98 |
| 1.6 | References | 99 |

Tables

| | | |
|-------------|--|----|
| Table 1.1: | Summary of key topics and issues raised during consultation activities undertaken for the Mona Offshore Wind Project relevant to offshore ornithology apportioning technical report of the Environmental Statement. | 4 |
| Table 1.2: | Species and impacts for which apportioning was undertaken | 8 |
| Table 1.3: | Seasonal definitions as the basis for assessment, from Furness (2015)..... | 9 |
| Table 1.4: | Number of birds assigned to different age class categories during site-specific surveys of the Mona Offshore Ornithology Array Area study area. | 10 |
| Table 1.5: | Age class percentages used in apportioning impacts. | 11 |
| Table 1.6: | Common guillemot colony weighting factors used for apportioning impacts of displacement in the breeding season. | 14 |
| Table 1.7: | Adult non-breeding common guillemot colony weighting factors used for apportioning impacts of displacement (UK Western region)..... | 16 |
| Table 1.8: | Immature non-breeding common guillemot colony weighting factors used for apportioning impacts of displacement (UK Western region)..... | 19 |
| Table 1.9: | Razorbill colony weighting factors used for apportioning impacts of displacement in the breeding season. | 22 |
| Table 1.10: | Adult non-breeding razorbill colony weighting factors used for apportioning impacts of displacement (UK Western region)..... | 25 |
| Table 1.11: | Immature non-breeding razorbill colony weighting factors used for apportioning impacts of displacement (UK Western region)..... | 30 |
| Table 1.12: | Northern gannet colony weighting factors used for apportioning impacts of collision and displacement in the breeding season. | 35 |
| Table 1.13: | Adult non-breeding northern gannet colony weighting factors used for apportioning impacts of collision risk and displacement (UK Western region). | 37 |
| Table 1.14: | Immature non-breeding northern gannet colony weighting factors used for apportioning impacts of collision risk and displacement (UK Western region). | 40 |

MONA OFFSHORE WIND PROJECT

| | |
|---|-----|
| Table 1.15: Black-legged kittiwake colony weighting factors used for apportioning impacts of collision and displacement in the breeding season..... | 43 |
| Table 1.16: Adult non-breeding black-legged kittiwake colony weighting factors for apportioning impacts of collision risk and displacement (UK Western waters and Channel region)..... | 49 |
| Table 1.17: Immature non-breeding black-legged kittiwake colony weighting factors for apportioning impacts of collision risk and displacement (UK Western waters and Channel region)..... | 56 |
| Table 1.18: Herring gull colony weighting factors used for apportioning impacts of collision risk in the breeding season..... | 63 |
| Table 1.19: Adult non-breeding herring gull colony weighting factors used for apportioning impacts of collision risk (UK Western region)..... | 67 |
| Table 1.20: Immature non-breeding herring gull colony weighting factors used for apportioning impacts of collision risk (UK Western region)..... | 69 |
| Table 1.21: Lesser black-backed gull colony weighting factors used for apportioning impacts of collision risk in the breeding season..... | 71 |
| Table 1.22: Adult non-breeding lesser black-backed gull colony weighting factors used for apportioning impacts of collision risk (UK Western region)..... | 79 |
| Table 1.23: Immature non-breeding lesser black-backed gull colony weighting factors used for apportioning impacts of collision risk (UK Western region)..... | 83 |
| Table 1.24: Great black-backed gull colony weighting factors used for apportioning impacts of collision risk in the breeding season..... | 87 |
| Table 1.25: Adult non-breeding great black-backed gull colony weighting factors used for apportioning impacts of collision risk (UK Southwest and Channel waters region)..... | 90 |
| Table 1.26: Immature non-breeding great black-backed gull colony weighting factors used for apportioning impacts of collision risk (UK Southwest and Channel waters region)..... | 91 |
| Table 1.27: Manx shearwater colony weighting factors used for apportioning impacts of collision and displacement in the breeding season..... | 92 |
| Table 1.28: Adult non-breeding Manx shearwater colony weighting factors used for apportioning impacts of collision risk (UK Western and Channel region)..... | 95 |
| Table 1.29: Immature non-breeding Manx shearwater colony weighting factors used for apportioning impacts of collision risk (UK Western and Channel region)..... | 97 |
| Table A. 1: Modelled expected mortality estimates across species and seasons from collision risk and displacement..... | 100 |

Figures

| | |
|--|---|
| Figure 1.1: Designated sites in close proximity that are covered in this apportioning assessment in relation to the Mona Array Area..... | 2 |
|--|---|

Appendices

| | |
|--|-----|
| APPENDIX A : ESTIMATED DISPLACEMENT AND COLLISION MORTALITIES..... | 100 |
|--|-----|

MONA OFFSHORE WIND PROJECT

Glossary

| Term | Meaning |
|---|--|
| Apportioning | A method that assigns unknown entities to known entities based on weighting factors. In this report, it refers to birds of unknown origin within the study area that are assigned to colonies based on distance to colony and colony size. |
| Biologically Defined Minimum Population Scale | Minimum regional population size of a particular bird species at a certain time of year, defined for a range of species in Furness (2015). |
| Ornithology | Ornithology is a branch of zoology that concerns the study of birds. |
| Seabird Monitoring Programme | The SMP is an ongoing annual monitoring programme, established in 1986, of 25 species of seabird that breed regularly in Britain and Ireland. |
| Special Protection Area | A designation under the European Union Directive on the Conservation of Wild Birds, under which countries have a duty to safeguard the habitats of migratory birds and certain particularly threatened birds. Since the UK's exit from the European Union, in the UK these sites now form part of the national site network protected by national legislation. In Ireland, Special Protection Areas remain part of the European Union's Natura 2000 ecological network of sites. |

Acronyms

| Term | Meaning |
|-------|---|
| BDMPS | Biologically Defined Minimum Population Scale |
| DAS | Digital Aerial Surveys |
| IND | Number of individuals (bird census) |
| MNR | Marine Nature Reserve |
| SAC | Special Areas of Conservation |
| SMP | Seabird Monitoring Programme |
| SPA | Special Protection Area |
| SSSI | Site of Species Scientific Interest |

Units

| Unit | Description |
|------|-------------|
| km | Kilometres |

1 OFFSHORE ORNITHOLOGY APPORTIONING TECHNICAL REPORT

1.1 Introduction

1.1.1 Background

1.1.1.1 When assessing the impact of a proposed offshore wind farm, it is crucial to determine the impact that such development will have on breeding seabird populations. Seabirds nest in colonies of variable sizes around the UK coastline (Mitchell *et al.*, 2004) and most species have large foraging ranges at sea (Woodward *et al.*, 2019). Establishing the connectivity between marine renewable sites and colonies located in designated-sites (i.e Special Protected Areas (SPAs), Sites of Species Scientific Interest (SSSIs) and Marine Nature Reserves (MNRs)), is a key element of the assessment of impact. A theoretical approach has been developed by NatureScot (NatureScot, 2018) to determine the proportion of birds from designated sites which use proposed development areas. The tools allow to ‘apportion’ the impact of a marine renewable site to multiple designated and non-designated sites.

1.1.1.2 This technical report presents the apportioning method and apportions the potential impacts of the Mona Offshore Wind Project on designated sites that support qualifying species deemed to be adversely impacted by the Mona Offshore Wind Project. It utilizes outcomes from other reports, including Volume 6, Annex 5.2: Offshore ornithology displacement technical report (Document Reference F6.5.2) and Volume 6, Annex 5.3: Offshore ornithology collision risk modelling technical report of the Environmental Statement (Document Reference F6.5.3). Apportioning was carried out for common guillemot *Uria aalge*, razorbill *Alca torda*, northern gannet *Morus bassanus*, black-legged kittiwake *Rissa tridactyla*, herring gull *Larus argentatus*, lesser black-backed gull *Larus fuscus* and great black-backed gull *Larus marinus*. Justification for the inclusion and exclusion of species is provided in section 1.3.1.

1.1.2 Aim of report

1.1.2.1 The primary purpose of this technical report is to apportion predicted mortalities from collisions and displacement of the Mona Offshore Wind Project to seabird colonies designated at these designated sites (i.e. qualifying as an individual species and/or assemblage of species).

1.1.2.2 Collision risk is an impact associated with the operation of wind turbines and their associated offshore structures. For this report, the impacts of collision risk were therefore assessed for the Mona Array Area only. With regards to displacement, the report considered the Mona Array Area plus a 2 km buffer.

1.1.3 Colonies considered

1.1.3.1 The Mona Array Area is located approximately 28.8 km from the north coast of Wales and 46.9 km from the northwest coast of England. The Mona Array Area covers 300 km².

1.1.3.2 The study area for the Mona Apportioning Assessment encompasses all designated sites and non-designated colonies within foraging range of the Mona Array Area (SPA colony locations in Figure 1.1). Details on how mortalities from collision risk and displacement are apportioned to designated site colonies are outlined below.

MONA OFFSHORE WIND PROJECT

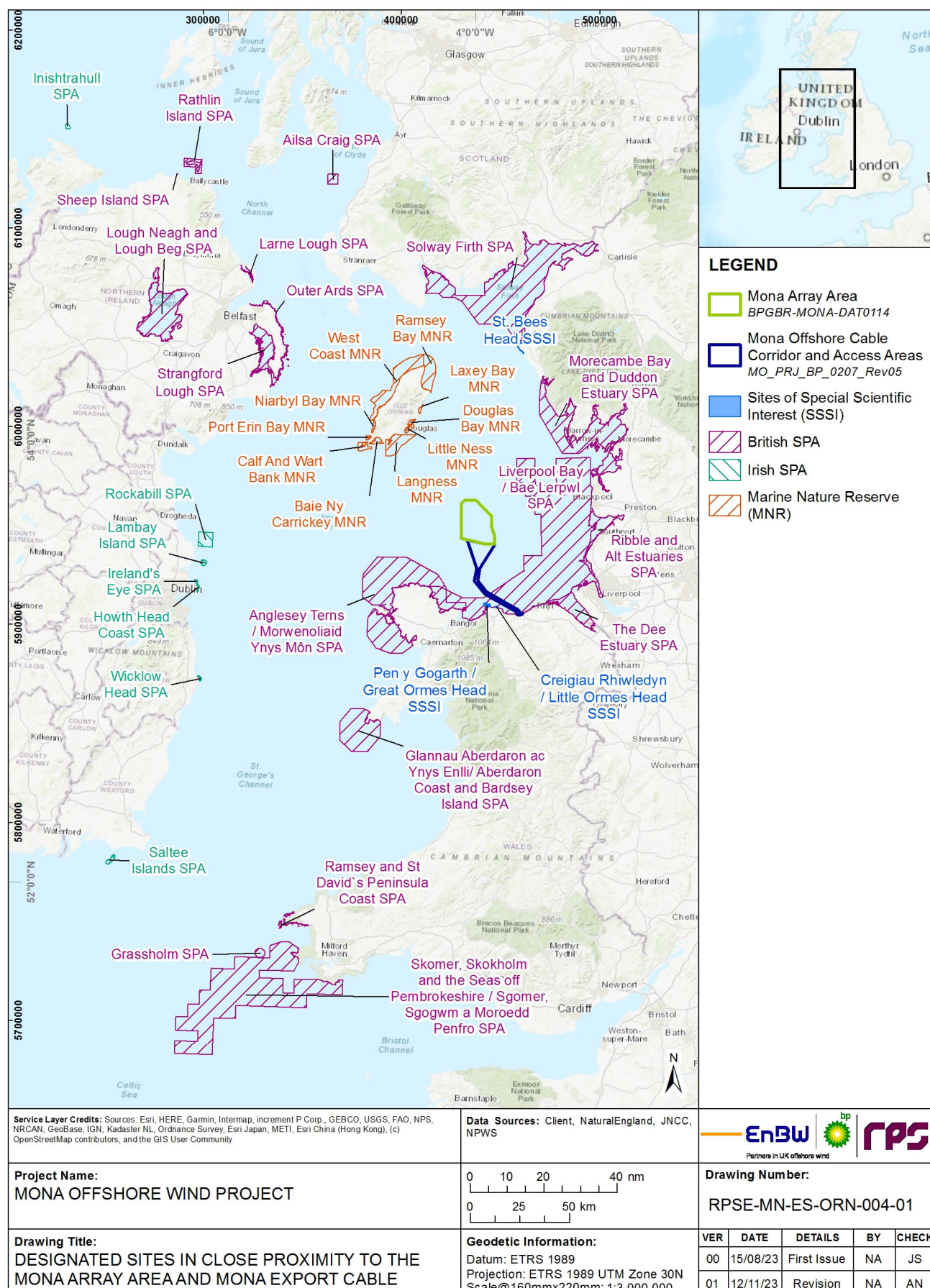


Figure 1.1: Designated sites in close proximity that are covered in this apportioning assessment in relation to the Mona Array Area.

MONA OFFSHORE WIND PROJECT

1.2 Consultation

1.2.1.1 A summary of the key issues raised during consultation activities undertaken to date specific to offshore ornithology is presented in Table 1.1 below, together with how these issues have been considered in the production of this apportioning technical report as part of the Environmental Statement.

1.2.2 Evidence Plan process

1.2.2.1 The purpose of the Evidence Plan process is to agree the information the Mona Offshore Wind Project needs to supply to the Secretary of State, as part of a DCO application for the Mona Offshore Wind Project. The Evidence Plan seeks to ensure compliance with EIA. The development and monitoring of the Evidence Plan and its subsequent progress is being undertaken by the Steering Group. The Steering Group will comprise of the Planning Inspectorate, the Applicant, NRW, Natural England, JNCC and the MMO as the key regulatory and SNCBs. To inform the EIA process during the pre-application stage of the Mona Offshore Wind Project, Expert Working Groups (EWGs) were also set up to discuss and agree topic specific issues with the relevant stakeholders. Consultation was undertaken via the Offshore Ornithology EWG, with meetings held in February 2022, July 2022, November 2022, February 2023, June 2023, October 2023 and December 2023.

1.2.2.2 The responses provided and changes suggested by the stakeholders through the EWG are summarized in Table 1.1, together with changes implemented in the apportioning technical report of the Environmental Statement.

1.2.2.3 A number of comments were received during the S42 consultation following submission of the PEIR chapter. All the responses provided, and changes suggested by the stakeholders are presented in the consultation report (Document reference E.3) together with changes implemented in the technical reports underpinning the Environmental Statement.

1.2.2.4 A summary of the key responses with changes implemented in the apportioning technical report of the Environmental Statement are presented in Table 1.1.

MONA OFFSHORE WIND PROJECT

Table 1.1: Summary of key topics and issues raised during consultation activities undertaken for the Mona Offshore Wind Project relevant to offshore ornithology apportioning technical report of the Environmental Statement.

| Date | Consultee and type of response | Topics and issues raised | Response to issue raised and/or where considered in this chapter |
|-----------|--|--|---|
| June 2023 | S42 Consultation NRW, JNCC, Natural England, IOM Gov Detailed response | NRW does not agree with the use of stable age structures for age-class apportioning or the removal of sabbaticals from impacts. | Where possible, site-specific age-classes from Digital Aerial Surveys (DAS) were used for age-class apportioning within the breeding season as advised by the Expert Working Group. If site-specific age class could not be generated during the breeding season, then all birds were assumed to be adult birds per EWG request. Sabbatical birds have not been removed nor have they been estimated to remove confusion. The methodology is presented in Volume 6, Annex 5.5: Offshore ornithology apportioning technical report of the Environmental Statement (Document Reference F6.5.5). |
| | | NRW does not agree with updating the colony figures from those in Furness (2015) in apportioning impacts to designated sites outside the breeding season, and the approach used does not follow the advice provided previously during the EWG. | Furness 2015 counts have not been updated and have been lifted directly from the tables presented in the report. The methodology has been presented in section 1.3. |
| | | NRW are unclear how apportionment of unidentified birds has been applied to the abundance estimates generated from MRSea modelling. | The apportioning of unidentified species was applied to design and model-based estimates of known species. |
| | | NRW suggest that the list of SPA colonies for the different species presented in Appendix A of Annex 5.5 include SSSIs. | Predicted mortalities from collisions and displacement of the Mona Offshore Wind Project to seabird colonies designated as SSSIs, including the Pen y Gogarth/Great Orme's Head SSSI have been presented in section 1.4 |
| | | NRW do not agree with Manx shearwater being screened out for apportionment of impacts to colonies. | Apportioning has been undertaken for Manx shearwater and presented in section 1.4. |

MONA OFFSHORE WIND PROJECT

| Date | Consultee and type of response | Topics and issues raised | Response to issue raised and/or where considered in this chapter |
|------|--------------------------------|---|--|
| | | NRW note that the number of adult and immature birds at each colony used in the non-breeding season apportionment are not those from the Tables in Appendix A of Furness (2015). NRW do not consider this to be appropriate as updating the SPA colonies figures, presented in the tables in Appendix A of Furness (2015) with more recent figures is not recommended, unless there is evidence to suggest that the colony in question has increased or decreased significantly relative to other colonies. | To apportion non-breeding season effects from the Mona Array Area between relevant SPAs, the contribution of adult and immature birds from an individual SPA as a proportion of the BDMPS defined in Furness (2015) was utilised. |
| | | NRW currently advise that proportions of adults and immatures are based on age-class information from site-specific surveys. We note the difficulties associated with ageing some species from digital aerial data and currently recommend that in the absence of site-specific information on age classes, a precautionary approach assuming all adult-type birds are adults is adopted. | Where possible, site-specific age-classes from Digital Aerial Surveys (DAS) were used for age-class apportioning within the breeding season. If age data was not available, all birds were assumed to be adult birds. Methodology is presented in section 1.3. |
| | | NRW recommend sabbaticals should not be removed from impact assessments. | Sabbaticals have been included in adults impacts for the purpose of the impact assessment. |
| | | JNCC advise that species that can be identified to age classes from digital aerial surveys should be done so. If it is not possible to assign age classes from digital aerial surveys, then all birds should be assumed to be adults. If this is the case, the adult alone survival rate should be used to calculate baseline mortality rates. | Where possible, site-specific age-classes from Digital Aerial Surveys (DAS) were used for age-class apportioning within the breeding season as advised by the Expert Working Group. Methodology is presented in section 1.3. |
| | | JNCC advise that, unless site-specific information on sabbatical rates is available, then all adults should be assumed to be breeding adults. | Sabbaticals have been included in adults impacts for the purpose of the impact assessment. |
| | | JNCC state not all of the values to be able to replicate calculation of the colony weight have been provided - colony sea proportion is not given therefore the colony weight cannot be verified. | All values used to calculate the colony weighting factors are presented in section 1.3. |
| | | JNCC suggest that non-SPA colonies should be treated individually, as is the case for SPA colonies. | Non-SPA colonies are treated individually in this technical report. |

MONA OFFSHORE WIND PROJECT

| Date | Consultee and type of response | Topics and issues raised | Response to issue raised and/or where considered in this chapter |
|------|--------------------------------|--|--|
| | | JNCC suggest that impacts should be apportioned to the Skomer and Skokholm and the Seas off Pembrokeshire SPA. | Apportioning for lesser black-backed gull at Skomer and Skokholm and the Seas off Pembrokeshire SPA is presented in section 1.4. |
| | | JNCC advise kittiwake at Skomer, Skokholm and Seas off Pembrokeshire SPA is correctly listed as being within foraging range, however it is incorrectly labelled as not a qualifying feature. Kittiwake is a named component of the seabird assemblage. | Apportioning for black-legged kittiwake at Skomer and Skokholm and the Seas off Pembrokeshire SPA is presented in section 1.4. |
| | | JNCC ask why Skomer and Skokholm and the Seas off Pembrokeshire SPA classed as a marine SPA and not included in apportioning? | Apportioning of relevant qualifying species at the Seas off Pembrokeshire SPA is presented in section 1.4. |
| | | Natural England retain some concerns regarding the current limitations of the apportioning approach using the NatureScot methods. | Apportioning presented in section 1.4 has been undertaken using the Nature Scot method in the absence of any other updated methodologies. |
| | | Natural England do not consider it is appropriate to apply the stable age structures in apportioning. | Where possible, site-specific age-classes from Digital Aerial Surveys (DAS) were used for age-class apportioning within the breeding season as advised by the Expert Working Group. Methodology is presented in section 1.4. |
| | | Natural England do not consider it is appropriate to remove sabbaticals. | Sabbaticals have been included in adults impacts for the purpose of the impact assessment. |
| | | IOM Gov pointed out that one of the closest breeding colonies is the Calf of Man so a link there is also very likely and should therefore be noted. However, no significant effects were predicted for this species. | The apportionment of predicted mortalities from collisions and displacement of the Mona Offshore Wind Project to seabird colonies presented in section 1.4 includes Marine Nature Reserves from the Isle of Man. |
| | | IOM Gov pointed out that there is no account of Manx sites in this section –designated MNRs and ASSIs and key seabird sites in Manx National Heritage ownership. | |
| | | IOM Gov advise that there is concern to ensure that where connections to Manx sites are concerned, that this is not taken as devaluing the level of the receptor and thereby skewing the process of assessment. | |

MONA OFFSHORE WIND PROJECT

| Date | Consultee and type of response | Topics and issues raised | Response to issue raised and/or where considered in this chapter |
|---------------|---|---|---|
| | | IOM Gov noted that Manx sites (all non-SPA of course as we do not have European SPAs in the jurisdiction) have been taken into account, in the apportioning, though as non-SPAs they are aggregated to a single non-SPA total. For the species of most interest to us in this discussion, the great black-backed gull, and another of local significance in regional terms, the herring gull, this is a significant proportion of the non-SPA total, but it is noted that this does not produce an expected adverse effect for that category (non-SPA). | |
| November 2023 | Offshore Ornithology Expert Working Group 3 Attended by: Natural England, JNCC, NRW, The Wildlife Trusts (TWT), IoM, MMO | Do not advise removal of sabbatical birds from apportioning | Sabbatical birds have not been removed from the apportioning assessment. A section on sabbaticals have been included in this technical report simply for discussion purposes. They have not been removed from the analysis. |
| December 2023 | Offshore Ornithology Expert Working Group 7 Attended by: Natural England, JNCC, NRW, MMO, RSPB, IoM | Methodology updates that affect the assessment were presented to the EWG (e.g., project alone and CEA breeding regional population approach and avoidance rates for gull species). | No actions required for this technical report. |

MONA OFFSHORE WIND PROJECT

1.3 Methodology

- 1.3.1.1 Apportioning undertaken for the Mona Offshore Wind Project is based on the NatureScot 'theoretical approach' method for the breeding season (NatureScot, 2018). Apportioning during the non-breeding season utilises the Biologically Defined Minimum Population Scales (BDMPS) approach developed by Furness (2015).
- 1.3.1.2 For apportioning impacts that may occur in the breeding season to seabird species from SPAs within foraging range of the Mona Offshore Wind Project, a two-step approach outlined in the NatureScot method is as follows:
1. To apportion impacts between designated sites and non-designated breeding colonies within foraging range of the wind farm; this is done using the most recent counts available for each colony
 2. The impacts assigned to the designated and non-designated sites component are further apportioned between the individual sites within foraging range. This is done by using the Seabird 2000 counts as a reference point.
- 1.3.1.3 As an additional step in stage 2, the choice was made to base the apportioning on the most recent counts, given that many colony counts have been updated since the NatureScot method was published. Colony counts were extracted from the Seabird Monitoring Programme (SMP) online database (JNCC, 2023) (<https://app.bto.org/seabirds/public/index.jsp>).

1.3.1 Screening species for assessment

- 1.3.1.1 Species were first screened to check whether any impacts were expected based on the collision risk and displacement analyses. The modelled expected mortality of collision risk and displacement are summarised in Appendix A. These estimates were directly derived from Volume 6, Annex 5.2: Offshore ornithology displacement technical report of the Environmental Statement (Document Reference F6.5.2) and Volume 6, Annex 5.3: Offshore ornithology collision risk modelling technical report of the Environmental Statement (Document Reference F6.5.3).
- 1.3.1.2 Two species were not assessed based on this initial screening. Atlantic puffin *Fratercula arctica* was screened out due to the species occurrence in low numbers in the Mona Array Area plus 2 km. The highest expected annual displacement mortality was one bird. Northern fulmar *Fulmarus glacialis* was screened out, because its expected annual collision risk was less than one bird (northern fulmar is not considered sensitive to displacement).
- 1.3.1.3 Apportioning was undertaken for the species outlined in Table 1.2.

Table 1.2: Species and impacts for which apportioning was undertaken

| Species | Nature of Impact |
|--------------------------|----------------------------|
| Common guillemot | Displacement |
| Razorbill | Displacement |
| Northern gannet | Collision and displacement |
| Black-legged kittiwake | Collision and displacement |
| Herring gull | Collision |
| Lesser black-backed gull | Collision |
| Great black-backed gull | Collision |

MONA OFFSHORE WIND PROJECT

| Species | Nature of Impact |
|-----------------|----------------------------|
| Manx shearwater | Collision and displacement |

1.3.2 Seasonality and regional populations

1.3.2.1 Seasons used within the apportioning assessment were defined according to the breeding, non-breeding and migratory periods (autumn and spring migration) based on Furness (2015) (Table 1.3).

