

MONA OFFSHORE WIND PROJECT

Preliminary Environmental Information Report

Volume 6, annex 10.5: Offshore ornithology apportioning assessment



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FINAL

Image of an offshore wind farm

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Glossary

Term	Meaning
Apparently Occupied Nests	A census method in the Seabird Monitoring Programme, where the colony count is expressed with nests as the unit. To get to individual birds, this number must be multiplied by two.
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).
Mean High Water Springs	Average height throughout the year of two successive high waters, during a 24-hour period in each month when the range of the tide is at its greatest.
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
AON	Apparently Occupied Nests (bird census)
BDMPS	Biologically Defined Minimum Population Scale
IND	Number of individuals (bird census)
ISAA	Information to Support the Appropriate Assessment
SMP	Seabird Monitoring Programme
NS	NatureScot
PEIR	Preliminary Environmental Information Report
SMP	Seabird Monitoring Programme
SPA	Special Protection Area

Units

Unit	Description
km	Kilometres
m	Metres
nm	Nautical miles

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, which are often protected as Special Protected Areas (SPAs), is a key element of the assessment of impact. A theoretical approach has been developed by NatureScot (NS, 2018) to determine the proportion of birds from SPA sites which use proposed development areas. The tools allow to 'apportion' the impact of a marine renewable site to multiple SPAs. This technical report presents the apportioning method and apportions the potential impacts of the Mona Offshore Wind Project on SPAs 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 10.2: Offshore ornithology displacement technical report and volume 6, annex 10.3: Offshore ornithology collision risk modelling technical report of the Preliminary Environmental Information Report (PEIR). 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 1.2.2.

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 as SPAs (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 2km buffer.

1.1.3 Study area

1.1.3.1 The Mona Array Area is located approximately 28.2km north of Colwyn Bay in North Wales and 39.9km from the northwest coast of England. The Mona Array Area covers 449.97km².

1.1.3.2 The study area for the Mona Apportioning Assessment encompasses all SPA and non-SPA 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 the SPA colonies are outlined below.

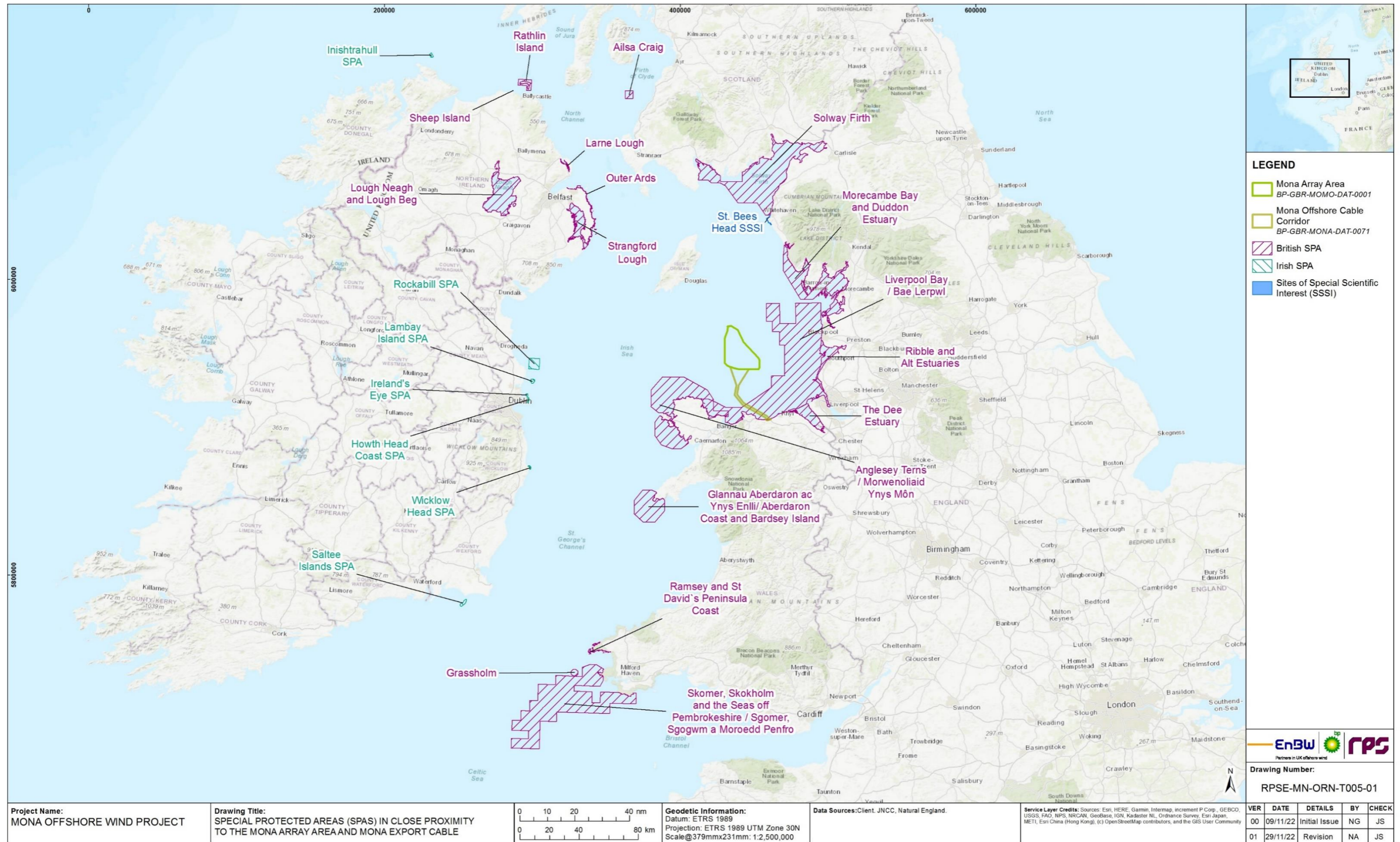


Figure 1.1: SPAs covered in this apportioning assessment in relation to the Mona Array Area.

1.2 Methodology

1.2.1.1 Apportioning undertaken for the Mona Offshore Wind Project is based on the NatureScot ‘theoretical approach’ method for the breeding season (NS, 2018). Apportioning during the non-breeding season utilises the Biologically Defined Minimum Population Scales (BDMPS) approach developed by Furness (2015).

1.2.1.2 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 SPA and non-SPA 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 SPA component are further apportioned between the individual SPAs within foraging range. This is done by using the Seabird 2000 counts as a reference point.

1.2.1.3 In this report, 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 (<https://app.bto.org/seabirds/public/index.jsp>).

1.2.2 Screening species for assessment

1.2.2.1 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 Table 1.1. These estimates were directly derived from volume 6, annex 10.2: Offshore ornithology displacement technical report and volume 6, annex 10.3: Offshore ornithology collision risk modelling technical report of the PEIR.

1.2.2.2 Three 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 2km. The highest increase in baseline mortality observed in the displacement report was therefore negligible, ranging from 0.000% to 0.004% (collision risk is not assessed for Atlantic puffin due to its low flight height). Northern fulmar *Fulmarus glacialis* was screened out, because its expected annual collision risk was 0.28 birds (northern fulmar is not considered sensitive to displacement). Lastly, Manx shearwater *Puffinus puffinus* was screened out, because its expected annual collision risk was zero birds. Moreover, Manx shearwater is considered to have a low sensitivity to displacement, with an expected increase in baseline mortality ranging from a negligible 0.000% to 0.005%. As a precautionary step, the species mentioned in the introduction were screened in, even when the impacts were low.

1.2.3 Seasonality and regional populations

1.2.3.1 Bio-seasons used within the assessment were defined according to the breeding, non-breeding and migratory periods (autumn and spring migration) based on Furness (2015) (Table 1.2). Colour-coding has been used to define the four main bio-seasons presented in Table 1.2.

Table 1.1 Modelled expected mortality estimates across species and seasons from collision risk and displacement.

Species	Season	Mortality collisions	Mortality displacement	Mortality combined
Common guillemot	Breeding	-	19 to 452	19 to 452
	Non-breeding	-	16 to 382	16 to 382
Razorbill	Pre-breeding	-	7 to 160	7 to 160
	Breeding	-	1 to 12	1 to 12
	Post-breeding	-	0 to 10	0 to 10
	Non-breeding	-	1 to 20	1 to 20
Northern gannet	Pre-breeding	0 to 1	1 to 8	1 to 9
	Breeding	0 to 4	2 to 28	2 to 32
	Post-breeding	0 to 1	1 to 19	1 to 20
Black-legged kittiwake	Pre-breeding	13 to 29	3 to 79	16 to 108
	Breeding	5 to 11	1 to 34	6 to 45
	Post-breeding	6 to 14	2 to 55	8 to 69
Herring gull	Breeding	0 to 1	-	0 to 1
	Non-breeding	1 to 4	-	1 to 4
Lesser black-backed gull	Pre-breeding	0 to 2	-	0 to 2
	Breeding	0 to 1	-	0 to 1
	Post-breeding	0 to 0	-	0 to 0
	Non-breeding	0 to 2	-	0 to 2
Great black-backed gull	Breeding	1 to 7	-	1 to 7
	Non-breeding	2 to 8	-	2 to 8

Table 1.2: 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 March	March to September	September to November	n/a
Black-legged kittiwake	January to April	April to August	August to December	n/a
Herring gull	n/a	March to August	n/a	September to February
Lesser black-backed gull	March to April	April to August	August to October	November to February
Great black-backed gull	n/a	Late March to August	n/a	September to March

1.2.4 Age composition

1.2.4.1 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). Demographic rates from Horswill and Robinson (2015) were used to calculate the expected stable proportions in each age class for each species during the breeding season.

