



Arklow Bank Wind Park 2

Environmental Impact Assessment Report

Volume III, Appendix 12.5: Offshore Ornithology Technical Report -
Seabird Collision Modelling Results (Revised March 2026)



MacArthur
Green

Arklow Bank Wind Park 2

~~Technical~~ Appendix 12.05 Offshore Ornithology **Technical Report**

Seabird Collision Modelling Results (**Revised March 2026**)

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Document Quality Record

Version	Date	Status	Author	Reviewed by	Approved by
1.0	02/05/2024	Final (External)	MacArthur Green	GoBe Consultants	Sure Partners Limited
2.0	10/03/2026	Final External (Revised March 2026)	SLR	GoBe Consultants	Sure Partners Limited

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GLOSSARY

Term	Meaning
Arklow Bank Wind Park 2 – Offshore Infrastructure	“The Proposed Development”, Arklow Bank Wind Park 2 Offshore Infrastructure: This includes all elements under the existing Maritime Area Consent.
Array Area	The Array Area is the area within which the Wind Turbine Generators (WTGs), the Offshore Substation Platforms (OSPs), and associated cables (export, inter-array and interconnector cabling) and foundations will be installed.
Nocturnal Activity Factor	<p>Nocturnal Activity Factors (NAF) indicate the amount of flight activity at night as a proportion of daytime flight activity.</p> <p>These factors were derived from reviews of seabird activity reported in Garthe and Hüppop (2004) which ranked species from 1 to 5 (1 low, 5 high) for relative nocturnal activity. These rates were subsequently modified for the purposes of CRM into 1 = 0%, 2 = 25%, 3 = 50%, 4 = 75% and 5 = 100% flying activity at night.</p> <p>For example, a nocturnal activity factor of 2 assumes that on average, nocturnal activity is around 25% of daytime level.</p>

ACRONYMS

Term	Meaning
c.i.	95% Confidence Interval
CRM	Collision Risk Modelling
EIA	Environmental Impact Assessment
NAF	Nocturnal Activity Factor

1 OFFSHORE ORNITHOLOGY TECHNICAL REPORT: SEABIRD COLLISION MODELLING TABULATED RESULTS

1.1 Introduction

1. This Technical Report provides the results of Collision Risk Modelling (CRM) for the Array Area to inform the Environmental Impact Assessment (EIA) of the Arklow Bank Wind Park 2 Offshore Infrastructure (hereafter referred to as ‘the Proposed Development’).
2. Collision mortality has been estimated using the Band (2012) CRM option 2 (generic flight heights) [for all species and Band CRM Option 1 \(site-specific flight heights\) for kittiwake](#). Collision mortality estimates are presented for each month and summed across the year.
3. Collision risks for non-seabird migrants are provided in Volume III, Appendix 12.07 [Offshore Ornithology Technical Report Migrant Non-Seabird Collision Risk Modelling \(Revised March 2026\)](#).

1.2 Seabird Collision Modelling Tabulated Results

4. Model results are presented for the three turbine options under consideration, ~~of which turbine option 1b generates the highest collision risks~~ as set out in Volume II, Chapter 4: Description of Development [\(Revised March 2026\)](#), [of which turbine option 1b generates the highest collision risks](#). Outputs from the CRM are presented for each species.
5. The Band (2012) stochastic CRM was used to produce monthly collision mortality estimates using the mean and standard deviation for seabird densities, bird dimensions, and behavioural characteristics (Volume III, Appendix 12.04 [Offshore Ornithology -Technical Report Collision Risk Model Input Parameters \(Revised March 2026\)](#) for details). Annual and seasonal totals were calculated as the sum of the monthly values for the respective seasons.
6. Summary results by season are provided in Table 12.5.1 with the monthly breakdown for each species in Tables 12.5.2 to 12.5.13.
7. Seasons are defined as per Furness (2015), using the ‘full’ breeding season (i.e. the maximum period defined by Furness, 2015) with adjoining seasons reduced in duration where seasonal definitions include overlaps (i.e. the values for each month are only included in one season for each species). Seasons are further defined in the EIAR Volume II, Chapter 12: [Offshore Ornithology \(Revised March 2026\)](#).

Table 12.5.1: Seasonal and annual predicted collision mortality (mean and 95% confidence interval) for all three turbine options, calculated using stochastic CRM with Band Option 2 for all species, with the addition of Band Option 1 for kittiwake (using site-specific flight height data).