Table 1.3: Seasonal definitions as the basis for assessment, from Furness (2015).

| Species | Pre-breeding season/spring migration | Breeding season | Post breeding season/autumn migration | Non-breeding/winter season |
|--------------------------|--------------------------------------|--------------------|---------------------------------------|----------------------------|
| Common guillemot | N/A | March to July | N/A | August to February |
| Razorbill | January to March | April to July | August to October | November to December |
| Northern gannet | December to February | March to September | October to November | N/A |
| Black-legged kittiwake | January to February | March to August | September to December | N/A |
| European herring gull | N/A | March to August | N/A | September to February |
| Lesser black-backed gull | March | April to August | September to October | November to February |
| Great black-backed gull | N/A | March to August | N/A | September to February |
| Manx shearwater | March | April to August | September to October | N/A |

1.3.2.2 As outlined in the Volume 6, Annex 5.1: Offshore ornithology baseline characterisation technical report of the Environmental Statement (Document Reference F6.5.1), breeding population colony counts used in the apportioning assessment were derived from the Seabird Monitoring Programme (SMP) database, with immature and juvenile counts calculated using Furness (2015) proportions.

1.3.2.3 Regional populations for other seasons are defined using the Biologically Defined Minimum Population Scales (BDMPS) provided in Furness (2015) relevant to each species considered in the apportioning assessment.

1.3.3 Age composition

1.3.3.1 Specific additional mortalities for a set of impact scenarios representing bird deaths due to wind turbine collisions and habitat displacement effects, or their combined effect, were provided for two population groups based on age-class breeding ability: adults (i.e. breeding age-classes) and sub-adults (i.e. immature age-classes).

1.3.3.2 Where possible, site-specific age-classes from Digital Aerial Surveys (DAS) were used for age-class apportioning within the breeding season as advised by the Expert Working Group (Table 1.4). If age information was not available from site-specific

MONA OFFSHORE WIND PROJECT

surveys, then the precautionary approach where all birds were assumed to be adult birds was adopted.

Table 1.4: Number of birds assigned to different age class categories during site-specific surveys of the Mona Offshore Ornithology Array Area study area.

| Species | Season (months) | Number of adult-type birds | Number of immature birds | Proportion of adult-type birds (%) |
|--------------------------|--------------------------------------|----------------------------|--------------------------|------------------------------------|
| Kittiwake | Breeding (March to August) | 657 | 32 | 95.36 |
| | Non-breeding (September to February) | 1807 | 157 | 92.01 |
| Gannet | Breeding (March to September) | 715 | 49 | 93.58 |
| | Non-breeding (October to February) | 135 | 5 | 96.43 |
| Herring gull | Breeding (March to August) | 12 | 3 | 80.00 |
| | Non-breeding (September to February) | 31 | 10 | 75.61 |
| Great black-backed gull | Breeding (March to August) | 30 | 6 | 83.33 |
| | Non-breeding (September to February) | 43 | 18 | 70.49 |
| Lesser black-backed gull | Breeding (April to August) | 18 | 4 | 81.82 |
| | Non-breeding (September to March) | 20 | 3 | 86.96 |

1.3.3.3 The identification of immature age classes of large gulls and gannets during baseline surveys is relatively easy and the age-class proportions calculated for these species are therefore considered to be representative. The identification of immature age classes of auk species is not possible from baseline surveys (with the exception of juvenile birds in the post-breeding season). For black-legged kittiwake, age classes at sea can be difficult to determine and in most cases impossible (with the exception of first summer of younger birds). Whilst one year old kittiwakes can be easily identified due to differences in plumage, second and third year old birds, which have not yet reached the age of first breeding, cannot (Coulson, 2011; Olsen and Larsson, 2003). The adult-type bird proportion was used for kittiwake for precaution, but the impact is therefore overestimated on the adult population due to the presence of non-mature individuals within their second and third calendar years.

MONA OFFSHORE WIND PROJECT

1.3.3.4 In the non-breeding season, site-specific age-class was used from site-specific DAS, or if age-class identification was not possible from site-specific DAS then it was presumed that 100% of birds were adults (Table 1.5).

Table 1.5: Age class percentages used in apportioning impacts.

| Species | Season | Adult % | Immatures % |
|--------------------------|--------------|---------|-------------|
| Common guillemot | Breeding | 100% | 0% |
| | Non-breeding | 100% | 0% |
| Razorbill | Breeding | 100% | 0% |
| | Non-breeding | 100% | 0% |
| Northern gannet | Breeding | 93.58% | 6.42% |
| | Non-breeding | 96.43% | 3.57% |
| Black-legged kittiwake | Breeding | 95.36% | 4.64% |
| | Non-breeding | 92.01% | 7.99% |
| Herring gull | Breeding | 80.00% | 20.00% |
| | Non-breeding | 75.61% | 24.39% |
| Lesser black-backed gull | Breeding | 81.82% | 18.18% |
| | Non-breeding | 86.96% | 13.04% |
| Great black-backed gull | Breeding | 83.33% | 16.67% |
| | Non-breeding | 70.49% | 29.51% |
| Manx shearwater | Breeding | 100% | 0% |
| | Non-breeding | 100% | 0% |

1.3.4 Apportioning of impacts during the breeding period

1.3.4.1 Following NatureScot guidance (NatureScot, 2018), impacts were apportioned between designated and non-designated breeding colonies within each species' mean-maximum (Woodward *et al.*, 2019) foraging range and the development site using the 'theoretical approach'. The method makes use of the following parameters:

- colony size (all colony sizes must be expressed as the same unit (e.g. individuals))
- distance of colony from development site (using geometric centres for both)
- sea area (the extent of open sea within Woodward *et al.* (2019) foraging range).

1.3.4.2 This was first done using the Seabird 2000 colony counts (Mitchell *et al.*, 2004) which follows the Seagreen Alpha and Bravo ((hereafter known as Seagreen) method (Seagreen, 2018), providing a common reference point as many non-designated breeding colonies have not been counted since.

1.3.4.3 Using the centroid for each proposed development area, a buffer zone was created which equated to the species' mean-maximum foraging range plus one standard deviation. The distance between the proposed development site and each designated site and non-designated colony within each species' foraging range at sea was then

MONA OFFSHORE WIND PROJECT

calculated. Using the most recent colony counts from the SMP online database, impacts assigned to each site was further apportioned to obtain each sites updated weighting estimate. The calculation to calculate apportion weights was:

$$\text{Colony Weight} = \frac{\text{Colony Population}}{\text{Sum of Populations}} \times \frac{\text{Sum of Distance}^2}{\text{Colony Distance}^2} \times \frac{1/\text{Colony Sea Proportion}}{\text{Sum of } \left(\frac{1}{\text{Colony Sea Proportions}} \right)}$$

- 1.3.4.4 Once the colony weights were calculated, the expected mortality from collisions and displacement were apportioned to the different colonies. The numbers of adults and immatures per colony were then calculated using published ratios in Furness (2015). For each of these age groups, the baseline mortality was then calculated by multiplying the mortality estimates per species and age group by the colony size of that age group.

Sabbaticals

- 1.3.4.5 Every breeding season a proportion of adults skip breeding and take a 'sabbatical' (Horswill and Robinson, 2015). Including any impacts occurring on these sabbatical birds within the apportioning assessment could overestimate the effects on the specific colony (Marine Scotland 2017a, b).
- 1.3.4.6 However, at the request of the SNCBs, following Offshore Ornithology EWG03 (in November 2023), the apportioning assessment carried out for the Mona Offshore Wind Project does not remove sabbatical birds from the predicted impact on adult birds from a specific colony.

1.3.5 Apportioning of impacts during the non-breeding period

- 1.3.5.1 The calculation of apportioning values for non-breeding seasons (post-breeding, non-breeding and pre-breeding) has followed the approach used previously in the application and examination documentation for multiple offshore wind farms (e.g. East Anglia THREE Ltd., 2015, Forewind, 2013, SMart Wind, 2015) and is advised for use by Natural England (Natural England, 2021). For apportionment, the contribution of adult birds from an individual designated site, as estimated by Furness (2015), to the relevant BDMPS population for each species/season combination is divided by the total adult BDMPS population. The calculated value is the proportion of the adult BDMPS population represented by adult birds from the designated site under consideration. It should be noted that no updates have been made to any of the individual colony populations presented in Furness (2015). Using any updated colony information from the SMP database would create a mismatch with Furness (2015).
- 1.3.5.2 As the proportion of adult birds from a specific colony within the adult population of the BDMPS is presented in the non-breeding period, a correction to the impact is used to correct for adults only. This correction factor is as presented in Table 1.5 from site-specific surveys. When a species age composition is not easily identified during site-specific surveys, it is presumed all birds are adults at the request of the SNCBs.
- 1.3.5.3 Not all sites are explicitly included in Furness (2015) with those located outside of UK waters grouped into national populations (e.g. Ireland, France, etc.). Connectivity have been identified for a number of non-UK designated sites and in order to calculate apportioning values for use in the non-breeding seasons, the same calculation assigned to grouped populations have been applied to the site on a precautionary basis, which would result in an overestimate.
- 1.3.5.4 Modelled estimates of the numbers of immatures per breeding individual, BDMPS population size and proportion of adults and immatures in spatially distinct BDMPS

MONA OFFSHORE WIND PROJECT

were used to calculate the contribution of individuals from SPAs and non-SPAs in the UK Western waters region to the estimated non-breeding BDMPS population.

1.4 Results

- 1.4.1.1 Based upon calculations undertaken by the approach described above, the apportioned estimates for each of the key seabird species at each designated and non-designated site with connectivity to the Mona Array Area plus 2 km buffer are presented below.
- 1.4.1.2 Ranges presented can be large due to the matrix approach used for displacement, the upper range of which can be considered a maximum impact scenario. Generally, it is observed that colonies may have a high weighting factor, but that the impact is small. This has to do with colony size, as distance to colony will already have been accounted for in calculating the weighting factor. The highest impact is generally observed on small colonies (because any additional mortality will have a higher proportional impact on small colonies than on large colonies) that are close to the Mona Array Area.

MONA OFFSHORE WIND PROJECT

1.4.1 Common guillemot

Colony weighted proportions

1.4.1.1 Colonies included based on foraging distance, distance to the Mona Array Area centroid, and the resulting designated and non-designated site weighted proportions of this species are given in Table 1.6 and Table 1.8, with the highest weighting factor assigned to Anglesey Terns SPA (0.369%), followed by Great Ormes Head SSSI (0.156%) and St. Bees Head SSSI (0.145%).

Table 1.6: Common guillemot colony weighting factors used for apportioning impacts of displacement in the breeding season.

| Colony location | Adult bird count (adjusted for IND) | Distance to Mona Array Area (km) | Distance ² | Prop of Forage Range as Sea | 1/Prop of Forage Range as Sea | Colony pop/ sum of pop | Sum dist ² / col dist ² | Colony sea/ sum of sea | SPA weight (based on distance ²) | Proportional SPA weight |
|---|-------------------------------------|----------------------------------|-----------------------|-----------------------------|-------------------------------|------------------------|---|------------------------|--|-------------------------|
| Anglesey Terns / Morwenoliaid Ynys Môn SPA | 13,247 | 34.0 | 1158.5 | 0.712 | 1.404 | 0.169 | 36.612 | 0.086 | 0.528 | 0.369 |
| Glannau Ynys Gybi / Holy Island Coast SPA | 10,605 | 55.7 | 3101.8 | 0.819 | 1.221 | 0.135 | 13.674 | 0.074 | 0.137 | 0.096 |
| Mynydd Cilan, Trwyn y Wylfa ac Ynysoedd Sant Tudwal SPA | 6,061 | 97.9 | 9587.2 | 0.615 | 1.627 | 0.077 | 4.424 | 0.099 | 0.034 | 0.024 |
| Pen y Gogarth / Great Ormes Head SSSI | 3,578 | 30.3 | 916.0 | 0.577 | 1.734 | 0.046 | 46.305 | 0.106 | 0.223 | 0.156 |
| St. Bees Head SSSI | 18,599 | 80.7 | 6513.0 | 0.453 | 2.205 | 0.237 | 6.512 | 0.134 | 0.207 | 0.145 |

MONA OFFSHORE WIND PROJECT

| Colony location | Adult bird count (adjusted for IND) | Distance to Mona Array Area (km) | Distance ² | Prop of Forage Range as Sea | 1/Prop of Forage Range as Sea | Colony pop/ sum of pop | Sum dist ² / col dist ² | Colony sea/ sum of sea | SPA weight (based on distance ²) | Proportional SPA weight |
|---|-------------------------------------|----------------------------------|-----------------------|-----------------------------|-------------------------------|------------------------|---|------------------------|--|-------------------------|
| Carreg y Llam SSSI | 18,170 | 79.9 | 6380.7 | 0.681 | 1.468 | 0.231 | 6.647 | 0.089 | 0.137 | 0.096 |
| Creigiau Rhiwledyn / Little Ormes Head SSSI | 1,298 | 31.5 | 994.7 | 0.543 | 1.841 | 0.068 | 42.641 | 0.112 | 0.079 | 0.055 |
| Baie ny Carrickey MNR | 5,308 | 55.7 | 3103.1 | 0.858 | 1.166 | 0.002 | 13.668 | 0.071 | 0.066 | 0.046 |
| Calf and Wart Bank MNR | 166 | 57.8 | 3346.0 | 0.860 | 1.163 | 0.008 | 12.676 | 0.071 | 0.002 | 0.001 |
| Ramsey Bay MNR | 631 | 58.7 | 3446.3 | 0.741 | 1.349 | 0.011 | 12.307 | 0.082 | 0.008 | 0.006 |
| West Coast MNR | 888 | 62.2 | 3867.0 | 0.803 | 1.245 | 0.068 | 10.968 | 0.076 | 0.009 | 0.007 |

MONA OFFSHORE WIND PROJECT

Table 1.7: Adult non-breeding common guillemot colony weighting factors used for apportioning impacts of displacement (UK Western region).

| Age | Season | Colony | Total number of SPA birds | Proportion SPA birds in area | Birds in region | Total birds BDMPS | Proportion SPA/BDMPS |
|-------|-----------------------------------|---------------------------------------|---------------------------|------------------------------|-----------------|-----------------------------------|----------------------|
| Adult | Non-breeding (August to February) | Faroe Islands | 200,000 | 0.05 | 10,000 | Adult UK Western waters = 656,156 | 1.52% |
| Adult | Non-breeding (August to February) | Norway | 200,000 | 0.01 | 2,000 | | 0.30% |
| Adult | Non-breeding (August to February) | Hermaness, Saxavord & Valla Field SPA | 9,240 | 0.02 | 185 | | 0.03% |
| Adult | Non-breeding (August to February) | Foula SPA | 33,230 | 0.02 | 665 | | 0.10% |
| Adult | Non-breeding (August to February) | Noss SPA | 29,566 | 0.02 | 591 | | 0.09% |
| Adult | Non-breeding (August to February) | Sumburgh SPA | 9,524 | 0.02 | 190 | | 0.03% |
| Adult | Non-breeding (August to February) | Fair Isle SPA | 26,132 | 0.02 | 523 | | 0.08% |
| Adult | Non-breeding (August to February) | West Westray SPA | 67,800 | 0.02 | 1,356 | | 0.21% |
| Adult | Non-breeding (August to February) | Calf of Eday SPA | 12,600 | 0.02 | 252 | | 0.04% |
| Adult | Non-breeding (August to February) | Rousay SPA | 12,400 | 0.02 | 248 | | 0.04% |
| Adult | Non-breeding (August to February) | Marwick Head SPA | 22,194 | 0.02 | 444 | | 0.07% |
| Adult | Non-breeding (August to February) | Hoy SPA | 12,600 | 0.02 | 252 | | 0.04% |
| Adult | Non-breeding (August to February) | Copinsay SPA | 11,214 | 0.02 | 224 | | 0.03% |

MONA OFFSHORE WIND PROJECT

| Age | Season | Colony | Total number of SPA birds | Proportion SPA birds in area | Birds in region | Total birds BDMPS | Proportion SPA/BDMPS |
|-------|-----------------------------------|---------------------------------------|---------------------------|------------------------------|-----------------|-------------------|----------------------|
| Adult | Non-breeding (August to February) | North Caithness Cliffs SPA | 94,000 | 0.02 | 1,880 | | 0.29% |
| Adult | Non-breeding (August to February) | North Sea UK non-SPA populations | 294,000 | 0.01 | 2,940 | | 0.45% |
| Adult | Non-breeding (August to February) | Sule Skerry & Sule Stack SPA | 15,266 | 0.95 | 14,503 | | 2.21% |
| Adult | Non-breeding (August to February) | North Rona & Sula Sgeir SPA | 10,000 | 0.95 | 9,500 | | 1.45% |
| Adult | Non-breeding (August to February) | Cape Wrath SPA | 54,718 | 0.95 | 51,982 | | 7.92% |
| Adult | Non-breeding (August to February) | Handa SPA | 75,986 | 0.95 | 72,187 | | 11.00% |
| Adult | Non-breeding (August to February) | Shiant Isles SPA | 10,296 | 0.95 | 9,781 | | 1.49% |
| Adult | Non-breeding (August to February) | Flannan Isles SPA | 19,614 | 0.95 | 18,633 | | 2.84% |
| Adult | Non-breeding (August to February) | St Kilda SPA | 31,400 | 0.95 | 29,830 | | 4.55% |
| Adult | Non-breeding (August to February) | Canna & Sanday SPA | 7,826 | 0.95 | 7,435 | | 1.13% |
| Adult | Non-breeding (August to February) | Rum SPA | 3,288 | 0.95 | 3,124 | | 0.48% |
| Adult | Non-breeding (August to February) | Mingulay & Berneray SPA | 27,054 | 0.95 | 25,701 | | 3.92% |
| Adult | Non-breeding (August to February) | North Colonsay and western cliffs SPA | 27,000 | 1 | 27,000 | | 4.11% |
| Adult | Non-breeding (August to February) | Ailsa Craig SPA | 10,494 | 1 | 10,494 | | 1.60% |

MONA OFFSHORE WIND PROJECT

| Age | Season | Colony | Total number of SPA birds | Proportion SPA birds in area | Birds in region | Total birds BDMPS | Proportion SPA/BDMPS |
|-------|-----------------------------------|-----------------------------------|---------------------------|------------------------------|-----------------|-------------------|----------------------|
| Adult | Non-breeding (August to February) | Rathlin Island SPA | 174,796 | 1 | 174,796 | | 26.64% |
| Adult | Non-breeding (August to February) | Skomer & Skokholm SPA | 32,600 | 0.9 | 29,340 | | 4.47% |
| Adult | Non-breeding (August to February) | West coast UK non-SPA populations | 158,000 | 0.95 | 150,100 | | 22.88% |

MONA OFFSHORE WIND PROJECT

Table 1.8: Immature non-breeding common guillemot colony weighting factors used for apportioning impacts of displacement (UK Western region).

| Age | Season | Colony | Total number of SPA birds | Proportion SPA birds in area | Birds in region | Total birds BDMPS | Proportion SPA/BDMPS |
|----------|-----------------------------------|---------------------------------------|---------------------------|------------------------------|-----------------|--------------------------------------|----------------------|
| Immature | Non-breeding (August to February) | Faroe Islands | 148,000 | 0.1 | 14,800 | Immature UK Western waters = 483,064 | 1.30% |
| Immature | Non-breeding (August to February) | Norway | 148,000 | 0.05 | 7,400 | | 0.65% |
| Immature | Non-breeding (August to February) | Hermaness, Saxavord & Valla Field SPA | 6,838 | 0.05 | 342 | | 0.03% |
| Immature | Non-breeding (August to February) | Foula SPA | 24,590 | 0.05 | 1,230 | | 0.11% |
| Immature | Non-breeding (August to February) | Noss SPA | 21,879 | 0.05 | 1,094 | | 0.10% |
| Immature | Non-breeding (August to February) | Sumburgh SPA | 7,048 | 0.05 | 352 | | 0.03% |
| Immature | Non-breeding (August to February) | Fair Isle SPA | 19,338 | 0.05 | 967 | | 0.08% |
| Immature | Non-breeding (August to February) | West Westray SPA | 50,172 | 0.05 | 2,509 | | 0.22% |
| Immature | Non-breeding (August to February) | Calf of Eday SPA | 9,324 | 0.05 | 466 | | 0.04% |
| Immature | Non-breeding (August to February) | Rousay SPA | 9,176 | 0.05 | 459 | | 0.04% |
| Immature | Non-breeding (August to February) | Marwick Head SPA | 16,424 | 0.05 | 821 | | 0.07% |
| Immature | Non-breeding (August to February) | Hoy SPA | 9,324 | 0.05 | 466 | | 0.04% |
| Immature | Non-breeding (August to February) | Copinsay SPA | 8,298 | 0.05 | 415 | | 0.04% |

MONA OFFSHORE WIND PROJECT

| Age | Season | Colony | Total number of SPA birds | Proportion SPA birds in area | Birds in region | Total birds BDMPS | Proportion SPA/BDMPS |
|----------|-----------------------------------|---------------------------------------|---------------------------|------------------------------|-----------------|-------------------|----------------------|
| Immature | Non-breeding (August to February) | North Caithness Cliffs SPA | 69,560 | 0.05 | 3,478 | | 0.31% |
| Immature | Non-breeding (August to February) | North Sea UK non-SPA populations | 217,560 | 0.02 | 4,351 | | 0.38% |
| Immature | Non-breeding (August to February) | Sule Skerry & Sule Stack SPA | 11,297 | 0.9 | 10,167 | | 0.89% |
| Immature | Non-breeding (August to February) | North Rona & Sula Sgeir SPA | 7,400 | 0.9 | 6,660 | | 0.58% |
| Immature | Non-breeding (August to February) | Cape Wrath SPA | 40,491 | 0.9 | 36,442 | | 3.20% |
| Immature | Non-breeding (August to February) | Handa SPA | 56,230 | 0.9 | 50,607 | | 4.44% |
| Immature | Non-breeding (August to February) | Shiant Isles SPA | 7,619 | 0.9 | 6,857 | | 0.60% |
| Immature | Non-breeding (August to February) | Flannan Isles SPA | 14,514 | 0.9 | 13,063 | | 1.15% |
| Immature | Non-breeding (August to February) | St Kilda SPA | 23,236 | 0.9 | 20,912 | | 1.84% |
| Immature | Non-breeding (August to February) | Canna & Sanday SPA | 5,791 | 0.9 | 5,212 | | 0.46% |
| Immature | Non-breeding (August to February) | Rum SPA | 2,433 | 0.9 | 2,190 | | 0.19% |
| Immature | Non-breeding (August to February) | Mingulay & Berneray SPA | 20,020 | 0.9 | 18,018 | | 1.58% |
| Immature | Non-breeding (August to February) | North Colonsay and western cliffs SPA | 20,000 | 0.95 | 19,000 | | 1.67% |
| Immature | Non-breeding (August to February) | Ailsa Craig SPA | 7,766 | 0.95 | 7,377 | | 0.65% |

MONA OFFSHORE WIND PROJECT

| Age | Season | Colony | Total number of SPA birds | Proportion SPA birds in area | Birds in region | Total birds BDMPS | Proportion SPA/BDMPS |
|----------|-----------------------------------|-----------------------------------|---------------------------|------------------------------|-----------------|-------------------|----------------------|
| Immature | Non-breeding (August to February) | Rathlin Island SPA | 129,349 | 0.95 | 122,882 | | 10.79% |
| Immature | Non-breeding (August to February) | Skomer & Skokholm SPA | 24,124 | 0.8 | 19,299 | | 1.69% |
| Immature | Non-breeding (August to February) | West coast UK non-SPA populations | 116,920 | 0.9 | 105,228 | | 9.24% |

MONA OFFSHORE WIND PROJECT

1.4.2 Razorbill

Colony weighted proportions

1.4.2.1 Colonies included based on foraging distance, distance to the Mona Array Area centroid, and the resulting designated and non-designated site weighted proportions of this species are given Table 1.9 and Table 1.11, with the highest weighting factor assigned to Great Ormes Head SSSI (0.205%) and Puffin Island SPA (0.204%), followed by Holy Island Coast (0.180%).