1.2.4.2 Non-breeding age class proportions were taken from Furness (2015).

Table 1.3: Age class percentages used in apportioning impacts. For breeding, the percentages of adults plus immatures add up to 100%. The sabbatical percentage is used as a modifier for the adult population.

Species	Season	Adult %	Immatures %	Sabbaticals %
Common guillemot	Breeding	55.7%	44.3%	7%
	Non-breeding	57%	43%	-
Razorbill	Breeding	61.0%	39.0%	7%
	Non-breeding	57%	43%	-
Northern gannet	Breeding	54.9%	45.1%	10%
	Non-breeding	59%	41%	-
Black-legged kittiwake	Breeding	49.6%	50.4%	10%
	Non-breeding	53%	47%	-

Species	Season	Adult %	Immatures %	Sabbaticals %
Herring gull	Breeding	38.4%	61.6%	35%
	Non-breeding	48%	52%	-
Lesser black-backed gull	Breeding	50.9%	49.1%	35%
	Non-breeding	60%	40%	-
Great black-backed gull	Breeding	38.1%	61.9%	10%
	Non-breeding	44%	56%	-

1.2.5 Species and age specific annual mortality

1.2.5.1 To express impacts from collisions and displacement, the impacts need to be compared to baseline mortalities of those specific species. The annual survival estimates of adults and immatures have been taken from Horswill and Robinson (2015), which provides age specific mortality estimates. To get an overall immature survival estimate, age specific mortalities were fed into a simple population model to derive relative proportions of each age class, which leads to the mortality proportions presented in Table 1.4.

Table 1.4: Species and age specific survival and mortality estimates, from Horswill and Robinson (2015).

Species	Adult survival	Adult mortality	Immature survival	Immature mortality
Common guillemot	0.939	0.061	0.763	0.237
Razorbill	0.895	0.105	0.718	0.282
Northern gannet	0.919	0.081	0.684	0.316
Black-legged kittiwake	0.854	0.146	0.832	0.168
Herring gull	0.834	0.166	0.824	0.176
Lesser black-backed gull	0.885	0.115	0.867	0.133
Great black-backed gull	0.930	0.070	0.888	0.112

1.2.6 Apportioning of impacts during the breeding period

1.2.6.1 Following NatureScot guidance (NS, 2018), impacts were apportioned between SPA and non-SPA 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:

- a. colony size (all colony sizes must be expressed as the same unit (e.g. individuals))
- b. distance of colony from development site (using geometric centres for both)

c. sea area (the extent of open sea within Woodward *et al.* (2019) foraging range).

1.2.6.2 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-SPA breeding colonies have not been counted since.

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 SPA and non-SPA colony within each species' foraging range at sea was then calculated. Using the most recent colony counts from the SMP online database, impacts assigned to the SPA component was further apportioned to obtain each SPA's updated weighting estimate. The calculation to calculate apportion weights was:

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

1.2.6.3 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 (Table 1.4) by the colony size of that age group.

1.2.6.4 The baseline mortality numbers are presented in each species-specific chapter.

Sabbaticals

1.2.6.5 Every breeding season, a proportion of adult birds will be taking a sabbatical from breeding. Therefore, these birds need to be removed from assessment as overestimation of potential effects to SPA populations would occur if sabbatical impacts were not removed. The proportion of adults taking sabbatical from breeding each year for each species are also presented within Table 1.3 (sabbatical rates taken from Seagreen, 2018). These sabbatical percentages are applied to impacts assigned to adult birds only after age-class apportioning among juveniles and adults.

1.2.7 Apportioning of impacts during the non-breeding period

1.2.7.1 To apportion non-breeding season effects from the proposed development sites 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.

1.2.7.2 Modelled estimates of the numbers of immatures per breeding individual, BDMPS population size and proportion of adults and immatures in spatially distinct BDMPS were used to calculate the contribution of individuals from SPAs in the UK Western waters to the estimated non-breeding BDMPS population.

1.3 Results

1.3.1.1 Based upon calculations undertaken by the approach described above, the apportioned estimates for each of the key seabird species at each of the SPAs with connectivity to the Mona Array Area plus 2km buffer are presented below. 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.

1.3.2 Common guillemot

SPA weighted proportions

1.3.2.1 SPA colonies included based on foraging distance, distance to the Mona Array Area centroid, and the resulting SPA weighted proportions of this species are given in Table 1.5 and Table 1.6, with the highest weighting factor assigned to Lambay Island SPA, followed by Great Orme and Little Orme and St Bee's Head.

Table 1.5: Breeding common guillemot colony weighting factors used for apportioning SPA impacts of displacement (IND = individuals).

¹ Colonies that make up the non-SPA total are presented in table A.1 of Appendix A.

SPA colony	Bird count (adjusted for IND)	Distance to Mona Array Area (km)	SPA weight (based on distance ²)	Proportional SPA weight
Aberdaron Coast and Bardsey Island SPA	3,787	116.6	0.02	0.01
Balcary Point	856	127.8	0.00	0.00
Great Orme and Little Orme	4,531	38.0	0.22	0.15
Howth village	1,167	150.7	0.00	0.00
Ireland's Eye	5,909	151.0	0.02	0.01
Lambay Island	80,377	145.7	0.28	0.19
Mynydd Cilan, Trwyn y Wylfa ac Ynysoedd Sant Tudwal	4,657	106.8	0.03	0.02
Porth Llanlleiana to Porth Eilian	7,437	48.3	0.19	0.12
Puffin Island	5,119	41.9	0.19	0.13
South Stack	10,605	48.3	0.12	0.08
St Bee's Head	23,451	41.9	0.23	0.15
Non-SPA Total ¹	27,092	114.4	0.19	0.13

Table 1.6: Non-breeding common guillemot colony weighting factors used for apportioning SPA impacts of displacement (UK Western 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	Non-breeding	UK Western non-designated SPA colonies	147,896	0.95	140,501	656,156	0.2141
Immature	Non-breeding	UK Western non-designated SPA colonies	130,148	0.9	117,133	483,064	0.2425

Apportioned breeding impacts

1.3.2.2 Apportioned mortality for common guillemot during the breeding season is presented in Table 1.7, and ranges from 0.010% to 12.398%. The highest impact was found to be on Great Orme and Little Orme, and Puffin Island, which are both close to the Mona Array Area. In contrast, despite Lambay Island having a high weighting factor (Table 1.5), impacts on baseline mortality in the population are limited due to the large size of the colony.

Table 1.7: Breeding common guillemot apportioned SPA mortality due to displacement (Sa = sabbatical, Ad = adult, Im = immature).

SPA colony	Mortality from displacement			Baseline mortality		Increase in baseline mortality %	
	Sa	Ad	Im	Ad	Im	Ad	Im
Aberdaron Coast and Bardsey Island SPA	0.0 to 0.2	0.1 to 2.7	0.1 to 2.3	231	714	0.049% to 1.169%	0.014% to 0.323%
Balcary Point	0.0 to 0.1	0.0 to 0.7	0.0 to 0.6	52	161	0.058% to 1.369%	0.016% to 0.379%
Great Orme and Little Orme	0.1 to 2.6	1.4 to 34.3	1.2 to 29.3	276	854	0.521% to 12.398%	0.144% to 3.430%
Howth village	0.0 to 0.0	0.0 to 0.6	0.0 to 0.5	71	220	0.036% to 0.847%	0.010% to 0.234%
Ireland's Eye	0.0 to 0.2	0.1 to 3.1	0.1 to 2.6	360	1,114	0.036% to 0.852%	0.010% to 0.236%
Lambay Island	0.1 to 3.4	1.9 to 44.7	1.6 to 38.3	4,903	15,155	0.038% to 0.912%	0.011% to 0.252%
Mynydd Cilan, Trwyn y Wylfa ac Ynysoedd Sant Tudwal	0.0 to 0.3	0.2 to 4.1	0.1 to 3.5	284	878	0.060% to 1.437%	0.017% to 0.398%
Porth Llanlleiana to Porth Eilian	0.1 to 2.2	1.2 to 29.2	1.1 to 25.0	454	1,402	0.271% to 6.445%	0.075% to 1.783%

SPA colony	Mortality from displacement			Baseline mortality		Increase in baseline mortality %	
	Sa	Ad	Im	Ad	Im	Ad	Im
Puffin Island	0.1 to 2.2	1.2 to 29.7	1.1 to 25.4	312	965	0.400% to 9.511%	0.111% to 2.631%
South Stack	0.1 to 1.4	0.8 to 19.3	0.7 to 16.5	647	2,000	0.125% to 2.978%	0.035% to 0.824%
St Bee's Head	0.1 to 2.7	1.5 to 36.0	1.3 to 30.8	1,431	4,422	0.106% to 2.514%	0.029% to 0.695%
Non-SPA Total	0.1 to 2.2	1.3 to 29.8	1.1 to 25.5	1,653	5,108	0.076% to 1.804%	0.021% to 0.499%

Apportioned non-breeding impacts

1.3.2.3 Apportioned mortality for common guillemot during the non-breeding season is presented in Table 1.8, and ranges from 0.005% to 0.517%.

Table 1.8: Non-breeding common guillemot apportioned expected SPA mortality due to displacement (based on Furness *et al.* 2015).

Age	Season	Colony	BDMPS	Baseline Mortality	Mortality increase	
					Number	Percentage
Adult	Non-breeding	UK Western non-designated SPA colonies	656,156	9,022	2.0 to 46.6	0.022% to 0.517%
Immature	Non-breeding	UK Western non-designated SPA colonies	483,064	30,855	1.7 to 39.8	0.005% to 0.129%

1.3.3 Razorbill

SPA weighted proportions

1.3.3.1 SPA colonies included based on foraging distance, distance to the Mona Array Area centroid, and the resulting SPA weighted proportions of this species are given in Table 1.9 and Table 1.10, with the highest weighting factor assigned to Puffin Island, followed by Lambay Island SPA.