Species	Turbine scenario	Spring migration	Breeding (full)	Autumn migration	Winter	Non-breeding	Annual
Arctic tern	1a	0.6 0.3 (0.1-1.3 0-0.6)	4.4 1.4 (1- 7.7 0.3- 2.5)	0.1 0 (0- 0.2 0-0.1)	0.7 0.4 (0.1-1.5 0- 0.8)	0 (0-0.1)	5.1 1.8 (1.1- 9.3 0.3-3.3)
	1b	0.7 0.3 (0.1-1.4 0- 0.7)	5.3 1.6 (1.3- 9.6 0.3- 2.9)	0.1 (0- 0.2 0-0.1)	0.8 0.4 (0.1-1.7 0- 0.9)	0 (0-0.1)	6.1 2 (1.4- 11.3 0.4-3.8)
	2	0.6 0.3 (0.1-1.3 0- 0.7)	4.7 1.6 (1- 8.2 0.4- 2.9)	0.1 0 (0- 0.2 0-0.1)	0.7 0.4 (0.1- 1.6 0.1-0.9)	0 (0-0.1)	5.4 2 (1.1- 9.8 0.4-3.7)
Black-headed gull	1a	0 (0-0)	0.1 (0- 0.3 0-0.2)	0 (0-0)	22.7 17 (3.5- 45.4 2.2- 34.7)	0 (0-0)	22.8 17.1 (3.5- 45.6 2.2- 34.9)
	1b	0 (0-0)	0.1 (0- 0.3 0-0.2)	0 (0-0)	26.3 20 (3.1-53.43- 40)	0 (0-0)	26.4 20.1 (3.1-53.83- 40.2)
	2	0 (0-0)	0.1 (0- 0.3 0-0.2)	0 (0-0)	23.1 18.9 (3.5- 46.4 2.4- 39)	0 (0-0)	23.2 18.9 (3.5- 46.7 2.4- 39.2)
Common gull	1a	0 (0-0)	1.9 0.9 (0.1-4.4 0- 2)	0 (0-0)	115.3 62.8 (16- 229.6 9.8- 124)	0 (0-0)	117.2 63.7 (16.2- 234 9.9-126)
	1b	0 (0-0)	2.2 1 (0.2- 5.2 0.1-2.5)	0 (0-0)	134.8 (17.6- 269.3 72.7 (10.9- 146.9)	0 (0-0)	137 73.7 (17.8- 274.5 11- 149.4)
	2	0 (0-0)	2 1 (0.1- 4.6 0-2.2)	0 (0-0)	117.2 (18.7- 234.5 70.3 (10.2- 139.4)	0 (0-0)	119.2 (18.8- 239.1 71.3 (10.2-141.6)
Common tern	1a	0.5 0.3 (0.1- 0.9 0.1- 0.6)	6.2 5 (2.1- 9.9 0.7- 4.6)	0.7 0.3 (0.2- 1.3 0.1-0.6)	0 (0-0)	0 (0-0)	7.2 3.2 (2.4- 12.1 0.9-5.8)
	1b	0.6 0.4 (0.1-1.0 0.1- 0.7)	7.2 2.9 (2.5- 11.9 0.8- 5.2)	0.9 0.4 (0.2- 1.5 0.1-0.7)	0 (0-0)	0 (0-0)	8.6 3.6 (2.8- 14.5 1-6.5)

