

Volume 2: Appendices

Appendix 20
**Offshore and Intertidal
Ornithology Apportioning
Appendix**

North Irish Sea Array Windfarm Ltd

Offshore Ornithology Apportioning Annex

North Irish Sea Array Offshore Windfarm



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APEM Group

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North Irish Sea Array Windfarm Limited Acronyms

Term	Definition
BDMPS	Biologically Defined Minimum Population Scales
CRM	Collision Risk Modelling
GIS	Geographic Information Systems
HRA	Habitat Regulations Assessment
MMF	Mean-maximum Foraging
NWIS	North-west Irish Sea
OWF	Offshore Wind Farm
SPA	Special Protection Area



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1 Introduction

1.1 Project Background

This document has been prepared by Arup and GoBe Consultants Limited (GoBe) on behalf of North Irish Sea Array Limited (NISA Ltd).

The Northern Irish Sea Array (hereafter 'NISA') Offshore Wind Farm (OWF) is proposed for construction 11.3 km off the east coast of Ireland (at their nearest points to the mainland). NISA will consist of offshore wind turbines, an offshore converter station, inter-array cables, interconnector cables and on- and offshore cables taking power to an onshore converter station. The area considered in the context of offshore ornithological receptors includes the entire NISA array area, covering 89 km², an asymmetric 4 km buffer surrounding the array area, and the offshore Export Cable Corridor (ECC) covering a further 67.8 km².

During the breeding season, the Irish Sea region provides foraging, loafing and preening habitat for a range of seabirds, including (but not limited to) northern gannet, *Morus bassanus*, various gull species, and several species of auks and terns. An overview of key species present within and in close proximity to NISA, including data collection methods is presented in Appendix 12: Offshore and Intertidal Ornithology Technical Baseline.

1.2 Apportioning

This annex supplements the Natura Impact Statement (NIS), with the aim of outlining the methodology and approach to the apportioning of impacts from NISA to ornithological receptors at designated sites screened in for assessment (Supporting Information: Screening for Appropriate Assessment (SISAA)). The direct impact of NISA has been assessed and presented in the corresponding Appendix 14: Offshore and Intertidal Ornithology Collision Risk Modelling Assessment and Appendix 13: Offshore and Intertidal Ornithology Displacement Analysis. The approach by which collision and displacement induced mortalities are apportioned to relevant sites is detailed within this report.



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2 Methodology

There is a current lack of Irish-specific data available to inform the bio-geographical populations to be applied during the non-breeding apportioning assessment. Bio-geographical population derived from Furness (2015) are used within UK assessments, however there is no data from the Republic of Ireland presented. Where possible, regional populations have been defined. These are based on the Furness BDMPS, with the Furness Irish population removed, and a more appropriate Irish population added. This process has been agreed with and is being used across all Phase 1 Projects.

2.1 Bio-seasons

Seabird behaviour and distribution can vary throughout the year with migration patterns influencing the times of the year certain species are present and breeding birds must attend their nests and as a result are restricted by the distance at which they can forage during the breeding season. Therefore, it is key to consider seasonality within assessments by assigning species biologically defined seasons (or bio-seasons) with distinct differences in population size or distribution to assess the impact of OWFs more accurately over these periods. The bio-seasons used throughout the assessments underpinning the results presented within Appendix 16: Offshore and Intertidal Ornithology Apportioning Appendix were defined from Furness (2015) for all screened in species and are presented in Table 2-1 below. Impacts assessed within the NIS were apportioned to SPAs within each of these bio-seasons. Two breeding season definitions are presented for guillemot. A full description of these two definitions can be found in the Guillemot bio-seasons section.

As seen in Table 2-1 some species have a different number of non-breeding bio-seasons to account for periods during which substantial migration of the species occurs through UK waters. Notably for multiple species, both a migration-free breeding season and a 'full' breeding season is presented in Furness (2015). Since the full breeding season will extend into the late stages of the return migration bio-season, and the early stages of the post-breeding migration bio-season, it is considered highly likely that large numbers of birds recorded in these overlaps are travelling through the area on migration as opposed to being breeding birds within the area. Therefore, it was considered more biologically relevant to use the migration-free breeding season, and this will form the basis of the assessments carried out in the NIS.

2.2 Guillemot bio-seasons

Two guillemot bio-seasons are assessed (see Table 2-1). One follows the Furness et al. (2015) approach of considering the guillemot breeding season to run from March to July. Along with this, the project presents a bespoke approach which considers a guillemot breeding season of April to June. This is deemed to be more appropriate as although guillemot can attend colonies from March, breeding (i.e. the laying of eggs) seldom commences until late April. Apportioning of impacts during the breeding season is based upon mean max foraging ranges, which have been defined using data from tracked birds during the incubation and chick rearing periods, when the birds are most constrained by the need to return to the nest. With this constraint not present in March (or April), it is appropriate to consider birds to be less constrained, and therefore the use of standard mean-max foraging ranges to apportion birds is not appropriate. The project therefore considers that breeding season apportioning based on mean max foraging ranges should begin in April.



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On the Isle of May, the mean fledging date has been calculated at July 10th, and colonies at similar latitudes will have similar phenology. As such, any offshore population of guillemots in July, and in particular, later in July, will be made up of a large proportion of birds that have finished breeding. As the mean fledging date is in the first half of the month, it is appropriate to assume that on average across July, more birds have completed breeding than are yet to complete breeding, and as such, it is inappropriate to consider July as part of the breeding season.

Consequently, two approaches are presented for guillemot throughout the assessment termed the site-specific approach, which defines bio-seasons based on survey data and the generic approach using the seasonal definitions presented in Furness (2015).



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Table 2-1: Bio- seasons of seabird species screened in for assessment, as per Furness (2015)

Species	Bio-season				
	Post- breeding migration	Return migration	Migration- free winter	Breeding	Non- breeding
Gannet	Oct – Nov	Dec – Feb	-	Mar – Sep	-
Kittiwake	Sep – Dec	Jan – Feb	-	Mar – Aug	-
Herring gull	-	-	-	Mar – Aug	Sep – Feb
Great black-backed gull	-	-	-	Apr – Aug	Sep – Mar
Lesser black-backed gull	Sep – Oct	Mar	-	Apr - Aug	Nov – Feb
Black-headed gull	-	-	Sep – Mar	Apr – Aug	-
Common gull				Apr - Aug	Sep - Apr
Little gull					
Arctic tern	Jul – Sep	Apr – May		May – Aug	-
Common tern	Sep	Apr	-	May – Aug	Oct – Mar
Roseate tern	Sep	Apr		May – Aug	-
Manx shearwater	Sep – Oct	Mar	-	April – Aug	-
Fulmar	Sep – Oct	Apr	Nov	Jan – Aug	-
Guillemot (Site-specific)	-	-	-	Apr – Jun	Jul – Mar
Guillemot (Generic)				Mar - Jul	Aug - Feb
Razorbill	Aug – Oct	Jan – Mar	Nov – Dec	Apr – Jul	-
Puffin	-	-	-	Apr – Jul	Aug – Mar
Red- throated diver	Sep – Nov	Feb – Apr	Dec – Jan	Mar - Aug	-
Great northern diver				-	Sep – May
Common scoter					Sep - Apr



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2.3 Proportion of breeding adults in the population

To calculate the proportion of impact consequent mortalities, attributed to each SPA, the NatureScot (2018) apportioning tool requires the number of breeding adults that are impacted by the OWF as opposed to individuals which are calculated by CRM and displacement. The proportion of adults in the population during the breeding season, used for this assessment are presented in Table 2-2 and were derived from Horswill and Robinson 2015. Site-specific proportions were also available however those presented in Horswill and Robinson (2015) were considered to represent the population age structure more accurately, since only a small number of individuals of each species could be positively aged within proposed development during digital aerial surveys (DAS).