Table 1.9: Razorbill colony weighting factors used for apportioning impacts of displacement in the breeding season.

| Colony location | Adult bird count (adjusted for IND) | Distance to Mona Array Area (km) | Distance ² | Prop of Forage Range as Sea | 1/Prop of Forage Range as Sea | Colony pop/ sum of pop | Sum dist ² / col dist ² | Colony sea/ sum of sea | SPA weight (based on distance ²) | Proportional SPA weight |
|---|-------------------------------------|----------------------------------|-----------------------|-----------------------------|-------------------------------|------------------------|---|------------------------|--|-------------------------|
| Anglesey Terns / Morwenoliaid Ynys Môn SPA | 614 | 38.7 | 1497.9 | 0.742 | 1.348 | 0.067 | 86.455 | 0.033 | 0.190 | 0.118 |
| Glannau Ynys Gybi / Holy Island Coast SPA | 1,982 | 55.7 | 3101.8 | 0.739 | 1.353 | 0.215 | 41.749 | 0.033 | 0.297 | 0.185 |
| Mynydd Cilan, Trwyn y Wylfa ac Ynysoedd Sant Tudwal SPA | 331 | 98.4 | 9674.8 | 0.588 | 1.701 | 0.036 | 13.385 | 0.042 | 0.020 | 0.012 |
| Solway Firth SPA | 193 | 115.5 | 13346.2 | 0.389 | 2.572 | 0.021 | 9.703 | 0.063 | 0.013 | 0.008 |

MONA OFFSHORE WIND PROJECT

| Colony location | Adult bird count (adjusted for IND) | Distance to Mona Array Area (km) | Distance ² | Prop of Forage Range as Sea | 1/Prop of Forage Range as Sea | Colony pop/ sum of pop | Sum dist ² / col dist ² | Colony sea/ sum of sea | SPA weight (based on distance ²) | Proportional SPA weight |
|--|-------------------------------------|----------------------------------|-----------------------|-----------------------------|-------------------------------|------------------------|---|------------------------|--|-------------------------|
| Glannau Aberdaron ac Ynys Enlli / Aberdaron Coast and Bardsey Island SPA | 2,716 | 104.7 | 10964.9 | 0.613 | 1.632 | 0.295 | 11.810 | 0.040 | 0.139 | 0.087 |
| Ynys Seiriol / Puffin Island SPA | 697 | 34.3 | 1174.8 | 0.606 | 1.651 | 0.076 | 110.233 | 0.040 | 0.336 | 0.210 |
| Pen y Gogarth / Great Ormes Head SSSI | 496 | 30.3 | 916.0 | 0.550 | 1.818 | 0.054 | 141.379 | 0.044 | 0.338 | 0.211 |
| West Burrow Head SSSI | 8 | 99.6 | 9920.8 | 0.527 | 1.897 | 0.001 | 13.053 | 0.046 | 0.001 | 0.000 |
| St. Bees Head SSSI | 228 | 80.7 | 6513.0 | 0.431 | 2.322 | 0.025 | 19.883 | 0.057 | 0.028 | 0.017 |
| Carreg y Llam SSSI | 492 | 79.9 | 6380.7 | 0.638 | 1.568 | 0.053 | 20.295 | 0.038 | 0.041 | 0.026 |
| Creigiau Rhiwledyn / Little Ormes Head SSSI | 39 | 31.5 | 994.7 | 0.524 | 1.909 | 0.004 | 130.191 | 0.047 | 0.026 | 0.016 |
| Mull of Galloway SSSI | 442 | 110.3 | 12159.6 | 0.558 | 1.794 | 0.048 | 10.650 | 0.044 | 0.022 | 0.014 |
| Borgue Coast SSSI | 4 | 107.7 | 11600.7 | 0.463 | 2.158 | 0.000 | 11.163 | 0.053 | 0.000 | 0.000 |

MONA OFFSHORE WIND PROJECT

| Colony location | Adult bird count (adjusted for IND) | Distance to Mona Array Area (km) | Distance ² | Prop of Forage Range as Sea | 1/Prop of Forage Range as Sea | Colony pop/ sum of pop | Sum dist ² / col dist ² | Colony sea/ sum of sea | SPA weight (based on distance ²) | Proportional SPA weight |
|--------------------------------|-------------------------------------|----------------------------------|-----------------------|-----------------------------|-------------------------------|------------------------|---|------------------------|--|-------------------------|
| Port o' Warren SSSI | 38 | 118.0 | 13918.0 | 0.373 | 2.678 | 0.004 | 9.304 | 0.065 | 0.002 | 0.002 |
| Llanbadrig - Dinas Gynfor SSSI | 3 | 33.8 | 1143.5 | 0.732 | 1.366 | 0.000 | 113.252 | 0.033 | 0.001 | 0.001 |
| Arfordir Gogleddol Penmon SSSI | 9 | 35.7 | 1275.0 | 0.633 | 1.580 | 0.001 | 101.567 | 0.039 | 0.004 | 0.002 |
| Baie ny Carrickey MNR | 393 | 55.7 | 3103.1 | 0.708 | 1.411 | 0.043 | 41.732 | 0.034 | 0.061 | 0.038 |
| Calf and Wart Bank MNR | 145 | 57.8 | 3346.0 | 0.710 | 1.409 | 0.016 | 38.702 | 0.034 | 0.021 | 0.013 |
| Ramsey Bay MNR | 48 | 58.7 | 3446.3 | 0.627 | 1.595 | 0.005 | 37.577 | 0.039 | 0.008 | 0.005 |
| West Coast MNR | 135 | 62.2 | 3867.0 | 0.685 | 1.461 | 0.015 | 33.488 | 0.036 | 0.018 | 0.011 |
| Port Erin Bay MNR | 55 | 57.3 | 3287.2 | 0.705 | 1.419 | 0.006 | 39.395 | 0.035 | 0.008 | 0.005 |
| Niarbyl Bay MNR | 4 | 57.9 | 3351.9 | 0.700 | 1.428 | 0.000 | 38.634 | 0.035 | 0.001 | 0.000 |
| Langness MNR | 59 | 47.9 | 2292.2 | 0.692 | 1.446 | 0.006 | 56.496 | 0.035 | 0.013 | 0.008 |
| Little Ness MNR | 75 | 47.1 | 2222.8 | 0.681 | 1.468 | 0.008 | 58.260 | 0.036 | 0.017 | 0.011 |

MONA OFFSHORE WIND PROJECT

Table 1.10: Adult non-breeding razorbill colony weighting factors used for apportioning impacts of displacement (UK Western region).

| Age | Season | Colony | Total number of SPA birds | Proportion SPA birds in area | Birds in region | Total birds BDMPS | Proportion SPA/BDMPS |
|-------|---|--------------------------|---------------------------|------------------------------|-----------------|-----------------------------------|----------------------|
| Adult | Migration seasons (August to October, and January to March) | Russia | 7,000 | 0.05 | 350 | Adult UK Western waters = 316,928 | 0.11% |
| Adult | Migration seasons (August to October, and January to March) | Iceland | 630,800 | 0.3 | 189,240 | | 59.71% |
| Adult | Migration seasons (August to October, and January to March) | Norway | 60,600 | 0.1 | 6,060 | | 1.91% |
| Adult | Migration seasons (August to October, and January to March) | Denmark, Finland, Sweden | 32,000 | 0.05 | 1,600 | | 0.50% |
| Adult | Migration seasons (August to October, and January to March) | Faroe | 9,000 | 0.5 | 4,500 | | 1.42% |
| Adult | Migration seasons (August to October, and January to March) | Foula | 750 | 0.05 | 38 | | 0.01% |
| Adult | Migration seasons (August to October, and January to March) | Fair Isle | 1,830 | 0.05 | 92 | | 0.03% |
| Adult | Migration seasons (August to October, and January to March) | West Westray | 1,100 | 0.05 | 55 | | 0.02% |
| Adult | Migration seasons (August to October, and January to March) | North Caithness Cliffs | 3,400 | 0.05 | 170 | | 0.05% |
| Adult | Migration seasons (August to October, and January to March) | North Rona & Sula Sgeir | 2,178 | 0.98 | 2,134 | | 0.67% |

MONA OFFSHORE WIND PROJECT

| Age | Season | Colony | Total number of SPA birds | Proportion SPA birds in area | Birds in region | Total birds BDMPS | Proportion SPA/BDMPS |
|-------|---|-----------------------------|---------------------------|------------------------------|-----------------|-------------------|----------------------|
| Adult | Migration seasons (August to October, and January to March) | Cape Wrath | 4,180 | 0.98 | 4,096 | | 1.29% |
| Adult | Migration seasons (August to October, and January to March) | Handa | 10,330 | 0.98 | 10,123 | | 3.19% |
| Adult | Migration seasons (August to October, and January to March) | St Kilda | 3,400 | 0.98 | 3,332 | | 1.05% |
| Adult | Migration seasons (August to October, and January to March) | Shiantis | 8,496 | 0.98 | 8,326 | | 2.63% |
| Adult | Migration seasons (August to October, and January to March) | Flannan Islands | 2,102 | 0.98 | 2,060 | | 0.65% |
| Adult | Migration seasons (August to October, and January to March) | Mingulay & Berneray | 20,222 | 0.98 | 19,818 | | 6.25% |
| Adult | Migration seasons (August to October, and January to March) | Rathlin Island | 30,786 | 0.98 | 30,170 | | 9.52% |
| Adult | Migration seasons (August to October, and January to March) | Skomer & Skokholm | 12,002 | 0.98 | 11,762 | | 3.71% |
| Adult | Migration seasons (August to October, and January to March) | UK Western non-SPA colonies | 20,000 | 0.98 | 19,600 | | 6.18% |
| Adult | Migration seasons (August to October, and January to March) | Ireland | 34,000 | 0.1 | 3,400 | | 1.07% |

MONA OFFSHORE WIND PROJECT

| Age | Season | Colony | Total number of SPA birds | Proportion SPA birds in area | Birds in region | Total birds BDMPs | Proportion SPA/BDMPs |
|-------|---|--------------------------|---------------------------|------------------------------|-----------------|-----------------------------------|----------------------|
| Adult | Migration seasons (August to October, and January to March) | France | 50 | 0.05 | 2 | Adult UK Western waters = 179,182 | 0.00% |
| Adult | Winter (November and December) | Russia | 7,000 | 0.01 | 70 | | 0.04% |
| Adult | Winter (November and December) | Iceland | 630,800 | 0.2 | 126,160 | | 70.41% |
| Adult | Winter (November and December) | Norway | 60,600 | 0.05 | 3,030 | | 1.69% |
| Adult | Winter (November and December) | Denmark, Finland, Sweden | 32,000 | 0.02 | 640 | | 0.36% |
| Adult | Winter (November and December) | Faroe | 9,000 | 0.3 | 2,700 | | 1.51% |
| Adult | Winter (November and December) | Foula | 750 | 0.01 | 8 | | 0.00% |
| Adult | Winter (November and December) | Fair Isle | 1,830 | 0.01 | 18 | | 0.01% |
| Adult | Winter (November and December) | West Westray | 1,100 | 0.01 | 11 | | 0.01% |
| Adult | Winter (November and December) | North Caithness Cliffs | 3,400 | 0.01 | 34 | | 0.02% |
| Adult | Winter (November and December) | East Caithness Cliffs | 25,000 | 0.01 | 250 | | 0.14% |
| Adult | Winter (November and December) | Troup, Pennan & Lions | 3,486 | 0.01 | 35 | | 0.02% |
| Adult | Winter (November and December) | Fowlsheugh | 7,048 | 0.01 | 70 | | 0.04% |
| Adult | Winter (November and December) | Forth Islands | 5,250 | 0.01 | 52 | | 0.03% |

MONA OFFSHORE WIND PROJECT

| Age | Season | Colony | Total number of SPA birds | Proportion SPA birds in area | Birds in region | Total birds BDMPS | Proportion SPA/BDMPS |
|-------|--------------------------------|-------------------------------|---------------------------|------------------------------|-----------------|-------------------|----------------------|
| Adult | Winter (November and December) | St Abbs to Fast Castle | 2,438 | 0.01 | 24 | | 0.01% |
| Adult | Winter (November and December) | Flamborough & Filey | 20,002 | 0.01 | 200 | | 0.11% |
| Adult | Winter (November and December) | UK North Sea non-SPA colonies | 20,000 | 0.01 | 200 | | 0.11% |
| Adult | Winter (November and December) | North Rona & Sula Sgeir | 2,178 | 0.4 | 871 | | 0.49% |
| Adult | Winter (November and December) | Cape Wrath | 4,180 | 0.4 | 1,672 | | 0.93% |
| Adult | Winter (November and December) | Handa | 10,330 | 0.4 | 4,132 | | 2.31% |
| Adult | Winter (November and December) | St Kilda | 3,400 | 0.4 | 1,360 | | 0.76% |
| Adult | Winter (November and December) | Shiant | 8,496 | 0.4 | 3,398 | | 1.90% |
| Adult | Winter (November and December) | Flannan Islands | 2,102 | 0.4 | 841 | | 0.47% |
| Adult | Winter (November and December) | Mingulay & Berneray | 20,222 | 0.4 | 8,089 | | 4.51% |
| Adult | Winter (November and December) | Rathlin Island | 30,786 | 0.4 | 12,314 | | 6.87% |
| Adult | Winter (November and December) | Skomer & Skokholm | 12,002 | 0.3 | 3,601 | | 2.01% |
| Adult | Winter (November and December) | UK Western non-SPA colonies | 20,000 | 0.3 | 6,000 | | 3.35% |
| Adult | Winter (November and December) | Ireland | 34,000 | 0.1 | 3,400 | | 1.90% |

MONA OFFSHORE WIND PROJECT

| Age | Season | Colony | Total number of SPA birds | Proportion SPA birds in area | Birds in region | Total birds BDMPS | Proportion SPA/BDMPS |
|-------|--------------------------------|--------|---------------------------|------------------------------|-----------------|-------------------|----------------------|
| Adult | Winter (November and December) | France | 50 | 0.05 | 2 | | 0.00% |

MONA OFFSHORE WIND PROJECT

Table 1.11: Immature non-breeding razorbill colony weighting factors used for apportioning impacts of displacement (UK Western region).

| Age | Season | Colony | Total number of SPA birds | Proportion SPA birds in area | Birds in region | Total birds BDMPS | Proportion SPA/BDMPS |
|----------|---|--------------------------|---------------------------|------------------------------|-----------------|--------------------------------------|----------------------|
| Immature | Migration seasons (August to October, and January to March) | Russia | 5250 | 0.1 | 525 | Immature UK Western waters = 289,988 | 0.18% |
| Immature | Migration seasons (August to October, and January to March) | Iceland | 473100 | 0.4 | 189,240 | | 65.26% |
| Immature | Migration seasons (August to October, and January to March) | Norway | 45450 | 0.3 | 13,635 | | 4.70% |
| Immature | Migration seasons (August to October, and January to March) | Denmark, Finland, Sweden | 24000 | 0.1 | 2,400 | | 0.83% |
| Immature | Migration seasons (August to October, and January to March) | Faroe | 6750 | 0.5 | 3,375 | | 1.16% |
| Immature | Migration seasons (August to October, and January to March) | Foula | 562 | 0.05 | 28 | | 0.01% |
| Immature | Migration seasons (August to October, and January to March) | Fair Isle | 1372 | 0.05 | 69 | | 0.02% |
| Immature | Migration seasons (August to October, and January to March) | West Westray | 825 | 0.05 | 41 | | 0.01% |
| Immature | Migration seasons (August to October, and January to March) | North Caithness Cliffs | 2550 | 0.05 | 128 | | 0.04% |

MONA OFFSHORE WIND PROJECT

| Age | Season | Colony | Total number of SPA birds | Proportion SPA birds in area | Birds in region | Total birds BDMPS | Proportion SPA/BDMPS |
|----------|---|-----------------------------|---------------------------|------------------------------|-----------------|-------------------|----------------------|
| Immature | Migration seasons (August to October, and January to March) | North Rona & Sula Sgeir | 18750 | 0.02 | 375 | | 0.13% |
| Immature | Migration seasons (August to October, and January to March) | Cape Wrath | 2614 | 0.02 | 52 | | 0.02% |
| Immature | Migration seasons (August to October, and January to March) | Handa | 5286 | 0.02 | 106 | | 0.04% |
| Immature | Migration seasons (August to October, and January to March) | St Kilda | 3938 | 0.02 | 79 | | 0.03% |
| Immature | Migration seasons (August to October, and January to March) | Shiantis | 1828 | 0.02 | 37 | | 0.01% |
| Immature | Migration seasons (August to October, and January to March) | Flannan Islands | 15002 | 0.02 | 300 | | 0.10% |
| Immature | Migration seasons (August to October, and January to March) | Mingulay & Berneray | 15000 | 0.02 | 300 | | 0.10% |
| Immature | Migration seasons (August to October, and January to March) | Rathlin Island | 1634 | 0.9 | 1,470 | | 0.51% |
| Immature | Migration seasons (August to October, and January to March) | Skomer & Skokholm | 3135 | 0.9 | 2,822 | | 0.97% |
| Immature | Migration seasons (August to October, and January to March) | UK Western non-SPA colonies | 7748 | 0.9 | 6,973 | | 2.40% |

MONA OFFSHORE WIND PROJECT

| Age | Season | Colony | Total number of SPA birds | Proportion SPA birds in area | Birds in region | Total birds BDMPS | Proportion SPA/BDMPS |
|----------|---|--------------------------|---------------------------|------------------------------|-----------------|--------------------------------------|----------------------|
| Immature | Migration seasons (August to October, and January to March) | Ireland | 2550 | 0.9 | 2,295 | | 0.79% |
| Immature | Migration seasons (August to October, and January to March) | France | 6372 | 0.9 | 5,735 | | 1.98% |
| Immature | Winter (November and December) | Russia | 1576 | 0.9 | 1,419 | | 0.49% |
| Immature | Winter (November and December) | Iceland | 15166 | 0.9 | 13,650 | | 4.71% |
| Immature | Winter (November and December) | Norway | 23090 | 0.9 | 20,781 | | 7.17% |
| Immature | Winter (November and December) | Denmark, Finland, Sweden | 9002 | 0.9 | 8,101 | | 2.79% |
| Immature | Winter (November and December) | Faroe | 15000 | 0.9 | 13,500 | | 4.66% |
| Immature | Winter (November and December) | Foula | 25500 | 0.1 | 2,550 | | 0.88% |
| Immature | Winter (November and December) | Fair Isle | 38 | 0.05 | 2 | | 0.00% |
| Immature | Winter (November and December) | West Westray | 5250 | 0.02 | 105 | Immature UK Western waters = 162,239 | 0.06% |
| Immature | Winter (November and December) | North Caithness Cliffs | 473100 | 0.3 | 141,930 | | 87.48% |
| Immature | Winter (November and December) | East Caithness Cliffs | 45450 | 0.1 | 4,545 | | 2.80% |
| Immature | Winter (November and December) | Troup, Pennan & Lions | 24000 | 0.05 | 1,200 | | 0.74% |

MONA OFFSHORE WIND PROJECT

| Age | Season | Colony | Total number of SPA birds | Proportion SPA birds in area | Birds in region | Total birds BDMPS | Proportion SPA/BDMPS |
|----------|--------------------------------|-------------------------------|---------------------------|------------------------------|-----------------|-------------------|----------------------|
| Immature | Winter (November and December) | Fowlsheugh | 6750 | 0.3 | 2,025 | | 1.25% |
| Immature | Winter (November and December) | Forth Islands | 562 | 0.02 | 11 | | 0.01% |
| Immature | Winter (November and December) | St Abbs to Fast Castle | 1372 | 0.02 | 27 | | 0.02% |
| Immature | Winter (November and December) | Flamborough & Filey | 825 | 0.02 | 16 | | 0.01% |
| Immature | Winter (November and December) | UK North Sea non-SPA colonies | 2550 | 0.02 | 51 | | 0.03% |
| Immature | Winter (November and December) | North Rona & Sula Sgeir | 18750 | 0.02 | 375 | | 0.23% |
| Immature | Winter (November and December) | Cape Wrath | 2614 | 0.02 | 52 | | 0.03% |
| Immature | Winter (November and December) | Handa | 5286 | 0.02 | 106 | | 0.07% |
| Immature | Winter (November and December) | St Kilda | 3938 | 0.02 | 79 | | 0.05% |
| Immature | Winter (November and December) | Shiant | 1828 | 0.02 | 37 | | 0.02% |
| Immature | Winter (November and December) | Flannan Islands | 15002 | 0.02 | 300 | | 0.18% |
| Immature | Winter (November and December) | Mingulay & Berneray | 15000 | 0.02 | 300 | | 0.18% |
| Immature | Winter (November and December) | Rathlin Island | 1634 | 0.1 | 163 | | 0.10% |
| Immature | Winter (November and December) | Skomer & Skokholm | 3135 | 0.1 | 314 | | 0.19% |

MONA OFFSHORE WIND PROJECT

| Age | Season | Colony | Total number of SPA birds | Proportion SPA birds in area | Birds in region | Total birds BDMPS | Proportion SPA/BDMPS |
|----------|--------------------------------|-----------------------------|---------------------------|------------------------------|-----------------|-------------------|----------------------|
| Immature | Winter (November and December) | UK Western non-SPA colonies | 7748 | 0.1 | 775 | | 0.48% |
| Immature | Winter (November and December) | Ireland | 2550 | 0.1 | 255 | | 0.16% |
| Immature | Winter (November and December) | France | 6372 | 0.1 | 637 | | 0.39% |

MONA OFFSHORE WIND PROJECT

1.4.3 Northern gannet

Colony weighted proportions

1.4.3.1 Colonies included based on foraging distance, distance to the Mona Array Area centroid, and the resulting designated and non-designated site weighted proportions of this species are given Table 1.12 and Table 1.14, with the highest weighting factor assigned to Ailsa Craig (0.562%).