Table 1.9: Razorbill colony weighting factors used for apportioning SPA impacts of displacement (IND = individuals).

¹ Colonies that make up the non-SPA total are presented in table A.2 of Appendix A.

SPA colony	Bird count (adjusted for IND)	Distance to Mona Array Area (km)	SPA weight (based on distance ²²)	Proportional SPA weight
Aberdaron Coast and Bardsey Island SPA	5,138	116.6	0.18	0.13
Great Orme and Little Orme	397	38.0	0.15	0.11
Howth Village	374	150.7	0.01	0.01
Ireland's Eye	2,144	151.0	0.05	0.04
Lambay Island	9,853	145.7	0.26	0.19
Lleyn Peninsula	437	108.2	0.02	0.01
Point Lynas to Trwyn Du	19	45.3	0.00	0.00
Porth Llanlleiana to Porth Eilian	612	48.3	0.13	0.09
Puffin Island	913	41.9	0.27	0.19
Rigg Bay + Cruggleton	0	125.9	0.00	0.00
South Stack	1,847	70.6	0.18	0.13
St Bees Head and Town	126	94.0	0.01	0.01
Wicklow Head	210	164.9	0.00	0.00
Non-SPA Total ¹	22,068	121.8	0.13	0.09

Table 1.10: Non-breeding razorbill colony weighting factors used for apportioning SPA impacts of displacement (UK Western 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	Pre- and post-breeding	Ireland	12,581	0.10	1,258	316,928	0.0040
		UK western non-designated SPA colonies	9,487	0.98	9,297	316,928	0.0293
	Non-breeding	Ireland	12,581	0.10	1,258	179,183	0.0070
		UK western non-designated SPA colonies	9,487	0.30	2,846	179,183	0.0159
Immature		Ireland	9,436	0.10	944	289,986	0.0033

Age	Season	Colony	Total number of SPA birds	Proportion SPA birds in area	SPA birds in region	Total birds BDMPS	Proportion SPA/BDMPS
	Pre- and post-breeding	UK western non-designated SPA colonies	7,115	0.90	6,404	289,986	0.0221
	Non-breeding	Ireland	9,436	0.10	944	162,239	0.0058
		UK western non-designated SPA colonies	7,115	0.10	712	162,239	0.0044

Apportioned breeding impacts

1.3.3.2 Apportioned mortality for razorbill during the breeding season is presented in Table 1.11, and ranges from 0.000% to 1.741%. The highest impact was found to be on Great Orme and Little Orme, and on Puffin Island, which are both close to the Mona Array Area. In contrast, despite Lambay Island having a high weighting factor (Table 1.9), increases in baseline mortality are limited due to it having a large colony.

Table 1.11: Breeding razorbill apportioned expected SPA mortality due to displacement (Sa = sabbatical, Ad = adult, Im = immature).

SPA colony	Mortality from displacement			Baseline mortality		Increase in baseline mortality %	
	Sa	Ad	Im	Ad	Im	Ad	Im
Aberdaron Coast and Bardsey Island SPA	0.0 to 0.1	0.1 to 0.9	0.0 to 0.6	539	926	0.013% to 0.162%	0.005% to 0.065%
Great Orme and Little Orme	0.0 to 0.1	0.1 to 0.7	0.0 to 0.5	42	71	0.145% to 1.741%	0.058% to 0.697%
Howth Village	0.0 to 0.0	0.0 to 0.0	0.0 to 0.0	39	67	0.010% to 0.114%	0.004% to 0.046%
Ireland's Eye	0.0 to 0.0	0.0 to 0.3	0.0 to 0.2	225	386	0.010% to 0.115%	0.004% to 0.046%
Lambay Island	0.0 to 0.2	0.1 to 1.3	0.1 to 0.9	1,035	1,776	0.010% to 0.123%	0.004% to 0.049%
Lleyn Peninsula	0.0 to 0.0	0.0 to 0.1	0.0 to 0.1	46	79	0.016% to 0.192%	0.006% to 0.077%
Point Lynas to Trwyn Du	0.0 to 0.0	0.0 to 0.0	0.0 to 0.0	2	3	0.096% to 1.154%	0.039% to 0.462%
Porth Llanlleiana to Porth Eilian	0.0 to 0.1	0.1 to 0.6	0.0 to 0.4	64	110	0.082% to 0.980%	0.033% to 0.392%
Puffin Island	0.0 to 0.2	0.1 to 1.3	0.1 to 0.9	96	164	0.115% to 1.376%	0.046% to 0.551%

SPA colony	Mortality from displacement			Baseline mortality		Increase in baseline mortality %	
	Sa	Ad	Im	Ad	Im	Ad	Im
Rigg Bay + Cruggleton	0.0 to 0.0	0.0 to 0.0	0.0 to 0.0	0	0	0.000% to 0.000%	0.000% to 0.000%
South Stack	0.0 to 0.1	0.1 to 0.9	0.0 to 0.6	194	333	0.037% to 0.449%	0.015% to 0.180%
St Bees Head and Town	0.0 to 0.0	0.0 to 0.0	0.0 to 0.0	13	23	0.029% to 0.346%	0.012% to 0.138%
Wicklow Head	0.0 to 0.0	0.0 to 0.0	0.0 to 0.0	22	38	0.007% to 0.089%	0.003% to 0.036%
Non-SPA Total	0.0 to 0.1	0.1 to 0.6	0.0 to 0.4	2,317	3,978	0.002% to 0.028%	0.001% to 0.011%

Apportioned non-breeding impacts

1.3.3.3 Apportioned mortality for razorbill during the non-breeding season is presented in Table 1.12, and ranges from 0.000% to 0.285%.

Table 1.12: Non-breeding razorbill apportioned expected SPA mortality due to collisions and displacement (based on Furness *et al.* 2015).

Age	Season	Colony	BDMPS	Baseline Mortality	Mortality increase	
					Number	Percentage
Adult	Pre- and post-breeding	Ireland	316,928	1,321	0.0 to 0.4	0.001% to 0.029%
		UK western non-designated SPA colonies	316,928	996	0.1 to 2.8	0.012% to 0.285%
	Non-breeding	Ireland	179,183	1,321	0.0 to 0.1	0.000% to 0.006%
		UK western non-designated SPA colonies	179,183	996	0.0 to 0.2	0.001% to 0.018%
Immature	Pre- and post-breeding	Ireland	289,986	2,660	0.0 to 0.2	0.000% to 0.009%
		UK western non-designated SPA colonies	289,986	2,006	0.1 to 1.6	0.003% to 0.080%
	Non-breeding	Ireland	162,239	2,660	0.0 to 0.1	0.000% to 0.002%
		UK western non-designated SPA colonies	162,239	2,006	0.0 to 0.0	0.000% to 0.002%

1.3.4 Northern gannet

SPA weighted proportions

1.3.4.1 The SPA weighted proportions of this species are given in

1.3.4.2 Table 1.13 and Table 1.14, with the highest weighting factor assigned to Ailsa Craig, followed by Grassholm.

Table 1.13: Northern gannet colony weighting factors used for apportioning SPA impacts of collision risk and displacement (AON = Apparently Occupied Nests).

¹ Colonies that make up the non-SPA total are presented in table A.3 of Appendix A.

SPA colony	Bird count (adjusted for AON)	Distance to Mona Array Area (km)	SPA weight (based on distance ²)	Proportional SPA weight
Ailsa Craig	64,452	194.3	0.43	0.48
Grassholm	72,022	243.5	0.34	0.37
Great Saltee	9,444	255.2	0.04	0.04
Ireland's Eye	700	150.6	0.01	0.01
Non-SPA Total ¹	4,752	123.9	0.09	0.10

Table 1.14: Non-breeding northern gannet colony weighting factors used for apportioning SPA impacts of collision risk and displacement (UK Western 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	Post-breeding	Ailsa Craig	64,452	1.00	64,452	318,001	0.2027	
		Ireland	10,144	0.20	2,029	318,001	0.0064	
		Grassholm	72,022	1.00	72,022	318,001	0.2265	
Pre-breeding	Pre-breeding	Ailsa Craig	64,452	1.00	64,452	391,540	0.1646	
		Ireland	10,144	0.30	3,043	391,540	0.0078	
		Grassholm	72,022	1.00	72,022	391,540	0.1839	
Immature	Post-breeding	Ailsa Craig	52,206	0.80	41,765	227,953	0.1832	
		Ireland	8,217	0.30	2,465	227,953	0.0108	
		Grassholm	58,338	0.80	46,670	227,953	0.2047	
	Pre-breeding	Pre-breeding	Ailsa Craig	52,206	0.80	41,765	270,348	0.1545
			Ireland	8,217	0.30	2,465	270,348	0.0091
			Grassholm	58,338	0.80	46,670	270,348	0.1726

Apportioned breeding impacts

1.3.4.3 Apportioned mortality for northern gannet during the breeding season is presented in Table 1.15, and ranges from 0.002% to 0.388%. The highest impact in a single location was found to be on Ireland’s Eye, despite it having a low weighting factor. This is due to it only having a small colony (Table 1.13).

Table 1.15: Breeding northern gannet apportioned expected SPA mortality due to collision risk and displacement (Sa = sabbatical, Ad = adult, Im = immature.)