During the breeding season some adults will take a ‘sabbatical’ and not breed. Individuals may skip a breeding season as result of various factors, though typically it is due to either (i) making an adaptive decision to conserve energy in a given year to improve survival probability, or (ii) constraints such as, insufficient food availability or loss of a breeding partner, will prevent birds from breeding in a given year. If these non-breeding birds are not accounted for the breeding colony population size would be overestimated, therefore impacts assigned to ‘sabbatical birds’ were removed from the assessment as per Marine Scotland guidance (Marine Scotland 2017 a, b) and in line with assessments undertaken for the Round 4 Plan Level HRA (NIRAS, 2022). Table 2-2 presents the sabbatical rates used within this assessment; the values were based upon advice by NatureScot (2018) or derived from Horswill and Robinson (2015). Sabbatical rates were not applied for all the assessed species, namely the tern species, due to limited data available. Therefore, assessments presented for these species are considered precautionary, since impacts will also be apportioned to a small proportion of non-breeding adults. Adult proportions are presented in Table 2-2.

Table 2-2: Demographic data used for the breeding season apportioning of impacts for the NIS derived from Horswill and Robinson (2015)

Species	Adult Proportions			Adult survival rate
	Adult proportion	Sabbatical rate	Adult proportion including sabbatical rate	
Guillemot	0.522	0.07	0.490	0.939
Razorbill	0.533	0.07	0.500	0.895
Gannet	0.568	0.10	0.51	0.919
Kittiwake	0.527	0.10	0.474	0.854
Roseate Tern	0.588	-	-	0.855
Common Tern	0.588	-	-	0.883
Herring Gull	0.422	0.35	0.275	0.834
LBBG	0.533	0.34	0.353	0.885
Puffin	0.534	0.07	0.500	0.906
GBBG	0.394	0.35	0.258	0.885
Manx shearwater	0.469	-	-	0.870
Fulmar	0.480	-	-	0.936
Arctic tern	0.662	-	-	



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2.4 Breeding season apportioning

Apportioning impacts from the proposed development to specific designated (breeding) seabird populations during the breeding season was undertaken as per the interim guidance from NatureScot, (2018). During the breeding season it can be expected that a considerable proportion of adult seabirds, potentially affected by impacts associated with OWFs, can be apportioned to colonies within foraging range as breeding birds are limited both spatially and temporally when foraging by the need to regularly return to the nest site. The NatureScot (2018) guidance provides an evidence led approach which uses this principle and thus calculates which colonies estimated collision and displacement induced mortalities are likely to be attributed to during the breeding bio-season. This guidance was considered to be the most appropriate to use for assessing the impact from Irish projects including NISA and this approach is well established and widely used across the UK. The methodology calculates an estimated proportion of breeding adults associated with each colony based on the following parameters:

- The population size of each colony;
- The distance from each colony (geometric centre) to proposed array area (geometric centre); and
- The proportion of sea within the mean-maximum foraging (MMF) range +1 Standard Deviation (SD) of the colony, as published by Woodward et al. (2019).

NatureScot (2018) guidance states using the following equation for apportioning calculations:

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

As per the NatureScot (2018) guidance colonies within the mean max foraging (MMF) of the species should be included in the apportioning calculations. However, within the UK it is becoming more widely accepted that designated sites should be screened in based on MMF plus one standard deviation (SD) as presented in Woodward et al. (2019).

The proposed development therefore screened in sites (designated and non-designated) that are within +1SD of the MMF range (Woodward et al., 2019). Having said this, due to the weighting of distance to colony in the apportioning methodology, only a very small proportion of the overall impacts are apportioned to sites beyond MMF range.

2.5 Colony population sizes

Colony sizes were based on data provided in Burnell et al. (2023) seabird count and the Seabird Monitoring Programme Database (JNCC, 2020), with data used from the year/s corresponding to the baseline surveys or the closest year available. Where more than one colony count was available during the baseline survey years, the average of all counts was used. All counts were converted into the number of individual breeding adults. A table summarising the citation count and most recent robust count for each screened in qualifying interest of SPAs can be found in Table 3-2. In addition, the citation count and most recent colony count at SPA colonies are presented in Table 3-1.



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2.6 Bespoke population sizes

North-west Irish Sea

Assessment of impact has been carried out against three populations for the North-west Irish Sea (NWIS) SPA. These are:

- The citation population at abutting breeding colony SPA's;
- The citation population of the NWIS SPA; and
- A bespoke reference population

The applicant's use of bespoke reference populations for species listed as features of the NWIS SPA is based on the following. Potential contributions to the NWIS SPA population from individual abutting SPA's have been assessed as part of the site-by-site assessment process. Where no adverse effect has been identified for individual SPA's, assessment of impacts against summed individual SPA populations will necessarily return an assessment of no adverse effect.

Use of the citation population is problematic for this SPA. For some species, there is no citation population given. For others, the population given in the citation documentation differs from the population provided in the conservation objectives documentation and as such it is not clear which one should be used. Finally, for some citation counts, it is unclear what time of year the data pertain to, so using these counts as reference populations against bio-seasonal impact predictions is not possible.

As such, the Applicant has defined bespoke reference populations for the NWIS SPA. These consider the fact that the NWIS SPA area will draw birds from SPA's and undesignated colonies beyond those that directly abut it, both within and outside the breeding season. Outside of the breeding season, where birds are not central place foragers and will move more freely, the population estimates taken from the Observe dataset are not considered representative of the wider population that will be using the SPA area transiently (i.e. the Observe data only capture a proportion of the wider population using the SPA). The bespoke reference populations address this and are thus considered to afford a more appropriate reference for the assessment process. These regional populations are defined in Appendix 12: Offshore and Intertidal Ornithology Technical Baseline.

Guillemot

For guillemot, a bespoke non-breeding season population was adopted to assess impacts on the NWIS cSPA. Peak counts for this species were encountered in September, and are likely to comprise a higher proportion of dispersing local breeders than would be expected later in the year. To reflect the likelihood that using a regional population or biogeographic reference population would not suitably account for the higher likelihood of local breeders being present, a bespoke reference population was defined. September dispersal ranges of birds tracked from a western Scottish colony (Buckingham et al. 2023) were used to define the distance from the project within which birds could reasonably reach the project by September, through post breeding dispersal. Buckingham et al. (2023) shows how swiftly birds can move during the post-breeding dispersal period, despite being flightless due to moult. Their data show how birds dispersing from Colonsay (off the west coast of



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Scotland) can be in waters adjacent to the NISA OWF array area, and well beyond (reaching the northern coast of Anglesey) in the period between August 16 and September 15. The bespoke non-breeding reference population for guillemot is therefore the summed populations of all colonies within the range of dispersal defined by Buckingham et al. (2023). The apportionment to the relevant SPA's within this bespoke region is summarised in Table 2-3.

Table 2-3 Bespoke non-breeding guillemot regional population, and relevant apportioning

SPA	Count (breeding adults)	Non-breeding Apportionment
North Colonsay and western cliffs SPA	27,000	0.083
Ailsa Craig SPA	10,494	0.032
Rathlin Island SPA	174,796	0.536
Skomer & Skokholm SPA	29,340	0.090
Lambay	59,983	0.184
Ireland's Eye	4,410	0.014
Wicklow Head	737	0.002
Bray Head	1,216	0.004
Howth Head	871	0.003
Great Saltee	17,501	0.054
TOTAL	326,348	

Distance from colony to Projects

Distances were calculated using Geographic Information Systems (GIS) and were measured from geometric centre of the colony to geometric centre of NISA array. This approach was proposed within the NatureScot (2018) apportioning guidance. However, it should be noted that sites within MMF+1SD from the edge of a colony to the edge of the array but are outside of MMF+1SD from the centre were included as there was still potential connectivity with NISA. At-sea distances were manually calculated where straight line distances crossed over land. Furthermore, where there were multiple colonies for an SPA within MMF range or MMF range +1SD then each colony was considered separately, therefore distances were based on the centre of each colony rather than the centre of the SPA.

