Partners in UK offshore wind

MONA OFFSHORE WIND PROJECT

Environmental Statement

Volume 6, Annex 5.5: Offshore ornithology apportioning technical report

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APPENDIX A : EXPECTED MORTALITIES 101

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 ~~Designated sites~~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 km^2.

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.

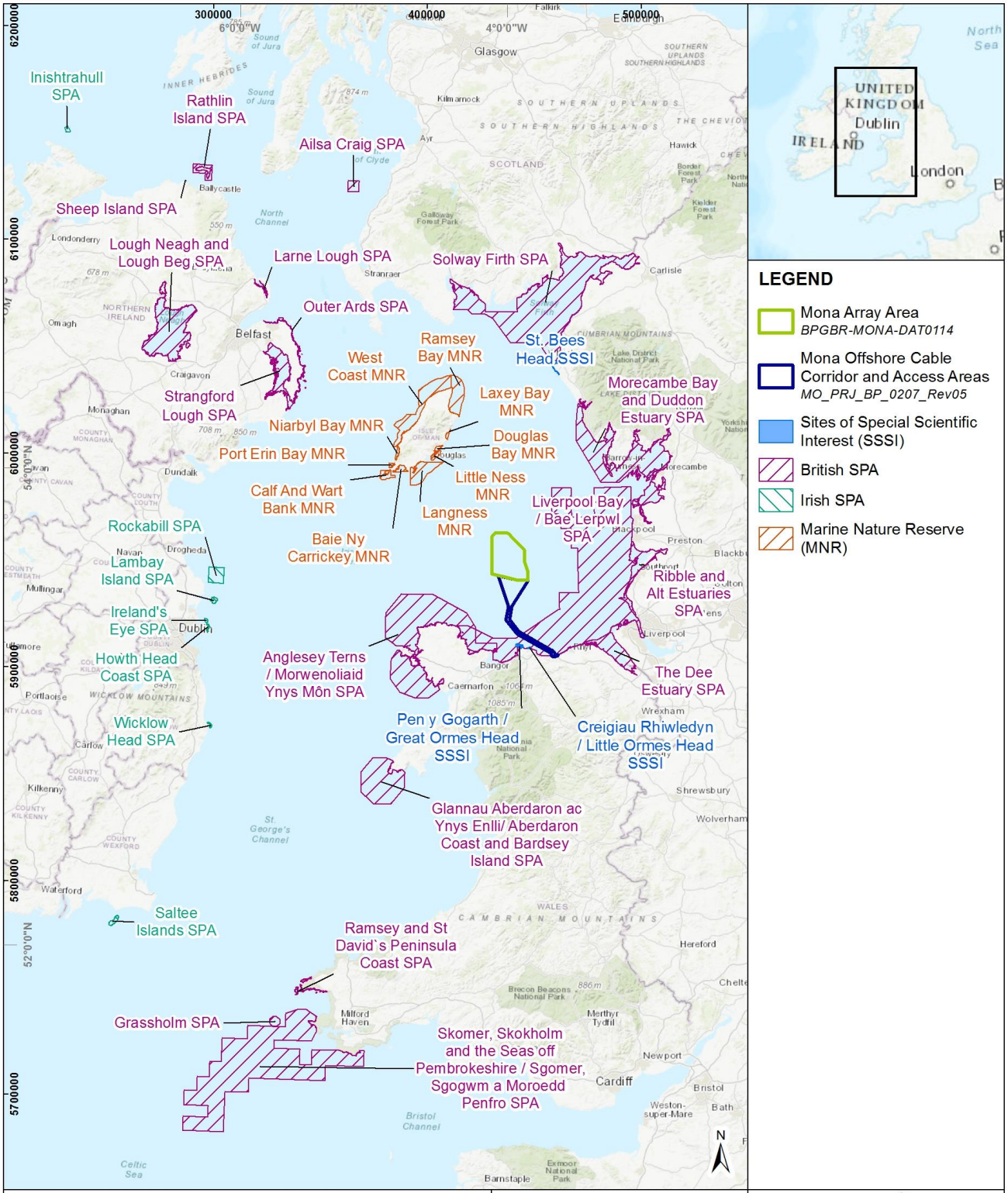

Figure 1.1: Designated sites in close proximity that are covered in this apportioning assessment in relation to the Mona Array Area.

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.

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.

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.

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.	

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.