Table 1.12: Northern gannet colony weighting factors used for apportioning impacts of collision and displacement in the breeding season.

| Colony location | Adult bird count (adjusted for IND) | Distance to Mona Array Area (km) | Distance ² | Prop of Forage Range as Sea | 1/Prop of Forage Range as Sea | Colony pop/ sum of pop | Sum dist ² / col dist ² | Colony sea/ sum of sea | SPA weight (based on distance ²) | Proportional SPA weight |
|--|-------------------------------------|----------------------------------|-----------------------|-----------------------------|-------------------------------|------------------------|---|------------------------|--|-------------------------|
| Anglesey Terns / Morwenoliaid Ynys Môn SPA | 42 | 33.3 | 1107.8 | 0.781 | 1.280 | 0.000 | 1376.575 | 0.064 | 0.010 | 0.006 |
| Lambay Island SPA | 1,852 | 129.5 | 16760.0 | 0.530 | 1.888 | 0.005 | 90.987 | 0.094 | 0.042 | 0.024 |
| Ireland's Eye SPA | 370 | 135.1 | 18241.5 | 0.520 | 1.922 | 0.001 | 83.597 | 0.096 | 0.008 | 0.004 |
| Ailsa Craig SPA | 66,452 | 174.6 | 30484.7 | 0.447 | 2.239 | 0.176 | 50.023 | 0.112 | 0.983 | 0.562 |
| Grassholm SPA | 72,022 | 232.5 | 54034.2 | 0.871 | 1.148 | 0.191 | 28.222 | 0.057 | 0.308 | 0.176 |

MONA OFFSHORE WIND PROJECT

| Colony location | Adult bird count (adjusted for IND) | Distance to Mona Array Area (km) | Distance ² | Prop of Forage Range as Sea | 1/Prop of Forage Range as Sea | Colony pop/ sum of pop | Sum dist ² / col dist ² | Colony sea/ sum of sea | SPA weight (based on distance ²) | Proportional SPA weight |
|--------------------------------|-------------------------------------|----------------------------------|-----------------------|-----------------------------|-------------------------------|------------------------|---|------------------------|--|-------------------------|
| Saltee Islands SPA | 9,444 | 240.8 | 57973.2 | 0.664 | 1.507 | 0.025 | 26.304 | 0.075 | 0.049 | 0.028 |
| Clare Island SPA | 1,238 | 392.2 | 153844.6 | 0.672 | 1.488 | 0.003 | 9.912 | 0.074 | 0.002 | 0.001 |
| Mingulay and Berneray SPA | 30 | 402.0 | 161579.2 | 0.944 | 1.060 | 0.000 | 9.438 | 0.053 | 0.000 | 0.000 |
| The Bull and the Cow Rocks SPA | 12,776 | 479.9 | 230307.1 | 0.789 | 1.268 | 0.034 | 6.621 | 0.063 | 0.014 | 0.008 |
| Skelligs SPA | 70,588 | 482.1 | 232387.1 | 0.799 | 1.251 | 0.187 | 6.562 | 0.062 | 0.077 | 0.044 |
| St Kilda SPA | 120,636 | 532.2 | 283232.0 | 0.973 | 1.028 | 0.320 | 5.384 | 0.051 | 0.088 | 0.050 |
| Scare Rocks SSSI | 4,752 | 104.1 | 10839.3 | 0.606 | 1.652 | 0.013 | 140.685 | 0.082 | 0.146 | 0.083 |
| Garvan Islands | 60 | 274.5 | 75366.5 | 0.993 | 1.007 | 0.000 | 20.234 | 0.050 | 0.000 | 0.000 |
| Alderney | 17,080 | 445.8 | 198774.5 | 0.757 | 1.321 | 0.045 | 7.672 | 0.066 | 0.023 | 0.013 |

MONA OFFSHORE WIND PROJECT

Table 1.13: Adult non-breeding northern gannet colony weighting factors used for apportioning impacts of collision risk and displacement (UK Western region).

| Age | Season | Colony | Total number of birds | Proportion birds in area | Total birds BDMPs | Birds in region | Percentage birds/BDMPs |
|-------|---|--------------------------|-----------------------|--------------------------|-------------------|-----------------------------------|------------------------|
| Adult | Post-breeding migration (September to November) | Iceland | 57,000 | 0.2 | 11,400 | Adult UK western waters = 318,002 | 3.58% |
| Adult | Post-breeding migration (September to November) | Norway | 9,000 | 0.2 | 1,800 | | 0.57% |
| Adult | Post-breeding migration (September to November) | Faroe | 5,000 | 0.2 | 1,000 | | 0.31% |
| Adult | Post-breeding migration (September to November) | Hermaness, Saxavord | 48,706 | 0.2 | 9,741 | | 3.06% |
| Adult | Post-breeding migration (September to November) | Noss | 19,534 | 0.2 | 3,907 | | 1.23% |
| Adult | Post-breeding migration (September to November) | Fair Isle | 7,848 | 0.2 | 1,570 | | 0.49% |
| Adult | Post-breeding migration (September to November) | Sule Skerry & Sule Stack | 9,350 | 0.9 | 8,415 | | 2.65% |
| Adult | Post-breeding migration (September to November) | North Rona & Sula Sgeir | 18,450 | 0.9 | 16,605 | | 5.22% |
| Adult | Post-breeding migration (September to November) | St Kilda | 119,244 | 0.9 | 107,320 | | 33.75% |

MONA OFFSHORE WIND PROJECT

| Age | Season | Colony | Total number of birds | Proportion birds in area | Total birds BDMPs | Birds in region | Percentage birds/BDMPs |
|-------|---|-------------------------|-----------------------|--------------------------|-------------------|-----------------------------------|------------------------|
| Adult | Post-breeding migration (September to November) | Ailsa Craig | 5,4260 | 1 | 54,260 | | 17.06% |
| Adult | Post-breeding migration (September to November) | Grassholm | 78,584 | 1 | 78,584 | | 24.71% |
| Adult | Post-breeding migration (September to November) | UK western non-SPA cols | 9,000 | 1 | 9,000 | | 2.83% |
| Adult | Post-breeding migration (September to November) | Ireland | 72,000 | 0.2 | 14,400 | | 4.53% |
| Adult | Return migration (December to March) | Iceland | 57,000 | 0.2 | 11,400 | Adult UK western waters = 391,540 | 2.91% |
| Adult | Return migration (December to March) | Norway | 9,000 | 0.2 | 1,800 | | 0.46% |
| Adult | Return migration (December to March) | Faroe | 5,000 | 0.3 | 1,500 | | 0.38% |
| Adult | Return migration (December to March) | Hermaness, Saxavord | 48,706 | 0.3 | 14,612 | | 3.73% |
| Adult | Return migration (December to March) | Noss | 19,534 | 0.3 | 5,860 | | 1.50% |
| Adult | Return migration (December to March) | Fair Isle | 7,848 | 0.3 | 2,354 | | 0.60% |
| Adult | Return migration (December to March) | Forth Islands | 110,964 | 0.3 | 33,289 | | 8.50% |
| Adult | Return migration (December to March) | Flamborough & Filey | 22,122 | 0.3 | 6,637 | | 1.69% |

MONA OFFSHORE WIND PROJECT

| Age | Season | Colony | Total number of birds | Proportion birds in area | Total birds BDMPs | Birds in region | Percentage birds/BDMPs |
|-------|--------------------------------------|---------------------------|-----------------------|--------------------------|-------------------|-----------------|------------------------|
| Adult | Return migration (December to March) | UK North Sea non-SPA cols | 12,000 | 0.3 | 3,600 | | 0.92% |
| Adult | Return migration (December to March) | Sule Skerry & Sule Stack | 9,350 | 1 | 9,350 | | 2.39% |
| Adult | Return migration (December to March) | North Rona & Sula Sgeir | 18,450 | 1 | 18,450 | | 4.71% |
| Adult | Return migration (December to March) | St Kilda | 119,244 | 1 | 119,244 | | 30.45% |
| Adult | Return migration (December to March) | Ailsa Craig | 54,260 | 1 | 54,260 | | 13.86% |
| Adult | Return migration (December to March) | Grassholm | 78,584 | 1 | 78,584 | | 20.07% |
| Adult | Return migration (December to March) | UK western non-SPA cols | 9,000 | 1 | 9,000 | | 2.30% |
| Adult | Return migration (December to March) | Ireland | 72,000 | 0.3 | 21,600 | | 5.52% |

MONA OFFSHORE WIND PROJECT

Table 1.14: Immature non-breeding northern gannet colony weighting factors used for apportioning impacts of collision risk and displacement (UK Western region).

| Age | Season | Colony | Total number of birds | Proportion birds in area | Total birds BDMPS | Birds in region | Percentage birds/BDMPS |
|-----------|--------------------------------------|---------------------------|-----------------------|--------------------------|-------------------|--------------------------------------|------------------------|
| Immatures | Return migration (December to March) | Iceland | 46,170 | 0.2 | 9,234 | Immature UK Western waters = 270,348 | 3.41% |
| Immatures | Return migration (December to March) | Norway | 7,290 | 0.2 | 1,458 | | 0.54% |
| Immatures | Return migration (December to March) | Faroe | 4,050 | 0.3 | 1,215 | | 0.45% |
| Immatures | Return migration (December to March) | Hermaness, Saxavord | 39,452 | 0.3 | 11,836 | | 4.38% |
| Immatures | Return migration (December to March) | Noss | 15,823 | 0.3 | 4,747 | | 1.75% |
| Immatures | Return migration (December to March) | Fair Isle | 6,357 | 0.3 | 1,907 | | 0.70% |
| Immatures | Return migration (December to March) | Forth Islands | 89,881 | 0.3 | 26,964 | | 9.97% |
| Immatures | Return migration (December to March) | Flamborough & Filey | 17,919 | 0.3 | 5,376 | | 1.99% |
| Immatures | Return migration (December to March) | UK North Sea non-SPA cols | 9,720 | 0.3 | 2,916 | | 1.08% |
| Immatures | Return migration (December to March) | Sule Skerry & Sule Stack | 7,574 | 0.8 | 6,059 | | 2.24% |
| Immatures | Return migration (December to March) | North Rona & Sula Sgeir | 14,944 | 0.8 | 11,956 | | 4.42% |
| Immatures | Return migration (December to March) | St Kilda | 96,588 | 0.8 | 77,270 | | 28.58% |

MONA OFFSHORE WIND PROJECT

| Age | Season | Colony | Total number of birds | Proportion birds in area | Total birds BDMPs | Birds in region | Percentage birds/BDMPs |
|-----------|---|-------------------------|-----------------------|--------------------------|-------------------|--------------------------------------|------------------------|
| Immatures | Return migration (December to March) | Ailsa Craig | 43,951 | 0.8 | 35,160 | | 13.00% |
| Immatures | Return migration (December to March) | Grassholm | 63,653 | 0.8 | 50,922 | | 18.83% |
| Immatures | Return migration (December to March) | UK western non-SPA cols | 7,290 | 0.8 | 5,832 | | 2.16% |
| Immatures | Return migration (December to March) | Ireland | 58,320 | 0.3 | 17,496 | | 6.47% |
| Immatures | Post-breeding migration (September to November) | Iceland | 46,170 | 0.3 | 13,851 | Immature UK western waters = 227,951 | 6.08% |
| Immatures | Post-breeding migration (September to November) | Norway | 7,290 | 0.3 | 2,187 | | 0.96% |
| Immatures | Post-breeding migration (September to November) | Faroe | 4,050 | 0.3 | 1,215 | | 0.53% |
| Immatures | Post-breeding migration (September to November) | Hermaness, Saxavord | 39,452 | 0.1 | 3,945 | | 1.73% |
| Immatures | Post-breeding migration (September to November) | Noss | 15,823 | 0.1 | 1,582 | | 0.69% |
| Immatures | Post-breeding migration (September to November) | Fair Isle | 6,357 | 0.1 | 636 | | 0.28% |
| Immatures | Post-breeding migration (September to November) | Forth Islands | 89,881 | 0.1 | 8,988 | | 3.94% |

MONA OFFSHORE WIND PROJECT

| Age | Season | Colony | Total number of birds | Proportion birds in area | Total birds BDMPs | Birds in region | Percentage birds/BDMPs |
|-----------|---|---------------------------|-----------------------|--------------------------|-------------------|-----------------|------------------------|
| Immatures | Post-breeding migration (September to November) | Flamborough & Filey | 17,919 | 0.1 | 1,792 | | 0.79% |
| Immatures | Post-breeding migration (September to November) | UK North Sea non-SPA cols | 9,720 | 0.1 | 972 | | 0.43% |
| Immatures | Post-breeding migration (September to November) | Sule Skerry & Sule Stack | 7,574 | 0.7 | 5,301 | | 2.32% |
| Immatures | Post-breeding migration (September to November) | North Rona & Sula Sgeir | 14,944 | 0.7 | 10,461 | | 4.59% |
| Immatures | Post-breeding migration (September to November) | St Kilda | 96,588 | 0.7 | 67,611 | | 29.66% |
| Immatures | Post-breeding migration (September to November) | Ailsa Craig | 43,951 | 0.8 | 35,160 | | 15.42% |
| Immatures | Post-breeding migration (September to November) | Grassholm | 63,653 | 0.8 | 50,922 | | 22.34% |
| Immatures | Post-breeding migration (September to November) | UK western non-SPA cols | 7,290 | 0.8 | 5,832 | | 2.56% |
| Immatures | Post-breeding migration (September to November) | Ireland | 58,320 | 0.3 | 17,496 | | 7.67% |

MONA OFFSHORE WIND PROJECT

1.4.4 Black-legged kittiwake

Colony weighted proportions

1.4.4.1 Colonies included based on foraging distance, distance to the Mona Array Area centroid, and the resulting designated and non-designated site weighted proportions of this species are given Table 1.15 and Table 1.17, with the highest weighting factor assigned to Great Ormes Head SSSI (0.156%), followed by Rathlin Island SPA (0.049%), Baie ny Carrickey MNR (0.042%), Lambay Island SPA (0.038%) and Anglesey Terns SPA (0.037%).

Table 1.15: Black-legged kittiwake colony weighting factors used for apportioning impacts of collision and displacement in the breeding season.

| Colony location | Adult bird count (adjusted for IND) | Distance to Mona Array Area (km) | Distance ² | Prop of Forage Range as Sea | 1/Prop of Forage Range as Sea | Colony pop/ sum of pop | Sum dist ² / col dist ² | Colony sea/ sum of sea | SPA weight (based on distance ²) | Proportional SPA weight |
|--|-------------------------------------|----------------------------------|-----------------------|-----------------------------|-------------------------------|------------------------|---|------------------------|--|-------------------------|
| Anglesey Terns / Morwenoliaid Ynys Môn SPA | 312 | 32.98 | 1087.5 | 0.340 | 2.941 | 0.004 | 1778.790 | 0.026 | 0.170 | 0.037 |
| Glannau Ynys Gybi / Holy Island Coast SPA | 22 | 55.92 | 3126.8 | 0.346 | 2.890 | 0.000 | 618.689 | 0.025 | 0.004 | 0.001 |
| Ynys Seiriol / Puffin Island SPA | 254 | 34.27 | 1174.8 | 0.344 | 2.910 | 0.003 | 1646.698 | 0.025 | 0.127 | 0.028 |
| Lambay Island SPA | 6,640 | 129.95 | 16888.0 | 0.458 | 2.182 | 0.080 | 114.549 | 0.019 | 0.173 | 0.038 |
| Horn Head to Fanad Head SPA | 1468 | 299.60 | 89757.2 | 0.649 | 1.541 | 0.018 | 21.553 | 0.013 | 0.005 | 0.001 |

MONA OFFSHORE WIND PROJECT

| Colony location | Adult bird count (adjusted for IND) | Distance to Mona Array Area (km) | Distance ² | Prop of Forage Range as Sea | 1/Prop of Forage Range as Sea | Colony pop/ sum of pop | Sum dist ² / col dist ² | Colony sea/ sum of sea | SPA weight (based on distance ²) | Proportional SPA weight |
|-------------------------------|-------------------------------------|----------------------------------|-----------------------|-----------------------------|-------------------------------|------------------------|---|------------------------|--|-------------------------|
| Inishtrahull SPA | 14 | 274.58 | 75393.7 | 0.590 | 1.694 | 0.000 | 25.659 | 0.015 | 0.000 | 0.000 |
| Sheep Island SPA | 460 | 219.66 | 48248.4 | 0.517 | 1.936 | 0.006 | 40.095 | 0.017 | 0.004 | 0.001 |
| Rathlin Island SPA | 27,534 | 219.32 | 48102.3 | 0.514 | 1.946 | 0.330 | 40.216 | 0.017 | 0.225 | 0.049 |
| Ireland's Eye SPA | 3,100 | 135.57 | 18378.0 | 0.467 | 2.141 | 0.037 | 105.262 | 0.019 | 0.073 | 0.016 |
| Howth Head Coast SPA | 3,586 | 135.62 | 18391.9 | 0.467 | 2.143 | 0.043 | 105.182 | 0.019 | 0.084 | 0.018 |
| Rockabill SPA | 266 | 129.08 | 16662.9 | 0.456 | 2.193 | 0.003 | 116.096 | 0.019 | 0.007 | 0.002 |
| Wicklow Head SPA | 1,348 | 150.54 | 22662.0 | 0.468 | 2.139 | 0.016 | 85.363 | 0.019 | 0.026 | 0.006 |
| Helvick Head to Ballyquin SPA | 130 | 293.67 | 86243.3 | 0.654 | 1.530 | 0.002 | 22.431 | 0.013 | 0.000 | 0.000 |
| Saltee Islands SPA | 1,690 | 241.30 | 58224.2 | 0.581 | 1.722 | 0.020 | 33.225 | 0.015 | 0.010 | 0.002 |
| Rinns of Islay SPA | 782 | 266.37 | 70953.3 | 0.558 | 1.791 | 0.009 | 27.264 | 0.016 | 0.004 | 0.001 |

MONA OFFSHORE WIND PROJECT

| Colony location | Adult bird count (adjusted for IND) | Distance to Mona Array Area (km) | Distance ² | Prop of Forage Range as Sea | 1/Prop of Forage Range as Sea | Colony pop/ sum of pop | Sum dist ² / col dist ² | Colony sea/ sum of sea | SPA weight (based on distance ²) | Proportional SPA weight |
|--|-------------------------------------|----------------------------------|-----------------------|-----------------------------|-------------------------------|------------------------|---|------------------------|--|-------------------------|
| The Oa SPA | 150 | 247.74 | 61375.5 | 0.540 | 1.853 | 0.002 | 31.519 | 0.016 | 0.001 | 0.000 |
| North Colonsay and Western Cliffs SPA | 9,361 | 290.36 | 84309.3 | 0.578 | 1.729 | 0.112 | 22.945 | 0.015 | 0.039 | 0.008 |
| Ailsa Craig SPA | 980 | 175.05 | 30643.4 | 0.476 | 2.102 | 0.012 | 63.129 | 0.018 | 0.014 | 0.003 |
| Glannau Aberdaron ac Ynys Enlli / Aberdaron Coast and Bardsey Island SPA | 242 | 110.82 | 12280.6 | 0.385 | 2.600 | 0.003 | 157.525 | 0.023 | 0.010 | 0.002 |
| Mynydd Cilan, Trwyn y Wylfa ac Ynysoedd Sant Tudwal SPA | 516 | 98.20 | 9643.9 | 0.368 | 2.717 | 0.006 | 200.594 | 0.024 | 0.029 | 0.006 |
| Ramsey and St David's Peninsula Coast SPA | 92 | 215.74 | 46542.6 | 0.548 | 1.824 | 0.001 | 41.564 | 0.016 | 0.001 | 0.000 |
| Skomer, Skokholm and the Seas off Pembrokeshire SPA | 2,014 | 227.24 | 51638.5 | 0.567 | 1.763 | 0.024 | 37.462 | 0.015 | 0.014 | 0.003 |
| Bae Caerfyrddin / Carmarthen Bay SPA | 22 | 229.71 | 52768.2 | 0.578 | 1.730 | 0.000 | 36.660 | 0.015 | 0.000 | 0.000 |
| Pen y Gogarth / Great Ormes Head SSSI | 1,128 | 30.27 | 916.0 | 0.349 | 2.865 | 0.014 | 2111.968 | 0.025 | 0.712 | 0.156 |
| Glac na Criche SSSI | 20 | 274.24 | 75207.3 | 0.564 | 1.772 | 0.000 | 25.722 | 0.015 | 0.000 | 0.000 |

MONA OFFSHORE WIND PROJECT

| Colony location | Adult bird count (adjusted for IND) | Distance to Mona Array (km) | Distance ² | Prop of Forage Range as Sea | 1/Prop of Forage Range as Sea | Colony pop/ sum of pop | Sum dist ² / col dist ² | Colony sea/ sum of sea | SPA weight (based on distance ²) | Proportional SPA weight |
|---|-------------------------------------|-----------------------------|-----------------------|-----------------------------|-------------------------------|------------------------|---|------------------------|--|-------------------------|
| Sanda Islands SSSI | 66 | 192.11 | 36905.2 | 0.487 | 2.053 | 0.001 | 52.418 | 0.018 | 0.001 | 0.000 |
| Mull of Galloway SSSI | 814 | 108.01 | 11665.2 | 0.419 | 2.386 | 0.010 | 165.835 | 0.021 | 0.034 | 0.007 |
| Scare Rocks SSSI | 104 | 104.57 | 10934.1 | 0.420 | 2.384 | 0.001 | 176.924 | 0.021 | 0.005 | 0.001 |
| Abbey Burn Foot to Balcary Point SSSI | 228 | 113.58 | 12900.0 | 0.440 | 2.272 | 0.003 | 149.961 | 0.020 | 0.008 | 0.002 |
| St. Bees Head SSSI | 1,144 | 80.70 | 6513.0 | 0.418 | 2.390 | 0.014 | 297.020 | 0.021 | 0.085 | 0.019 |
| Carreg y Llam SSSI | 1,448 | 79.88 | 6380.7 | 0.350 | 2.860 | 0.017 | 303.181 | 0.025 | 0.131 | 0.029 |
| Creigiau Rhiwledyn / Little Ormes Head SSSI | 56 | 31.54 | 994.7 | 0.351 | 2.851 | 0.001 | 1944.844 | 0.025 | 0.032 | 0.007 |
| Grassholm / Ynys Gwales SSSI | 60 | 232.96 | 54272.4 | 0.572 | 1.748 | 0.001 | 35.644 | 0.015 | 0.000 | 0.000 |
| Aberarth - Carreg Wylan SSSI | 664 | 159.08 | 25306.9 | 0.465 | 2.152 | 0.008 | 76.442 | 0.019 | 0.011 | 0.002 |
| St. Margaret's Island SSSI | 452 | 226.14 | 51140.4 | 0.573 | 1.745 | 0.005 | 37.827 | 0.015 | 0.003 | 0.001 |
| Lundy SSSI | 568 | 276.48 | 76438.5 | 0.645 | 1.551 | 0.007 | 25.308 | 0.013 | 0.002 | 0.001 |
| Bracelet Bay SSSI | 180 | 227.18 | 51609.9 | 0.566 | 1.767 | 0.002 | 37.483 | 0.015 | 0.001 | 0.000 |
| West Exmoor Coast and Woods SSSI | 390 | 264.88 | 70159.7 | 0.615 | 1.626 | 0.005 | 27.573 | 0.014 | 0.002 | 0.000 |

MONA OFFSHORE WIND PROJECT

| Colony location | Adult bird count (adjusted for IND) | Distance to Mona Array (km) | Distance ² | Prop of Forage Range as Sea | 1/Prop of Forage Range as Sea | Colony pop/ sum of pop | Sum dist ² / col dist ² | Colony sea/ sum of sea | SPA weight (based on distance ²) | Proportional SPA weight |
|-----------------------------|-------------------------------------|-----------------------------|-----------------------|-----------------------------|-------------------------------|------------------------|---|------------------------|--|-------------------------|
| Baie ny Carrickey MNR | 1,106 | 55.71 | 3103.1 | 0.375 | 2.668 | 0.013 | 623.413 | 0.023 | 0.192 | 0.042 |
| Calf and Wart Bank MNR | 26 | 57.84 | 3346.0 | 0.375 | 2.667 | 0.000 | 578.146 | 0.023 | 0.004 | 0.001 |
| Ramsey Bay MNR | 156 | 58.70 | 3446.3 | 0.385 | 2.599 | 0.002 | 561.332 | 0.023 | 0.024 | 0.005 |
| West Coast MNR | 108 | 62.19 | 3867.0 | 0.380 | 2.631 | 0.001 | 500.253 | 0.023 | 0.015 | 0.003 |
| Skerries and Causeway SAC | 874 | 229.52 | 52680.0 | 0.535 | 1.868 | 0.010 | 36.722 | 0.016 | 0.006 | 0.001 |
| North Channel SAC | 3,712 | 158.11 | 24997.6 | 0.456 | 2.194 | 0.045 | 77.388 | 0.019 | 0.066 | 0.014 |
| Murlough NNR | 1,700 | 127.49 | 16254.0 | 0.431 | 2.322 | 0.020 | 119.017 | 0.020 | 0.049 | 0.011 |
| Downhill | 234 | 233.42 | 54483.9 | 0.546 | 1.832 | 0.003 | 35.506 | 0.016 | 0.002 | 0.000 |
| Causeway Coast | 635 | 217.82 | 47445.5 | 0.514 | 1.944 | 0.008 | 40.773 | 0.017 | 0.005 | 0.001 |
| Sligo Bay | 56 | 295.80 | 87498.7 | 0.665 | 1.504 | 0.001 | 22.109 | 0.013 | 0.000 | 0.000 |
| Bray | 2,946 | 143.62 | 20625.4 | 0.474 | 2.110 | 0.035 | 93.792 | 0.018 | 0.061 | 0.013 |
| Dunmore East to Red Head | 884 | 257.93 | 66525.9 | 0.605 | 1.654 | 0.011 | 29.079 | 0.014 | 0.004 | 0.001 |
| Creadan Head to Foilakipeen | 52 | 256.10 | 65586.2 | 0.602 | 1.660 | 0.001 | 29.496 | 0.014 | 0.000 | 0.000 |

MONA OFFSHORE WIND PROJECT

| Colony location | Adult bird count (adjusted for IND) | Distance to Mona Array Area (km) | Distance ² | Prop of Forage Range as Sea | 1/Prop of Forage Range as Sea | Colony pop/ sum of pop | Sum dist ² / col dist ² | Colony sea/ sum of sea | SPA weight (based on distance ²) | Proportional SPA weight |
|--------------------------------|-------------------------------------|----------------------------------|-----------------------|-----------------------------|-------------------------------|------------------------|---|------------------------|--|-------------------------|
| Portally to Benlea Head | 200 | 259.38 | 67278.3 | 0.606 | 1.649 | 0.002 | 28.754 | 0.014 | 0.001 | 0.000 |
| Offshore - Irish Sea | 1,234 | 20.56 | 422.8 | 0.373 | 2.684 | 0.015 | 4575.200 | 0.023 | 1.581 | 0.345 |
| Morecambe Central Gas Platform | 1,112 | 33.15 | 1099.1 | 0.393 | 2.544 | 0.013 | 1760.008 | 0.022 | 0.520 | 0.113 |

MONA OFFSHORE WIND PROJECT

Table 1.16: Adult non-breeding black-legged kittiwake colony weighting factors for apportioning impacts of collision risk and displacement (UK Western waters and Channel region).

| Age | Season | Colony | Total number of birds | Proportion birds in area | Birds in region | Total birds BDMPS | Percentage birds/BDMPS |
|-------|---------------------------------------|---------------------|-----------------------|--------------------------|-----------------|---|------------------------|
| Adult | Autumn migration (August to December) | Russia | 280,000 | 0.1 | 28,000 | Adult UK Western waters and Channel = 498,970 | 5.61% |
| Adult | Autumn migration (August to December) | Norway | 1,400,000 | 0.15 | 210,000 | | 42.09% |
| Adult | Autumn migration (August to December) | Faroe | 400,000 | 0.2 | 80,000 | | 16.03% |
| Adult | Autumn migration (August to December) | Germany | 12,000 | 0.05 | 600 | | 0.12% |
| Adult | Autumn migration (August to December) | France | 8,000 | 0.1 | 800 | | 0.16% |
| Adult | Autumn migration (August to December) | Ireland | 40,000 | 0.3 | 12,000 | | 2.40% |
| Adult | Autumn migration (August to December) | Hermaness, Saxavord | 782 | 0.2 | 156 | | 0.03% |
| Adult | Autumn migration (August to December) | Foula | 654 | 0.2 | 131 | | 0.03% |
| Adult | Autumn migration (August to December) | Noss | 1,014 | 0.2 | 203 | | 0.04% |
| Adult | Autumn migration (August to December) | Sumburgh Head | 420 | 0.2 | 84 | | 0.02% |
| Adult | Autumn migration (August to December) | Fair Isle | 1,542 | 0.2 | 308 | | 0.06% |
| Adult | Autumn migration (August to December) | West Westray | 24,110 | 0.2 | 4,822 | | 0.97% |
| Adult | Autumn migration (August to December) | Calf of Eday | 1,494 | 0.2 | 299 | | 0.06% |