Proportion of sea within foraging range

GIS was also used to calculate the area of suitable foraging habitat within the sea for each species from each colony with a buffer drawn around each colony equal to the MMF or MMF+1SD of each species. The foraging areas for all species only considered the at sea areas so any land, estuaries and/or freshwater bodies of water were excluded. At sea areas that were within foraging range from the colony via a straight line but were outside of foraging range when assuming seabird only travel over sea were manually excluded from the apportioning assessment. The resultant areas were then converted into a proportion by dividing these areas by the area of the circle with a radius equal to the foraging range.



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Using the calculation and parameters described above, a resultant weighting for each colony within foraging range was calculated.

This then gave a resultant proportion of mortalities for each colony. Where an SPA consisted of more than one colony, the total number of birds apportioned to that SPA was the sum of birds apportioned to each constituent colony.

Non-breeding season apportioning

During the non-breeding bio-seasons, the population of birds may comprise individuals from Irish breeding colonies and from further away. As a result a considerably lower percentage of birds can be attributed to any particular breeding colony population. Apportionment for NISA, outside of the breeding season was undertaken by calculating the proportion that each colony contributes to the non-breeding regional population. These regional populations are defined in the Appendix 12: Offshore and Intertidal Ornithology Technical Baseline. This approach is also used within other well established OWF industries such as the UK and is agreed the best current practice by UK SNCBs. This approach will use the following data:

- Defined bio-seasons taken from Furness (2015);
- SPA breeding adult populations (to be determined based on the regional population equivalent approach);
- Non-breeding season population sizes; and
- Proportions of SPA adult population remaining in relevant regions during the non-breeding bio-seasons (where there is a lack of information for colonies on the proportion that remain in the region during the non-breeding bio-seasons, this will be assumed to be 100% unless a justification for a lower proportion can be made).

Proportions of mortality impacts attributed for each relevant designated site were calculated using the following equation:

$$\frac{\text{Designated site population size}}{\text{Regional population size}} \times \text{Proportion of population that remain during season}$$

Non-breeding bio-season regional populations as defined in the Appendix 12: Offshore and Intertidal Ornithology Technical Baseline are presented in Table 2-4 below.

Table 2-4: Non-breeding bio-season regional population sizes

Species	Autumn	Winter	Spring	Non-breeding
Guillemot				1,332,623
Razorbill	632,453	366,961	632,453	
Puffin				300,427
Herring gull				187,094
Gannet	535,183		643,917	
Kittiwake	933,197		713,137	
Lesser black-backed gull	171,500	53,368	171,500	



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The resulting non-breeding season weightings for each screened in qualifying interest of each SPA can be found in Table 2-5.

Table 2-5 Non-breeding season weightings for each screened in qualifying interest of each SPA

Site	Species	Autumn	Winter	Spring	Non-breeding
Ailsa Craig	Gannet	12.42		10.32	
	Kittiwake	0.11		0.14	
	Lesser black-backed gull	0.22	0.71	0.22	
Bardsey Island	Puffin				0.09
Bray Head	Herring gull				0.00
	Kittiwake	0.19		0.24	
Dalkey Island	Herring gull				0.02
Grassholm	Gannet	13.46		11.18	
Saltee Islands SPA	Kittiwake	0.22		0.29	
	Lesser black-backed gull	0.15	0.49	0.15	
	Gannet	1.76		1.47	
	Guillemot				1.31
	Razorbill	0.46	0.80	0.46	
Helvick Head	Kittiwake	0.01		0.02	
Horn Head	Kittiwake	0.39		0.51	
Howth Head	Herring gull				0.01
	Kittiwake	0.38		0.50	
Ireland's Eye	Guillemot				0.33
	Herring gull				0.34
	Kittiwake	0.09		0.11	
	Razorbill	0.25	0.44	0.25	
	Gannet	0.13		0.11	
Lambay Island	Guillemot				4.50
	Fulmar	0.09		0.09	
	Kittiwake	0.71		0.93	
	Lesser black-backed gull	0.40	1.29	0.40	
	Razorbill	1.16	2.00	1.16	
	Herring gull				0.97
North Colonsay and Western Cliffs SPA	Kittiwake	0.13		0.17	
NWIS	All Species				100.00
Puffin Island	Lesser black-backed gull	0.61	1.97	0.61	
Rathlin Island	Kittiwake	1.47		1.92	
Ripple Estuary	Lesser black-backed gull	5.23	16.82	5.23	
Rockabill SPA	Common tern				100.00
	Arctic tern				100.00
	Roseate tern				100.00
Skerries Island	Herring gull				0.00
Skomer SPA	Kittiwake	0.33		0.43	



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	Lesser black-backed gull	8.47	27.21	8.47	
St Kilda	Gannet	22.53		18.73	
Wicklow Head (2019/2021)	Kittiwake	0.16		0.20	



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3 References

Buckingham, L., Daunt, F., Bogdanova, M.I., Furness, R.W., Bennett, S., Duckworth, J., Dunn, R.E., Wanless, S., Harris, M.P., Jardine, D.C., Newell, M.A., Ward, R.M., Weston, E.D. and Green, J.A. (2023), Energetic synchrony throughout the non-breeding season in common guillemots from four colonies. *J Avian Biol*, 2023: e03018. <https://doi.org/10.1111/jav.03018>

Furness, R.W., 2015. Non-breeding season populations of seabirds in UK waters: Population sizes for Biologically Defined Minimum Population Scales (BDMPS), Natural England Commissioned Reports, Number 164.

Horswill, C. and Robinson, R.A., 2015. Review of Seabird Demographic Rates and Density Dependence, JNCC, Peterborough.

Marine Scotland, 2017a. Marine Scotland - Licensing Operations Team Scoping Opinion. Addendum: Ornithology. Scoping Opinion for Inch Cape Offshore Windfarm – Revised Design Parameters – Ornithology.

Marine Scotland, 2017b. Marine Scotland - Licensing Operations Team Scoping Opinion. Addendum: Ornithology. Scoping Opinion for Moray East Offshore Windfarm – Alternative Design Parameters – Ornithology.

Natural England, 2021. Designated Sites View, [Accessed August 2023]. Available at: <https://designatedsites.naturalengland.org.uk>.

NatureScot, 2018. Interim Guidance on apportioning impacts from marine renewable developments to breeding seabird populations in SPAs. Available at: <https://www.nature.scot/doc/interim-guidance-apportioning-impacts-marine-renewable-developments-breeding-seabird-populations>.

NIRAS, 2022. RIAA Annex H.3 Apportioning, Offshore Wind Leasing Round 4 Plan Level HRA.

Woodward, I., Thaxter, C.B., Owen, E., and Cook, A.S.C.P., 2019. Desk-based revision of seabird foraging ranges used for HRA screening, British Trust for Ornithology research report number 724.