Species	Turbine scenario	Spring migration	Breeding (full)	Autumn migration	Winter	Non-breeding	Annual
	2	0.5 0.4 (0.1 0.9 0.1- 0.7)	6.3 2.8 (2.1 10.4 0.7- 5.2)	0.8 0.4 (0.2 1.4 0.1-0.7)	0 (0-0)	0 (0-0)	7.6 3.6 (2.4 12.8 0.9-6.5)
Fulmar	1a	0 (0-0)	0 (0-0)	0 (0-0)	0 (0-0)	0 (0-0)	0 (0-0)
	1b	0 (0-0)	0 (0-0)	0 (0-0)	0 (0-0)	0 (0-0)	0 (0-0)
	2	0 (0-0)	0 (0-0)	0 (0-0)	0 (0-0)	0 (0-0)	0 (0-0)
Gannet	1a	0.1 (0 0.4 0-0.3)	0.6 0.8 (0 1.3 0.1-2)	0.3 (0- 0.6)	0.4 0.5 (0 0.9 0-1.1)	0.1 (0-0.2)	0.9 1.3 (0.1 2.2 0.1-3.1)
	1b	0.1 (0 0.4 0-0.3)	0.6 0.9 (0 1.5 0.1-2.2)	0.3 (0 0.6 0-0.7)	0.4 0.5 (0 0.9 0.1-1.2)	0.1 (0-0.2)	1.4 (0.1 2.4 0.1-3.4)
	2	0.1 (0 0.4 0-0.3)	0.6 0.9 (0 1.4 0.1-2.2)	0.2 0.3 (0 0.6 0-0.7)	0.4 0.5 (0 0.9 0-1.2)	0.1 (0-0.2)	0.9 1.4 (0.1 2.2 0.1-3.4)
Great black-backed gull	1a	1.6 0.7 (0.2 3.9 0.1-1.8)	0 (0-0)	0 (0-0)	0 (0-0)	0 (0-0)	1.6 0.7 (0.2 3.9 0.1-1.8)
	1b	1.8 0.8 (0.1 4.2 0.1-2)	0 (0-0)	0 (0-0)	0 (0-0)	0 (0-0)	1.8 0.8 (0.1 4.2 0.1-2)
	2	1.5 0.7 (0.1 3.5 0- 1.9)	0 (0-0)	0 (0-0)	0 (0-0)	0 (0-0)	1.5 0.7 (0.1 3.5 0-1.9)
Herring gull	1a	0.7 0.3 (0 1.6 0-0.7)	0.1 9 (0 0.2 4.2)	0.7 0.4 (0 1.6 0-1)	1.3 0.7 (0.1 3.3 0- 1.7)	0 (0-0)	1.3 2.6 (0.1 3.3 0.2-5.9)
	1b	0.3 (0- 0.8)	2.2 (0.2- 5.1)	0.4 (0-1.1)	0.8 (0.1- 1.8)	0 (0-0) 0.8 (0.1 1.5 0-1.8) 3.5	1.5 2.9 (0.1 3.5 0.2-7)
	2	0.3 (0- 0.7)	2.1 (0.2- 4.7)	0.4 (0-1)	0.7 (0.1- 1.7)	0 (0-0)	2.8 (0.2-6.5)
Kittiwake (Band Option 1: weighted average site-specific flight height)	2 1a	0.7 17.5 (0 1.6 6.1- 29.5)	0.5 (0 0.1 8-8.5)	0.7 7.8 (0 1.7 1.4-15)	1.3 0 (0.1 3.2 0-0)	0 (0-0)	1.3 30.3 (0.1 3.2 9.2-52.9)
Kittiwake	1a 1b	127.3 20.1 (43.1 217.9 7.3- 34.7)	16.7 5.8 (3.5 30.7 2-9.7)	42.8 8.7 (6.2 83.9 1.4- 16.7)	0 (0-0)	0 (0-0)	186.8 (52.9 332.4 34.5 (10.7-61.1)
	2	19.1 (6.2- 33)	5.6 (2-9.4)	8.4 (1.8- 16.5)	0 (0-0)	0 (0-0)	33.1 (10-59)
Kittiwake (Band)	1a	1.8 (0.6- 3.1)	0.5 (0.2- 0.9)	0.8 (0.1- 1.6)	0 (0-0)	0 (0-0)	3.2 (1-5.6)