MONA OFFSHORE WIND PROJECT

| Age | Season | Colony | Total number of birds | Proportion birds in area | Birds in region | Total birds BDMPS | Percentage birds/BDMPS |
|-------|---------------------------------------|-----------------------------|-----------------------|--------------------------|-----------------|-------------------|------------------------|
| Adult | Autumn migration (August to December) | Marwick Head | 1,052 | 0.2 | 210 | | 0.04% |
| Adult | Autumn migration (August to December) | Rousay | 3,528 | 0.2 | 706 | | 0.14% |
| Adult | Autumn migration (August to December) | Copinsay | 1,332 | 0.2 | 266 | | 0.05% |
| Adult | Autumn migration (August to December) | Hoy | 794 | 0.2 | 159 | | 0.03% |
| Adult | Autumn migration (August to December) | North Caithness Cliffs | 20,300 | 0.2 | 4,060 | | 0.81% |
| Adult | Autumn migration (August to December) | East Caithness Cliffs | 80,820 | 0.2 | 16,164 | | 3.24% |
| Adult | Autumn migration (August to December) | Troup, Pennan & Lions Heads | 29,792 | 0.2 | 5,958 | | 1.19% |
| Adult | Autumn migration (August to December) | Buchan Ness to Collieston | 25,084 | 0.2 | 5,017 | | 1.01% |
| Adult | Autumn migration (August to December) | Fowlsheugh | 18,674 | 0.2 | 3,735 | | 0.75% |
| Adult | Autumn migration (August to December) | Forth Islands | 6,200 | 0.2 | 1,240 | | 0.25% |
| Adult | Autumn migration (August to December) | St Abbs Head to Fast Castle | 6,806 | 0.2 | 1,361 | | 0.27% |
| Adult | Autumn migration (August to December) | Farne Islands | 6,886 | 0.2 | 1,377 | | 0.28% |
| Adult | Autumn migration (August to December) | Flamborough and Filey | 75,234 | 0.2 | 150,47 | | 3.02% |

MONA OFFSHORE WIND PROJECT

| Age | Season | Colony | Total number of birds | Proportion birds in area | Birds in region | Total birds BDMPS | Percentage birds/BDMPS |
|-------|---------------------------------------|---------------------------------|-----------------------|--------------------------|-----------------|-------------------|------------------------|
| Adult | Autumn migration (August to December) | UK North Sea non-SPA colonies | 140,000 | 0.2 | 28,000 | | 5.61% |
| Adult | Autumn migration (August to December) | Cape Wrath | 20,688 | 0.6 | 12,413 | | 2.49% |
| Adult | Autumn migration (August to December) | North Rona & Sula Sgeir | 2,506 | 0.6 | 1,504 | | 0.30% |
| Adult | Autumn migration (August to December) | Handa | 3,744 | 0.6 | 2,246 | | 0.45% |
| Adult | Autumn migration (August to December) | St Kilda | 1,914 | 0.6 | 1,148 | | 0.23% |
| Adult | Autumn migration (August to December) | Flannan Isles | 2,784 | 0.6 | 1,670 | | 0.33% |
| Adult | Autumn migration (August to December) | Shiant Isles | 1,098 | 0.6 | 659 | | 0.13% |
| Adult | Autumn migration (August to December) | Canna & Sanday | 1,640 | 0.6 | 984 | | 0.20% |
| Adult | Autumn migration (August to December) | Rum | 1,576 | 0.6 | 946 | | 0.19% |
| Adult | Autumn migration (August to December) | Mingulay & Berneray | 4,456 | 0.6 | 2,674 | | 0.54% |
| Adult | Autumn migration (August to December) | North Colonsay & Western Cliffs | 11,126 | 0.6 | 6,676 | | 1.34% |
| Adult | Autumn migration (August to December) | Ailsa Craig | 978 | 0.6 | 587 | | 0.12% |
| Adult | Autumn migration (August to December) | Rathlin Island | 15,844 | 0.6 | 9,506 | | 1.91% |

MONA OFFSHORE WIND PROJECT

| Age | Season | Colony | Total number of birds | Proportion birds in area | Birds in region | Total birds BDMPs | Percentage birds/BDMPs |
|-------|---------------------------------------|------------------------------|-----------------------|--------------------------|-----------------|---|------------------------|
| Adult | Autumn migration (August to December) | Skomer, Skokholm, Middleholm | 2,090 | 0.6 | 1,254 | | 0.25% |
| Adult | Autumn migration (August to December) | UK Western non-SPA colonies | 60,000 | 0.6 | 36,000 | | 7.21% |
| Adult | Spring migration (January to April) | Russia | 280,000 | 0.05 | 14,000 | Adult Uk Western waters and Channel = 375,711 | 3.73% |
| Adult | Spring migration (January to April) | Norway | 1,400,000 | 0.05 | 70,000 | | 18.63% |
| Adult | Spring migration (January to April) | Faroe | 400,000 | 0.1 | 40,000 | | 10.65% |
| Adult | Spring migration (January to April) | Germany | 12,000 | 0.05 | 600 | | 0.16% |
| Adult | Spring migration (January to April) | France | 8,000 | 0.1 | 800 | | 0.21% |
| Adult | Spring migration (January to April) | Ireland | 40,000 | 0.3 | 120,00 | | 3.19% |
| Adult | Spring migration (January to April) | Hermaness, Saxavord | 782 | 0.3 | 235 | | 0.06% |
| Adult | Spring migration (January to April) | Foula | 654 | 0.3 | 196 | | 0.05% |
| Adult | Spring migration (January to April) | Noss | 1,014 | 0.3 | 304 | | 0.08% |
| Adult | Spring migration (January to April) | Sumburgh Head | 420 | 0.3 | 126 | | 0.03% |
| Adult | Spring migration (January to April) | Fair Isle | 1,542 | 0.3 | 463 | | 0.12% |

MONA OFFSHORE WIND PROJECT

| Age | Season | Colony | Total number of birds | Proportion birds in area | Birds in region | Total birds BDMPS | Percentage birds/BDMPS |
|-------|-------------------------------------|-----------------------------|-----------------------|--------------------------|-----------------|-------------------|------------------------|
| Adult | Spring migration (January to April) | West Westray | 24,110 | 0.3 | 7,233 | | 1.93% |
| Adult | Spring migration (January to April) | Calf of Eday | 1,494 | 0.3 | 448 | | 0.12% |
| Adult | Spring migration (January to April) | Marwick Head | 1,052 | 0.3 | 316 | | 0.08% |
| Adult | Spring migration (January to April) | Rousay | 3,528 | 0.3 | 1,058 | | 0.28% |
| Adult | Spring migration (January to April) | Copinsay | 1,332 | 0.3 | 400 | | 0.11% |
| Adult | Spring migration (January to April) | Hoy | 794 | 0.3 | 238 | | 0.06% |
| Adult | Spring migration (January to April) | North Caithness Cliffs | 20,300 | 0.3 | 6,090 | | 1.62% |
| Adult | Spring migration (January to April) | East Caithness Cliffs | 80,820 | 0.3 | 24,246 | | 6.45% |
| Adult | Spring migration (January to April) | Troup, Pennan & Lions Heads | 29,792 | 0.3 | 8,938 | | 2.38% |
| Adult | Spring migration (January to April) | Buchan Ness to Collieston | 25,084 | 0.3 | 7,525 | | 2.00% |
| Adult | Spring migration (January to April) | Fowlsheugh | 18,674 | 0.3 | 5,602 | | 1.49% |
| Adult | Spring migration (January to April) | Forth Islands | 6,200 | 0.3 | 1,860 | | 0.50% |
| Adult | Spring migration (January to April) | St Abbs Head to Fast Castle | 6,806 | 0.3 | 2,042 | | 0.54% |
| Adult | Spring migration (January to April) | Farne Islands | 6,886 | 0.3 | 2,066 | | 0.55% |

MONA OFFSHORE WIND PROJECT

| Age | Season | Colony | Total number of birds | Proportion birds in area | Birds in region | Total birds BDMPs | Percentage birds/BDMPs |
|-------|-------------------------------------|---------------------------------|-----------------------|--------------------------|-----------------|-------------------|------------------------|
| Adult | Spring migration (January to April) | Flamborough and Filey | 75,234 | 0.3 | 22,570 | | 6.01% |
| Adult | Spring migration (January to April) | UK North Sea non-SPA colonies | 140,000 | 0.3 | 42,000 | | 11.18% |
| Adult | Spring migration (January to April) | Cape Wrath | 20,688 | 0.8 | 16,550 | | 4.40% |
| Adult | Spring migration (January to April) | North Rona & Sula Sgeir | 2,506 | 0.8 | 2,005 | | 0.53% |
| Adult | Spring migration (January to April) | Handa | 3,744 | 0.8 | 2,995 | | 0.80% |
| Adult | Spring migration (January to April) | St Kilda | 1,914 | 0.8 | 1,531 | | 0.41% |
| Adult | Spring migration (January to April) | Flannan Isles | 2,784 | 0.8 | 2,227 | | 0.59% |
| Adult | Spring migration (January to April) | Shiant Isles | 1,098 | 0.8 | 878 | | 0.23% |
| Adult | Spring migration (January to April) | Canna & Sanday | 1,640 | 0.8 | 1,312 | | 0.35% |
| Adult | Spring migration (January to April) | Rum | 1,576 | 0.8 | 1,261 | | 0.34% |
| Adult | Spring migration (January to April) | Mingulay & Berneray | 4,456 | 0.8 | 3,565 | | 0.95% |
| Adult | Spring migration (January to April) | North Colonsay & Western Cliffs | 11,126 | 0.8 | 8,901 | | 2.37% |
| Adult | Spring migration (January to April) | Ailsa Craig | 978 | 0.8 | 782 | | 0.21% |

MONA OFFSHORE WIND PROJECT

| Age | Season | Colony | Total number of birds | Proportion birds in area | Birds in region | Total birds BDMPS | Percentage birds/BDMPS |
|-------|-------------------------------------|------------------------------|-----------------------|--------------------------|-----------------|-------------------|------------------------|
| Adult | Spring migration (January to April) | Rathlin Island | 15,844 | 0.8 | 1,2675 | | 3.37% |
| Adult | Spring migration (January to April) | Skomer, Skokholm, Middleholm | 2,090 | 0.8 | 1,672 | | 0.45% |
| Adult | Spring migration (January to April) | UK Western non-SPA colonies | 60,000 | 0.8 | 48,000 | | 12.78% |

MONA OFFSHORE WIND PROJECT

Table 1.17: Immature non-breeding black-legged kittiwake colony weighting factors for apportioning impacts of collision risk and displacement (UK Western waters and Channel region).

| Age | Season | Colony | Total number of birds | Proportion birds in area | Birds in region | Total birds BDMPs | Percentage birds/BDMPs |
|----------|---------------------------------------|---------------------|-----------------------|--------------------------|-----------------|--|------------------------|
| Immature | Autumn migration (August to December) | Russia | 246,400 | 0.1 | 24,640 | Immature UK Western waters and Channel = 412,615 | 5.97% |
| Immature | Autumn migration (August to December) | Norway | 1,232,000 | 0.15 | 184,800 | | 44.79% |
| Immature | Autumn migration (August to December) | Faroe | 352,000 | 0.2 | 70,400 | | 17.06% |
| Immature | Autumn migration (August to December) | Germany | 10,560 | 0.05 | 528 | | 0.13% |
| Immature | Autumn migration (August to December) | France | 7,040 | 0.1 | 704 | | 0.17% |
| Immature | Autumn migration (August to December) | Ireland | 35,200 | 0.2 | 7,040 | | 1.71% |
| Immature | Autumn migration (August to December) | Hermaness, Saxavord | 688 | 0.2 | 138 | | 0.03% |
| Immature | Autumn migration (August to December) | Foula | 576 | 0.2 | 115 | | 0.03% |
| Immature | Autumn migration (August to December) | Noss | 892 | 0.2 | 178 | | 0.04% |
| Immature | Autumn migration (August to December) | Sumburgh Head | 370 | 0.2 | 74 | | 0.02% |
| Immature | Autumn migration (August to December) | Fair Isle | 1,357 | 0.2 | 271 | | 0.07% |
| Immature | Autumn migration (August to December) | West Westray | 21,217 | 0.2 | 4,243 | | 1.03% |
| Immature | Autumn migration (August to December) | Calf of Eday | 1,315 | 0.2 | 263 | | 0.06% |

MONA OFFSHORE WIND PROJECT

| Age | Season | Colony | Total number of birds | Proportion birds in area | Birds in region | Total birds BDMPS | Percentage birds/BDMPS |
|----------|---------------------------------------|-----------------------------|-----------------------|--------------------------|-----------------|-------------------|------------------------|
| Immature | Autumn migration (August to December) | Marwick Head | 926 | 0.2 | 185 | | 0.04% |
| Immature | Autumn migration (August to December) | Rousay | 3,105 | 0.2 | 621 | | 0.15% |
| Immature | Autumn migration (August to December) | Copinsay | 1,172 | 0.2 | 234 | | 0.06% |
| Immature | Autumn migration (August to December) | Hoy | 699 | 0.2 | 140 | | 0.03% |
| Immature | Autumn migration (August to December) | North Caithness Cliffs | 17,864 | 0.2 | 3,573 | | 0.87% |
| Immature | Autumn migration (August to December) | East Caithness Cliffs | 71,122 | 0.2 | 14,224 | | 3.45% |
| Immature | Autumn migration (August to December) | Troup, Pennan & Lions Heads | 26,217 | 0.2 | 5,243 | | 1.27% |
| Immature | Autumn migration (August to December) | Buchan Ness to Collieston | 22,074 | 0.2 | 4,415 | | 1.07% |
| Immature | Autumn migration (August to December) | Fowlsheugh | 16,433 | 0.2 | 3,287 | | 0.80% |
| Immature | Autumn migration (August to December) | Forth Islands | 5,456 | 0.2 | 1,091 | | 0.26% |
| Immature | Autumn migration (August to December) | St Abbs Head to Fast Castle | 5,989 | 0.2 | 1,198 | | 0.29% |
| Immature | Autumn migration (August to December) | Farne Islands | 6,060 | 0.2 | 1,212 | | 0.29% |
| Immature | Autumn migration (August to December) | Flamborough and Filey | 66,206 | 0.2 | 13,241 | | 3.21% |

MONA OFFSHORE WIND PROJECT

| Age | Season | Colony | Total number of birds | Proportion birds in area | Birds in region | Total birds BDMPS | Percentage birds/BDMPS |
|----------|---------------------------------------|---------------------------------|-----------------------|--------------------------|-----------------|-------------------|------------------------|
| Immature | Autumn migration (August to December) | UK North Sea non-SPA colonies | 123,200 | 0.2 | 24,640 | | 5.97% |
| Immature | Autumn migration (August to December) | Cape Wrath | 18,205 | 0.4 | 7,282 | | 1.76% |
| Immature | Autumn migration (August to December) | North Rona & Sula Sgeir | 2,205 | 0.4 | 882 | | 0.21% |
| Immature | Autumn migration (August to December) | Handa | 3,295 | 0.4 | 1,318 | | 0.32% |
| Immature | Autumn migration (August to December) | St Kilda | 1,684 | 0.4 | 674 | | 0.16% |
| Immature | Autumn migration (August to December) | Flannan Isles | 2,450 | 0.4 | 980 | | 0.24% |
| Immature | Autumn migration (August to December) | Shiant Isles | 966 | 0.4 | 386 | | 0.09% |
| Immature | Autumn migration (August to December) | Canna & Sanday | 1,443 | 0.4 | 577 | | 0.14% |
| Immature | Autumn migration (August to December) | Rum | 1,387 | 0.4 | 555 | | 0.13% |
| Immature | Autumn migration (August to December) | Mingulay & Berneray | 3,921 | 0.4 | 1,569 | | 0.38% |
| Immature | Autumn migration (August to December) | North Colonsay & Western Cliffs | 9,791 | 0.4 | 3,916 | | 0.95% |
| Immature | Autumn migration (August to December) | Ailsa Craig | 861 | 0.4 | 344 | | 0.08% |
| Immature | Autumn migration (August to December) | Rathlin Island | 13,943 | 0.4 | 5,577 | | 1.35% |

MONA OFFSHORE WIND PROJECT

| Age | Season | Colony | Total number of birds | Proportion birds in area | Birds in region | Total birds BDMPs | Percentage birds/BDMPs |
|----------|---------------------------------------|------------------------------|-----------------------|--------------------------|-----------------|--|------------------------|
| Immature | Autumn migration (August to December) | Skomer, Skokholm, Middleholm | 1,839 | 0.4 | 736 | | 0.18% |
| Immature | Autumn migration (August to December) | UK Western non-SPA colonies | 52,800 | 0.4 | 21,120 | | 5.12% |
| Immature | Spring migration (January to April) | Russia | 246,400 | 0.1 | 24,640 | Immature UK Western waters and Channel = 315,815 | 7.80% |
| Immature | Spring migration (January to April) | Norway | 12,32,000 | 0.1 | 123,200 | | 39.01% |
| Immature | Spring migration (January to April) | Faroe | 352,000 | 0.1 | 35,200 | | 11.15% |
| Immature | Spring migration (January to April) | Germany | 10,560 | 0.05 | 528 | | 0.17% |
| Immature | Spring migration (January to April) | France | 7,040 | 0.1 | 704 | | 0.22% |
| Immature | Spring migration (January to April) | Ireland | 35,200 | 0.2 | 7,040 | | 2.23% |
| Immature | Spring migration (January to April) | Hermaness, Saxavord | 688 | 0.2 | 138 | | 0.04% |
| Immature | Spring migration (January to April) | Foula | 576 | 0.2 | 115 | | 0.04% |
| Immature | Spring migration (January to April) | Noss | 892 | 0.2 | 178 | | 0.06% |
| Immature | Spring migration (January to April) | Sumburgh Head | 370 | 0.2 | 74 | | 0.02% |
| Immature | Spring migration (January to April) | Fair Isle | 1,357 | 0.2 | 271 | | 0.09% |

MONA OFFSHORE WIND PROJECT

| Age | Season | Colony | Total number of birds | Proportion birds in area | Birds in region | Total birds BDMPs | Percentage birds/BDMPs |
|----------|-------------------------------------|-----------------------------|-----------------------|--------------------------|-----------------|-------------------|------------------------|
| Immature | Spring migration (January to April) | West Westray | 21,217 | 0.2 | 4,243 | | 1.34% |
| Immature | Spring migration (January to April) | Calf of Eday | 1,315 | 0.2 | 263 | | 0.08% |
| Immature | Spring migration (January to April) | Marwick Head | 926 | 0.2 | 185 | | 0.06% |
| Immature | Spring migration (January to April) | Rousay | 3,105 | 0.2 | 621 | | 0.20% |
| Immature | Spring migration (January to April) | Copinsay | 1,172 | 0.2 | 234 | | 0.07% |
| Immature | Spring migration (January to April) | Hoy | 699 | 0.2 | 140 | | 0.04% |
| Immature | Spring migration (January to April) | North Caithness Cliffs | 17,864 | 0.2 | 3,573 | | 1.13% |
| Immature | Spring migration (January to April) | East Caithness Cliffs | 71,122 | 0.2 | 14,224 | | 4.50% |
| Immature | Spring migration (January to April) | Troup, Pennan & Lions Heads | 26,217 | 0.2 | 5,243 | | 1.66% |
| Immature | Spring migration (January to April) | Buchan Ness to Collieston | 22,074 | 0.2 | 4,415 | | 1.40% |
| Immature | Spring migration (January to April) | Fowlsheugh | 16,433 | 0.2 | 3,287 | | 1.04% |
| Immature | Spring migration (January to April) | Forth Islands | 5,456 | 0.2 | 1,091 | | 0.35% |
| Immature | Spring migration (January to April) | St Abbs Head to Fast Castle | 5,989 | 0.2 | 1,198 | | 0.38% |
| Immature | Spring migration (January to April) | Farne Islands | 6,060 | 0.2 | 1,212 | | 0.38% |

MONA OFFSHORE WIND PROJECT

| Age | Season | Colony | Total number of birds | Proportion birds in area | Birds in region | Total birds BDMPs | Percentage birds/BDMPs |
|----------|-------------------------------------|---------------------------------|-----------------------|--------------------------|-----------------|-------------------|------------------------|
| Immature | Spring migration (January to April) | Flamborough and Filey | 66,206 | 0.2 | 13,241 | | 4.19% |
| Immature | Spring migration (January to April) | UK North Sea non-SPA colonies | 123,200 | 0.2 | 24,640 | | 7.80% |
| Immature | Spring migration (January to April) | Cape Wrath | 18,205 | 0.4 | 7,282 | | 2.31% |
| Immature | Spring migration (January to April) | North Rona & Sula Sgeir | 2,205 | 0.4 | 882 | | 0.28% |
| Immature | Spring migration (January to April) | Handa | 3,295 | 0.4 | 1,318 | | 0.42% |
| Immature | Spring migration (January to April) | St Kilda | 1,684 | 0.4 | 674 | | 0.21% |
| Immature | Spring migration (January to April) | Flannan Isles | 2,450 | 0.4 | 980 | | 0.31% |
| Immature | Spring migration (January to April) | Shiant Isles | 966 | 0.4 | 386 | | 0.12% |
| Immature | Spring migration (January to April) | Canna & Sanday | 1,443 | 0.4 | 577 | | 0.18% |
| Immature | Spring migration (January to April) | Rum | 1,387 | 0.4 | 555 | | 0.18% |
| Immature | Spring migration (January to April) | Mingulay & Berneray | 3,921 | 0.4 | 1,569 | | 0.50% |
| Immature | Spring migration (January to April) | North Colonsay & Western Cliffs | 9,791 | 0.4 | 3,916 | | 1.24% |
| Immature | Spring migration (January to April) | Ailsa Craig | 861 | 0.4 | 344 | | 0.11% |

MONA OFFSHORE WIND PROJECT

| Age | Season | Colony | Total number of birds | Proportion birds in area | Birds in region | Total birds BDMPS | Percentage birds/BDMPS |
|----------|-------------------------------------|------------------------------|-----------------------|--------------------------|-----------------|-------------------|------------------------|
| Immature | Spring migration (January to April) | Rathlin Island | 13,943 | 0.4 | 5,577 | | 1.77% |
| Immature | Spring migration (January to April) | Skomer, Skokholm, Middleholm | 1,839 | 0.4 | 736 | | 0.23% |
| Immature | Spring migration (January to April) | UK Western non-SPA colonies | 52,800 | 0.4 | 21,120 | | 6.69% |

MONA OFFSHORE WIND PROJECT

1.4.5 Herring gull

Colony weighted proportions

1.4.5.1 Colonies included based on foraging distance, distance to the Mona Array Area centroid, and the resulting designated and non-designated site weighted proportions of this species are given Table 1.18 and Table 1.20 with the highest weighting factor assigned to Anglesey Terns SPA (0.292%), followed by Morecambe Bay and Duddon Estuary SPA (0.188%) and Ribble and Alt Estuaries SPA (0.146%).