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Table 3-1 Summary of the citation count and most recent robust count for each screened in qualifying interest of SPAs

Site	Species	Citation	Year	Recent	Year
Ailsa Craig	Gannet	46,000	2001	66,452	2014
	Kittiwake	6,200	1990	980	2019
	Lesser black-backed gull	3,600	1990	378	2019
Bardsey Island	Puffin			282	2019
Blasket	Manx shearwater			7,168	2001
Bray Head	Herring gull			4	2015
	Kittiwake			1,746	2010
Carlingford Lough SPA	Common gull			4	2021
Copeland Islands	Manx shearwater			2,812	2007
Dalkey Island	Herring gull			38	2016
Grassholm	Gannet	66,000	2001	72,022	2015
Saltee Islands SPA	Lesser black-backed gull	328	1998-2000	262	2014
	Gannet	4,892	2004	9,444	2013-2014
	Kittiwake	4,250	1998-2000	2,076	2015-2018
	Guillemot	28,724	1998-2000	17,501	2013
	Razorbill	5,010	2019	2,931	2022
Helvick Head	Kittiwake	1,037	1996/97	130	2018
Horn Head	Kittiwake	3,853	1999	3,640	2015
Howth Head	Herring gull			18	2015
	Kittiwake	4,538	1999	3,546	2015
Ireland's Eye	Guillemot	3,950	2001	4,410	2015
	Herring gull	492	1999	636	2015
	Razorbill	920	2001	1,600	2015
	Kittiwake	2,048	2001	802	2015
	Gannet			700	2015
Lambay Island	Kittiwake	7,894	2004	6,640	2015
	Lesser black-backed gull	266	2004	690	2015-2018
	Common gull			8	2009
	Fulmar	1,170	1999	750	2015
	Guillemot	77,998	2004	59,983	2015
	Herring gull	622	2004	1,812	2015-2018
	Puffin			144	2015
Razorbill	7,610	2001	7,353	2015	
North Colonsay and Western Cliffs SPA	Kittiwake	4,512	2009	1,217	2023
NWIS cSPA	Lesser black-backed gull	6,893	2018-2019		
NWIS cSPA	Manx shearwater	13,010	2016		
Puffin Island	Lesser black-backed gull			1,052	2017
Puffin Island SPA	Manx shearwater			12,658	2000
Rathlin Island	Kittiwake	6,822	1985	13,706	2021
Ribble Estuary	Lesser black-backed gull	3,600	1993	8,978	2021
Rockabill SPA	Common tern	702	2010	4,078	2010



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	Arctic tern	500	2010	118	2018
	Roseate tern	2,186	2010	3,408	2021
Rum	Manx shearwater	61,000	1982	240,000	2001
Skerries Island	Herring gull			20	2010
Skomer SPA	Kittiwake			3,088	2022
	Lesser black-backed gull			14,524	2022
	Manx shearwater			910,312	2018
St Kilda	Gannet	100,100	1992	120,580	2013
Wicklow Head (2019/2021)	Kittiwake	1,912	2002	1,458	2021



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Table 3-2 Breeding season apportionment calculations for screened in species based on the NatureScot Apportionment methodology (NatureScot, 2018)

Site	Count (year)	Distance to project (km) (around land)	Percentage sea	1/P(Sea)	Distance2	Resulting weighting for colony	Proportional weight for colony
Kittiwake							
Antrim	544 (2021)	110.6	50.0	0.020	12,232	0.012	0.002
Bardsey Island	242 (2019)	129.1	50.9	0.020	16,667	0.004	0.001
Bray Head	1,746 (2010)	58.8	48.8	0.020	3,457	0.144	0.022
Burrow Head	0 (2020)	148.7	42.2	0.024	22,112	0.000	0.000
Calf of Man	26 (2013)	83.106	29.5	0.034	6,907	0.002	0.000
Carreg y Llam	1,228 (2021)	125	50.9	0.020	15,625	0.020	0.003
Dublin Port	2 (1994)	43.4	45.2	0.022	1,884	0.000	0.000
Dunmore East to Red Head	802 (2014)	193.4	50.2	0.020	37,404	0.006	0.001
Fair Head	0 (2016)	188.9	48.9	0.020	35,683	0.000	0.000
Freshwater Bay	0 (2016)	115.6	56.3	0.018	13,363	0.000	0.000
Glen Maye - Peel	108 (2017)	99.54	51.9	0.019	9,908	0.003	0.000
Gobbins	2,290 (2019)	138.9	48.7	0.021	19,293	0.032	0.005
Great Orme	1,796 (2021)	145	51.4	0.019	21,025	0.023	0.004
Great Saltee Island	2,076 (2015)	194.9	49.9	0.020	37,986	0.015	0.002
Guns Island	0 (2012)	73.3	49.5	0.020	5,373	0.000	0.000
Horn Head	3,640 (2015)	298.9	55.2	0.018	89,341	0.010	0.002
Howth Head	3,546 (2015-18)	37.1	47.1	0.021	1,376	0.760	0.117
Ireland's Eye	802 (2015)	32.9	46.6	0.021	1,082	0.221	0.034
Lambay	6,640 (2015)	22.15	47.0	0.021	491	4.001	0.616
Little Orme	648 (2021)	150.1	49.6	0.020	22,530	0.008	0.001
Little Saltee	- (2015)	192.3	49.9	0.020	36,979	0.000	0.000
Lynas to Freshwater Bay	0 (2016)	114.2	54.0	0.019	13,042	0.000	0.000
Lythe Mead to Carrick-Keel	678 (2015)	127.2	48.7	0.021	16,180	0.011	0.002



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Maggy's Leap 1/Donnard Cove	152 (2017)	57.5	43.4	0.023	3,306	0.014	0.002
Maggy's Leap to Newcastle 1	1,160 (2019)	58.5	43.1	0.023	3,422	0.109	0.017
Meikle Ross	0 (2021)	171.5	36.7	0.027	29,412	0.000	0.000
Middle Mouse	0 (2016)	98.9	57.4	0.017	9,781	0.000	0.000
Muck Island	1,038 (2019)	141.58	46.3	0.022	20,045	0.015	0.002
Mull Of Galloway RSPB	188 (2022)	127.83	48.2	0.021	16,341	0.003	0.001
Murian	0 (2016)	145.80	49.1	0.020	21,258	0.000	0.000
Penlas, Anglesey (Gwyn.)	424 (1992)	91.70	58.0	0.017	8,409	0.012	0.002
Penymynydd	0 (2016)	142.57	50.0	0.020	20,326	0.000	0.000
Port Mona	50 (2021)	126.40	48.0	0.021	15,977	0.001	0.000
Port St Mary - Sound	1,106 (2017)	87.00	52.3	0.019	7,569	0.039	0.006
Porth Ceiriad East	0 (2016)	146.70	49.0	0.020	21,521	0.000	0.000
Porth Ceiriad West	0 (2016)	146.10	49.2	0.020	21,345	0.000	0.000
Puffin Island	406 (2021)	134.80	53.7	0.019	18,171	0.006	0.001
Ramsey - Port Mooar	156 (2017)	129.00	47.8	0.021	16,641	0.003	0.000
Rathlin Island	27,412 (2021)	202.90	47.4	0.021	41,168	0.195	0.030
Rockabill	330 (2018)	11.90	46.7	0.021	142	0.693	0.107
South Stack Cliffs RSPB	20 (2021)	91.60	58.1	0.017	8,391	0.001	0.000
St Tudwal's Island East	620 (2016)	149.20	50.8	0.020	22,261	0.007	0.001
St Tudwal's Island West	0 (2016)	148.20	54.3	0.018	21,963	0.000	0.000
Trwyn Cilan	56 (2016)	143.20	53.1	0.019	20,506	0.001	0.000
Trwyn Yr Wylfa 1	0 (2016)	148.40	54.4	0.018	22,023	0.000	0.000
Trwyn Yr Wylfa 2	0 (2016)	146.90	54.4	0.018	21,580	0.000	0.000
Wicklow Head	1,348 (2022)	83.30	50.9	0.020	6,939	0.053	0.008
Ynys Moelfre	312 (2016)	122.03	55.9	0.018	14,891	0.005	0.001
Ailsa Craig	980 (2021)	190.38	35.3	0.028	36,245	0.011	0.002
Great Saltee Island	2,076 (2018)	194.80	62.5	0.016	37,947	0.012	0.002
Helvick Head 1	130 (2018)	259.60	52.1	0.019	67,392	0.001	0.000