Species	Turbine scenario	Spring migration	Breeding (full)	Autumn migration	Winter	Non-breeding	Annual
Option 1: site specific data collected at ABWP2 Array Area)	1b	2.1 (0.8-3.7)	0.6 (0.2-1)	0.9 (0.1-1.8)	0 (0-0)	0 (0-0)	3.6 (1.1-6.5)
	2	2 (0.7-3.5)	0.6 (0.2-1)	0.9 (0.2-1.7)	0 (0-0)	0 (0-0)	3.5 (1.1-6.2)
Kittiwake (Band Option 2: generic flight height)	1b 1a	142.9 (47.7 252.678.5 (27.2-132.5)	18.8 22.6 (4.1 35.78.1-37.9)	47.3 35 (6.1 94.86.1-67.1)	0 (0-0)	0 (0-0)	209.1 (57.8 383.1 136 (41.4-237.5)
	2 1b	128.7 90.1 (37.7 223.633-155.8)	16.8 25.8 (3.5 31.89.1-43.5)	43.2 38.8 (6.3 87.96.2-75)	0 (0-0)	0 (0-0)	188.8 (47.5 343.3 154.7 (48.2-274.3)
	2	85.9 (27.9-148.1)	25.1 (9-42.3)	37.7 (7.9-74.1)	0 (0-0)	0 (0-0)	148.7 (44.8-264.5)
Lesser black-backed gull	1a	0.7 0.8 (0.1 1.6 0.1-1.8)	0 (0-0)	0 (0-0)	0 (0-0)	0 (0-0)	0.7 0.8 (0.1 1.6 0.1-1.8)
	1b	0.7 0.8 (0.1 1.7 0.1-1.9)	0 (0-0)	0 (0-0)	0 (0-0)	0 (0-0)	0.7 0.8 (0.1 1.7 0.1-1.9)
	2	0.6 0.8 (0.1 1.5 0.1-1.9)	0 (0-0)	0 (0-0)	0 (0-0)	0 (0-0)	0.6 0.8 (0.1 1.5 0.1-1.9)
Little gull	1a	0 (0-0)	0.1 (0 0.2)	0 (0-0)	42.6 39.3 (5.3 87.65.9-76.6)	0 (0-0)	42.6 39.4 (5.3 87.65.9-76.8)
	1b	0 (0-0)	0.1 (0 0.3)	0 (0-0)	50.4 47 (6.1 103.37.8-93.8)	0 (0-0)	50.4 47.1 (6.1 103.37.8-94.1)
	2	0 (0-0)	0.1 (0 0.3)	0 (0-0)	44.1 44.4 (4.7 89.56.2-89.2)	0 (0-0)	44.1 44.5 (4.7 89.56.2-89.5)
Sandwich tern	1a	0 (0-0)	0.2 0.1 (0 0.4 0.2)	0.1 (0 0.2 0.1)	0.1 (0 0.2 0.1)	0 (0-0)	0.3 0.1 (0 0.6 0.3)
	1b	0 (0-0)	0.2 0.1 (0 0.5 0.2)	0.1 (0 0.3 0.2)	0.1 (0 0.3 0.2)	0 (0-0)	0.3 0.2 (0 0.7 0.4)
	2	0 (0-0)	0.2 0.1 (0 0.4 0.2)	0.1 (0-0.2)	0.1 (0-0.2)	0 (0-0)	0.3 0.2 (0 0.6 0.4)

1.2.1 Arctic Tern

Table 12.5.2: Arctic tern collision mortality for all three turbine options, calculated using stochastic CRM with Band Option 2. Monthly values are the mean and 95% confidence intervals (c.i.).

		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Turbine model	Stochastic CRM													
	Mean	0	0	0	0.6	0.3	0	0	4.1	0.1	0	0	0	5.1
1a	95% c.i.	0-0	0-0	0-0	0.1-1.3	0.0-0.5	0-0	0-0	1-7.2	0-0.2	0-0.1	0-0	0-0	1.1-9.3
	Mean	0	0	0	0.7	0.3	0	0	5.1	0.1	0	0	0	6.1
1b	95% c.i.	0-0	0-0	0-0	0.1-1.4	0.0-0.6	0-0	0-0	1.3-9.0	0-0.2	0-0.1	0-0	0-0	1.4-11.3
	Mean	0	0	0	0.6	0.3	0	0	4.4	0.1	0	0	0	5.4
2	95% c.i.	0-0	0-0	0-0	0.1-1.3	0.0-0.5	0-0	0-0	1-7.7	0-0.2	0-0.1	0-0	0-0	1.1-9.8
	Mean	0	0	0	0.6	0.3	0	0	4.4	0.1	0	0	0	5.4
	95% c.i.	0-0	0-0	0-0	0.1-1.3	0.0-0.5	0-0	0-0	1-7.7	0-0.2	0-0.1	0-0	0-0	1.1-9.8

1.2.2 Black-headed Gull

Table 12.5.3: Black-headed gull collision mortality for all three turbine options, calculated using stochastic CRM with Band Option 2. Monthly values are the mean and 95% confidence intervals (c.i.).