Table 1.18: Herring gull colony weighting factors used for apportioning impacts of collision risk in the breeding season.

| Colony location | Adult bird count (adjusted for IND) | Distance to Mona Array Area (km) | Distance ² | Prop of Forage Range as Sea | 1/Prop of Forage Range as Sea | Colony pop/ sum of pop | Sum dist ² / col dist ² | Colony sea/ sum of sea | SPA weight (based on distance ²) | Proportional SPA weight |
|--|-------------------------------------|----------------------------------|-----------------------|-----------------------------|-------------------------------|------------------------|---|------------------------|--|-------------------------|
| Anglesey Terns / Morwenoliaid Ynys Môn SPA | 3,274 | 38.80 | 1505.1 | 0.753 | 1.328 | 0.219 | 82.262 | 0.017 | 0.309 | 0.292 |
| The Dee Estuary SPA | 14 | 43.43 | 1886.1 | 0.354 | 2.827 | 0.001 | 65.641 | 0.036 | 0.002 | 0.002 |
| Glannau Ynys Gybi / Holy Island Coast SPA | 322 | 55.82 | 3115.5 | 0.815 | 1.228 | 0.022 | 39.739 | 0.016 | 0.014 | 0.013 |
| Ribble & Alt Estuaries SPA | 1,710 | 58.57 | 3429.9 | 0.345 | 2.895 | 0.114 | 36.096 | 0.037 | 0.154 | 0.146 |
| Morecambe Bay and Duddon Estuary SPA | 3,188 | 60.60 | 3672.2 | 0.467 | 2.143 | 0.213 | 33.715 | 0.028 | 0.199 | 0.188 |

MONA OFFSHORE WIND PROJECT

| Colony location | Adult bird count (adjusted for IND) | Distance to Mona Array Area (km) | Distance ² | Prop of Forage Range as Sea | 1/Prop of Forage Range as Sea | Colony pop/ sum of pop | Sum dist ² / col dist ² | Colony sea/ sum of sea | SPA weight (based on distance ²) | Proportional SPA weight |
|---------------------------------------|-------------------------------------|----------------------------------|-----------------------|-----------------------------|-------------------------------|------------------------|---|------------------------|--|-------------------------|
| Mersey Estuary SPA | 20 | 76.18 | 5802.9 | 0.194 | 5.161 | 0.001 | 21.336 | 0.067 | 0.002 | 0.002 |
| Pen y Gogarth / Great Ormes Head SSSI | 98 | 31.67 | 1002.9 | 0.557 | 1.794 | 0.007 | 123.456 | 0.023 | 0.019 | 0.018 |
| Llanbadrig - Dinas Gynfor SSSI | 36 | 33.82 | 1143.5 | 0.793 | 1.261 | 0.002 | 108.276 | 0.016 | 0.004 | 0.004 |
| Aber Afon Conwy SSSI | 192 | 35.62 | 1268.6 | 0.547 | 1.829 | 0.013 | 97.593 | 0.024 | 0.030 | 0.028 |
| Arfordir Gogleddol Penmon SSSI | 82 | 35.71 | 1275.0 | 0.671 | 1.490 | 0.005 | 97.104 | 0.019 | 0.010 | 0.010 |
| Baron Hill Park SSSI | 86 | 40.88 | 1671.4 | 0.646 | 1.548 | 0.006 | 74.077 | 0.020 | 0.009 | 0.008 |
| Coedydd Afon Menai SSSI | 82 | 45.06 | 2030.3 | 0.647 | 1.546 | 0.005 | 60.981 | 0.020 | 0.007 | 0.006 |
| Sefton Coast SSSI | 10 | 48.94 | 2395.3 | 0.369 | 2.711 | 0.001 | 51.688 | 0.035 | 0.001 | 0.001 |
| Afon Seiont SSSI | 204 | 56.92 | 3239.6 | 0.668 | 1.498 | 0.014 | 38.217 | 0.019 | 0.010 | 0.010 |
| Penrhynoedd Llangadwaladr SSSI | 100 | 58.28 | 3396.6 | 0.729 | 1.371 | 0.007 | 36.450 | 0.018 | 0.004 | 0.004 |
| Mynydd Hiraethog SSSI | 88 | 60.69 | 3682.8 | 0.345 | 2.901 | 0.006 | 33.618 | 0.037 | 0.007 | 0.007 |

MONA OFFSHORE WIND PROJECT

| Colony location | Adult bird count (adjusted for IND) | Distance to Mona Array Area (km) | Distance ² | Prop of Forage Range as Sea | 1/Prop of Forage Range as Sea | Colony pop/ sum of pop | Sum dist ² / col dist ² | Colony sea/ sum of sea | SPA weight (based on distance ²) | Proportional SPA weight |
|------------------------|-------------------------------------|----------------------------------|-----------------------|-----------------------------|-------------------------------|------------------------|---|------------------------|--|-------------------------|
| Coed y Rhygen SSSI | 816 | 77.92 | 6072.1 | 0.457 | 2.189 | 0.055 | 20.390 | 0.028 | 0.031 | 0.030 |
| St. Bees Head SSSI | 396 | 82.37 | 6784.7 | 0.462 | 2.165 | 0.027 | 18.248 | 0.028 | 0.014 | 0.013 |
| Little Ness MNR | 248 | 47.15 | 2222.8 | 0.891 | 1.122 | 0.017 | 55.700 | 0.014 | 0.013 | 0.013 |
| Douglas Bay MNR | 102 | 48.29 | 2331.5 | 0.865 | 1.156 | 0.007 | 53.102 | 0.015 | 0.005 | 0.005 |
| Langness MNR | 270 | 48.74 | 2375.6 | 0.911 | 1.098 | 0.018 | 52.117 | 0.014 | 0.013 | 0.013 |
| Laxey Bay MNR | 44 | 51.79 | 2681.9 | 0.830 | 1.205 | 0.003 | 46.165 | 0.016 | 0.002 | 0.002 |
| Baie ny Carrickey MNR | 64 | 55.71 | 3103.1 | 0.898 | 1.114 | 0.004 | 39.899 | 0.014 | 0.002 | 0.002 |
| Port Erin Bay MNR | 154 | 57.33 | 3287.2 | 0.892 | 1.121 | 0.010 | 37.664 | 0.014 | 0.006 | 0.005 |
| Calf and Wart Bank MNR | 626 | 57.48 | 3304.3 | 0.893 | 1.120 | 0.042 | 37.469 | 0.014 | 0.023 | 0.021 |
| Ramsey Bay MNR | 248 | 62.26 | 3876.9 | 0.761 | 1.314 | 0.017 | 31.935 | 0.017 | 0.009 | 0.008 |
| West Coast MNR | 468 | 64.11 | 4109.7 | 0.824 | 1.213 | 0.031 | 30.126 | 0.016 | 0.015 | 0.014 |
| Colwyn Bay | 48 | 35.77 | 1279.7 | 0.467 | 2.142 | 0.003 | 96.746 | 0.028 | 0.009 | 0.008 |
| Llanddulas Quarries | 88 | 37.15 | 1380.3 | 0.421 | 2.374 | 0.006 | 89.697 | 0.031 | 0.016 | 0.015 |

MONA OFFSHORE WIND PROJECT

| Colony location | Adult bird count (adjusted for IND) | Distance to Mona Array Area (km) | Distance ² | Prop of Forage Range as Sea | 1/Prop of Forage Range as Sea | Colony pop/ sum of pop | Sum dist ² / col dist ² | Colony sea/ sum of sea | SPA weight (based on distance ²) | Proportional SPA weight |
|--|-------------------------------------|----------------------------------|-----------------------|-----------------------------|-------------------------------|------------------------|---|------------------------|--|-------------------------|
| Kinmel Bay | 38 | 38.22 | 1460.6 | 0.407 | 2.457 | 0.003 | 84.763 | 0.032 | 0.007 | 0.006 |
| Rhyl | 148 | 38.97 | 1518.9 | 0.387 | 2.584 | 0.010 | 81.512 | 0.033 | 0.027 | 0.025 |
| Prestatyn | 100 | 40.08 | 1606.7 | 0.839 | 1.191 | 0.007 | 77.057 | 0.015 | 0.008 | 0.007 |
| East Island | 262 | 51.93 | 2696.4 | 0.397 | 2.519 | 0.018 | 45.915 | 0.032 | 0.026 | 0.025 |
| Blackpool | 95 | 54.00 | 2916.5 | 0.287 | 3.488 | 0.006 | 42.451 | 0.045 | 0.012 | 0.011 |
| Seaforth Nature Reserve and Liverpool City | 10 | 58.32 | 3400.9 | 0.468 | 2.136 | 0.001 | 36.405 | 0.028 | 0.001 | 0.001 |
| Inland Gwynedd | 44 | 59.00 | 3481.5 | 0.482 | 2.074 | 0.003 | 35.562 | 0.027 | 0.003 | 0.003 |
| Barrow-in-Furness | 34 | 59.86 | 3583.2 | 0.483 | 2.072 | 0.002 | 34.553 | 0.027 | 0.002 | 0.002 |
| Sellafield | 300 | 74.06 | 5485.6 | 0.437 | 2.289 | 0.020 | 22.570 | 0.030 | 0.013 | 0.013 |
| Cleator Moor | 42 | 84.34 | 7113.4 | 0.444 | 2.253 | 0.003 | 17.405 | 0.029 | 0.001 | 0.001 |
| Whitehaven (Buildings) | 784 | 84.96 | 7217.6 | 0.626 | 1.597 | 0.052 | 17.154 | 0.021 | 0.019 | 0.018 |

MONA OFFSHORE WIND PROJECT

Table 1.19: Adult non-breeding herring gull colony weighting factors used for apportioning impacts of collision risk (UK Western region).

| Age | Season | Colony | Total number of SPA birds | Proportion SPA birds in area | Birds in region | Total birds BDMPS | Proportion SPA/BDMPS |
|-------|---|---------------------------|---------------------------|------------------------------|-----------------|----------------------------------|----------------------|
| Adult | Non-breeding season (September to February) | Barents Sea | 252,000 | 0.001 | 252 | Adult UK Western waters = 87,134 | 0.289% |
| Adult | Non-breeding season (September to February) | Faroe | 3,000 | 0.2 | 600 | | 0.689% |
| Adult | Non-breeding season (September to February) | Ireland | 10,000 | 0.3 | 3,000 | | 3.443% |
| Adult | Non-breeding season (September to February) | East Caithness Cliffs | 6,786 | 0.001 | 7 | | 0.008% |
| Adult | Non-breeding season (September to February) | Troup, Pennan & Lions | 3,194 | 0.001 | 3 | | 0.003% |
| Adult | Non-breeding season (September to February) | Buchan Ness to Collieston | 6,228 | 0.001 | 6 | | 0.007% |
| Adult | Non-breeding season (September to February) | Fowlsheugh | 518 | 0.001 | 1 | | 0.001% |
| Adult | Non-breeding season (September to February) | Forth Islands | 5,654 | 0.001 | 6 | | 0.007% |
| Adult | Non-breeding season (September to February) | St Abbs Head/ Fast Castle | 478 | 0.001 | 0 | | 0.000% |
| Adult | Non-breeding season (September to February) | Flamborough & Filey Coast | 990 | 0.001 | 1 | | 0.001% |
| Adult | Non-breeding season (September to February) | Alde-Ore Estuary | 1,600 | 0.001 | 2 | | 0.002% |
| Adult | Non-breeding season (September to February) | UK North Sea non-SPA cols | 130,000 | 0.001 | 130 | | 0.149% |
| Adult | Non-breeding season (September to February) | Canna & Sanday | 126 | 0.8 | 101 | | 0.116% |

MONA OFFSHORE WIND PROJECT

| Age | Season | Colony | Total number of SPA birds | Proportion SPA birds in area | Birds in region | Total birds BDMPS | Proportion SPA/BDMPS |
|-------|---|-------------------------|---------------------------|------------------------------|-----------------|-------------------|----------------------|
| Adult | Non-breeding season (September to February) | Ailsa Craig | 258 | 0.8 | 206 | | 0.236% |
| Adult | Non-breeding season (September to February) | Rathlin Island | 56 | 0.8 | 45 | | 0.052% |
| Adult | Non-breeding season (September to February) | Morecambe Bay | 3468 | 0.8 | 2,774 | | 3.184% |
| Adult | Non-breeding season (September to February) | UK western non-SPA cols | 100,000 | 0.8 | 80,000 | | 91.813% |

MONA OFFSHORE WIND PROJECT

Table 1.20: Immature non-breeding herring gull colony weighting factors used for apportioning impacts of collision risk (UK Western region).

| Age | Season | Colony | Total number of SPA birds | Proportion SPA birds in area | Birds in region | Total birds BDMPs | Proportion SPA/BDMPs |
|----------|---|---------------------------|---------------------------|------------------------------|-----------------|-------------------------------------|----------------------|
| Immature | Non-breeding season (September to February) | Barents Sea | 274,680 | 0.005 | 1,373 | Immature UK western waters = 86,165 | 1.593% |
| Immature | Non-breeding season (September to February) | Faroe | 3,270 | 0.3 | 981 | | 1.139% |
| Immature | Non-breeding season (September to February) | Ireland | 10,900 | 0.4 | 4,360 | | 5.060% |
| Immature | Non-breeding season (September to February) | East Caithness Cliffs | 7,397 | 0.001 | 7 | | 0.008% |
| Immature | Non-breeding season (September to February) | Troup, Pennan & Lions | 3481 | 0.001 | 3 | | 0.003% |
| Immature | Non-breeding season (September to February) | Buchan Ness to Collieston | 6,789 | 0.001 | 7 | | 0.008% |
| Immature | Non-breeding season (September to February) | Fowlsheugh | 565 | 0.001 | 1 | | 0.001% |
| Immature | Non-breeding season (September to February) | Forth Islands | 6,163 | 0.001 | 6 | | 0.007% |
| Immature | Non-breeding season (September to February) | St Abbs Head/ Fast Castle | 521 | 0.001 | 1 | | 0.001% |
| Immature | Non-breeding season (September to February) | Flamborough & Filey Coast | 1,079 | 0.001 | 1 | | 0.001% |
| Immature | Non-breeding season (September to February) | Alde-Ore Estuary | 1,744 | 0.001 | 2 | | 0.002% |
| Immature | Non-breeding season (September to February) | UK North Sea non-SPA cols | 141,700 | 0.001 | 142 | | 0.165% |
| Immature | Non-breeding season (September to February) | Canna & Sanday | 137 | 0.7 | 96 | | 0.111% |

MONA OFFSHORE WIND PROJECT

| Age | Season | Colony | Total number of SPA birds | Proportion SPA birds in area | Birds in region | Total birds BDMPs | Proportion SPA/BDMPs |
|----------|---|-------------------------|---------------------------|------------------------------|-----------------|-------------------|----------------------|
| Immature | Non-breeding season (September to February) | Ailsa Craig | 281 | 0.7 | 197 | | 0.229% |
| Immature | Non-breeding season (September to February) | Rathlin Island | 61 | 0.7 | 43 | | 0.050% |
| Immature | Non-breeding season (September to February) | Morecambe Bay | 3,780 | 0.7 | 2,646 | | 3.071% |
| Immature | Non-breeding season (September to February) | UK western non-SPA cols | 109,000 | 0.7 | 76,300 | | 88.550% |

MONA OFFSHORE WIND PROJECT

1.4.6 Lesser black-backed gull

Colony weighted proportions

1.4.6.1 Colonies included based on foraging distance, distance to the Mona Array Area centroid, and the resulting designated and non-designated site weighted proportions of this species are given in Table 1.21 and Table 1.23 with the highest weighting factor assigned to Ribble and Alt Estuaries SPA (0.430%), followed by Morecambe Bay and Duddon Estuary SPA (0.204%) and Puffin Island SPA (0.149%).

Table 1.21: Lesser black-backed gull colony weighting factors used for apportioning impacts of collision risk in the breeding season.

| Colony location | Adult bird count (adjusted for IND) | Distance to Mona Array Area (km) | Distance ² | Prop of Forage Range as Sea | 1/Prop of Forage Range as Sea | Colony pop/ sum of pop | Sum dist ² / col dist ² | Colony sea/ sum of sea | SPA weight (based on distance ²) | Proportional SPA weight |
|--|-------------------------------------|----------------------------------|-----------------------|-----------------------------|-------------------------------|------------------------|---|------------------------|--|-------------------------|
| Ynys Seiriol / Puffin Island SPA | 1,052 | 34.275 | 1174.776 | 0.359 | 2.784 | 0.011 | 2506.109 | 0.013 | 0.370 | 0.093 |
| Anglesey Terns / Morwenoliaid Ynys Môn SPA | 268 | 52.037 | 2707.882 | 0.385 | 2.599 | 0.003 | 1087.239 | 0.013 | 0.038 | 0.010 |
| Glannau Ynys Gybi / Holy Island Coast SPA | 28 | 56.630 | 3207.013 | 0.394 | 2.539 | 0.000 | 918.024 | 0.012 | 0.003 | 0.001 |
| Ribble & Alt Estuaries SPA | 8,978 | 58.566 | 3429.944 | 0.365 | 2.739 | 0.094 | 858.357 | 0.013 | 1.064 | 0.268 |
| Morecambe Bay and Duddon Estuary SPA | 4,874 | 60.578 | 3669.700 | 0.390 | 2.563 | 0.051 | 802.277 | 0.012 | 0.505 | 0.127 |

MONA OFFSHORE WIND PROJECT

| Colony location | Adult bird count (adjusted for IND) | Distance to Mona Array Area (km) | Distance ² | Prop of Forage Range as Sea | 1/Prop of Forage Range as Sea | Colony pop/ sum of pop | Sum dist ² / col dist ² | Colony sea/ sum of sea | SPA weight (based on distance ²) | Proportional SPA weight |
|--|-------------------------------------|----------------------------------|-----------------------|-----------------------------|-------------------------------|------------------------|---|------------------------|--|-------------------------|
| Mersey Estuary SPA | 100 | 76.177 | 5802.869 | 0.354 | 2.828 | 0.001 | 507.355 | 0.014 | 0.007 | 0.002 |
| Bowland Fells SPA | 29,254 | 84.534 | 7145.922 | 0.411 | 2.430 | 0.305 | 411.999 | 0.012 | 1.476 | 0.372 |
| Craig yr Aderyn (Bird's Rock) SPA | 14 | 108.258 | 11719.701 | 0.411 | 2.431 | 0.000 | 251.211 | 0.012 | 0.000 | 0.000 |
| Solway Firth SPA | 1,472 | 110.767 | 12269.302 | 0.413 | 2.424 | 0.010 | 197.091 | 0.012 | 0.024 | 0.006 |
| Glannau Aberdaron ac Ynys Enlli / Aberdaron Coast and Bardsey Island SPA | 328 | 110.818 | 12280.609 | 0.454 | 2.201 | 0.003 | 239.737 | 0.011 | 0.009 | 0.002 |
| Strangford Lough SPA | 698 | 120.158 | 14437.899 | 0.425 | 2.352 | 0.007 | 203.916 | 0.011 | 0.017 | 0.004 |
| Lambay Island SPA | 952 | 129.954 | 16887.950 | 0.427 | 2.341 | 0.010 | 174.332 | 0.011 | 0.020 | 0.005 |
| Copeland Islands SPA | 2,666 | 137.804 | 18990.019 | 0.433 | 2.309 | 0.028 | 155.035 | 0.011 | 0.048 | 0.012 |
| Dalkey Islands SPA | 70 | 140.715 | 19800.729 | 0.440 | 2.274 | 0.001 | 148.687 | 0.011 | 0.001 | 0.000 |
| Ailsa Craig SPA | 378 | 175.053 | 30643.418 | 0.445 | 2.248 | 0.004 | 96.077 | 0.011 | 0.004 | 0.001 |

MONA OFFSHORE WIND PROJECT

| Colony location | Adult bird count (adjusted for IND) | Distance to Mona Array Area (km) | Distance ² | Prop of Forage Range as Sea | 1/Prop of Forage Range as Sea | Colony pop/ sum of pop | Sum dist ² / col dist ² | Colony sea/ sum of sea | SPA weight (based on distance ²) | Proportional SPA weight |
|---|-------------------------------------|----------------------------------|-----------------------|-----------------------------|-------------------------------|------------------------|---|------------------------|--|-------------------------|
| Lough Neagh and Lough Beg SPA | 2,429 | 180.321 | 32515.711 | 0.500 | 2.000 | 0.025 | 90.544 | 0.010 | 0.022 | 0.006 |
| Ramsey and St David's Peninsula Coast SPA | 334 | 213.890 | 45748.959 | 0.565 | 1.770 | 0.003 | 64.354 | 0.009 | 0.002 | 0.000 |
| Rathlin Island SPA | 1,038 | 218.180 | 47602.508 | 0.517 | 1.934 | 0.011 | 61.848 | 0.009 | 0.006 | 0.002 |
| Sheep Island SPA | 176 | 219.655 | 48248.404 | 0.526 | 1.902 | 0.002 | 61.020 | 0.009 | 0.001 | 0.000 |
| Severn Estuary SPA | 126 | 228.650 | 52281.000 | 0.369 | 2.712 | 0.001 | 56.313 | 0.013 | 0.001 | 0.000 |
| Skomer, Skokholm and the Seas off Pembrokeshire SPA | 16,214 | 229.951 | 52877.644 | 0.587 | 1.705 | 0.169 | 55.678 | 0.008 | 0.078 | 0.020 |
| Grassholm SPA | 76 | 232.964 | 54272.431 | 0.589 | 1.699 | 0.001 | 54.247 | 0.008 | 0.000 | 0.000 |
| Inner Clyde SPA | 60 | 235.403 | 55414.497 | 0.455 | 2.196 | 0.001 | 53.129 | 0.011 | 0.000 | 0.000 |
| Afon Seiont SSSI | 34 | 56.917 | 3239.595 | 0.387 | 2.581 | 0.000 | 908.791 | 0.012 | 0.004 | 0.001 |
| Mynydd Hiraethog SSSI | 36 | 60.686 | 3682.761 | 0.348 | 2.872 | 0.000 | 799.432 | 0.014 | 0.004 | 0.001 |
| Coed y Rhygen SSSI | 158 | 77.924 | 6072.132 | 0.387 | 2.582 | 0.002 | 484.857 | 0.012 | 0.010 | 0.003 |
| River Derwent and Tributaries SSSI | 52 | 98.827 | 9766.680 | 0.420 | 2.382 | 0.001 | 301.445 | 0.011 | 0.002 | 0.000 |

MONA OFFSHORE WIND PROJECT

| Colony location | Adult bird count (adjusted for IND) | Distance to Mona Array Area (km) | Distance ² | Prop of Forage Range as Sea | 1/Prop of Forage Range as Sea | Colony pop/ sum of pop | Sum dist ² / col dist ² | Colony sea/ sum of sea | SPA weight (based on distance ²) | Proportional SPA weight |
|--|-------------------------------------|----------------------------------|-----------------------|-----------------------------|-------------------------------|------------------------|---|------------------------|--|-------------------------|
| Naddle Forest SSSI | 70 | 108.454 | 11762.182 | 0.443 | 2.255 | 0.001 | 250.303 | 0.011 | 0.002 | 0.001 |
| Aberarth - Carreg Wylan SSSI | 690 | 175.590 | 30831.829 | 0.509 | 1.965 | 0.007 | 95.489 | 0.009 | 0.007 | 0.002 |
| River Wye SSSI | 10 | 187.597 | 35192.553 | 0.354 | 2.821 | 0.000 | 83.657 | 0.014 | 0.000 | 0.000 |
| Tweedsmuir Hills SSSI | 37 | 189.303 | 35835.766 | 0.463 | 2.160 | 0.000 | 82.156 | 0.010 | 0.000 | 0.000 |
| Sanda Islands SSSI | 46 | 192.107 | 36905.157 | 0.472 | 2.120 | 0.000 | 79.775 | 0.010 | 0.000 | 0.000 |
| Strumble Head - Llechdafad Cliffs SSSI | 58 | 193.644 | 37497.955 | 0.539 | 1.855 | 0.001 | 78.514 | 0.009 | 0.000 | 0.000 |
| Stenders Quarry SSSI | 464 | 213.504 | 45583.970 | 0.350 | 2.854 | 0.005 | 64.587 | 0.014 | 0.004 | 0.001 |
| Hucclecote Meadows SSSI | 52 | 224.760 | 50517.250 | 0.324 | 3.089 | 0.001 | 58.279 | 0.015 | 0.000 | 0.000 |
| St. Margaret's Island SSSI | 94 | 226.142 | 51140.402 | 0.576 | 1.738 | 0.001 | 57.569 | 0.008 | 0.000 | 0.000 |
| Cynffig / Kenfig SSSI | 28 | 230.670 | 53208.596 | 0.527 | 1.899 | 0.000 | 55.332 | 0.009 | 0.000 | 0.000 |
| Possil Marsh SSSI | 34 | 232.295 | 53960.963 | 0.457 | 2.190 | 0.000 | 54.560 | 0.011 | 0.000 | 0.000 |
| River Usk (Lower Usk) / Afon Wysg (Wysg Isaf) SSSI | 1,200 | 232.806 | 54198.561 | 0.445 | 2.246 | 0.013 | 54.321 | 0.011 | 0.007 | 0.002 |