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Skomer	3,088 (2022)	225.90	48.4	0.021	51,031	0.017	0.003
North Colonsay and Western Cliffs SPA	7,194 (2022 - 2023)	291.15	51.6	0.019	84,769	0.023	0.004
Gannet							
Boreray and Stacs (St Kilda SPA)	120,580 (2013)	522.70	78.66	0.013	27,3215	0.065	0.025
Ailsa Craig	66,452 (2014)	190.38	39.20	0.026	36,245	0.544	0.211
Garvan Isles	60 (2016)	270.52	55.90	0.018	73,178	0.000	0.000
Grassholm	72,022 (2015)	223.03	51.40	0.019	49,742	0.328	0.127
Great Saltee Island	9,444 (2013 - 2014)	194.82	52.99	0.019	37,956	0.055	0.021
Ireland's Eye	700 (2015)	32.98	35.24	0.028	1,088	0.212	0.082
Lambay	1,852 (2015)	22.15	35.06	0.029	490	1.252	0.486
Scar Rocks	4,752 (2014)	125.70	50.00	0.020	15,800	0.070	0.027
Middle Mouse	42 (2022)	103.61	30.61	0.033	10,736	0.001	0.001
St Margaret's Island	0 (2019)	271.40	45.75	0.022	73,658	0.000	0.000
Little Skellig	70,588 (2014)	497.75	83.53	0.012	24,7754	0.040	0.015
Bull Rock	12,776 (2014)	473.02	83.37	0.012	22,3748	0.008	0.003
Razorbill							
Abraham's Bosom	83 (2016)	92	54.3	0.0184	8,464	0.004	0.000
Bardsey Island	3,384 (2019)	129	52.3	0.0191	16,641	0.084	0.010
Bradda - Fleshwick	27 (2017)	89.2	48.7	0.0205	7,956.64	0.002	0.000
Bray Head	150 (2010)	58.8	46.8	0.0214	3,457.44	0.020	0.002
Calf of Man	108 (2017)	83.1	49.3	0.0203	6,905.61	0.007	0.001
Carreg y Llam	438 (2021)	125	51.0	0.0196	15625	0.012	0.001
Da Leura Strands - Stroin Vuigh	2 (1985)	92.7	48.4	0.0207	8,593.29	0.000	0.000
Fleshwick - Stroin Vuigh	3 (2017)	91.1	48.5	0.0206	8,299.21	0.000	0.000



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Glen Maye - Peel	101 (2017)	99.5	48.0	0.0208	9,900.25	0.005	0.001
Gobbins	679 (2019)	139.9	46.4	0.0216	19,572.01	0.016	0.002
Gogarath	18 (2016)	91.6	54.3	0.0184	8,390.56	0.001	0.000
Great Orme	254 (2022)	145	48.6	0.0206	21,025	0.005	0.001
Howth Head	279 (2015)	37.053	46.3	0.0216	1,372.92	0.095	0.012
Ireland's Eye	1,600 (2015)	32.983	45.8	0.0218	1,087.88	0.693	0.086
Lambay	7,353 (2015)	22.145	46.38	0.0216	490.40	6.976	0.861
Little Orme	40 (2022)	150.105	47.04	0.0213	22,531.51	0.001	0.000
Maen Du	65 (2016)	125.983	52.12	0.0192	1,5871.72	0.002	0.000
Marine Drive	56 (2017)	106.917	45.85	0.0218	11,431.24	0.002	0.000
Middle Mouse	455 (2016)	103.61	53.21	0.0188	10,735.86	0.017	0.002
Muck Island	1,118 (2019)	141.58	46.23	0.0216	20,045.46	0.026	0.003
Pant yr Eglwys	0 (2016)	95.68	54.05	0.0185	9,154.66	0.000	0.000
Penbrynyreglwys	48 (1986)	95.53	54.05	0.0185	9,125.41	0.002	0.000
Port Soderick - Port Grenaugh	44 (2017)	104.16	46.47	0.0215	10,848.68	0.002	0.000
Port St Mary - Sound	293 (2017)	86.92	48.91	0.0204	7,555.09	0.017	0.002
Sound - Port Erin	14 (2017)	86.42	49.05	0.0204	7,468.07	0.001	0.000
South Stack Cliffs RSPB	1,378 (2021)	91.64	54.27	0.0184	8,397.71	0.065	0.008
Stroin Vuigh - Eairn	14 (1995)	92.03	48.52	0.0206	8,468.60	0.001	0.000
The Skerries RSPB	3 (2017)	92.57	54.16	0.0185	8,569.39	0.000	0.000
Wicklow Head	184 (2021)	83.27	49.46	0.0202	6,933.39	0.012	0.001
Ynysoedd Gwylan (Fawr and Bach Total) (Aberdaron Coast not in SPA)	13 (2019)	132.07	51.31	0.0195	17,442.48	0.000	0.000
Puffin Island	1229 (2022)	134.83	50.55	0.0198	18,178.86	0.029	0.004
Braich Anelog (Aberdaron Coast not in SPA)	25 (2016)	125.15	52.12	0.0192	15,663.02	0.001	0.000
Llein Peninsula (inc. St Tudwalls Island and	233 (2023)	162.37	45.29	0.0221	26,364.67	0.005	0.001



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Trwyn Cilan, excluding Carreg y Llam)							
Point Lynas	14 (2016)	130.39	50.71	0.0197	17,000.25	0.000	0.000
Great Saltee Island	2931 (2013)	194.80					
Little Saltee	500 (2000)	192.30					
Guillemot							
Bray Head	1,413 (2010)	58.80	53.40	0.0187	3,457.44	0.050	0.003
Calf of Man	124 (2017)	83.50	93.30	0.0107	6,972.25	0.001	0.000
Howth Head	871 (2015)	37.10	55.80	0.0179	1,376.41	0.074	0.005
Ireland's Eye	4,410 (2015)	32.90	54.80	0.0182	1,082.41	0.484	0.033
Lambay	59,983 (2015)	22.15	57.50	0.0174	490.62	13.839	0.938
Port St Mary - Sound	3,961 (2017)	87.00	94.00	0.0106	7,569	0.036	0.002
Sound - Port Erin	30 (1999)	86.40	93.50	0.0107	7,464.96	0.000	0.000
Wicklow Head	737 (2021)	83.30	58.10	0.0172	6,938.89	0.012	0.001
Maen Du (Aberdaron Coast not in SPA)	40 (2016)	125.90	53.81	0.0186	15,850.81	0.000	0.000
Braich Anelog (Aberdaron Coast not in SPA)	10 (2016)	125.15	53.91	0.0185	15,663.02	0.000	0.000
Middle Mouse	5,550 (2016)	103.61	58.14	0.0172	10,735.86	0.058	0.004
Lleyn Peninsula (inc. St Tudwalls Island and Trwyn Cilan, excluding Carreg y Llam)	3,295 (2016)	146.94	46.22	0.0216	21,591.95	0.021	0.001
Ynysoedd Gwylan (Fawr and Bach Total) (Aberdaron Coast not in SPA)	162 (2019)	132.07	52.80	0.0189	17,442.48	0.001	0.000
Bardsey Island	2,826 (2019)	129.12	53.60	0.0187	16,672.75	0.021	0.001
South Stack Cliffs RSPB	7,592 (2021)	91.64	59.13	0.0169	8,397.71	0.100	0.007