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

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	~~September~~ October to ~~October~~November	N/A
Black-legged kittiwake	January to ~~March~~February	~~April~~ 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	~~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 ~~early~~ 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

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	SBreeding season (months)extent	Number of adult-type birds	Number of immature birds	Proportion of adult-typeimmature birds (%)
Kittiwake	Breeding (April March to August)	657639	3232	95.3695.23
	Non-breeding (September to MarchFebruary)	1807	157	92.01
Gannet	Breeding (March to September)	7151	4950	93.5843
	Non-breeding (October to February)	135	5	96.43
Herring gull	Breeding (March to August)	1213	34	80.0076.47
	Non-breeding (September to February)	31	10	75.61
Great black-backed gull	Breeding (March to August)	3026	66	83.3381.25
	Non-breeding (September to February)	43	18	70.49
Lesser black-backed gull	Breeding (April to August)	1819	45	81.8279.17
	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 far relatively easyeasier than for kittiwakes and the immature age-class proportions calculated for these species are therefore considered to be more 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.

1.3.3.4 Coulson (2011) presents evidence that shows that immature kittiwakes, particularly those in their second and third years, frequent natal waters, with older immatures increasingly populating breeding colonies. Using site-specific survey data to calculate

age class proportions for the breeding season will lead to an underestimation of second and third year immatures. Utilising the current approach (i.e. using proportions of adult and immature birds from DAS to age-class birds) will therefore lead to an overestimation of adults, as only one-year-old birds are distinguishable during surveys, with all other age groups categorised as adults. An adjustment is therefore necessary. This would involve calculating the number of two and three year olds from the overall adult count and subsequently added this proportion to the count of immature birds to accurately estimate the total number of immatures present at the Mona Offshore Wind Farm Project.

1.3.3.5 An approach was developed during the examination for Hornsea Offshore Wind Farm Project Two (SMart Wind, 2015) and has been applied in several other offshore wind farm assessments. The approach makes use of age-specific survival rates from Horswill and Robinson (2015) to calculate the proportion of different age classes likely to be present: 0.790 for juveniles, 0.854 for one year olds and 0.854 for two year olds.

1.3.3.6 These survival rates along with the proportion of adult and immature kittiwake recorded during DAS are presented in Table 1.5.

Table 1.5: Estimated breeding season contribution of adult birds to the total predicted to be present in the Mona Offshore Ornithology Array Area Study Area using immature proportions as calculated from survival rates and numbers of one-year old birds recorded during DAS.

Analysis step	Formula (using the parameters identified as part of each analysis step)	Value
(a) Survival rate of juvenile birds	-	0.790
(b) Survival rate of one year old birds	-	0.854
(c) % of kittiwake at the Mona Offshore Wind Farm Project assigned to one year old birds	-	4.77%
% of kittiwake at the Mona Offshore Wind Farm Project assigned to other immature age classes (d) two years old (e) three years old	d = [{(a) x b} / a] x c e = ([{(a) x b} x b] / a) x c	d = 4.074% e = 3.479%
(f) adjusted % of kittiwake at the Mona Offshore Wind Farm assigned to adults	f = 100% - (d + e + c)	87.68%

1.3.3.40 Based on the proportion of first year birds observed from DAS, it is considered that adults will account for 86.68% of all individuals. This is considered to be precautionary however as the survival rates used by Horswill and Robinson (2015) are precautionary.

1.3.3.4 In the non-breeding season, site-specific age-class was based on Furness (2015)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).

1.3.3.41

Table 1.5: Age class percentages used in apportioning impacts.

Species	Season	Adult %	Immatures %
Common guillemot	Breeding	100%	0%
	Non-breeding	100%~~57%~~	0%~~43%~~
Razorbill	Breeding	100%	0%
	Non-breeding	100%~~57%~~	0%~~43%~~
Northern gannet	Breeding	93.58%~~93.43%~~	6.42%~~6.57%~~
	Non-breeding	96.43%~~59%~~	3.57%~~41%~~
Black-legged kittiwake	Breeding	95.36%~~87.68%~~	4.64%~~12.32%~~
	Non-breeding	92.01%~~53%~~	7.9947%
Herring gull	Breeding	80.00%~~76.47%~~	20.00%~~23.53%~~
	Non-breeding	75.61%~~48%~~	24.39%~~52%~~
Lesser black-backed gull	Breeding	81.82%~~79.17%~~	18.18%~~20.83%~~
	Non-breeding	86.96%~~60%~~	13.04%~~40%~~
Great black-backed gull	Breeding	83.33%~~81.25%~~	16.67%~~18.75%~~
	Non-breeding	70.49%~~44%~~	29.51%~~56%~~
Manx shearwater	Breeding	100%	0%
	Non-breeding	100%~~54%~~	0%~~46%~~