SPA colony	Mortality from collisions and displacement			Baseline mortality		Increase in baseline mortality %	
	Sa	Ad	Im	Ad	Im	Ad	Im
Ailsa Craig	0.1 to 1.5	0.6 to 7.5	0.5 to 6.8	5,221	16,733	0.011% to 0.143%	0.003% to 0.041%
Grassholm	0.1 to 1.2	0.4 to 5.8	0.4 to 5.3	5,834	18,698	0.008% to 0.100%	0.002% to 0.028%
Great Saltee	0.0 to 0.1	0.0 to 0.6	0.0 to 0.6	765	2,452	0.006% to 0.081%	0.002% to 0.023%
Ireland's Eye	0.0 to 0.0	0.0 to 0.1	0.0 to 0.1	57	182	0.019% to 0.252%	0.005% to 0.072%
Non-SPA Total	0.0 to 0.3	0.1 to 1.5	0.1 to 1.4	385	1,234	0.030% to 0.388%	0.008% to 0.110%

Apportioned non-breeding impacts

1.3.4.4 Apportioned mortality for northern gannet during the non-breeding season is presented in Table 1.16, and ranges from 0.000% to 0.046%.

Table 1.16: Non-breeding northern gannet apportioned expected SPA mortality due to collision risk and displacement (based on Furness *et al.* 2015).

Age	Season	Colony	BDMPS	Baseline Mortality	Mortality increase	
					Number	Percentage
Adult	Post-breeding	Ailsa Craig	318,001	5,221	0.1 to 2.4	0.003% to 0.046%
		Ireland	318,001	822	0.0 to 0.1	0.001% to 0.009%
		Grassholm	318,001	5,834	0.2 to 2.7	0.003% to 0.046%
	Pre-breeding	Ailsa Craig	391,540	5,221	0.1 to 0.8	0.002% to 0.016%
		Ireland	391,540	822	0.0 to 0.0	0.001% to 0.005%

Age	Season	Colony	BDMPS	Baseline Mortality	Mortality increase	
					Number	Percentage
Immature	Post-breeding	Grassholm	391,540	5,834	0.1 to 0.9	0.002% to 0.016%
		Ailsa Craig	227,953	16,499	0.1 to 1.5	0.001% to 0.009%
		Ireland	227,953	2,597	0.0 to 0.1	0.000% to 0.003%
	Pre-breeding	Grassholm	227,953	18,437	0.1 to 1.7	0.001% to 0.009%
		Ailsa Craig	270,348	16,499	0.1 to 0.5	0.000% to 0.003%
		Ireland	270,348	2,597	0.0 to 0.0	0.000% to 0.001%
Grassholm	270,348	18,437	0.1 to 0.6	0.000% to 0.003%		

1.3.5 Black-legged kittiwake

SPA weighted proportions

1.3.5.1 The SPA weighted proportions of this species are given in Table 1.17 and Table 1.18, with the highest weighting factor assigned to Great Orme and Little Orme.

Table 1.17: Black-legged kittiwake colony weighting factors used for apportioning SPA impacts of collision risk and displacement.

¹ Colonies that make up the non-SPA total are presented in table A.4 of Appendix A.

SPA colony	Bird count (adjusted for AON)	Distance to Mona Array Area (km)	SPA weight (based on distance ²)	Proportional SPA weight
Aberdaron Coast and Bardsey Island SPA	242	120.42	0.01	0.00
Ailsa Craig	980	194.30	0.01	0.01
Bae Caerfyrddin	22	234.01	0.00	0.00
Grassholm	60	230.88	0.00	0.00
Great Orme and Little Orme	1,750	38.05	0.78	0.32
Howth Head Coast	6,162	150.71	0.14	0.06
Inishtrahull Island	14	294.55	0.00	0.00
Ireland's Eye	3,220	150.99	0.07	0.03
Lambay Island	6,640	145.75	0.17	0.07
Mynydd Cilan	676	102.22	0.04	0.02

SPA colony	Bird count (adjusted for AON)	Distance to Mona Array Area (km)	SPA weight (based on distance ²)	Proportional SPA weight
Point Lynas to Trwyn Du	312	43.19	0.11	0.05
Porth Llanlleiana to Porth Eilian	104	48.34	0.03	0.01
Puffin Island	406	41.88	0.15	0.06
Ramsay and St Davids Peninsula Coast	166	230.88	0.00	0.00
Rathlin Island	27,534	239.83	0.23	0.09
Rockabill	266	144.01	0.01	0.00
Saltee island	1,690	255.24	0.01	0.00
Skomer, Skokholm and the Seas off Pembrokeshire	2,878	237.38	0.03	0.01
St Bees Head and Town	1,618	93.98	0.11	0.04
Wicklow Head	1,414	164.95	0.03	0.01
Non-SPA Total ¹	19,464	200.59	0.48	0.20

Table 1.18: Non-breeding black-legged kittiwake colony weighting factors for apportioning SPA impacts of collision risk and displacement (UK Western 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	Post-breeding	Ailsa Craig	980	0.6	588	498,970	0.0012		
		Rathlin island	27,534	0.6	16,520	498,970	0.0331		
		Ireland	17,978	0.5	8,989	498,970	0.0180		
		UK Western non-designated SPA colonies	9,662	0.6	5,797	498,970	0.0116		
	Pre-breeding	Ailsa Craig	980	0.8	784	375,711	0.0021		
		Rathlin island	1,414	0.8	1,131	375,711	0.0030		
		Ireland	17,978	0.3	5,393	375,711	0.0144		
		UK Western non-designated SPA colonies	9,662	0.8	7,730	375,711	0.0206		
		Immature	Post-breeding	Ailsa Craig	862	0.4	345	412,615	0.0008
				Rathlin island	24,230	0.4	9,692	412,615	0.0235
Ireland	15,821			0.3	4,746	412,615	0.0115		

Age	Season	Colony	Total number of SPA birds	Proportion SPA birds in area	SPA birds in region	Total birds BDMPS	Proportion SPA/BDMPS
	Pre-breeding	UK Western non-designated SPA colonies	8,503	0.4	3,401	412,615	0.0082
		Ailsa Craig	862	0.4	345	315,815	0.0011
		Rathlin island	1,244	0.4	498	315,815	0.0016
		Ireland	15,821	0.2	3,164	315,815	0.0100
		UK Western non-designated SPA colonies	8,503	0.4	3,401	315,815	0.0108

Apportioned breeding impacts

1.3.5.2 Apportioned mortality for black-legged kittiwake during the breeding season is presented in Table 1.19, and ranges from 0.003% to 2.570%. The highest impact in a single location was found to be on Great Orme and Little Orme, which is due to its proximity to the Mona Array Area (Table 1.17).

Table 1.19: Breeding black-legged kittiwake apportioned SPA mortality due to collision risk and displacement (Sa = sabbatical, Ad = adult, Im = immature).

SPA colony	Mortality from collisions and displacement			Baseline mortality		Increase in baseline mortality %	
	Sa	Ad	Im	Ad	Im	Ad	Im
Aberdaron Coast and Bardsey Island SPA	0.0 to 0.0	0.0 to 0.1	0.0 to 0.1	35	41	0.030% to 0.244%	0.029% to 0.236%
Ailsa Craig	0.0 to 0.0	0.0 to 0.1	0.0 to 0.1	143	167	0.010% to 0.079%	0.009% to 0.076%
Bae Caerfyrddin	0.0 to 0.0	0.0 to 0.0	0.0 to 0.0	3	4	0.005% to 0.045%	0.005% to 0.043%
Grassholm	0.0 to 0.0	0.0 to 0.0	0.0 to 0.0	9	10	0.006% to 0.048%	0.006% to 0.046%
Great Orme and Little Orme	0.1 to 0.7	0.8 to 6.6	0.9 to 7.4	256	298	0.317% to 2.570%	0.306% to 2.484%
Howth Head Coast	0.0 to 0.1	0.1 to 1.2	0.2 to 1.4	900	1,051	0.017% to 0.134%	0.016% to 0.129%
Inishtrahull Island	0.0 to 0.0	0.0 to 0.0	0.0 to 0.0	2	2	0.003% to 0.027%	0.003% to 0.026%
Irelands Eye	0.0 to 0.1	0.1 to 0.6	0.1 to 0.7	470	549	0.016% to 0.133%	0.016% to 0.129%

SPA colony	Mortality from collisions and displacement			Baseline mortality		Increase in baseline mortality %	
	Sa	Ad	Im	Ad	Im	Ad	Im
Lambay Island	0.0 to 0.2	0.2 to 1.4	0.2 to 1.6	969	1,132	0.018% to 0.145%	0.017% to 0.140%
Mynydd Cilan	0.0 to 0.0	0.0 to 0.3	0.0 to 0.4	99	115	0.043% to 0.350%	0.042% to 0.338%
Point Lynas to Trwyn Du	0.0 to 0.1	0.1 to 0.9	0.1 to 1.0	46	53	0.249% to 2.020%	0.241% to 1.952%
Porth Llanlleiana to Porth Eilian	0.0 to 0.0	0.0 to 0.2	0.0 to 0.3	15	18	0.199% to 1.610%	0.192% to 1.556%
Puffin Island	0.0 to 0.1	0.2 to 1.3	0.2 to 1.4	59	69	0.264% to 2.140%	0.255% to 2.068%
Ramsay and St Davids Peninsula Coast	0.0 to 0.0	0.0 to 0.0	0.0 to 0.0	24	28	0.006% to 0.048%	0.006% to 0.046%
Rathlin Island	0.0 to 0.2	0.2 to 1.9	0.3 to 2.2	4,020	4,695	0.006% to 0.048%	0.006% to 0.046%
Rockabill	0.0 to 0.0	0.0 to 0.1	0.0 to 0.1	39	45	0.018% to 0.149%	0.018% to 0.144%
Saltee island	0.0 to 0.0	0.0 to 0.1	0.0 to 0.1	247	288	0.005% to 0.037%	0.004% to 0.036%
Skomer, Skokholm and the Seas off Pembrokeshire	0.0 to 0.0	0.0 to 0.3	0.0 to 0.3	420	491	0.008% to 0.063%	0.008% to 0.061%
St Bees Head and Town	0.0 to 0.1	0.1 to 0.9	0.1 to 1.0	236	276	0.046% to 0.375%	0.045% to 0.362%
Wicklow Head	0.0 to 0.0	0.0 to 0.2	0.0 to 0.3	206	241	0.014% to 0.112%	0.013% to 0.108%
Non-SPA Total	0.1 to 0.4	0.5 to 4.0	0.6 to 4.5	2,842	3,319	0.017% to 0.142%	0.017% to 0.137%

Apportioned non-breeding impacts

1.3.5.3 Apportioned mortality for black-legged kittiwake during the non-breeding season is presented in Table 1.20, and ranges from 0.003% to 0.084%.