MONA OFFSHORE WIND PROJECT

| Colony location | Adult bird count (adjusted for IND) | Distance to Mona Array Area (km) | Distance ² | Prop of Forage Range as Sea | 1/Prop of Forage Range as Sea | Colony pop/ sum of pop | Sum dist ² / col dist ² | Colony sea/ sum of sea | SPA weight (based on distance ²) | Proportional SPA weight |
|--|-------------------------------------|----------------------------------|-----------------------|-----------------------------|-------------------------------|------------------------|---|------------------------|--|-------------------------|
| North Bellstane Plantation SSSI | 134 | 236.194 | 55787.558 | 0.466 | 2.148 | 0.002 | 49.035 | 0.011 | 0.001 | 0.000 |
| Calf and Wart Bank MNR | 54 | 57.845 | 3346.039 | 0.352 | 2.838 | 0.001 | 879.881 | 0.014 | 0.007 | 0.002 |
| North Channel SAC | 38 | 159.517 | 25445.832 | 0.461 | 2.169 | 0.000 | 115.701 | 0.010 | 0.000 | 0.000 |
| The Maidens SAC | 14 | 166.715 | 27793.856 | 0.469 | 2.134 | 0.000 | 105.927 | 0.010 | 0.000 | 0.000 |
| South Arran MPA | 250 | 193.332 | 37377.420 | 0.450 | 2.224 | 0.003 | 78.767 | 0.011 | 0.002 | 0.001 |
| West Wales Marine / Gorllewin Cymru Forol MPA | 124 | 211.365 | 44675.129 | 0.562 | 1.779 | 0.001 | 65.901 | 0.009 | 0.001 | 0.000 |
| Pembrokeshire Marine / Sir Benfro Forol SAC | 78 | 224.183 | 50257.933 | 0.577 | 1.732 | 0.001 | 58.580 | 0.008 | 0.000 | 0.000 |
| Bristol Channel Approaches / Dynesfeydd Mor Hafren SAC | 830 | 226.418 | 51264.976 | 0.575 | 1.738 | 0.009 | 57.429 | 0.008 | 0.004 | 0.001 |
| Skerries and Causeway SAC | 1,068 | 230.420 | 53093.232 | 0.544 | 1.839 | 0.011 | 55.452 | 0.009 | 0.005 | 0.001 |
| Blackpool | 10 | 53.713 | 2885.041 | 0.369 | 2.712 | 0.000 | 1020.476 | 0.013 | 0.001 | 0.000 |
| Seaforth Nature Reserve and Liverpool City | 22 | 58.089 | 3374.389 | 0.348 | 2.871 | 0.000 | 872.488 | 0.014 | 0.003 | 0.001 |

MONA OFFSHORE WIND PROJECT

| Colony location | Adult bird count (adjusted for IND) | Distance to Mona Array Area (km) | Distance ² | Prop of Forage Range as Sea | 1/Prop of Forage Range as Sea | Colony pop/ sum of pop | Sum dist ² / col dist ² | Colony sea/ sum of sea | SPA weight (based on distance ²) | Proportional SPA weight |
|---|-------------------------------------|----------------------------------|-----------------------|-----------------------------|-------------------------------|------------------------|---|------------------------|--|-------------------------|
| Barrow-in-Furness | 18 | 59.860 | 3583.204 | 0.390 | 2.562 | 0.000 | 821.643 | 0.012 | 0.002 | 0.000 |
| Sellafield | 300 | 74.065 | 5485.558 | 0.397 | 2.519 | 0.003 | 536.703 | 0.012 | 0.020 | 0.005 |
| Cleator Moor | 16 | 84.341 | 7113.421 | 0.404 | 2.477 | 0.000 | 413.882 | 0.012 | 0.001 | 0.000 |
| Whitehaven (Buildings) | 106 | 85.551 | 7319.035 | 0.403 | 2.480 | 0.001 | 402.255 | 0.012 | 0.005 | 0.001 |
| Salterhall Quarry | 36 | 87.205 | 7604.697 | 0.407 | 2.454 | 0.000 | 387.144 | 0.012 | 0.002 | 0.000 |
| Workington | 24 | 94.556 | 8940.773 | 0.411 | 2.435 | 0.000 | 329.291 | 0.012 | 0.001 | 0.000 |
| Dublin City Centre, Skerries and Balbriggan | 10 | 95.727 | 9163.676 | 0.433 | 2.309 | 0.000 | 321.281 | 0.011 | 0.001 | 0.000 |
| Belfast | 482 | 150.732 | 22720.061 | 0.447 | 2.236 | 0.000 | 129.582 | 0.011 | 0.000 | 0.000 |
| Antrim Town | 1,200 | 151.363 | 22910.641 | 0.462 | 2.165 | 0.005 | 128.504 | 0.010 | 0.007 | 0.002 |
| Birmingham | 80 | 176.263 | 31068.698 | 0.494 | 2.025 | 0.013 | 94.761 | 0.010 | 0.012 | 0.003 |
| Monaghan Lakes | 13 | 179.129 | 32087.030 | 0.259 | 3.858 | 0.001 | 91.754 | 0.019 | 0.001 | 0.000 |
| Hereford City | 118 | 182.509 | 33309.693 | 0.508 | 1.968 | 0.000 | 88.386 | 0.010 | 0.000 | 0.000 |
| Worcester City Centre | 744 | 186.721 | 34864.834 | 0.354 | 2.823 | 0.001 | 84.444 | 0.014 | 0.001 | 0.000 |

MONA OFFSHORE WIND PROJECT

| Colony location | Adult bird count (adjusted for IND) | Distance to Mona Array Area (km) | Distance ² | Prop of Forage Range as Sea | 1/Prop of Forage Range as Sea | Colony pop/ sum of pop | Sum dist ² / col dist ² | Colony sea/ sum of sea | SPA weight (based on distance ²) | Proportional SPA weight |
|-----------------------------|-------------------------------------|----------------------------------|-----------------------|-----------------------------|-------------------------------|------------------------|---|------------------------|--|-------------------------|
| Lady Isle | 492 | 196.358 | 38556.574 | 0.446 | 2.244 | 0.005 | 76.358 | 0.011 | 0.004 | 0.001 |
| Blaenau Gwent | 92 | 206.679 | 42716.068 | 0.446 | 2.241 | 0.001 | 68.923 | 0.011 | 0.001 | 0.000 |
| Carstairs Junction | 80 | 210.847 | 44456.627 | 0.462 | 2.166 | 0.001 | 66.224 | 0.010 | 0.001 | 0.000 |
| Horse Island | 1,802 | 211.127 | 44574.771 | 0.446 | 2.243 | 0.019 | 66.049 | 0.011 | 0.013 | 0.003 |
| Pembrey | 68 | 215.437 | 46413.031 | 0.545 | 1.836 | 0.001 | 63.433 | 0.009 | 0.000 | 0.000 |
| Waunarlwydd | 100 | 218.422 | 47708.119 | 0.530 | 1.888 | 0.001 | 61.711 | 0.009 | 0.001 | 0.000 |
| Gloucestershire Urban Gulls | 2,628 | 220.535 | 48635.731 | 0.320 | 3.128 | 0.027 | 60.534 | 0.015 | 0.025 | 0.006 |
| Little Cumbrae | 264 | 221.090 | 48880.645 | 0.448 | 2.230 | 0.003 | 60.231 | 0.011 | 0.002 | 0.000 |
| Gloucester City | 6,338 | 222.642 | 49569.517 | 0.331 | 3.022 | 0.066 | 59.394 | 0.015 | 0.057 | 0.014 |
| Maesteg | 74 | 223.189 | 49813.252 | 0.509 | 1.966 | 0.001 | 59.103 | 0.009 | 0.000 | 0.000 |
| Port Talbot | 60 | 223.233 | 49833.133 | 0.522 | 1.915 | 0.001 | 59.079 | 0.009 | 0.000 | 0.000 |
| Bellshill | 50 | 224.375 | 50344.309 | 0.459 | 2.180 | 0.001 | 58.480 | 0.011 | 0.000 | 0.000 |
| Newhouse | 12 | 224.882 | 50571.818 | 0.461 | 2.172 | 0.000 | 58.217 | 0.010 | 0.000 | 0.000 |

MONA OFFSHORE WIND PROJECT

| Colony location | Adult bird count (adjusted for IND) | Distance to Mona Array Area (km) | Distance ² | Prop of Forage Range as Sea | 1/Prop of Forage Range as Sea | Colony pop/ sum of pop | Sum dist ² / col dist ² | Colony sea/ sum of sea | SPA weight (based on distance ²) | Proportional SPA weight |
|--------------------------|-------------------------------------|----------------------------------|-----------------------|-----------------------------|-------------------------------|------------------------|---|------------------------|--|-------------------------|
| Brockworth | 112 | 225.224 | 50725.632 | 0.323 | 3.099 | 0.001 | 58.040 | 0.015 | 0.001 | 0.000 |
| Lydney | 208 | 226.389 | 51252.067 | 0.373 | 2.679 | 0.002 | 57.444 | 0.013 | 0.002 | 0.000 |
| Paisley | 234 | 228.243 | 52095.020 | 0.452 | 2.213 | 0.002 | 56.514 | 0.011 | 0.001 | 0.000 |
| Linwood | 16 | 228.991 | 52436.936 | 0.452 | 2.215 | 0.000 | 56.146 | 0.011 | 0.000 | 0.000 |
| Caerphilly | 70 | 229.224 | 52543.461 | 0.474 | 2.112 | 0.001 | 56.032 | 0.010 | 0.000 | 0.000 |
| Glasgow | 1,082 | 229.858 | 52834.743 | 0.456 | 2.193 | 0.011 | 55.723 | 0.011 | 0.007 | 0.002 |
| Clydebank | 80 | 231.826 | 53743.332 | 0.455 | 2.199 | 0.001 | 54.781 | 0.011 | 0.000 | 0.000 |
| Inchmarnock Island, Bute | 400 | 232.061 | 53852.450 | 0.454 | 2.204 | 0.004 | 54.670 | 0.011 | 0.002 | 0.001 |
| Newport | 142 | 234.304 | 54898.398 | 0.436 | 2.291 | 0.001 | 53.628 | 0.011 | 0.001 | 0.000 |
| Bridgend | 488 | 234.330 | 54910.604 | 0.518 | 1.930 | 0.005 | 53.617 | 0.009 | 0.003 | 0.001 |
| Bishopbriggs | 420 | 234.752 | 55108.563 | 0.459 | 2.178 | 0.004 | 53.424 | 0.011 | 0.002 | 0.001 |
| Kirkintilloch | 54 | 236.160 | 55771.701 | 0.462 | 2.167 | 0.001 | 52.789 | 0.010 | 0.000 | 0.000 |

MONA OFFSHORE WIND PROJECT

Table 1.22: Adult non-breeding lesser black-backed gull colony weighting factors used for apportioning impacts of collision risk (UK Western region).

| Age | Season | Colony | Total number of SPA birds | Proportion SPA birds in area | Birds in region | Total birds BDMPS | Proportion SPA/BDMPS |
|-------|--------------------------------------|-------------------------|---------------------------|------------------------------|-----------------|-----------------------------------|----------------------|
| Adult | Autumn migration (August to October) | Iceland | 50,000 | 0.2 | 10,000 | Adult UK Western waters = 110,708 | 9.03% |
| Adult | Autumn migration (August to October) | Norway | 60,000 | 0.1 | 6,000 | | 5.42% |
| Adult | Autumn migration (August to October) | Faroe | 18,000 | 0.4 | 7,200 | | 6.50% |
| Adult | Autumn migration (August to October) | Sweden | 36,000 | 0.05 | 1,800 | | 1.63% |
| Adult | Autumn migration (August to October) | Denmark | 8,800 | 0.05 | 440 | | 0.40% |
| Adult | Autumn migration (August to October) | Ireland | 7,600 | 0.4 | 3,040 | | 2.75% |
| Adult | Autumn migration (August to October) | Netherlands | 160,000 | 0.025 | 4,000 | | 3.61% |
| Adult | Autumn migration (August to October) | Ailsa Craig | 366 | 0.5 | 183 | | 0.17% |
| Adult | Autumn migration (August to October) | Rathlin Island | 214 | 0.5 | 107 | | 0.10% |
| Adult | Autumn migration (August to October) | Lough Neagh & Lough Beg | 986 | 0.5 | 493 | | 0.45% |
| Adult | Autumn migration (August to October) | Bowland Fells | 9,150 | 0.5 | 4,575 | | 4.13% |
| Adult | Autumn migration (August to October) | Morecambe Bay | 9,974 | 0.5 | 4,987 | | 4.50% |
| Adult | Autumn migration (August to October) | Ribble & Alt Estuaries | 16,534 | 0.5 | 8,267 | | 7.47% |

MONA OFFSHORE WIND PROJECT

| Age | Season | Colony | Total number of SPA birds | Proportion SPA birds in area | Birds in region | Total birds BDMPs | Proportion SPA/BDMPs |
|-------|--------------------------------------|-------------------------|---------------------------|------------------------------|-----------------|----------------------------------|----------------------|
| Adult | Autumn migration (August to October) | Skokholm, Skomer, Mholm | 19,280 | 0.7 | 13,496 | | 12.19% |
| Adult | Autumn migration (August to October) | Isles of Scilly | 6,800 | 0.9 | 6,120 | | 5.53% |
| Adult | Autumn migration (August to October) | UK Western non-SPA cols | 80,000 | 0.5 | 40,000 | | 36.13% |
| Adult | Winter (November to February) | Iceland | 50,000 | 0.05 | 2,500 | Adult UK Western waters = 36,029 | 6.94% |
| Adult | Winter (November to February) | Norway | 60,000 | 0.02 | 1,200 | | 3.33% |
| Adult | Winter (November to February) | Faroe | 18,000 | 0.05 | 900 | | 2.50% |
| Adult | Winter (November to February) | Sweden | 36,000 | 0.01 | 360 | | 1.00% |
| Adult | Winter (November to February) | Denmark | 8,800 | 0.01 | 88 | | 0.24% |
| Adult | Winter (November to February) | Ireland | 7,600 | 0.2 | 1,520 | | 4.22% |
| Adult | Winter (November to February) | Netherlands | 160,000 | 0.005 | 800 | | 2.22% |
| Adult | Winter (November to February) | Ailsa Craig | 366 | 0.2 | 73 | | 0.20% |
| Adult | Winter (November to February) | Rathlin Island | 214 | 0.2 | 43 | | 0.12% |
| Adult | Winter (November to February) | Lough Neagh & Lough Beg | 986 | 0.2 | 197 | | 0.55% |
| Adult | Winter (November to February) | Bowland Fells | 9,150 | 0.2 | 1,830 | | 5.08% |

MONA OFFSHORE WIND PROJECT

| Age | Season | Colony | Total number of SPA birds | Proportion SPA birds in area | Birds in region | Total birds BDMPS | Proportion SPA/BDMPS |
|-------|-----------------------------------|-------------------------|---------------------------|------------------------------|-----------------|-----------------------------------|----------------------|
| Adult | Winter (November to February) | Morecambe Bay | 9,974 | 0.2 | 1,995 | | 5.54% |
| Adult | Winter (November to February) | Ribble & Alt Estuaries | 16,534 | 0.2 | 3,307 | | 9.18% |
| Adult | Winter (November to February) | Skokholm, Skomer, Mholm | 19,280 | 0.2 | 3,856 | | 10.70% |
| Adult | Winter (November to February) | Isles of Scilly | 6,800 | 0.2 | 1,360 | | 3.77% |
| Adult | Winter (November to February) | UK Western non-SPA cols | 80,000 | 0.2 | 16,000 | | 44.41% |
| Adult | Spring migration (March to April) | Iceland | 50,000 | 0.2 | 10,000 | Adult UK Western waters = 110,708 | 9.03% |
| Adult | Spring migration (March to April) | Norway | 60,000 | 0.1 | 6,000 | | 5.42% |
| Adult | Spring migration (March to April) | Faroe | 18,000 | 0.4 | 7,200 | | 6.50% |
| Adult | Spring migration (March to April) | Sweden | 36,000 | 0.05 | 1,800 | | 1.63% |
| Adult | Spring migration (March to April) | Denmark | 8,800 | 0.05 | 440 | | 0.40% |
| Adult | Spring migration (March to April) | Ireland | 7,600 | 0.4 | 3,040 | | 2.75% |
| Adult | Spring migration (March to April) | Netherlands | 160,000 | 0.025 | 4,000 | | 3.61% |
| Adult | Spring migration (March to April) | Ailsa Craig | 366 | 0.5 | 183 | | 0.17% |
| Adult | Spring migration (March to April) | Rathlin Island | 214 | 0.5 | 107 | | 0.10% |

MONA OFFSHORE WIND PROJECT

| Age | Season | Colony | Total number of SPA birds | Proportion SPA birds in area | Birds in region | Total birds BDMPS | Proportion SPA/BDMPS |
|-------|-----------------------------------|-------------------------|---------------------------|------------------------------|-----------------|-------------------|----------------------|
| Adult | Spring migration (March to April) | Lough Neagh & L. Beg | 986 | 0.5 | 493 | | 0.45% |
| Adult | Spring migration (March to April) | Bowland Fells | 9,150 | 0.5 | 4,575 | | 4.13% |
| Adult | Spring migration (March to April) | Morecambe Bay | 9,974 | 0.5 | 4,987 | | 4.50% |
| Adult | Spring migration (March to April) | Ribble & Alt Estuaries | 16,534 | 0.5 | 8,267 | | 7.47% |
| Adult | Spring migration (March to April) | Skokholm, Skomer, Mholm | 19,280 | 0.7 | 13,496 | | 12.19% |
| Adult | Spring migration (March to April) | Isles of Scilly | 6,800 | 0.9 | 6,120 | | 5.53% |
| Adult | Spring migration (March to April) | UK Western non-SPA cols | 80,000 | 0.5 | 40,000 | | 36.13% |

MONA OFFSHORE WIND PROJECT

Table 1.23: Immature non-breeding lesser black-backed gull colony weighting factors used for apportioning impacts of collision risk (UK Western region).

| Age | Season | Colony | Total number of SPA birds | Proportion SPA birds in area | Birds in region | Total birds BDMPS | Proportion SPA/BDMPS |
|----------|--------------------------------------|---------------------------|---------------------------|------------------------------|-----------------|-------------------------------------|----------------------|
| Immature | Autumn migration (August to October) | Iceland | 34,000 | 0.1 | 3,400 | Immature Uk western waters = 52,596 | 6.46% |
| Immature | Autumn migration (August to October) | Norway | 40,800 | 0.05 | 2,040 | | 3.88% |
| Immature | Autumn migration (August to October) | Faroe | 12,240 | 0.2 | 2,448 | | 4.65% |
| Immature | Autumn migration (August to October) | Sweden | 24,480 | 0.02 | 490 | | 0.93% |
| Immature | Autumn migration (August to October) | Denmark | 5,984 | 0.02 | 120 | | 0.23% |
| Immature | Autumn migration (August to October) | Ireland | 5,168 | 0.2 | 1,034 | | 1.97% |
| Immature | Autumn migration (August to October) | Netherlands | 108,800 | 0.01 | 1,088 | | 2.07% |
| Immature | Autumn migration (August to October) | Forth Islands | 2,187 | 0.1 | 219 | | 0.42% |
| Immature | Autumn migration (August to October) | Alde-Ore Estuary | 870 | 0.1 | 87 | | 0.17% |
| Immature | Autumn migration (August to October) | UK North Sea non-SPA cols | 17,680 | 0.1 | 1,768 | | 3.36% |
| Immature | Autumn migration (August to October) | Ailsa Craig | 249 | 0.4 | 100 | | 0.19% |
| Immature | Autumn migration (August to October) | Rathlin Island | 146 | 0.4 | 58 | | 0.11% |
| Immature | Autumn migration (August to October) | Lough Neagh & Lough Beg | 670 | 0.4 | 268 | | 0.51% |

MONA OFFSHORE WIND PROJECT

| Age | Season | Colony | Total number of SPA birds | Proportion SPA birds in area | Birds in region | Total birds BDMPs | Proportion SPA/BDMPs |
|----------|--------------------------------------|-------------------------|---------------------------|------------------------------|-----------------|------------------------------------|----------------------|
| Immature | Autumn migration (August to October) | Bowland Fells | 6,222 | 0.4 | 2,489 | | 4.73% |
| Immature | Autumn migration (August to October) | Morecambe Bay | 6,782 | 0.4 | 2,713 | | 5.16% |
| Immature | Autumn migration (August to October) | Ribble & Alt Estuaries | 11,243 | 0.4 | 4,497 | | 8.55% |
| Immature | Autumn migration (August to October) | Skokholm, Skomer, Mholm | 13,110 | 0.4 | 5,244 | | 9.97% |
| Immature | Autumn migration (August to October) | Isles of Scilly | 4,624 | 0.6 | 2,774 | | 5.27% |
| Immature | Autumn migration (August to October) | UK Western non-SPA cols | 54,400 | 0.4 | 21,760 | | 41.37% |
| Immature | Winter (November to February) | Ireland | 5,168 | 0.05 | 258 | Immature Uk western waters = 5,130 | 5.03% |
| Immature | Winter (November to February) | Ailsa Craig | 249 | 0.05 | 12 | | 0.23% |
| Immature | Winter (November to February) | Rathlin Island | 146 | 0.05 | 7 | | 0.14% |
| Immature | Winter (November to February) | Lough Neagh & Lough Beg | 670 | 0.05 | 34 | | 0.66% |
| Immature | Winter (November to February) | Bowland Fells | 6,222 | 0.05 | 311 | | 6.06% |
| Immature | Winter (November to February) | Morecambe Bay | 6,782 | 0.05 | 339 | | 6.61% |
| Immature | Winter (November to February) | Ribble & Alt Estuaries | 11,243 | 0.05 | 562 | | 10.96% |
| Immature | Winter (November to February) | Skokholm, Skomer, Mholm | 13,110 | 0.05 | 656 | | 12.79% |

MONA OFFSHORE WIND PROJECT

| Age | Season | Colony | Total number of SPA birds | Proportion SPA birds in area | Birds in region | Total birds BDMPs | Proportion SPA/BDMPs |
|----------|-----------------------------------|-------------------------|---------------------------|------------------------------|-----------------|-------------------------------------|----------------------|
| Immature | Winter (November to February) | Isles of Scilly | 4,624 | 0.05 | 231 | | 4.50% |
| Immature | Winter (November to February) | UK Western non-SPA cols | 54,400 | 0.05 | 2,720 | | 53.02% |
| Immature | Spring migration (March to April) | Iceland | 34,000 | 0.1 | 3,400 | Immature Uk western waters = 52,596 | 6.46% |
| Immature | Spring migration (March to April) | Norway | 40,800 | 0.05 | 2,040 | | 3.88% |
| Immature | Spring migration (March to April) | Faroe | 12,240 | 0.2 | 2,448 | | 4.65% |
| Immature | Spring migration (March to April) | Sweden | 24,480 | 0.02 | 490 | | 0.93% |
| Immature | Spring migration (March to April) | Denmark | 5,984 | 0.02 | 120 | | 0.23% |
| Immature | Spring migration (March to April) | Ireland | 5,168 | 0.2 | 1,034 | | 1.97% |
| Immature | Spring migration (March to April) | Netherlands | 108,800 | 0.01 | 1,088 | | 2.07% |
| Immature | Spring migration (March to April) | Forth Islands | 2,187 | 0.1 | 219 | | 0.42% |
| Immature | Spring migration (March to April) | Alde-Ore Estuary | 870 | 0.1 | 87 | | 0.17% |
| Immature | Spring migration (March to April) | UK North Sea non-SPA | 17,680 | 0.1 | 1,768 | | 3.36% |
| Immature | Spring migration (March to April) | Ailsa Craig | 249 | 0.4 | 100 | | 0.19% |
| Immature | Spring migration (March to April) | Rathlin Island | 146 | 0.4 | 58 | | 0.11% |

MONA OFFSHORE WIND PROJECT

| Age | Season | Colony | Total number of SPA birds | Proportion SPA birds in area | Birds in region | Total birds BDMPS | Proportion SPA/BDMPS |
|----------|-----------------------------------|-------------------------|---------------------------|------------------------------|-----------------|-------------------|----------------------|
| Immature | Spring migration (March to April) | Lough Neagh & L. Beg | 670 | 0.4 | 268 | | 0.51% |
| Immature | Spring migration (March to April) | Bowland Fells | 6,222 | 0.4 | 2,489 | | 4.73% |
| Immature | Spring migration (March to April) | Morecambe Bay | 6,782 | 0.4 | 2,713 | | 5.16% |
| Immature | Spring migration (March to April) | Ribble & Alt Estuaries | 11,243 | 0.4 | 4,497 | | 8.55% |
| Immature | Spring migration (March to April) | Skokholm, Skomer, Mholm | 13,110 | 0.4 | 5,244 | | 9.97% |
| Immature | Spring migration (March to April) | Isles of Scilly | 4,624 | 0.6 | 2,774 | | 5.27% |
| Immature | Spring migration (March to April) | UK Western non-SPA cols | 54,400 | 0.4 | 21,760 | | 41.37% |

MONA OFFSHORE WIND PROJECT

1.4.7 Great black-backed gull

Colony weighted proportions

1.4.7.1 Colonies included based on foraging distance, distance to the Mona Array Area centroid, and the resulting designated and non-designated site weighted proportions of this species are given in Table 1.24 and Table 1.26, with the highest weighting factor assigned to Puffin Island SPA (0.546%), followed by Anglesey Terns SPA (0.151%) and Morecambe Bay and Duddon Estuary SPA (0.051%).