		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Turbine model	Stochastic CRM													
	Mean	6.26	5.83	0.4	0	0	0	0.1	0.1	0.1	10.7	261.7	75.1	22817.1
1a	95% c.i.	1.3 11.81 11.6	0.9 11.40.4 6.1	0.00.1	0-0	0-0	0-0	0 0.30 0.2	0 0.30 0.1	0.00	0.1 20.1 1.5	0.6 4.80.2 3.2	0.6 15.40.5 11	3.5 45.62.2 34.9
		Mean	7.26.9	6.73.5	0.5	0	0	0	0.1	0.1	0.1	120.8	3.2	86.1
1b	95% c.i.	0.9 13.31.2 12.9	0.7 13.60.5 6.8	0.00	0-0	0-0	0-0	0 0.30 0.2	0 0.30 0.1	0.00	0.2 2.50.1 1.7	0.6 5.90.4 3.8	0.7 17.80.8 13.3	3.1 53.83 40.2
		Mean	6.46.6	5.83.2	0.5	0	0	0	0.1	0.1	0.1	10.8	261.9	75.8
2	95% c.i.	1.2 11.71.1 12.6	1 11.50.4 6.6	0.00	0-0	0-0	0-0	0 0.30 0.2	0 0.30 0.1	0.00	0.1 20.1 1.6	0.5 5.20.2 3.9	0.8 15.70.5 12.9	3.5 46.72.4 39.2

1.2.3 Common Gull

Table 12.5.4: Common gull collision mortality for all three turbine options, calculated using stochastic CRM with Band Option 2. Monthly values are the mean and 95% confidence intervals (c.i.).

		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Turbine model	Stochastic CRM													
	Mean	24.3 15.6	63.7 29.5	0.3 0.8	0 0.1	0	1.9 0.9	0	0	0	0	0	74.2	20 12.6
1a	95% c.i.	2.9 49.9-2.2- 32	10.1 1205.9- 53.4	0 0.7-0.1- 1.7	0-0 0.3	0-0	0.1 4.4-0-2	0-0	0-0	0-0	0-0	1.6 13.1-0.5- 8.3	1.5 45.9-1.2- 28.3	16.2 2349.9- 126
	Mean	27.1 17.4	74.8 34.4	0.3 1	0 0.1	0	2.2 1	0	0	0	0	0	8.5 5	24.1 14.8
1b	95% c.i.	3.6 53.3-2.2- 35	10.3 144.9-6.5- 65.6	0 0.8-0.1- 2	0-0 0.4	0-0	0.2 5.2-0.1- 2.5	0-0	0-0	0-0	0-0	1.7 15.8-0.8- 9.5	2 54.5-1.4- 34.5	17.8 274.5-11- 149.4
	Mean	23.7 17.3	65.4 33.1	0.3 1	0 0.1	0	2 1	0	0	0	0	0	7.3 4.7	20.5 14.2
2	95% c.i.	3.1 47.2-2.3- 33.9	12.4 125.2-5.8- 61.7	0 0.7-0.1- 1.9	0-0 0.3	0-0	0.1 4.6-0- 2.2	0-0	0-0	0-0	0-0	1.3 13.5-0.7- 9.1	1.8 47.9-1.4- 32.5	18.8 239.1-10.2- 141.6

1.2.4 Common Tern

Table 12.5.5: Common tern collision mortality for all three turbine options, calculated using stochastic CRM with Band Option 2. Monthly values are the mean and 95% confidence intervals (c.i.).

		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Turbine model	Stochastic CRM													
	Mean	0	0	0	0.5 0.3	0 0.6	0	0	6 1.9	0.7 0.3	0	0	0	7.2 3.2
1a	95% c.i.	0-0	0-0	0-0	0.1 0.9 0.1- 0.6	0 0.1- 1.4	0-0	0-0	2.1 9.9 0.7- 3.2	0.2 1.3 0.1- 0.6	0-0	0-0	0-0	2.4 12.1 0.9- 5.8
	Mean	0	0	0	0.6 0.4	0 0.7	0	0	7.2 2.2	0.9 0.4	0	0	0	8.6 3.6
1b	95% c.i.	0-0	0-0	0-0	0.1 10.1 - 0.7	0 0.1- 1.6	0-0	0-0	2.5 11.9 0.8- 3.6	0.2 1.5 0.1- 0.7	0-0	0-0	0-0	2.8 14.5 1- 6.5
	Mean	0	0	0	0.5 0.4	0 0.7	0	0	6.3 2.1	0.8 0.4	0	0	0	7.6 3.6
2	95% c.i.	0-0	0-0	0-0	0.1 0.9 0.1- 0.7	0 0.1- 1.6	0-0	0-0	2.1 10.4 0.7- 3.6	0.2 1.4 0.1- 0.7	0-0	0-0	0-0	2.4 12.8 0.9- 6.5

1.2.5 Fulmar

Table 12.5.6: Fulmar collision mortality for all three turbine options, calculated using stochastic CRM with Band Option 2. Monthly values are the mean and 95% confidence intervals (c.i.).