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Puffin Island SPA (Wales)	4,200 (2022)	134.83	53.92	0.0185	18,178.86	0.028	0.002
Little Orme	2,322 (2022)	150.11	47.84	0.0209	22,531.51	0.014	0.001
Great Orme	1,029 (2022)	145.00	50.65	0.0197	21,025.29	0.006	0.000
Glen Maye - Peel	663 (2017)	99.55	52.21	0.0192	9,909.80	0.008	0.001
Lesser black-backed gull							
Aberporth 4	0 (2018)	194.11	44.98	0.022	37677	0.000	0.000
Ailsa Craig	378 (2019)	190.39	37.08	0.027	36248	0.008	0.004
Almorness	0 (2021)	190.29	25.81	0.039	36210	0.000	0.000
Arnaby Marsh	0 (2018)	195.23	26.04	0.038	38114	0.000	0.0000
Askam-in-Furness (urban)	76 (2019)	190.97	26.07	0.038	36469	0.002	0.001
Balbriggan Town	20 (2021)	21.23	38.00	0.026	451	0.032	0.015
Bangor buildings (urban)	0 (2019)	143.41	33.81	0.030	20568	0.000	0.000
Bardsey Island	328 (2019)	129.12	44.46	0.022	16673	0.012	0.006
Belfast City Centre	442 (2019)	146.29	36.14	0.028	21400	0.016	0.008
Bishops & Clerks Islands RSPB	48 (2018)	205.79	51.94	0.019	42347	0.001	0.000
Black Loch 1	4 (2021)	156.57	32.66	0.031	24514	0.000	0.000
Bodorgan Head	6 (2018)	114.82	36.63	0.027	13182	0.000	0.000
Caernarfon (urban)	34 (2019)	128.86	35.54	0.028	16604	0.002	0.001
Calf of Man	54 (2017)	83.11	34.43	0.029	6907	0.006	0.003
Cardigan Island	646 (2019)	193.11	46.08	0.022	37293	0.010	0.005
Carreg yr Esgob	38 (2018)	213.15	51.33	0.019	45432	0.000	0.000
Castell Coch	8 (2018)	205.84	50.61	0.020	42369	0.000	0.000
Castle Loch	0 (2021)	155.11	33.02	0.030	24059	0.000	0.000
Ceibwr2	10 (2018)	196.97	46.49	0.022	38796	0.000	0.000
Cemaes Head/Poppit	34 (2018)	194.97	46.11	0.022	38013	0.001	0.000
Chapel Island	44 (2018)	206.28	25.15	0.040	42551	0.001	0.001
Conwy RSPB	2 (2019)	150.34	30.84	0.032	22603	0.000	0.000
Conwy Town (urban)	0 (2019)	149.19	30.91	0.032	22258	0.000	0.000
Craig yr Aderyn	14 (2018)	183.18	36.91	0.027	33553	0.000	0.000



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Craro	2 (2021)	233.90	44.53	0.022	54708	0.000	0.000
Cwta Aber (incl. Ynys Meicel & Onnen)	22 (2018)	197.91	49.32	0.020	39169	0.000	0.000
Dalkey Island	70 (2016)	48.45	39.77	0.025	2348	0.020	0.010
Drogheda	48 (2021)	17.30	40.00	0.025	299	0.109	0.053
E.of Aber Yw - Aber Mawr	0 (2018)	204.14	49.73	0.020	41672	0.000	0.000
Eilean Garbh (Inland)	0 (2021)	240.81	43.50	0.023	57990	0.000	0.000
Esso Jetty	4 (2018)	242.72	50.14	0.020	58911	0.000	0.000
Fleetwood Town	18 (2019)	199.37	26.06	0.038	39748	0.000	0.000
Furness General Hospital	18 (2019)	190.51	26.50	0.038	36294	0.001	0.000
Goat Island	1 (2016)	88.01	37.36	0.027	7746	0.000	0.000
Grassholm	76 (2018)	223.03	53.53	0.019	49742	0.001	0.000
Great Saltee	262 (2014)	194.82	54.50	0.018	37955	0.003	0.002
Greenscar	78 (2018)	219.93	50.64	0.020	48368	0.001	0.000
Greenside Quarry or Kendal Fell Quarry	4 (2021)	234.08	20.84	0.048	54791	0.000	0.000
Haverigg Prison (urban)	150 (2019)	183.97	26.72	0.037	33846	0.005	0.002
Hensingham	46 (2018)	184.38	26.71	0.037	33997	0.001	0.001
Hestan Island	746 (2021)	188.49	25.98	0.038	35528	0.022	0.011
Hodbarrow RSPB	4 (2022)	187.11	26.48	0.038	35012	0.000	0.000
Horse Isle	1802 (2017)	233.99	28.85	0.035	54753	0.031	0.015
Ireland's Eye	4 (2015)	32.98	38.18	0.026	1088	0.003	0.001
Islands of Fleet	16 (2018)	167.91	29.25	0.034	28194	0.001	0.000
Islay-Texa	14 (2018)	235.32	48.91	0.020	55373	0.000	0.000
Killard Point	20 (2022)	77.16	37.44	0.027	5954	0.002	0.001
Lady Isle 1	492 (2018)	222.05	32.12	0.031	49307	0.008	0.004
Lambay Island	690 (2015)	22.145	37.35	0.027	490	1.028	0.500
Lighthouse Island	1094 (2019)	121.05	39.28	0.025	14653	0.052	0.025
Little Cumbrae 1	264 (2021)	240.75	27.67	0.036	57959	0.004	0.002
Little Ross	8 (2018)	169.52	28.60	0.035	28737	0.000	0.000



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Little Saltee	40 (2000)	192.30	54.00	0.019	36979	0.001	0.000
Liverpool 1 (urban)	8 (2019)	204.82	26.27	0.038	41953	0.000	0.000
Liverpool 2 (urban)	10 (2019)	201.95	26.47	0.038	40785	0.000	0.000
Liverpool 3 (urban)	12 (2019)	201.42	26.48	0.038	40571	0.000	0.000
Llandudno Town (urban)	4 (2019)	148.17	30.91	0.032	21956	0.000	0.000
Llangrannog 1	0 (2018)	195.58	43.75	0.023	38252	0.000	0.000
Llyn Trwsfynydd Rese	158 (2018)	189.07	32.31	0.031	35749	0.004	0.002
Lynas to Freshwater Bay	0 (2016)	114.19	32.74	0.031	13039	0.000	0.000
Maenmelyn (incl. Pen Brush island)	16 (2018)	199.30	49.36	0.020	39720	0.000	0.000
Marchon Chemical Works	0 (2018)	181.41	26.97	0.037	32909	0.000	0.000
Middle Mouse	6 (2016)	103.61	34.01	0.029	10736	0.000	0.000
Midland Island (Middleholm)	10 (2022)	226.63	51.83	0.019	51360	0.000	0.000
Moresby Parks	0 (2018)	186.84	26.14	0.038	34908	0.000	0.000
Mossbay (urban)	14 (2019)	189.91	25.90	0.039	36064	0.000	0.000
Mull Of Galloway RSPB	4 (2015)	127.83	35.49	0.028	16340	0.000	0.000
Netherton Factory Roofs	2 (2019)	201.78	26.38	0.038	40716	0.000	0.000
Padian	300 (2022)	99.60	37.76	0.026	9920	0.022	0.011
Park Road Ind. Est.	194 (2019)	188.76	26.42	0.038	35631	0.006	0.003
Peel - Glen Moorar	2 (2017)	105.32	34.18	0.029	11093	0.000	0.000
Penpleidau	12 (2018)	216.74	51.01	0.020	46976	0.000	0.000
Phil Roe's Flat	150 (2022)	103.27	36.45	0.027	10666	0.011	0.005
Pladda (Arran)	250 (2016)	212.99	33.74	0.030	45365	0.004	0.002
Port Moorar - Dhoon	2 (2017)	126.03	32.36	0.031	15884	0.000	0.000
Porth Diana	12 (2016)	97.58	36.64	0.027	9522	0.001	0.000
Porthlysgi	16 (2018)	214.90	51.18	0.020	46184	0.000	0.000
Puffin Island	1052 (2017)	134.83	32.51	0.031	18179	0.049	0.024
Pwll Deri (incl. Ynys: Ddu, y Dinas & Melyn)	42 (2018)	200.44	49.31	0.020	40177	0.001	0.000
Rampside Gas Terminal	300 (2022)	195.06	26.55	0.038	38046	0.008	0.004