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 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). ~~To i~~Includinge~~d~~ any impacts occurring on ~~any~~these sabbatical birds within ~~that~~ the apportioninged ~~to those individuals of the species breeding at a colony~~assessment~~,~~ ~~would likely~~could overestimate the effects ~~to these species/populations~~on the specific colony (Marine Scotland 2017a, b). ~~This is because breeding colony population size estimates, which are used within the Environmental Impact Assessment and HRA Stage 2 ISAA (Document Reference E1.1) to inform the derivation of the significance of impacts, do not include these sabbatical birds.~~

~~1.3.4.5~~1.3.4.6 However, at the request of the SNCBs, following Offshore Ornithology EWG03 (in November 2023), the~~The~~ apportioning assessment carried out for the Mona Offshore Wind Project does not ~~exclude~~ remove sabbatical birds from the predicted impact on adult birds ~~at the request of the Offshore Ornithology EWG meeting three (held 30/11/2023). It is likely therefore that impacts assigned to breeding colonies will be an overestimate, however it will not affect the assigned weighting factor detailed within this technical report.~~ from a specific colony.

~~1.3.4.6 It is not possible to separate non-breeding adult birds from those that are breeding in a given sea area and therefore published estimates of sabbatical behaviour have been obtained (Table 1.7).~~

~~Table 1.7: Proportion of sabbatical birds to be considered in the HRA Stage 2 ISAA (Document Reference E1.3).~~

~~Species~~	~~Incidence of missed breeding~~			
	~~Horswill and Robinson (2015)~~			~~Marine Scotland (2017a, b)~~
	~~Value (%)~~	~~Data quality~~	~~Data representation~~	
~~Black-legged kittiwake~~	~~18.0-20.8~~	~~Intermediate~~	~~Poor~~	~~10~~
~~Northen gannet~~	~~N/A~~	~~-~~	~~-~~	~~10~~
~~Herring gull~~	~~35.0~~	~~Intermediate~~	~~Good~~	~~35~~
~~Great black-backed gull~~	~~N/A~~	~~-~~	~~-~~	~~N/A~~
~~Lesser black-backed gull~~	~~33.7~~	~~Intermediate~~	~~Poor~~	~~34~~
~~Manx shearwater~~	~~15.7~~	~~Poor~~	~~Good~~	~~N/A~~
~~Common guillemot~~	~~7.9~~	~~Good~~	~~Good~~	~~7~~
~~Razorbill~~	~~3.0~~	~~Intermediate~~	~~Good~~	~~7~~

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).

~~1.3.5.1~~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.

~~1.3.5.2~~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.

~~1.3.5.3~~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 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.

1.4.1 Common guillemot

~~SPA 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 ~~SPA impacts~~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 ~~MÃ´n~~ 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

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

Table 1.7: Adult non-breeding common guillemot colony weighting factors used for apportioning ~~SPA impacts~~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%

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%

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%

Table 1.8: Immature non-breeding common guillemot colony weighting factors used for apportioning ~~SPA impacts~~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%

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%

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%

1.4.2 Razorbill

~~SPA~~ 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 ~~SPA impacts~~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 ~~MÃ´n~~ 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

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

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

Table 1.10: Adult non-breeding razorbill colony weighting factors used for apportioning ~~SPA impacts~~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%

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)	North Rona & Sula Sgeir	2,178	0.98	2,134		0.67%
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)	Shiants	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%

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)	Ireland	34,000	0.1	3,400		1.07%
Adult	Migration seasons (August to October, and January to March)	France	50	0.05	2		0.00%
Adult	Winter (November and December)	Russia	7,000	0.01	70	Adult UK Western waters = 179,182	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%

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)	Fowlsheugh	7,048	0.01	70		0.04%
Adult	Winter (November and December)	Forth Islands	5,250	0.01	52		0.03%
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)	Shiants	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%

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)	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%
Adult	Winter (November and December)	France	50	0.05	2		0.00%

Table 1.11: Immature non-breeding razorbill colony weighting factors used for apportioning ~~SPA impacts~~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%

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)	Shiants	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%

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%

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)	Shiants	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%

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%

1.4.3 Northern gannet

~~SPA~~ 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 ~~SPA impacts~~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 ~~MÃ´n~~ 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

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

Table 1.13: Adult non-breeding northern gannet colony weighting factors used for apportioning ~~SPA impacts~~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%

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%

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%

Table 1.14: Immature non-breeding northern gannet colony weighting factors used for apportioning ~~SPA impacts~~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%

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%

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%

1.4.4 Black-legged kittiwake

~~SPA~~ 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 ~~SPA impacts~~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 ~~MÃ´n~~ 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

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

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

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	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

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
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

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

Table 1.16: Adult non-breeding black-legged kittiwake colony weighting factors for apportioning ~~SPA impacts~~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%

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%

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%

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%

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%

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%

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%

Table 1.17: Immature non-breeding black-legged kittiwake colony weighting factors for apportioning ~~SPA impacts~~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%