		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual	
Turbine model	Stochastic CRM														
	Mean	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1a	95% c.i.	0-0	0-0	0-0	0-0	0-0	0-0	0-0	0-0	0-0	0-0	0-0	0-0	0-0	0-0
	Mean	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1b	95% c.i.	0-0	0-0	0-0	0-0	0-0	0-0	0-0	0-0	0-0	0-0	0-0	0-0	0-0	0-0
	Mean	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	95% c.i.	0-0	0-0	0-0	0-0	0-0	0-0	0-0	0-0	0-0	0-0	0-0	0-0	0-0	0-0

1.2.6 Great Black-backed Gull

Table 12.5.7: Great black-backed gull collision mortality for all three turbine options, calculated using stochastic CRM with Band Option 2. Monthly values are the mean and 95% confidence intervals (c.i.).

		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual	
Turbine model	Stochastic CRM														
	Mean	1.60.7	0	0	0	0	0	0	0	0	0	0	0	0	1.60.7
1a	95% c.i.	0.2-3.90.1-1.8	0-0	0-0	0-0	0-0	0-0	0-0	0-0	0-0	0-0	0-0	0-0	0-0	0.2-3.90.1-1.8
	Mean	1.80.8	0	0	0	0	0	0	0	0	0	0	0	0	1.80.8
1b	95% c.i.	0.1-4.20.1-2	0-0	0-0	0-0	0-0	0-0	0-0	0-0	0-0	0-0	0-0	0-0	0-0	0.1-4.20.1-2
	Mean	1.50.7	0	0	0	0	0	0	0	0	0	0	0	0	1.50.7
2	95% c.i.	0.1-3.50-1.9	0-0	0-0	0-0	0-0	0-0	0-0	0-0	0-0	0-0	0-0	0-0	0-0	0.1-3.50-1.9

1.2.7 Gannet

Table 12.5.8: Gannet ~~collision~~-collision mortality for all three turbine options, calculated using stochastic CRM with Band Option 2. Monthly values are the mean and 95% confidence intervals (c.i.).

		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Turbine model	Stochastic CRM													
	Mean	0	0.1	0.1	0.1	0.1	0.2	0.1	0.4	0	0.2	0	0.1	1.3
1a	95% c.i.	0-0.1	0-0.2	0-0.3	0-0.2	0-0.2	0-0.5	0-0.2	0-0.4	0-0.1	0-0.5	0-0.1	0-0.2	0.1-2.2
	Mean	0	0.1	0.1	0.1	0.1	0.2	0.1	0.4	0.1	0.2	0	0.1	1.4
1b	95% c.i.	0-0.1	0-0.2	0-0.3	0-0.3	0-0.2	0-0.5	0-0.3	0-0.4	0-0.1	0-0.5	0-0.1	0-0.2	0.1-2.4
	Mean	0	0.1	0.1	0.1	0.1	0.2	0.1	0.4	0.1	0.2	0	0.1	1.4
2	95% c.i.	0-0.1	0-0.2	0-0.3	0-0.3	0-0.2	0-0.5	0-0.3	0-0.4	0-0.1	0-0.5	0-0.1	0-0.2	0.1-2.2
	Mean	0	0.1	0.1	0.1	0.1	0.2	0.1	0.4	0.1	0.2	0	0.1	1.4
	95% c.i.	0-0.1	0-0.2	0-0.3	0-0.3	0-0.2	0-0.5	0-0.3	0-0.4	0-0.1	0-0.5	0-0.1	0-0.2	0.1-2.2

1.2.8 Herring Gull

Table 12.5.9: Herring gull collision mortality for all three turbine options, calculated using stochastic CRM with Band Option 2. Monthly values are the mean and 95% confidence intervals (c.i.).

		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Turbine model	Stochastic CRM													
	Mean	0	0.7 0.3	0 0.3	0 0.6	0	0	0	0 0.9	0	0	0.7 0.4	0	1.3 2.6
1a	95% c.i.	0-0	0.1-0.6 0.7	0-0 0.8	0-0 0.1-1.4	0-0	0-0	0-0	0-0 0.1-2.1	0-0	0-0	0.1-0.6 1	0-0	0.1-3.3 0.2-5.9
	Mean	0	0.7 0.3	0 0.4	0 0.7	0	0	0	0 1.1	0	0	0.8 0.4	0	1.5 2.9
1b	95% c.i.	0-0	0.1-0.7 0.8	0-0 0.9	0-0 0.1-1.6	0-0	0-0	0-0	0-0 0.1-2.6	0-0	0-0	0.1-0.8 0.1-1.1	0-0	0.1-3.5 0.2-7
	Mean	0	0.7 0.3	0 0.4	0 0.7	0	0	0	0 1	0	0	0.7 0.4	0	1.3 2.8
2	95% c.i.	0-0	0.1-0.6 0.7	0-0 0.9	0-0 0.1-1.5	0-0	0-0	0-0	0-0 0.1-2.3	0-0	0-0	0.1-0.7 0.1	0-0	0.1-3.2 0.2-6.5