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Ramsey Island RSPB	200 (2018)	210.75	51.66	0.019	44416	0.002	0.001
Rathlin Island	1038 (2021)	202.93	49.76	0.020	41179	0.014	0.007
Rhoscolyn Beacon	12 (2016)	100.93	37.09	0.027	10187	0.001	0.000
Rhyl (urban)	8 (2019)	186.92	27.56	0.036	34939	0.000	0.000
Ribble Estuary	8978 (2021)	197.31	26.03	0.038	38931	0.242	0.118
Rockcliffe Marsh	520 (2019)	239.95	19.60	0.051	57578	0.013	0.006
Sanda Islands	46 (2019)	187.28	43.83	0.023	35073	0.001	0.000
Sheep Island (Dyfed)	0 (2017)	239.05	50.49	0.020	57144	0.000	0.000
Silloth (urban)	0 (2013)	213.10	23.18	0.043	45413	0.000	0.000
Skokholm	1666 (2022)	230.43	52.09	0.019	53096	0.016	0.008
Skomer	14524 (2022)	225.92	52.01	0.019	51038	0.149	0.073
South Stack Cliffs RSPB	8 (2022)	91.64	36.47	0.027	8398	0.001	0.000
South Walney	1060 (2022)	191.53	26.66	0.038	36682	0.030	0.014
St Bees Head RSPB	0 (2020)	178.75	27.18	0.037	31951	0.000	0.000
St Tudwal's Island East	12 (2016)	149.25	40.92	0.024	22275	0.000	0.000
St Tudwal's Island West	76 (2016)	148.30	41.36	0.024	21991	0.002	0.001
Stack Rock	2 (2018)	241.63	50.31	0.020	58384	0.000	0.000
Stack Rocks	30 (2018)	225.62	49.93	0.020	50902	0.000	0.000
Strangford Lough	678 (2022)	96.47	37.75	0.026	9305	0.053	0.026
The Ayres NNR, Isle of Man (Point of Ayre to Rue Point)	2 (2017)	128.72	32.61	0.031	16569	0.000	0.000
The Skerries RSPB	244 (2022)	92.57	34.86	0.029	8569	0.022	0.011
Thorn Island	14 (2017)	239.47	50.57	0.020	57344	0.000	0.000
Tolan's Flat	120 (2022)	99.92	38.22	0.026	9984	0.009	0.004
Trwyn Penrhyn	0 (2016)	133.00	43.14	0.023	17690	0.000	0.000
Valley Wetlands RSPB	2 (2019)	104.49	36.18	0.028	10918	0.000	0.000
Walney Urban Gulls	22 (2019)	185.59	26.91	0.037	34444	0.001	0.000
West Quarry	6 (2017)	159.98	29.45	0.034	25594	0.000	0.000
West wall to W&SW of Weston Point	100 (2022)	221.38	24.53	0.041	49010	0.002	0.001



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Whitehaven Town Centre	60 (2018)	183.27	26.44	0.038	33588	0.002	0.001
Ynys Barry - Trefin	10 (2017)	204.88	50.25	0.020	41977	0.000	0.000
Ynys Moelfre	8 (2016)	122.03	32.78	0.031	14892	0.000	0.000
Ynys Piod	0 (2016)	132.31	43.24	0.023	17505	0.000	0.000
Ynys Traus	28 (2016)	101.38	37.04	0.027	10279	0.002	0.001
Herring gull							
Balbriggan Town	2970 (2021)	21.20	44.20	0.023	449	2.123	0.397
Bardsey Island	690 (2019)	129.10			16,667		
Bray	124 (2021)	56.00	54.00	0.019	3,136	0.010	0.002
Bray Head	4 (2015)	58.80	54.00	0.019	3,457	0.000	0.000
Calf of Man (South Island)	590 (2017)	83.10	88.70	0.011	6,906	0.014	0.003
Dalkey Island	38 (2016)	48.50	53.50	0.019	2,352	0.004	0.001
Drogheda	720 (2021)	17.30	53.70	0.019	299	0.636	0.119
Dublin City South	36 (2021)	52.80	41.40	0.024	2,788	0.004	0.001
Gun's Island (NI)	10 (2022)	73.30	60.00	0.017	5,373	0.000	0.000
Howth	920 (2021)	35.50	53.00	0.019	1,260	0.196	0.037
Howth Head	18 (2015)	37.10	54.30	0.018	1,376	0.003	0.001
Howth Head coast	18 (2015)	35.50	53.00	0.019	1,260	0.004	0.001
Ireland's Eye	636 (2015)	33.00	53.40	0.019	1,089	0.155	0.029
Lambay Island SPA	1812 (2015)	22.10	55.40	0.018	488	0.951	0.178
Rockabill	430 (2015)	11.90	53.60	0.019	142	0.805	0.150
Skerries Island SPA	20 (2021)	18.46	50.40	0.020	341	0.017	0.003
Skerries Town	498 (2021)	18.50	48.80	0.020	342	0.424	0.079
South Stack Cliffs RSPB	152 (2021)	91.60			8,391		
The Skerries RSPB	1282 (2022)	92.60			8,575		
Wicklow Head (2019/2021)	18 (2021)	83.30	58.10	0.017	6,939	0.001	0.000
Ynysoedd Gwylan (Fawr and Bach Total)	178 (2019)	132.00			17,424		



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(Aberdaron Coast not in SPA)							
Great black-backed gull							
Bray Head	2 (2010)						
Dalkey Island SPA including Lamb Island and Maiden Rock	120 (2016)	48.45	50.9	0.020	2347	0.086	0.033
Ireland's Eye	308 (2015)	32.90	55.40	0.018	1082	0.442	0.169
Lambay	360 (2015)	22.15	53.40	0.019	491	1.182	0.451
Skerries Island	190 (2010)	18.46	52.81	0.019	341	0.908	0.347
The Skerries RSPB	76 (2022)						
Wicklow Head	2 (2019)	83.3	50.9	0.020	6939	0.000	0.000
Common gull							
Carlingford Lough	4 (2021)	41.39	43.7	0.023	1713.46	0.253	0.171
Lambay	8 (2009)	22.15	63.01	0.016	490.40	1.227	0.829
Fulmar							
Rockabill	2 (1989)	11.87	85.54	0.012	140.92	0.029	0.005
St Patricks Island	8 (2010)	15.69	85.75	0.012	246.27	0.066	0.010
Shenicks Island	54 (2007)	17.16	85.79	0.012	294.33	0.373	0.058
Loughshinny Cliffs	86 (2014)	19.70	85.01	0.012	388.05	0.454	0.071
Lambay	1,170 (1999)	22.15	85.16	0.012	490.40	4.884	0.760
Ireland's Eye	74 (2015)	32.98	86.26	0.012	1087.88	0.137	0.021
Howth Head	28 (2015)	37.05	84.28	0.012	1372.92	0.042	0.007
Dalkey Island	2 (1995)	48.45	86.72	0.012	2347.79	0.002	0.000
Killiney	12 (2001)	50.21	84.06	0.012	2520.94	0.010	0.002
Maggy's Leap 1/Donnard Cove	2 (2017)	57.05	83.63	0.012	3255.16	0.001	0.000
Bray Head	92 (2010)	58.82	84.51	0.012	3460.26	0.055	0.009
Killard Point	4 (2000)	77.16	80.86	0.012	5953.51	0.001	0.000
Calf of Man	108 (2017)	83.11	79.34	0.013	6906.61	0.034	0.005
Wicklow Head	30 (2022)	83.27	84.29	0.012	6933.39	0.009	0.001
Sound - Port Erin	284 (2017)	86.42	90.29	0.011	7468.07	0.073	0.011