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%

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%

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%

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%

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%

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%

1.4.5 Herring gull

~~SPA 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 ~~MÃ´n~~ 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

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

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

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

Table 1.19: Adult non-breeding herring gull colony weighting factors used for apportioning ~~SPA impacts~~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%

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%

Table 1.20: Immature non-breeding herring gull colony weighting factors used for apportioning ~~SPA impacts~~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%

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%

1.4.6 Lesser black-backed gull

SPA 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 MÃ´n 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

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

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

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

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

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

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

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

Table 1.22: Adult non-breeding lesser black-backed gull colony weighting factors used for apportioning ~~SPA impacts~~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 ctober)	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%

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%

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%

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%

Table 1.23: Immature non-breeding lesser black-backed gull colony weighting factors used for apportioning ~~SPA impacts~~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%

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%

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%

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%

1.4.7 Great black-backed gull

SPA 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 MÃ´n 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

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
Llynnau 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

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

Table 1.25: Adult non-breeding great black-backed gull colony weighting factors used for apportioning ~~SPA impacts~~impacts of collision risk (UK South~~W~~west~~ern~~ 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%

Table 1.26: Immature non-breeding great black-backed gull colony weighting factors used for apportioning ~~SPA impacts~~impacts of collision risk (UK South~~W~~west~~ern~~ 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%

1.4.8 Manx shearwater

~~SPA 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 ~~SPA impacts~~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

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

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

Table 1.28: Adult non-breeding Manx shearwater colony weighting factors used for apportioning ~~SPA impacts~~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%

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%

Table 1.29: Immature non-breeding Manx shearwater colony weighting factors used for apportioning ~~SPA impacts~~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

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Appendix A: ~~Expected~~ 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 ~~Natural England~~species-group avoidance rates)	Mortality Collisions (using species-specific ~~JNCC~~ avoidance rates)	Mortality displacement	Mortality Combined (using species-group ~~Natural England~~ avoidance rates)	Mortality Combined (using ~~JNCC~~ 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 (0 to ~~2~~0)	0 (0 to 0)
Northern gannet (no correction for to collision impacts to account for macroavoidance)	Pre-breeding	~~1~~0 (0 to 1~~2~~)	~~-1 (0 to 2)~~	0 (0 to 2)	0~~1~~ (0 to 3~~4~~)	~~-1 (0 to 4)~~
	Breeding	5~~4~~ (1 to 1~~1~~3)	~~-3 (1 to 9)~~	2 (2 to 20)	7~~6~~ (3 to 3~~1~~)	~~-6 (3 to 31)~~
	Post-breeding	1 (0 to 1~~3~~)	~~-1 (0 to 3)~~	0 (0 to 5)	1 (0 to 6~~8~~)	~~-1 (0 to 8)~~
Northern fulmar	Pre-breeding	0 (0 to 0~~1~~)	~~-0 (0 to 1)~~	-	0 (0 to 0~~1~~)	~~-0 (0 to 1)~~
	Breeding	0 (0 to 2~~1~~)	~~-0 (0 to 1)~~	-	0 (0 to 2~~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	0 (0 to ~~2~~0)	~~-0 (0 to 2)~~	-	0 (0 to ~~2~~0)	~~-0 (0 to 2)~~

Species	Season	Mortality Collisions (using ~~Natural England~~species-group avoidance rates)	Mortality Collisions (using species-specific ~~JNCC~~ avoidance rates)	Mortality displacement	Mortality Combined (using species-group ~~Natural England~~ avoidance rates)	Mortality Combined (using ~~JNCC~~ species-specific avoidance rates)
Black-legged kittiwake	Pre-breeding	~~169~~ (~~36~~ to 1~~833~~)	~~35~~ (~~21~~ to ~~510~~)	~~43~~ (~~23~~ to ~~4062~~)	1~~21320~~ (~~569~~ to ~~588095~~)	~~6720~~ (~~349~~ to ~~489~~5)
	Breeding	~~168~~ (~~63~~ to ~~3116~~)	~~52~~ (~~21~~ to ~~95~~)	~~42~~ (~~21~~ to ~~25~~ ~~51~~)	~~20180~~ (~~874~~ to ~~835641~~)	~~9710~~ (~~434~~ to ~~602441~~)
	Post-breeding	~~89~~ (3 to 18)	3 (1 to 5)	3 (2 to 39)	1~~212~~ (5 to 57)	~~612~~ (~~35~~ to ~~5744~~)
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)	0 (0 to 0)
	Breeding	0 (0 to 0)	~~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 0)~~	~~10~~ (~~01~~ to ~~113~~)	~~01~~ (~~01~~ to 1~~3~~)	1 (1 to 13)