1.2.9 Kittiwake – Band Option 1 (site-specific flight height) using a weighted average PCH

Table 12.5.10: Kittiwake collision mortality for all three turbine options, calculated using stochastic CRM with Band Option 1. Monthly values are the mean and 95% confidence intervals (c.i.). Collisions calculated using weighted average site-specific flight height data collected at Arklow Bank Wind Park 2, Codling Wind Park and Dublin Array.

		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
<i>Turbine model</i>	<i>Stochastic CRM</i>													
1a	Mean	3.20	10.80	3.50	2.60	0.90	0.80	0.40	0.30	0.20	0.90	1.60	5.10	30.30
	95% c.i.	1.1-5.5	3.9-18	1.1-6	1.2-4.1	0.2-1.6	0.3-1.4	0.1-0.7	0.1-0.6	0-0.5	0.3-1.6	0.3-3	0.8-9.9	9.2-52.9
1b	Mean	3.70	12.50	4.00	3.00	1.10	1.00	0.40	0.30	0.30	1.00	1.80	5.60	34.50
	95% c.i.	1.3-6.4	4.9-21.6	1.2-6.7	1.3-4.7	0.3-1.9	0.3-1.6	0.1-0.8	0.1-0.6	0-0.5	0.3-1.7	0.4-3.3	0.6-11.1	10.7-61.1
2	Mean	3.50	11.80	3.80	2.90	1.10	0.90	0.40	0.30	0.30	0.90	1.70	5.50	33.10
	95% c.i.	1.1-6.1	3.9-20.5	1.3-6.5	1.2-4.6	0.4-1.9	0.3-1.6	0.1-0.8	0.1-0.6	0-0.5	0.2-1.7	0.4-3.2	1.1-11.2	10-59

1.2.10 Kittiwake – Band Option 1 (site-specific flight height) using data collected at ABWP2 only

Table 12.5.11: Kittiwake collision mortality for all three turbine options, calculated using stochastic CRM with Band Option 1. Monthly values are the mean and 95% confidence intervals (c.i.). Collisions calculated using site-specific flight height data collected at Arklow Bank Wind Park 2 only.

		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Turbine model	Stochastic CRM													
	Mean	20.10.30	107.21.10	30.40	2.60.30	6.10.10	0.70.10	2.10.00	2.20.00	1.50.00	3.70.10	12.30.20	25.40.50	186.83.20
1a	95% c.i.	6.9-33.90.1-0.6	36.3-1840.4-1.9	0.5-5.90.1-0.6	0.3-5.30.1-0.4	1.9-10.30-0.2	0.1-1.40-0.2	0.3-4.10-0.1	0.5-3.80-0.1	0.2-30-0.1	0.8-70-0.2	3-22.20-0.3	2.3-51.70.1-1	52.9-332.41-5.6
	Mean	22.70.40	120.31.30	3.50.40	2.80.30	6.80.10	0.80.10	2.40.00	2.50.00	1.70.00	4.10.10	13.90.20	27.70.60	209.13.60
1b	95% c.i.	8.6-38.80.1-0.7	39.1-213.80.5-2.3	0.5-70.1-0.7	0.4-5.90.1-0.5	2.1-120-0.2	0.1-1.60-0.2	0.4-4.80-0.1	0.6-4.50-0.1	0.2-3.40-0.1	0.9-7.40-0.2	2.4-250-0.3	2.5-59.10.1-1.2	57.8-383.11.1-6.5
	Mean	20.70.40	1081.20	3.10.40	2.60.30	60.10	0.70.10	2.20.00	2.30.00	1.50.00	3.70.10	12.60.20	25.50.60	188.83.50
2	95% c.i.	7.5-34.50.1-0.6	30.2-189.10.4-2.2	0.5-6.20.1-0.7	0.3-5.20.1-0.5	1.8-10.50-0.2	0.1-1.50-0.2	0.3-4.30-0.1	0.6-4.10-0.1	0.3-30-0.1	0.7-6.70-0.2	2.4-23.70-0.3	2.9-54.50.1-1.2	47.5-343.31.1-6.2

1.2.11 Kittiwake – Band Option 2 (generic flight height)

Table 12.5.12: Kittiwake collision mortality for all three turbine options, calculated using stochastic CRM with Band Option 2. Monthly values are the mean and 95% confidence intervals (c.i.). Collisions calculated using Band Option2, generic flight height data.