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Port St Mary - Sound	126 (2017)	86.92	79.09	0.013	7555.09	0.037	0.006
Bradda - Fleshwick	166 (2017)	89.20	79.11	0.013	7957.35	0.046	0.007
Eairnyerey - Fleshwick	34 (1999)	90.55	90.31	0.011	8199.12	0.008	0.001
Fleshwick - Stroin Vuigh	90 (2017)	91.14	90.33	0.011	8306.32	0.021	0.003
Gogarath	10 (2016)	91.56	83.38	0.012	8383.60	0.002	0.000
South Stack Cliffs RSPB	56 (2022)	91.64	83.46	0.012	8397.71	0.014	0.002
Abraham's Bosom	4 (2016)	91.96	83.47	0.012	8456.27	0.001	0.000
Stroin Vuigh - Eairn	78 (2003)	92.03	90.34	0.011	8468.60	0.018	0.003
Da Leura Strands - Stroin Vuigh	16 (1999)	92.78	90.39	0.011	8608.31	0.004	0.001
Traie Vane - Gob yn Ushtey	230 (2002)	93.86	90.44	0.011	8809.14	0.050	0.008
Around Traie Vrish	0 (1998)	94.42	90.49	0.011	8914.57	0.000	0.000
Ynys y Fydlyn	0 (2016)	95.45	83.22	0.012	9110.70	0.000	0.000
Penbrynyreglwys	18 (1987)	95.53	81.66	0.012	9125.41	0.004	0.001
Pant yr Eglwys	10 (2016)	95.68	83.21	0.012	9154.66	0.002	0.000
Niarbyl - Glen Maye	114 (2017)	96.05	79.24	0.013	9226.37	0.027	0.004
Port Grenaugh - Derbyhaven	60 (2017)	98.93	90.17	0.011	9787.54	0.012	0.002
Glen Maye - Peel	32 (2017)	99.55	79.15	0.013	9909.80	0.007	0.001
Saltee Islands	1,040 (1998-2000)	194.82	87.02	0.011	37955.61	0.055	0.009
Manx Shearwater							
Ailsa Craig	40 (2018)	190.39	89.61	0.0112	36247.59	0.000	0.000
Annet	458 (2015)	431.53	96.96	0.0103	186214.69	0.000	0.000
Bardsey Island	16,183 (2001)	129.12	89.59	0.0112	16672.75	0.162	0.046
Big Copeland Island	2,812 (2007)	118.87	90.12	0.0111	14129.13	0.033	0.009
Bryher	78 (2015)	424.75	96.95	0.0103	180413.41	0.000	0.000
Cairn na Burgh Beg	0 (2000)	339.48	93.71	0.0107	115246.67	0.000	0.000
Cairn na Burgh More	0 (2000)	339.23	93.72	0.0107	115079.03	0.000	0.000
Calf of Man	848 (2014)	83.11	88.62	0.0113	6906.61	0.021	0.006



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Canna and Sanday	4 (2001)	400.97	94.63	0.0106	160776.94	0.000	0.000
Cardigan Island	0 (1999)	193.11	91.19	0.0110	37292.63	0.000	0.000
Cruagh	6,572 (2001)	579.96	94.58	0.0106	336350.12	0.003	0.001
Davillaun	0 (2001)	568.92	94.59	0.0106	323667.69	0.000	0.000
Deenish	702 (2000)	482.55	96.50	0.0104	232852.57	0.000	0.000
Dun		516.40	96.56	0.0104	266671.03	0.000	0.000
Eigg	500 (1999)	389.99	94.12	0.0106	152094.54	0.001	0.000
Enegars	0 (2011)	709.87	97.55	0.0103	503912.58	0.000	0.000
Friar	0 (2001)	577.28	94.59	0.0106	333253.35	0.000	0.000
Great Blasket - shearwaters	7,168 (2001)	530.55	96.44	0.0104	281482.24	0.004	0.001
Great Ganilly	2 (2015)	423.60	96.94	0.0103	179439.50	0.000	0.000
Great Saltee Island	300 (2002)	194.82	92.97	0.0108	37955.61	0.001	0.000
Great Skellig Whole Island	1,476 (2001)	498.73	96.63	0.0103	248726.63	0.001	0.000
Gugh	160 (2022)	430.84	96.96	0.0103	185626.55	0.000	0.000
High Island	1,636 (2015)	577.22	94.63	0.0106	333184.08	0.001	0.000
Hoy RSPB Reserve	0 (2012)	710.38	97.52	0.0103	504642.59	0.000	0.000
Illauntannig	0 (2001)	572.53	95.64	0.0105	327789.46	0.000	0.000
Inchmarnock (West)	2 (2002)	250.32	89.54	0.0112	62661.60	0.000	0.000
Inishabro	11,222 (2000)	526.53	96.46	0.0104	277230.68	0.006	0.002
Inishshark	102 (2001)	571.95	94.63	0.0106	327123.37	0.000	0.000
Inishtooskert	19,392 (2000)	534.06	96.40	0.0104	285214.74	0.011	0.003
Inishvickillane	1,286 (2001)	524.86	96.49	0.0104	275475.92	0.001	0.000
Isle of May	2 (2015)	1,032.09	88.72	0.0113	1065203.58	0.000	0.000
Lamb Hoga - shearwaters	14 (2002)	951.01	97.77	0.0102	904425.73	0.000	0.000
Lighthouse Island	6,888 (2007)	121.05	90.16	0.0111	14652.62	0.078	0.022
Little Saltee	200 (2001)	192.30	92.89	0.0108	36980.83	0.001	0.000



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Lundy	11,008 (2017)	302.34	93.27	0.0107	91410.68	0.019	0.006
Lunga and Sgeir a' Chaisteil	9,384 (2018)	336.85	93.76	0.0107	113465.90	0.013	0.004
Midland Island (Middleholm)	33,096 (2018)	226.63	93.27	0.0107	51360.25	0.103	0.030
Puffin Island Whole	12,658 (2000)	498.17	96.65	0.0103	248175.34	0.008	0.002
Ramsey Island RSPB	12,450 (2022)	210.75	92.20	0.0108	44416.41	0.045	0.013
Rathlin Island	0 (2021)	202.93	91.94	0.0109	41179.37	0.000	0.000
Round Island	156 (2015)	421.52	96.95	0.0103	177675.74	0.000	0.000
Rum SPA	240,000 (2001)	402.30	94.85	0.0105	161846.09	0.234	0.067
Sanda Islands	600 (2006)	187.28	91.45	0.0109	35073.42	0.003	0.001
Scariff - shearwaters	3,920 (2000)	483.56	96.55	0.0104	233833.17	0.003	0.001
Shipman Head	78 (2015)	423.70	96.94	0.0103	179520.00	0.000	0.000
Skokholm	177,890 (2018)	230.43	93.30	0.0107	53096.14	0.537	0.154
Skomer	699,326 (2018)	225.92	93.29	0.0107	51037.59	2.195	0.630
Smaull Farm RSPB	0 (2019)	264.83	92.89	0.0108	70133.34	0.000	0.000
Soa	2 (2013)	314.29	93.52	0.0107	98778.83	0.000	0.000
St Agnes	130 (2022)	432.51	96.96	0.0103	187064.90	0.000	0.000
St Helen's	248 (2022)	422.31	96.93	0.0103	178345.74	0.000	0.000
St Martin's	52 (2015)	422.10	96.93	0.0103	178166.72	0.000	0.000
Tresco	92 (2015)	425.36	96.95	0.0103	180932.83	0.000	0.000
Common tern							
Lambay	18 (1987)	22.15	76.50	0.013	491	0.003	0.001
Rockabill	4,068 (2018)	11.90	83.10	0.012	142	2.131	0.999
Roseate tern							
Rockabill	3,284 (2018)	11.90	78.30	0.013	142	1.000	1.000



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Arctic tern							
Rockabill							1.000



GoBe

APEMGroup

GoBe Consultants Ltd
Suites B2 & C2, Higher Mill
Higher Mill Lane
Buckfastleigh
Devon
TQ11 0EN

GoBe Consultants Ltd
5/2 Merchant's House
7 West George Street
Glasgow
Scotland
G2 1BA

www.gobeconsultants.com