Table 1.20: Non-breeding black-legged kittiwake apportioned SPA mortality due to collision risk and displacement (based on Furness et al. 2015).

Age	Season	Colony	BDMPS	Baseline Mortality	Mortality increase	
					Number	Percentage
Adult	Post-breeding	Ailsa Craig	498,970	143	0.00 to 0.04	0.003% to 0.030%

Age	Season	Colony	BDMPS	Baseline Mortality	Mortality increase	
					Number	Percentage
Immature	Pre-breeding	Rathlin Island	498,970	4,020	0.14 to 1.22	0.003% to 0.030%
		Ireland	498,970	2,625	0.07 to 0.66	0.003% to 0.025%
		UK Western non-designated SPA colonies	498,970	1,411	0.05 to 0.43	0.003% to 0.030%
		Ailsa Craig	375,711	143	0.02 to 0.12	0.012% to 0.084%
		Rathlin Island	375,711	206	0.02 to 0.17	0.012% to 0.084%
		Ireland	375,711	2,625	0.12 to 0.82	0.005% to 0.031%
	Post-breeding	UK Western non-designated SPA colonies	375,711	1,411	0.17 to 1.18	0.012% to 0.084%
		Ailsa Craig	412,615	145	0.00 to 0.03	0.002% to 0.019%
		Rathlin Island	412,615	4,066	0.09 to 0.77	0.002% to 0.019%
		Ireland	412,615	2,655	0.04 to 0.37	0.002% to 0.014%
		UK Western non-designated SPA colonies	412,615	1,427	0.03 to 0.27	0.002% to 0.019%
		Pre-breeding	Ailsa Craig	315,815	145	0.01 to 0.06
Rathlin Island	315,815		209	0.01 to 0.08	0.006% to 0.038%	
Ireland	315,815		2,655	0.07 to 0.51	0.003% to 0.019%	
UK Western non-designated SPA colonies	315,815		930	0.05 to 0.36	0.006% to 0.038%	

1.3.6 Herring gull

SPA weighted proportions

1.3.6.1 The SPA weighted proportions of this species are given in Table 1.21 and Table 1.22, with the highest weighting factor assigned to Ribble and Alt Estuaries, followed by Anglesey Terns.

Table 1.21: Herring gull colony weighting factors used for apportioning impacts of collision risk.

¹ Colonies that make up the non-SPA total are presented in table A.5 of Appendix A.

SPA colony	Bird count (adjusted for AON)	Distance to Mona Array Area (km)	SPA weight (based on distance ²)	Proportional SPA weight
Morecambe Bay and Duddon Estuary	900	62.7	0.06	0.08
Ribble and Alt Estuaries	1,710	61.0	0.16	0.20
Llawndy	14	49.8	0.00	0.00
Puffin Island	944	41.9	0.10	0.13
Anglesey Terns/Morwenoliaid Ynys Môn	2,472	57.0	0.11	0.14
Glannau Ynys Gybi/Holy Island Coast	596	70.2	0.01	0.02
Non-SPA Total ¹	6,074	56.5	0.33	0.43

Table 1.22: Non-breeding herring gull colony weighting factors used for apportioning SPA impacts of collision risk (UK Western region).

Age	Season	Colony	Total number of SPA birds	Proportion SPA birds in area	SPA birds in region	Total birds BDMPS	Proportion SPA/BDMP S
Adult	Non-breeding	Morecambe Bay	900	0.8	720	87,134	0.0083
		UK Western non-designated SPA colonies	5,736	0.8	4,589	87,134	0.0527
Immature	Non-breeding	Morecambe Bay	981	0.7	687	86,165	0.0080
		UK Western non-designated SPA colonies	6,252	0.7	4,377	86,165	0.0508

Apportioned breeding impacts

1.3.6.2 Apportioned mortality for herring gull during the breeding season is presented in Table 1.23, and ranges from 0.000% to 0.021%. The highest impact, albeit still minimal, in a single location was found to be on Llawndy, which did not have the highest weighting factor. However, its herring gull population is limited compared to the colonies with high weighting factors (Table 1.21).

Table 1.23: Breeding herring gull apportioned expected SPA mortality due to collision risk (Sa = sabbatical, Ad = adult, Im = immature).

SPA colony	Mortality from collisions			Baseline mortality		Increase in baseline mortality %	
	Sa	Ad	Im	Ad	Im	Ad	Im
Morecambe Bay and Duddon Estuary SPA	0.0 to 0.0	0.0 to 0.0	0.0 to 0.0	149	254	0.000% to 0.010%	0.000% to 0.015%
Ribble and Alt Estuaries	0.0 to 0.1	0.0 to 0.0	0.0 to 0.1	284	482	0.000% to 0.014%	0.000% to 0.021%
Llawndy	0.0 to 0.0	0.0 to 0.0	0.0 to 0.0	2	4	0.000% to 0.021%	0.000% to 0.030%
Puffin Island SPA	0.0 to 0.0	0.0 to 0.0	0.0 to 0.1	157	266	0.000% to 0.016%	0.000% to 0.024%
Anglesey Terns/Morwenoliaid Ynys Môn	0.0 to 0.0	0.0 to 0.0	0.0 to 0.1	410	697	0.000% to 0.007%	0.000% to 0.010%
Glannau Ynys Gybi/Holy Island Coast	0.0 to 0.0	0.0 to 0.0	0.0 to 0.0	99	168	0.000% to 0.003%	0.000% to 0.005%
Non-SPA Total	0.0 to 0.1	0.0 to 0.1	0.0 to 0.2	1,008	1,712	0.000% to 0.008%	0.000% to 0.012%

Apportioned non-breeding impacts

1.3.6.3 Apportioned mortality for herring gull during the non-breeding season is presented in Table 1.20, and ranges from 0.002% to 0.011%.

Table 1.24: Non-breeding herring gull apportioned expected SPA mortality due to collision risk (based on Furness *et al.* 2015).

Age	Season	Colony	BDMPS	Baseline Mortality	Mortality increase	
					Number	Percentage
Adult	Non-breeding	Morecambe Bay	87,134	149	0.0 to 0.0	0.002% to 0.011%
		UK Western non-designated SPA colonies	87,134	952	0.0 to 0.1	0.002% to 0.011%
Immature	Non-breeding	Morecambe Bay	86,165	172	0.0 to 0.0	0.002% to 0.009%
		UK Western non-designated SPA colonies	86,165	1,099	0.0 to 0.1	0.002% to 0.009%

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1.3.7 Lesser black-backed gull

SPA weighted proportions

1.3.7.1 The SPA weighted proportions of this species are given in Table 1.25 and Table 1.26, with the highest weighting factor assigned to Ribble and Alt Estuaries, followed by Puffin Island.

Table 1.25: Lesser black-backed gull colony weighting factors used for apportioning impacts of collision risk.

¹ Colonies that make up the non-SPA total are presented in table A.6 of Appendix A.

SPA colony	Bird count (adjusted for AON)	Distance to Mona Array Area (km)	SPA weight (based on distance ²)	Proportional SPA weight
Ireland's Eye	10	151.0	0.00	0.00
Lambay Island	952	146.0	0.04	0.01
Rathlin Island	1,038	236.5	0.01	0.00
Ailsa Craig	378	194.3	0.01	0.00
Morecambe Bay and Duddon Estuary	826	76.7	0.12	0.03
Ribble and Alt Estuaries	8,978	61.0	2.16	0.62
Dalkey Island	72	156.4	0.00	0.00
Skerries Island	2	148.7	0.00	0.00
Strangford Lough	632	147.6	0.02	0.01
Copeland Islands	2,556	157.8	0.08	0.02
Lough Neagh and Lough Beg	1,744	202.8	0.03	0.01
Larne Lough	0	179.5	0.00	0.00
Puffin Island	1,052	41.9	0.54	0.16
Anglesey Terns/Morwenoliaid Ynys Môn	230	57.0	0.06	0.02
Glannau Aberdaron ac Ynys Enlli/Aberdaron Coast and Bardsey Island	328	117.4	0.02	0.01
Non-SPA Total ¹	11,342	144.4	0.39	0.11

Table 1.26: Non-breeding lesser black-backed gull colony weighting factors used for apportioning SPA impacts of collision risk (UK Western 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	Post-breeding	Ailsa Craig	378	0.5	189	110,708	0.0017
		Morecambe Bay	826	0.5	413	110,708	0.0037