Table 1.24: Great black-backed gull colony weighting factors used for apportioning impacts of collision risk in the breeding season.

| Colony location | Adult bird count (adjusted for IND) | Distance to Mona Array Area (km) | Distance ² | Prop of Forage Range as Sea | 1/Prop of Forage Range as Sea | Colony pop/ sum of pop | Sum dist ² / col dist ² | Colony sea/ sum of sea | SPA weight (based on distance ²) | Proportional SPA weight |
|--|-------------------------------------|----------------------------------|-----------------------|-----------------------------|-------------------------------|------------------------|---|------------------------|--|-------------------------|
| Anglesey Terns / Morwenoliaid Ynys Môn SPA | 112 | 42.22 | 1782.9 | 0.787 | 1.271 | 0.169 | 44.263 | 0.032 | 0.241 | 0.151 |
| Glannau Ynys Gybi / Holy Island Coast SPA | 10 | 56.27 | 3166.8 | 0.806 | 1.241 | 0.015 | 24.920 | 0.031 | 0.012 | 0.007 |
| Migneint-Arenig-Dduallt SPA | 2 | 68.01 | 4626.0 | 0.392 | 2.553 | 0.003 | 17.059 | 0.065 | 0.003 | 0.002 |
| Morecambe Bay and Duddon Estuary SPA | 92 | 60.01 | 3601.1 | 0.478 | 2.092 | 0.139 | 21.915 | 0.053 | 0.161 | 0.101 |
| Ribble & Alt Estuaries SPA | 34 | 58.57 | 3429.9 | 0.370 | 2.703 | 0.051 | 23.008 | 0.068 | 0.081 | 0.051 |

MONA OFFSHORE WIND PROJECT

| Colony location | Adult bird count (adjusted for IND) | Distance to Mona Array Area (km) | Distance ² | Prop of Forage Range as Sea | 1/Prop of Forage Range as Sea | Colony pop/ sum of pop | Sum dist ² / col dist ² | Colony sea/ sum of sea | SPA weight (based on distance ²) | Proportional SPA weight |
|---|-------------------------------------|----------------------------------|-----------------------|-----------------------------|-------------------------------|------------------------|---|------------------------|--|-------------------------|
| The Dee Estuary SPA | 2 | 58.23 | 3390.3 | 0.265 | 3.772 | 0.003 | 23.277 | 0.095 | 0.007 | 0.004 |
| Ynys Seiriol / Puffin Island SPA | 214 | 34.27 | 1174.8 | 0.632 | 1.582 | 0.323 | 67.176 | 0.040 | 0.869 | 0.546 |
| Llyn Maelog SSSI | 2 | 54.57 | 2977.4 | 0.757 | 1.320 | 0.003 | 26.505 | 0.033 | 0.003 | 0.002 |
| Llynau y Fali - Valley Lakes SSSI | 6 | 52.19 | 2723.3 | 0.775 | 1.290 | 0.009 | 28.978 | 0.033 | 0.009 | 0.005 |
| Mynydd Hiraethog SSSI | 6 | 60.69 | 3682.8 | 0.298 | 3.353 | 0.009 | 21.429 | 0.085 | 0.016 | 0.010 |
| Newborough Warren - Ynys Llanddwyn SSSI | 4 | 60.80 | 3697.0 | 0.699 | 1.431 | 0.006 | 21.346 | 0.036 | 0.005 | 0.003 |
| Penrhynoedd Llangadwaladr SSSI | 4 | 58.28 | 3396.6 | 0.715 | 1.398 | 0.006 | 23.234 | 0.035 | 0.005 | 0.003 |
| Baie ny Carrickey MNR | 4 | 55.71 | 3103.1 | 0.939 | 1.065 | 0.006 | 25.432 | 0.027 | 0.004 | 0.003 |
| Calf and Wart Bank MNR | 80 | 57.48 | 3304.3 | 0.933 | 1.072 | 0.121 | 23.883 | 0.027 | 0.078 | 0.049 |
| Douglas Bay MNR | 12 | 48.29 | 2331.5 | 0.932 | 1.073 | 0.018 | 33.848 | 0.027 | 0.017 | 0.010 |
| Langness MNR | 4 | 48.41 | 2343.3 | 0.950 | 1.053 | 0.006 | 33.678 | 0.027 | 0.005 | 0.003 |

MONA OFFSHORE WIND PROJECT

| Colony location | Adult bird count (adjusted for IND) | Distance to Mona Array Area (km) | Distance ² | Prop of Forage Range as Sea | 1/Prop of Forage Range as Sea | Colony pop/ sum of pop | Sum dist ² / col dist ² | Colony sea/ sum of sea | SPA weight (based on distance ²) | Proportional SPA weight |
|--------------------|-------------------------------------|----------------------------------|-----------------------|-----------------------------|-------------------------------|------------------------|---|------------------------|--|-------------------------|
| Laxey Bay MNR | 2 | 51.79 | 2681.9 | 0.900 | 1.112 | 0.003 | 29.426 | 0.028 | 0.003 | 0.002 |
| Little Ness MNR | 10 | 47.15 | 2222.8 | 0.949 | 1.053 | 0.015 | 35.504 | 0.027 | 0.014 | 0.009 |
| Niarbyl Bay MNR | 2 | 57.90 | 3351.9 | 0.929 | 1.076 | 0.003 | 23.544 | 0.027 | 0.002 | 0.001 |
| Port Erin Bay MNR | 8 | 57.33 | 3287.2 | 0.933 | 1.072 | 0.012 | 24.008 | 0.027 | 0.008 | 0.005 |
| Ramsey Bay MNR | 12 | 58.70 | 3446.3 | 0.848 | 1.180 | 0.018 | 22.899 | 0.030 | 0.012 | 0.008 |
| West Coast MNR | 34 | 64.39 | 4146.1 | 0.875 | 1.142 | 0.051 | 19.034 | 0.029 | 0.028 | 0.018 |
| Llyn Elsi | 2 | 59.00 | 3481.5 | 0.483 | 2.068 | 0.003 | 22.667 | 0.052 | 0.004 | 0.002 |
| Llyn yr Adar | 2 | 67.19 | 4513.9 | 0.867 | 1.153 | 0.003 | 17.483 | 0.029 | 0.002 | 0.001 |
| Port Mooar - Dhoon | 2 | 55.27 | 3054.3 | 0.721 | 1.388 | 0.003 | 25.838 | 0.035 | 0.003 | 0.002 |

MONA OFFSHORE WIND PROJECT

Table 1.25: Adult non-breeding great black-backed gull colony weighting factors used for apportioning impacts of collision risk (UK Southwest and Channel waters region).

| Age | Season | Colony | Total number of SPA birds | Proportion SPA birds in area | Birds in region | Total birds BDMPS | Proportion SPA/BDMPS |
|-------|--------------|-----------------------------|---------------------------|------------------------------|-----------------|---|----------------------|
| Adult | Non-breeding | Barents Sea | 66,000 | 0 | 0 | Adult UK Southwest and Channel waters = 5,622 | 0.00% |
| Adult | Non-breeding | Faroe | 2,000 | 0 | 0 | | 0.00% |
| Adult | Non-breeding | Ireland | 4,000 | 0.1 | 400 | | 7.11% |
| Adult | Non-breeding | North Rona & Sula Sgeir | 382 | 0 | 0 | | 0.00% |
| Adult | Non-breeding | Isles of Scilly | 1,802 | 0.9 | 1,622 | | 28.85% |
| Adult | Non-breeding | UK western non-SPA colonies | 18,000 | 0.2 | 3,600 | | 64.03% |

MONA OFFSHORE WIND PROJECT

Table 1.26: Immature non-breeding great black-backed gull colony weighting factors used for apportioning impacts of collision risk (UK Southwest and Channel waters region).

| Age | Season | Colony | Total number of SPA birds | Proportion SPA birds in area | SPA birds in region | Total birds BDMPS | Proportion SPA/BDMPS |
|----------|--------------|-----------------------------|---------------------------|------------------------------|---------------------|---|----------------------|
| Immature | Non-breeding | Barents Sea | 83,160 | 0.02 | 6,653 | Immature UK Southwest and Channel waters = 12,120 | 13.72% |
| Immature | Non-breeding | Faroe | 2,520 | 0.2 | 504 | | 4.16% |
| Immature | Non-breeding | Ireland | 5,040 | 0.3 | 1,512 | | 12.48% |
| Immature | Non-breeding | North Rona & Sula Sgeir | 481 | 0.1 | 48 | | 0.40% |
| Immature | Non-breeding | Isles of Scilly | 2,271 | 0.7 | 1,589 | | 13.12% |
| Immature | Non-breeding | UK western non-SPA colonies | 22,680 | 0.3 | 6,804 | | 56.14% |

MONA OFFSHORE WIND PROJECT

1.4.8 Manx shearwater

Colony weighted proportions

1.4.8.1 Colonies included based on foraging distance, distance to the Mona Array Area centroid, and the resulting designated and non-designated site weighted proportions of this species are given in Table 1.27, with the highest weighting factor assigned to Skomer, Skokholm and the Seas off Pembrokeshire SPA (0.750%), followed by Aberdaron Coast and Bardsey Island SPA (0.113%).

Table 1.27: Manx shearwater colony weighting factors used for apportioning impacts of collision and displacement in the breeding season

| Colony location | Adult bird count (adjusted for IND) | Distance to Mona Array Area (km) | Distance ² | Prop of Forage Range as Sea | 1/Prop of Forage Range as Sea | Colony pop/ sum of pop | Sum dist ² / col dist ² | Colony sea/ sum of sea | SPA weight (based on distance ²) | Proportional SPA weight |
|--|-------------------------------------|----------------------------------|-----------------------|-----------------------------|-------------------------------|------------------------|---|------------------------|--|-------------------------|
| Glannau Aberdaron ac Ynys Enlli / Aberdaron Coast and Bardsey Island SPA | 32,366 | 110.8 | 12280.6 | 0.982 | 1.018 | 0.025 | 165.040 | 0.056 | 0.230 | 0.113 |
| Copeland Islands SPA | 9,700 | 137.6 | 18941.4 | 0.982 | 1.018 | 0.008 | 107.003 | 0.056 | 0.045 | 0.022 |
| High Island, Inishshark and Davillaun SPA | 1,738 | 411.1 | 169019.8 | 0.982 | 1.018 | 0.001 | 11.991 | 0.056 | 0.001 | 0.000 |
| Cruagh Island SPA | 6,572 | 408.2 | 166652.8 | 0.982 | 1.018 | 0.005 | 12.162 | 0.056 | 0.003 | 0.002 |
| Blasket Islands SPA | 39,068 | 472.8 | 223566.3 | 0.982 | 1.018 | 0.030 | 9.066 | 0.056 | 0.015 | 0.008 |

MONA OFFSHORE WIND PROJECT

| Colony location | Adult bird count (adjusted for IND) | Distance to Mona Array Area (km) | Distance ² | Prop of Forage Range as Sea | 1/Prop of Forage Range as Sea | Colony pop/ sum of pop | Sum dist ² / col dist ² | Colony sea/ sum of sea | SPA weight (based on distance ²) | Proportional SPA weight |
|---|-------------------------------------|----------------------------------|-----------------------|-----------------------------|-------------------------------|------------------------|---|------------------------|--|-------------------------|
| Skelligs SPA | 1,476 | 485.1 | 235352.4 | 0.982 | 1.018 | 0.001 | 8.612 | 0.056 | 0.001 | 0.000 |
| Puffin Island SPA | 12,658 | 473.6 | 224271.7 | 0.982 | 1.018 | 0.010 | 9.037 | 0.056 | 0.005 | 0.002 |
| Deenish Island and Scariff Island SPA | 4,622 | 468.8 | 219755.7 | 0.982 | 1.018 | 0.004 | 9.223 | 0.056 | 0.002 | 0.001 |
| Saltee Islands SPA | 500 | 239.8 | 57511.3 | 0.982 | 1.018 | 0.000 | 35.242 | 0.056 | 0.001 | 0.000 |
| Treshnish Isles SPA | 3,984 | 335.0 | 112207.9 | 0.982 | 1.018 | 0.003 | 18.063 | 0.056 | 0.003 | 0.002 |
| Rum SPA | 240,000 | 383.9 | 147344.4 | 0.982 | 1.018 | 0.186 | 13.755 | 0.056 | 0.142 | 0.070 |
| Ailsa Craig SPA | 40 | 175.1 | 30643.4 | 0.982 | 1.018 | 0.000 | 66.141 | 0.056 | 0.000 | 0.000 |
| Ramsey and St David's Peninsula Coast SPA | 12,450 | 215.7 | 46542.6 | 0.982 | 1.018 | 0.010 | 43.547 | 0.056 | 0.023 | 0.012 |
| Skomer, Skokholm and the Seas off Pembrokeshire SPA | 910,312 | 228.5 | 52226.0 | 0.982 | 1.018 | 0.706 | 38.808 | 0.056 | 1.522 | 0.750 |
| Isles of Scilly SPA | 1,452 | 440.2 | 193785.0 | 0.982 | 1.018 | 0.001 | 10.459 | 0.056 | 0.001 | 0.000 |

MONA OFFSHORE WIND PROJECT

| Colony location | Adult bird count (adjusted for IND) | Distance to Mona Array Area (km) | Distance ² | Prop of Forage Range as Sea | 1/Prop of Forage Range as Sea | Colony pop/ sum of pop | Sum dist ² / col dist ² | Colony sea/ sum of sea | SPA weight (based on distance ²) | Proportional SPA weight |
|------------------------|-------------------------------------|----------------------------------|-----------------------|-----------------------------|-------------------------------|------------------------|---|------------------------|--|-------------------------|
| Sanda Islands SSSI | 600 | 192.1 | 36905.2 | 0.982 | 1.018 | 0.000 | 54.919 | 0.056 | 0.001 | 0.001 |
| Lundy SSSI | 11,008 | 276.5 | 76438.5 | 0.982 | 1.018 | 0.009 | 26.515 | 0.056 | 0.013 | 0.006 |
| Calf and Wart Bank MNR | 848 | 57.8 | 3346.0 | 0.982 | 1.018 | 0.001 | 605.728 | 0.056 | 0.022 | 0.011 |

MONA OFFSHORE WIND PROJECT

Table 1.28: Adult non-breeding Manx shearwater colony weighting factors used for apportioning impacts of collision risk (UK Western and Channel region).

| Age | Season | Colony | Total number of SPA birds | Proportion SPA birds in area | SPA birds in region | Total birds BDMPS | Proportion SPA/BDMPS |
|-------|--|----------------------------|---------------------------|------------------------------|---------------------|-----------------------------------|----------------------|
| Adult | Migration seasons (August to early October, late March to May) | Iceland | 17,000 | 0.01 | 170 | Adult UK Western waters = 992,300 | 0.02% |
| Adult | Migration seasons (August to early October, late March to May) | Faroe | 50,000 | 0.01 | 500 | | 0.05% |
| Adult | Migration seasons (August to early October, late March to May) | Ireland | 65,200 | 0.05 | 3,260 | | 0.33% |
| Adult | Migration seasons (August to early October, late March to May) | St Kilda | 9,604 | 1 | 9,604 | | 0.97% |
| Adult | Migration seasons (August to early October, late March to May) | Rum | 240,000 | 1 | 240,000 | | 24.19% |
| Adult | Migration seasons (August to early October, late March to May) | Aberdaron Coast & Bardsey | 32,366 | 1 | 32,366 | | 3.26% |
| Adult | Migration seasons (August to early October, late March to May) | Skomer, Skokholm & Middleh | 700,000 | 1 | 700,000 | | 70.54% |

MONA OFFSHORE WIND PROJECT

| Age | Season | Colony | Total number of SPA birds | Proportion SPA birds in area | SPA birds in region | Total birds BDMPS | Proportion SPA/BDMPS |
|-------|--|---------------------|---------------------------|------------------------------|---------------------|-------------------|----------------------|
| Adult | Migration seasons (August to early October, late March to May) | UK non-SPA colonies | 8,000 | 0.8 | 6,400 | | 0.64% |

MONA OFFSHORE WIND PROJECT

Table 1.29: Immature non-breeding Manx shearwater colony weighting factors used for apportioning impacts of collision risk (UK Western and Channel region).

| Age | Season | Colony | Total number of SPA birds | Proportion SPA birds in area | SPA birds in region | Total birds BDMPS | Proportion SPA/BDMPS |
|----------|--|----------------------------|---------------------------|------------------------------|---------------------|--------------------------------------|----------------------|
| Immature | Migration seasons (August to early October, late March to May) | Iceland | 14,280 | 0.03 | 428.4 | Immature UK western waters = 588,595 | 0.07% |
| Immature | Migration seasons (August to early October, late March to May) | Faroe | 42,000 | 0.03 | 1,260 | | 0.21% |
| Immature | Migration seasons (August to early October, late March to May) | Ireland | 54,768 | 0.1 | 5,476.8 | | 0.93% |
| Immature | Migration seasons (August to early October, late March to May) | St Kilda | 8,067 | 0.7 | 5,646.9 | | 0.96% |
| Immature | Migration seasons (August to early October, late March to May) | Rum | 201,600 | 0.7 | 141,120 | | 23.98% |
| Immature | Migration seasons (August to early October, late March to May) | Aberdaron Coast & Bardsey | 27,187 | 0.7 | 19,030.9 | | 3.23% |
| Immature | Migration seasons (August to early October, late March to May) | Skomer, Skokholm & Middleh | 588,000 | 0.7 | 411,600 | | 69.93% |
| Immature | Migration seasons (August to early October, late March to May) | UK non-SPA colonies | 6,720 | 0.6 | 4,032 | | 0.69% |

1.5 Discussion

- 1.5.1.1 This technical report's use of NatureScot's theoretical approach to apportioning impacts to breeding seabirds in SPAs and its consideration of immature birds results in certain assumptions that may lead to under or over-estimates of the proportion of breeding adult birds present in a given area. These include:
- Breeding adult birds
 - That birds are evenly distributed at sea, with this being extremely unlikely due to the known patchy distribution of prey species and information gained from tracking studies
 - That seabird colonies are independent of one another
 - Larger foraging ranges at larger breeding colonies due to competition and prey depletion closer to the colony (Storer-Ashmole's Halo; Elliot *et al.*, 2009)
 - The use of mean-maximum plus one standard deviation foraging ranges
 - Immature birds
 - Limited information is available on the proportion of immature birds that return to natal waters and the distribution of immature birds within natal waters.
- 1.5.1.2 Consideration has been given in the HRA Stage 2 ISAA (Document Reference E1.3) to these assumptions, including where available site-specific tracking studies, and what effect they may have on the overall magnitude of any potential impacts.

1.6 References

- Coulson, J.C., 2011. *The Kittiwake*. London: T. & A.D. Poyser
- East Anglia THREE Ltd. (2015). East Anglia THREE Information for the Habitats Regulations Assessment. Document Reference 5.4.
- Forewind (2013). Dogger Bank Creyke Beck Information for Appropriate Assessment Report. F-OFC-RP-002 Issue 11. Application Reference: 5.2.
- Furness, R.W. (2015) Non-breeding season populations of seabirds in UK waters: Population sizes for Biologically Defined Minimum Population Scales (BDMPS). Natural England Commissioned Reports, No. 164.
- Horswill, C. and Robinson R. A. (2015) Review of seabird demographic rates and density dependence. JNCC Report No. 552. Joint Nature Conservation Committee, Peterborough.
- JNCC (2023) Seabird Monitoring Programme. Available at <https://app.bto.org/seabirds>
- Marine Scotland (2017b). Marine Scotland - Licensing Operations Team Scoping Opinion. Addendum: Ornithology. Scoping Opinion for Moray East Offshore Windfarm – Alternative Design Parameters – Ornithology. 16 June 2017
- Marine Scotland (2017a). Marine Scotland - Licensing Operations Team Scoping Opinion. Addendum: Ornithology. Scoping Opinion for Moray East Offshore Windfarm – Alternative Design Parameters – Ornithology. 16 June 2017
- Mitchell, P.I., Newton, S.F., Ratcliffe, N. and Dunn, T.E. (2004). Seabird Populations of Britain and Ireland. T. and A.D. Poyser, London.
- Seagreen, 2018. Appendix 16B: Apportioning impacts on HRA species at the optimised Seagreen project to SPAS. EIA Report Volume 3.
- SMart Wind, 2015. Kittiwake Collision Risk: Review of Core Assumptions. Appendix DD to the Response submitted for Deadline IV Application. Reference: EN010053. Hornsea Offshore Wind Farm, Project Two. SMart Wind Limited, London.
- NatureScot (2018). Interim Guidance on apportioning impacts from marine renewable developments to breeding seabird populations in SPAs.
- Woodward, I., Thaxter, C.B., Owen, E. and Cook, A.S.C.P. (2019) Desk-based revision of seabird foraging ranges used for HRA screening. BTO Report 724 for The Crown Estate.

Appendix A: Estimated displacement and collision mortalities

Table A. 1: Modelled expected mortality estimates across species and seasons from collision risk and displacement.

| Species | Season | Mortality Collisions (using species-group avoidance rates) | Mortality Collisions (using species-specific avoidance rates) | Mortality displacement | Mortality Combined (using species-group avoidance rates) | Mortality Combined (using species-specific avoidance rates) |
|--|---------------|---|--|---------------------------|---|--|
| Common guillemot | Breeding | - | - | 21 (13 to 295) | 21 (13 to 295) | 21 (13 to 295) |
| | Non-breeding | - | - | 19 (11 to 263) | 19 (11 to 263) | 19 (11 to 263) |
| Razorbill | Pre-breeding | - | - | 10 (6 to 135) | 10 (6 to 135) | 10 (6 to 135) |
| | Breeding | - | - | 0 (0 to 6) | 0 (0 to 6) | 0 (0 to 6) |
| | Post-breeding | - | - | 0 (0 to 6) | 0 (0 to 6) | 0 (0 to 6) |
| | Non-breeding | - | - | 2 (1 to 29) | 2 (1 to 29) | 2 (1 to 29) |
| Atlantic puffin | Breeding | - | - | 0 (0 to 1) | 0 (0 to 1) | 0 (0 to 1) |
| | Non-breeding | - | - | 0 (0 to 2) | 0 (0 to 2) | 0 (0 to 0) |
| Northern gannet (no correction for to collision impacts to account for macroavoidance) | Pre-breeding | 0 (0 to 1) | - | 0 (0 to 2) | 0 (0 to 3) | - |
| | Breeding | 5 (1 to 13) | - | 2 (2 to 20) | 7 (3 to 33) | - |
| | Post-breeding | 1 (0 to 1) | - | 0 (0 to 5) | 1 (0 to 6) | - |
| Northern fulmar | Pre-breeding | 0 (0 to 0) | - | - | 0 (0 to 0) | - |
| | Breeding | 0 (0 to 2) | - | - | 0 (0 to 2) | - |
| | Post-breeding | 0 (0 to 0) | - | - | 0 (0 to 0) | - |
| | Non-breeding | 0 (0 to 0) | - | - | 0 (0 to 0) | - |
| Black-legged kittiwake | Pre-breeding | 9 (3 to 18) | 3 (1 to 5) | 3 (2 to 40) | 12 (5 to 58) | 6 (3 to 45) |

MONA OFFSHORE WIND PROJECT

| Species | Season | Mortality Collisions (using species-group avoidance rates) | Mortality Collisions (using species-specific avoidance rates) | Mortality displacement | Mortality Combined (using species-group avoidance rates) | Mortality Combined (using species-specific avoidance rates) |
|--------------------------|---------------|--|---|------------------------|--|---|
| | Breeding | 16 (6 to 31) | 5 (2 to 9) | 4 (2 to 51) | 20 (8 to 83) | 9 (4 to 60) |
| | Post-breeding | 8 (3 to 18) | 3 (1 to 5) | 3 (2 to 39) | 12 (5 to 57) | 6 (3 to 44) |
| Herring gull | Breeding | 0 (0 to 0) | 0 (0 to 0) | - | 0 (0 to 0) | 0 (0 to 0) |
| | Non-breeding | 2 (1 to 3) | 1 (0 to 3) | - | 2 (1 to 3) | 2 (1 to 3) |
| Lesser black-backed gull | Pre-breeding | 1 (0 to 2) | 1 (0 to 2) | - | 1 (0 to 2) | 1 (0 to 2) |
| | Breeding | 0 (0 to 1) | 0 (0 to 1) | - | 0 (0 to 1) | 0 (0 to 1) |
| | Post-breeding | 0 (0 to 0) | 0 (0 to 0) | - | 0 (0 to 0) | 0 (0 to 0) |
| | Non-breeding | 1 (0 to 2) | 1 (0 to 1) | - | 1 (0 to 2) | 1 (0 to 2) |
| Great black-backed gull | Breeding | 2 (1 to 3) | 0 (0 to 1) | - | 2 (1 to 3) | 2 (1 to 3) |
| | Non-breeding | 3 (1 to 7) | 1 (0 to 1) | - | 3 (1 to 7) | 3 (1 to 7) |
| Manx shearwater | Pre-breeding | 0 (0 to 0) | - | 0 (0 to 0) | 0 (0 to 0) | 0 (0 to 0) |
| | Breeding | 0 (0 to 0) | - | 6 (4 to 87) | 6 (4 to 87) | 6 (4 to 87) |
| | Post-breeding | 0 (0 to 0) | - | 0 (0 to 1) | 0 (0 to 1) | 1 (1 to 13) |