Age	Season	Colony	Total number of SPA birds	Proportion SPA birds in area	SPA birds in region	Total birds BDMPS	Proportion SPA/BDMPS
Immature	Pre-breeding	Rathlin Island	1,038	0.5	519	110,708	0.0047
		Ribble and Alt Estuaries	8,978	0.5	4,489	110,708	0.0405
		Ireland	962	0.4	385	110,708	0.0035
		UK Western non-designated SPA colonies	6,616	0.5	3,308	110,708	0.0299
		Ailsa Craig	378	0.5	189	110,708	0.0017
		Morecambe Bay	826	0.5	413	110,708	0.0037
		Rathlin Island	1,038	0.5	519	110,708	0.0047
		Ribble and Alt Estuaries	8,978	0.5	4,489	110,708	0.0405
		Ireland	962	0.4	385	110,708	0.0035
		UK Western non-designated SPA colonies	6,616	0.5	3,308	110,708	0.0299
	Ailsa Craig	378	0.2	76	36,029	0.0021	
	Morecambe Bay	826	0.2	165	36,029	0.0046	
	Rathlin Island	1,038	0.2	208	36,029	0.0058	
	Ribble and Alt Estuaries	8,978	0.2	1,796	36,029	0.0498	
	Ireland	962	0.2	192	36,029	0.0053	
	UK Western non-designated SPA colonies	6,616	0.2	1,323	36,029	0.0367	
	Ailsa Craig	257	0.4	103	52,596	0.0020	
	Morecambe Bay	562	0.4	225	52,596	0.0043	
	Rathlin Island	706	0.4	282	52,596	0.0054	
	Ribble and Alt Estuaries	6,105	0.4	2,442	52,596	0.0464	
Ireland	654	0.2	131	52,596	0.0025		
UK Western non-designated SPA colonies	4,499	0.4	1,800	52,596	0.0342		
Pre-breeding	Ailsa Craig	257	0.4	103	52,596	0.0020	
	Morecambe Bay	562	0.4	225	52,596	0.0043	
	Rathlin Island	706	0.4	282	52,596	0.0054	
	Ribble and Alt Estuaries	6,105	0.4	2,442	52,596	0.0464	
	Ireland	654	0.2	131	52,596	0.0025	
	UK Western non-designated SPA colonies	4,499	0.4	1,800	52,596	0.0342	
	Ailsa Craig	257	0.05	13	5,130	0.0025	

Age	Season	Colony	Total number of SPA birds	Proportion SPA birds in area	SPA birds in region	Total birds BDMPS	Proportion SPA/BDMPS
	Non-breeding	Morecambe Bay	562	0.05	28	5,130	0.0055
		Rathlin Island	706	0.05	35	5,130	0.0069
		Ribble and Alt Estuaries	6,105	0.05	305	5,130	0.0595
		Ireland	654	0.05	33	5,130	0.0064
		UK Western non-designated SPA colonies	4,499	0.05	225	5,130	0.0438

Apportioned breeding impacts

1.3.7.2 Apportioned mortality for lesser black-backed gull during the breeding season is presented in Table 1.27, and ranges from 0.000% to 0.030%. The highest impact, albeit still minimal, in a single location was found to be on Puffin Island.

Table 1.27: Breeding lesser black-backed gull apportioned SPA mortality due to collision risk (Sa = sabbatical, Ad = adult, Im = immature).

SPA colony	Mortality from collisions			Baseline mortality		Increase in baseline mortality %	
	Sa	Ad	Im	Ad	Im	Ad	Im
Ireland's Eye	0.0 to 0.0	0.0 to 0.0	0.0 to 0.0	1	1	0.000% to 0.002%	0.000% to 0.003%
Lambay Island	0.0 to 0.0	0.0 to 0.0	0.0 to 0.0	109	122	0.000% to 0.002%	0.000% to 0.003%
Rathlin Island	0.0 to 0.0	0.0 to 0.0	0.0 to 0.0	119	134	0.000% to 0.001%	0.000% to 0.001%
Ailsa Craig	0.0 to 0.0	0.0 to 0.0	0.0 to 0.0	43	49	0.000% to 0.001%	0.000% to 0.002%
Morecambe Bay and Duddon Estuary	0.0 to 0.0	0.0 to 0.0	0.0 to 0.0	95	106	0.001% to 0.008%	0.002% to 0.011%
Ribble and Alt Estuaries	0.0 to 0.1	0.0 to 0.1	0.0 to 0.2	1,032	1,155	0.002% to 0.014%	0.003% to 0.018%
Dalkey Island	0.0 to 0.0	0.0 to 0.0	0.0 to 0.0	8	9	0.000% to 0.002%	0.000% to 0.002%
Skerries Island	0.0 to 0.0	0.0 to 0.0	0.0 to 0.0	0	0	0.000% to 0.002%	0.000% to 0.003%
Strangford Lough	0.0 to 0.0	0.0 to 0.0	0.0 to 0.0	73	81	0.000% to 0.002%	0.000% to 0.003%
Copeland Islands	0.0 to 0.0	0.0 to 0.0	0.0 to 0.0	294	329	0.000% to 0.002%	0.000% to 0.002%

SPA colony	Mortality from collisions			Baseline mortality		Increase in baseline mortality %	
	Sa	Ad	Im	Ad	Im	Ad	Im
Lough Neagh and Lough Beg	0.0 to 0.0	0.0 to 0.0	0.0 to 0.0	201	224	0.000% to 0.001%	0.000% to 0.001%
Larne Lough	0.0 to 0.0	0.0 to 0.0	0.0 to 0.0	0	0	0.000% to 0.000%	0.000% to 0.000%
Puffin Island	0.0 to 0.0	0.0 to 0.0	0.0 to 0.1	121	135	0.004% to 0.030%	0.006% to 0.040%
Anglesey Terns/Morwenoliaid Ynys Môn	0.0 to 0.0	0.0 to 0.0	0.0 to 0.0	26	30	0.002% to 0.016%	0.003% to 0.021%
Glannau Aberdaron ac Ynys Enlli/Aberdaron Coast and Bardsey Island	0.0 to 0.0	0.0 to 0.0	0.0 to 0.0	38	42	0.000% to 0.003%	0.001% to 0.004%
Non-SPA Total	0.0 to 0.0	0.0 to 0.0	0.0 to 0.0	1,304	1,459	0.000% to 0.002%	0.000% to 0.003%

Apportioned non-breeding impacts

1.3.7.3 Apportioned mortality for lesser black-backed gull during the non-breeding season is presented in Table 1.28, and ranges from 0.000% to 0.004%.

Table 1.28: Non-breeding lesser black-backed gull apportioned expected SPA mortality due to collision risk (based on Furness *et al.* 2015).

Age	Season	Colony	BDMPS	Baseline Mortality	Mortality increase	
					Number	Percentage
Adult	Post-breeding	Ailsa Craig	110,708	43	0.0 to 0.0	0.000% to 0.000%
		Morecambe Bay	110,708	95	0.0 to 0.0	0.000% to 0.000%
		Rathlin Island	110,708	119	0.0 to 0.0	0.000% to 0.000%
		Ribble and Alt Estuaries	110,708	1,032	0.0 to 0.0	0.000% to 0.000%
		Ireland	110,708	111	0.0 to 0.0	0.000% to 0.000%
		UK Western non-designated SPA colonies	110,708	761	0.0 to 0.0	0.000% to 0.000%
	Pre-breeding	Ailsa Craig	110,708	43	0.0 to 0.0	0.001% to 0.002%
		Morecambe Bay	110,708	95	0.0 to 0.0	0.001% to 0.002%

Age	Season	Colony	BDMPS	Mortality increase		
				Baseline Mortality	Number	Percentage
Immature	Non-breeding	Rathlin Island	110,708	119	0.0 to 0.0	0.001% to 0.002%
		Ribble and Alt Estuaries	110,708	1,032	0.0 to 0.0	0.001% to 0.002%
		Ireland	110,708	111	0.0 to 0.0	0.001% to 0.001%
		UK Western non-designated SPA colonies	110,708	761	0.0 to 0.0	0.001% to 0.002%
		Ailsa Craig	36,029	43	0.0 to 0.0	0.001% to 0.004%
		Morecambe Bay	36,029	95	0.0 to 0.0	0.001% to 0.004%
		Rathlin Island	36,029	119	0.0 to 0.0	0.001% to 0.004%
		Ribble and Alt Estuaries	36,029	1,032	0.0 to 0.0	0.001% to 0.004%
	Post-breeding	Ireland	36,029	111	0.0 to 0.0	0.001% to 0.004%
		UK Western non-designated SPA colonies	36,029	761	0.0 to 0.0	0.001% to 0.004%
		Ailsa Craig	52,596	34	0.0 to 0.0	0.000% to 0.000%
		Morecambe Bay	52,596	75	0.0 to 0.0	0.000% to 0.000%
		Rathlin Island	52,596	94	0.0 to 0.0	0.000% to 0.000%
		Ribble and Alt Estuaries	52,596	814	0.0 to 0.0	0.000% to 0.000%
Pre-breeding	Ireland	52,596	87	0.0 to 0.0	0.000% to 0.000%	
	UK Western non-designated SPA colonies	52,596	600	0.0 to 0.0	0.000% to 0.000%	
	Ailsa Craig	52,596	34	0.0 to 0.0	0.001% to 0.002%	
	Morecambe Bay	52,596	75	0.0 to 0.0	0.001% to 0.002%	
		Rathlin Island	52,596	94	0.0 to 0.0	0.001% to 0.002%

Age	Season	Colony	BDMPS	Mortality increase		
				Baseline Mortality	Number	Percentage
Immature	Breeding	Ribble and Alt Estuaries	52,596	814	0.0 to 0.0	0.001% to 0.002%
		Ireland	52,596	87	0.0 to 0.0	0.000% to 0.001%
		UK Western non-designated SPA colonies	52,596	600	0.0 to 0.0	0.001% to 0.002%
		Ailsa Craig	5,130	34	0.0 to 0.0	0.001% to 0.004%
	Non-breeding	Morecambe Bay	5,130	75	0.0 to 0.0	0.001% to 0.004%
		Rathlin Island	5,130	94	0.0 to 0.0	0.001% to 0.004%
		Ribble and Alt Estuaries	5,130	814	0.0 to 0.0	0.001% to 0.004%
		Ireland	5,130	87	0.0 to 0.0	0.001% to 0.004%
		UK Western non-designated SPA colonies	5,130	600	0.0 to 0.0	0.001% to 0.004%

1.3.8 Great black-backed gull

SPA weighted proportions

1.3.8.1 The SPA weighted proportions of this species are given in Table 1.29 and Table 1.30, with the highest weighting factor assigned to Puffin Island SPA, followed by Morecambe Bay and Duddon Estuary SPA.

Table 1.29: Great black-backed gull colony weighting factors used for apportioning impacts of collision risk.

¹ Colonies that make up the non-SPA total are presented in table A.7 of Appendix A.

SPA colony	Bird count (adjusted for IND)	Distance to Mona Array Area (km)	SPA weight (based on distance ²)	Proportional SPA weight
Morecambe Bay and Duddon Estuary	98	76.7	0.18	0.16
Ribble and Alt Estuaries	34	61.0	0.10	0.09
Puffin Island	214	41.9	0.72	0.64
Anglesey Terns/Morwenoliaid Ynys Môn	54	57.0	0.06	0.06
Glannau Ynys Gybi/Holy Island Coast	12	70.0	0.01	0.01
Non-SPA Total ¹	182	65.1	0.05	0.05

Table 1.30: Non-breeding great black-backed gull colony weighting factors used for apportioning SPA impacts of collision risk (UK Western 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	Non-breeding	UK Western non-designated SPA colonies	412	0.7	288	14,238	0.0203
Immature	Non-breeding	UK Western non-designated SPA colonies	449	0.5	225	20,142	0.0111

Apportioned breeding impacts

1.3.8.2 Apportioned mortality for great black-backed gull during the breeding season is presented in Table 1.31, and ranges from 0.146% to 9.596%. The highest impact in a single location was found to be on Puffin Island, followed by Ribble and Alt Estuaries.

Table 1.31: Breeding great black-backed gull apportioned expected SPA mortality due to collision risk (Sa = sabbatical, Ad = adult, Im = immature).

SPA colony	Mortality from collisions			Baseline mortality		Increase in baseline mortality %	
	Sa	Ad	Im	Ad	Im	Ad	Im
Morecambe Bay and Duddon Estuary	0.0 to 0.1	0.1 to 0.4	0.1 to 0.6	7	18	0.968% to 5.244%	0.672% to 3.641%
Ribble and Alt Estuaries	0.0 to 0.1	0.0 to 0.2	0.1 to 0.3	2	6	1.471% to 7.971%	1.022% to 5.535%
Puffin Island	0.1 to 0.4	0.3 to 1.4	0.5 to 2.6	15	39	1.772% to 9.596%	1.230% to 6.664%
Anglesey Terns/Morwenoliad Ynys Môn	0.0 to 0.0	0.0 to 0.1	0.0 to 0.2	4	10	0.611% to 3.311%	0.424% to 2.299%
Glannau Ynys Gybi/Holy Island Coast	0.0 to 0.0	0.0 to 0.0	0.0 to 0.0	1	2	0.347% to 1.878%	0.241% to 1.304%
Non-SPA Total	0.0 to 0.0	0.0 to 0.1	0.0 to 0.2	13	33	0.146% to 0.793%	0.102% to 0.551%

Apportioned non-breeding impacts

1.3.8.3 Apportioned mortality for great black-backed gull during the non-breeding season is presented in Table 1.28, and ranges from 0.019% to 0.260%.

Table 1.32: Non-breeding great black-backed gull apportioned expected SPA mortality due to collision risk (based on Furness et al. 2015).

Age	Season	Colony	BDMPS	Baseline Mortality	Mortality increase	
					Number	Percentage
Adult	Non-breeding	UK Western non-designated SPA colonies	14,238	29	0.0 to 0.1	0.059% to 0.260%
Immature	Non-breeding	UK Western non-designated SPA colonies	20,142	50	0.0 to 0.0	0.019% to 0.082%

1.4 Conclusion

1.4.1.1 The results from this apportioning assessment for each species (common guillemot, razorbill, northern gannet, black-legged kittiwake, herring gull, lesser black-backed gull, and great black-backed gull) and their respective bio-seasons highlight that none of the increases in baseline mortality caused by the Mona Offshore Wind Project exceeds the 1% threshold in the context of the entire BDMPS population. However, some individual SPA colonies for some species experience increases in baseline mortality that exceed the 1% threshold at the upper end of the range of possible impacts.

1.4.1.2 To understand how these colonies may be affected, as part of the Information to Support the Appropriate Assessment (ISAA) report, these colonies require further assessment in a PVA, which has been undertaken and can be found in volume 6, annex 10.6: PVA analysis of the PEIR.

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Appendix A: Regional Populations

A.1 Breeding Season

Table A 1: Common guillemot breeding colonies within the mean-max plus one standard deviation foraging ranges of the Mona Array Area and regional population (individuals: IND) used to assess displacement during the breeding season.

Colonies	Qualifying species	Master site in SMP	Count (IND)	Last counted
SPA	NO	Aberdaron Coast and Bardsey Island SPA	2826	2019
SPA	NO	Balcary Point	639	2019
SPA	NO	Great Orme and Little Orme	3381	2022
SPA	YES	Howth Head Coast	871	2015
SPA	YES	Ireland's Eye	4410	2015
SPA	YES	Lambay Island	59983	2015
SPA	NO	Mynydd Cilan, Trwyn y Wylfa ac Ynysoedd Sant Tudwal	3475	2016
SPA	NO	Porth Llanlleiana to Porth Eilian	5550	2016
SPA	NO	Puffin Island	3820	2021
SPA	NO	South Stack	7914	2021
MCZ	NO	St Bee's Head	17501	2021
NON-SPA	NO	Coastal Gwynedd	14116	2021
NON-SPA	NO	Isle of Man	5219	2017
NON-SPA	NO	Meikle Ross and Little Ross	27	2018
NON-SPA	NO	Monrieth Cliffs and Scar Rocks	350	2016
NON-SPA	NO	Mull of Galloway	277	2019
NON-SPA	NO	Port Mona, Devil's Bridge, Laggantalluch Head	229	2021

Table A 2: Razorbill breeding colonies within the mean-max plus one standard deviation foraging ranges of the Mona Array Area and regional population (individuals: IND) used to assess displacement during the breeding season.

Colonies	Qualifying species	Master site in SMP	Count (IND)	Last counted
SPA	NO	Aberdaron Coast and Bardsey Island SPA	3834	2019
SPA	NO	Great Orme and Little Orme	296	2022
SPA	YES	Howth Head Coast	279	2015
SPA	YES	Ireland's Eye	1600	2015
SPA	YES	Lambay Island	7353	2015
SPA	NO	Lleyn Peninsula	326	2021
SPA	NO	Point Lynas to Trwyn Du	14	2016
SPA	NO	Porth Llanlleiana to Porth Eilian	457	2016
SPA	NO	Puffin Island	681	2021
SPA	NO	Rigg Bay + Craggleton	0	2020
SPA	NO	South Stack	1378	2021
MCZ	YES	St Bees Head and Town	94	2021
SPA	YES	Wicklow Head	157	2022
NON-SPA	NO	Port Mona, Devil's Bridge, Laggantalluch Head	37	2021
NON-SPA	NO	Mull of Galloway	44	2019
NON-SPA	NO	Monreith Cliffs and Scar Rocks	0	2018
NON-SPA	NO	Meikle Ross and Little Ross	3	2018
NON-SPA	NO	Balcary Point	91	2019
NON-SPA	NO	Coastal Cwynedd	557	2021
NON-SPA	NO	Isle of Man	696	2017
NON-SPA	NO	Bray	150	2010

Table A 3: Northern gannet breeding colonies within the mean-max plus on standard deviation foraging ranges of the Mona Array Area and regional population (apparently occupied nests: AON) used to assess displacement during the breeding season.

Colonies	Qualifying species	Master site in SMP	Count (AON)	Last counted
SPA	YES	Ailsa Craig	32226	2014
SPA	YES	Grassholm	36011	2015
SPA	YES	Great Saltee	4722	2013
SPA	YES	Ireland's Eye	350	2015
NON-SPA	NO	Monreith Cliffs and Scar Rocks	2376	2014

Table A 4: Black-legged kittiwake breeding colonies within the mean-max plus on standard deviation foraging ranges of the Mona Array Area and regional population (apparently occupied nests: AON) used to assess displacement during the breeding season.

Colonies	Qualifying species	Master site in SMP	Count (AON)	Last counted
SPA	NO	Aberdaron Coast and Bardsey Island SPA	121	2019
SPA	YES	Ailsa Craig	490	2021
SPA	NO	Bae Caerfyrddin	11	2018
SPA	NO	Grassholm	30	2018
SPA	NO	Great Orme and Little Orme	875	2022
SPA	YES	Howth Head Coast	3081	2015
SPA	YES	Inishtrahull Island	7	2016
SPA	YES	Ireland's Eye	1610	2015
SPA	YES	Lambay Island	3320	2015
SPA	NO	Mynydd Cilan	338	2016
SPA	NO	Point Lynas to Trwyn Du	156	2016
SPA	NO	Porth Llanlleiana to Porth Eilian	52	2016
SPA	NO	Puffin Island	203	2021
SPA	NO	Ramsay and St David's Peninsula Coast	83	2019
SPA	YES	Rathlin Island	13706	2021
SPA	NO	Rockabill	266	2018
SPA	YES	Saltee Island	845	2013
SPA	NO	Skomer, Skokholm and the Seas off Pembrokeshire	1439	2021
MCZ	NO	St Bees Head and Town	809	2021
SPA	NO	Wicklow Head	707	2022
NON-SPA	NO	Bray	1473	2010

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Colonies	Qualifying species	Master site in SMP	Count (AON)	Last counted
NON-SPA	NO	Caldey Island	271	2021
NON-SPA	NO	Causeway Coast	1197	2021
NON-SPA	NO	Creadan Head to Foilakipeen	26	2018
NON-SPA	NO	Downhill	92	2015
NON-SPA	NO	Dunmore East to Red Head	442	2014
NON-SPA	NO	Giants Causeway Coast	13	2000
NON-SPA	NO	Islay - East	59	2021
NON-SPA	NO	Islay - West	246	2019
NON-SPA	NO	Isle of Man	685	2017
NON-SPA	NO	Larne Lough to Portmuck	1145	2019
NON-SPA	NO	Lleyn Peninsula	614	2021
NON-SPA	NO	Lundy	284	2021
NON-SPA	NO	Maggys Leap	656	2019
NON-SPA	NO	Monreith Cliffs and Scar Rocks	19	2018
NON-SPA	NO	Morecambe Central Gas Platform	556	2020
NON-SPA	NO	Mucks Island	519	2019
NON-SPA	NO	Mull of Galloway	447	2019
NON-SPA	NO	Mumbles Head	90	2018
NON-SPA	NO	New Quay to Lochtyn	332	2018
NON-SPA	NO	North Antrim Coast	332	2018
NON-SPA	NO	Port Mona, Devils Bridge, Laggantalluch Head	25	2021
NON-SPA	NO	Portally to Benlea Head	100	2018
NON-SPA	NO	Sanda Islands - Kintyre	33	2019
NON-SPA	NO	Skerry Island	76	2000

Table A 5: Herring Gull breeding colonies within the mean-max plus one standard deviation foraging ranges of the Mona Array Area and regional population (apparently occupied nests: AON) used to assess displacement during the breeding season.

Colonies	Qualifying species	master site in SMP	Count (AON)	Last counted
SPA	YES	Morecambe Bay and Duddon Estuary	450	2018
SPA	NO	Ribble and Alt Estuaries	855	2021
SPA	NO	Llawndy	7	2001
SPA	NO	Puffin Island	472	2017
SPA	NO	Anglesey Terns / Morwenoliaid Ynys Môn	1236	2019
SPA	NO	Glannau Ynys Gybi/ Holy Island Coast	298	2021
NON-SPA	NO	Isle of Man	1209	2017
NON-SPA	NO	Haverigg and Millom	190	2019
NON-SPA	NO	Barrow-In-Furness	518	2019
NON-SPA	NO	Morecambe	1	2000
NON-SPA	NO	Heysham Power Station	30	2000
NON-SPA	NO	Fleetwood	44	2019
NON-SPA	NO	Blackpool	55	2001
NON-SPA	NO	Morecambe Central Gas Platform	8	2020
NON-SPA	NO	Netherton	0	2019
NON-SPA	NO	Seaforth Nature Reserve and Liverpool City	8	2019
NON-SPA	NO	Prestatyn	50	2019
NON-SPA	NO	Rhyl	74	2019
NON-SPA	NO	Kinmel Bay	19	2019
NON-SPA	NO	Colwyn Bay	24	2019
NON-SPA	NO	Llanddulas Quarries	48	2017
NON-SPA	NO	Inland Gwynedd	589	2018
NON-SPA	NO	Beaumaris	43	2019
NON-SPA	NO	Bangor and Caernarfon	144	2019

Table A 6: Lesser black-backed gull breeding colonies within the mean-max plus one standard deviation foraging ranges of the Mona Array Area and regional population (apparently occupied nests: AON) used to assess displacement during the breeding season.

Colonies	Qualifying species	Master site in SMP	Count (AON)	Last counted
SPA	YES	Ireland's Eye	5	2015
SPA	YES	Lambay Island	476	2010
SPA	YES	Rathlin Island	519	2021
SPA	YES	Ailsa Craig	189	2019
SPA	YES	Morecambe Bay and Duddon Estuary	413	2018
SPA	YES	Ribble and Alt Estuaries	4489	2021
SPA	NO	Dalkey Island	36	2016
SPA	NO	Skerries Island	1	2010
SPA	NO	Strangford Lough	316	2019
SPA	NO	Copeland Islands	1278	2019
SPA	NO	Lough Neagh and Lough Beg	1210	2021
SPA	NO	Larne Lough	0	2019
SPA	NO	Puffin Island	526	2017
SPA	NO	Anglesey Terns / Morwenoliaid Ynys Môn	115	2019
SPA	NO	Glannau Aberdaron ac Ynys Enlli/ Aberdaron Coast and Bardsey Island	164	2019
NON-SPA	NO	Aber Bach - Ynys Barry	8	2018
NON-SPA	NO	Aberdaron Coast not in SPA	10	2016
NON-SPA	NO	Aberystwyth - Borth	0	2018
NON-SPA	NO	Almorness Point	373	2016
NON-SPA	NO	Arran	250	2016
NON-SPA	NO	Ayr	128	1999
NON-SPA	NO	Bangor and Caernarfon	17	2019
NON-SPA	NO	Barassie and Troon	9	1999
NON-SPA	NO	Belfast	85	2019
NON-SPA	NO	Blackpool	5	2001
NON-SPA	NO	Cardigan Island and Mwnt to Carreg Lydan	326	2019
NON-SPA	NO	Carlisle	20	2013
NON-SPA	NO	Causeway Coast	7	2021
NON-SPA	NO	Derwent Water	6	2019
NON-SPA	NO	Dublin City Centre, Skerries and Balbriggan	10	2002
NON-SPA	NO	East Island (Isle of Man)	17	2017

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Colonies	Qualifying species	Master site in SMP	Count (AON)	Last counted
NON-SPA	NO	Fleetwood	9	2019
NON-SPA	NO	Greenside Quarry, Kendal	26	2021
NON-SPA	NO	Haverigg and Millom	77	2019
NON-SPA	NO	Haweswater RSPB	35	2018
NON-SPA	NO	Heathfield Sawmills	126	1999
NON-SPA	NO	Heysham Power Station	35	2000
NON-SPA	NO	Holy Island	1	2021
NON-SPA	NO	Horse Island	901	2017
NON-SPA	NO	Inland Gwynedd	95	2019
NON-SPA	NO	Irvine	97	1999
NON-SPA	NO	Kilmarnock	134	1999
NON-SPA	NO	Kirkconnell Merse	0	2021
NON-SPA	NO	Lady Isle	246	2018
NON-SPA	NO	Little Cumbrae	1200	1999
NON-SPA	NO	Llanddulas Quarries	4	2017
NON-SPA	NO	Llangrannog to Penpeles (includes Tresaith SSSI and Aberporth)	1	2018
NON-SPA	NO	Loch Ryan	0	2021
NON-SPA	NO	McCalls Avenue, Ayr	32	1999
NON-SPA	NO	Monaghan Lakes	13	2000
NON-SPA	NO	Morecambe	1	2000
NON-SPA	NO	Muck Island	0	2020
NON-SPA	NO	Netherton	1	2019
NON-SPA	NO	New Quay to Lochtyn	3	2018
NON-SPA	NO	Newport to Poppit	40	2018
NON-SPA	NO	North Island (Isle of Man)	21	2017
NON-SPA	NO	Pembrey	34	2002
NON-SPA	NO	Penllyn to Gogarth (River Dovey mouth)	0	2018
NON-SPA	NO	Portpatrick	0	2021
NON-SPA	NO	Prestatyn	3	2019
NON-SPA	NO	Prestwick Town	16	1999
NON-SPA	NO	Rhyl	4	2019
NON-SPA	NO	Rough Firth Merse	0	2020
NON-SPA	NO	Sanda Islands - Kintyre	23	2019

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Colonies	Qualifying species	Master site in SMP	Count (AON)	Last counted
NON-SPA	NO	Seaforth Nature Reserve and Liverpool City	33	2019
NON-SPA	NO	Skerry Islands	269	2010
NON-SPA	NO	South Island (Isle of Man)	36	2017
NON-SPA	NO	South Solway	780	2019
NON-SPA	NO	St Bees Head and Town	0	2020
NON-SPA	NO	Starling Knowe to Downan Point	3	2018
NON-SPA	NO	Strumble Head - Aberbach	51	2018
NON-SPA	NO	Strumble Head to Fishguard to Newport	4	2018
NON-SPA	NO	The Maiden	7	2000
NON-SPA	NO	West Island (Isle of Man)	4	2017
NON-SPA	NO	Whitehaven (Buildings)	53	2018
NON-SPA	NO	Wigtown Bay Merse and Baldoon	4	2021
NON-SPA	NO	Windermere	6	2009

Table A 7: Great black-backed gull breeding colonies within the mean-max plus one standard deviation foraging ranges of the Mona Array Area and regional population (apparently occupied nests: AON) used to assess displacement during the breeding season.

Colonies	Qualifying species	Master site in SMP	Count (AON)	Last counted
SPA	NO	Morecambe Bay and Duddon Estuary	49	2020
SPA	NO	Ribble and Alt Estuaries	17	2021
SPA	NO	Puffin Island	107	2017
SPA	NO	Anglesey Terns / Morwenoliaid Ynys Môn	27	2019
SPA	NO	Glannau Ynys Gybi/ Holy Island Coast	6	2016
NON-SPA	NO	Barrow-In-Furness	3	2010
NON-SPA	NO	Fleetwood	2	2019
NON-SPA	NO	Inland Gwynedd	1	2018
NON-SPA	NO	Isle of Man	85	2017