		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
<i>Turbine model</i>	<i>Stochastic CRM</i>													
1a	Mean	14.2	48.7	15.6	11.8	4.1	3.7	1.6	1.3	1.1	3.9	7	23	136
	95% c.i.	4.8-24.7	17.4-80.9	4.9-27	5.4-18.6	1.1-7.2	1.1-6.5	0.2-3.2	0.2-2.5	0.1-2.1	1.2-7	1.4-13.4	3.4-44.6	41.4-237.5
1b	Mean	16.4	55.9	17.8	13.4	4.8	4.3	1.9	1.5	1.2	4.4	8	25.3	154.7
	95% c.i.	5.6-28.9	22.2-96.9	5.2-30	5.8-21.3	1.4-8.4	1.4-7.4	0.3-3.6	0.3-2.8	0.2-2.4	1.3-7.8	1.9-14.8	2.8-49.9	48.2-274.3
2	Mean	15.9	52.9	17.1	12.8	4.8	4.2	1.8	1.4	1.2	4.2	7.7	24.6	148.7
	95% c.i.	4.8-27.2	17.3-91.8	5.8-29.1	5.5-20.5	1.6-8.3	1.5-7.1	0.2-3.6	0.2-2.8	0.2-2.3	1.1-7.5	1.7-14.3	4.9-50.1	44.8-264.5

1.2.12 ~~1.2.10~~ Lesser Black-backed Gull

Table 12.5.413: Lesser black-backed gull collision mortality for all three turbine options, calculated using stochastic CRM with Band Option 2. Monthly values are the mean and 95% confidence intervals (c.i.).

		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Turbine model	Stochastic CRM													
	Mean	0	0	0 0.8	0	0	0	0	0	0	0	0	0	0
1a	95% c.i.	0-0	0-0	0 1.6-1.8	0-0	0-0	0-0	0-0	0-0	0-0	0-0	0-0	0-0	0 1.6-1.8
	Mean	0	0	0 0.8	0	0	0	0	0	0	0	0	0	0
1b	95% c.i.	0-0	0-0	0 1.7-1.9	0-0	0-0	0-0	0-0	0-0	0-0	0-0	0-0	0-0	0 1.7-1.9
	Mean	0	0	0 0.8	0	0	0	0	0	0	0	0	0	0
2	95% c.i.	0-0	0-0	0 1.5-1.9	0-0	0-0	0-0	0-0	0-0	0-0	0-0	0-0	0-0	0 1.5-1.9
	Mean	0	0	0 0.8	0	0	0	0	0	0	0	0	0	0

1.2.13 ~~1.2.14~~ Little Gull

Table 12.5.14: Little gull collision mortality for all three turbine options, calculated using stochastic CRM with Band Option 2. Monthly values are the mean and 95% confidence intervals (c.i.).

		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual		
Turbine model	Stochastic CRM															
	Mean	7.7	10.1	1.5	2.1	0.1	0	0	0	0.5	3.2	3.6	6.6	14.4	13.5	42.6
1a	95% c.i.	0.8-16.5	0.1-20.3	0.3-8.8	0-0.2	0-0	0-0	0-0	0.1-1.1	0.3-7.0	0.3-8.0	1.5-14.6	1.9-28.8	5.3-87.6	5.3-87.6	
		10.1	20.6	3.1	0.2				1.1	4.3	6.7	12	25	76.8		
1b	Mean	9.5	11.9	1.8	2.4	0.1	0	0	0	0.6	2.4	4.3	7.8	17.2	16.2	50.4
	95% c.i.	1.1-20.2	0.2-21.6	0.5-10.2	0-0.3	0-0	0-0	0-0	0.1-1.3	0.3-9.0	0.4-10.6	1.3-16.6	2.3-34.3	6.1-103.3	6.1-103.3	
		11.9	25.3	3.8	0.3				1.2	5.5	7.9	14.1	31.3	94.1		
2	Mean	8.2	11.5	1.5	2.2	0.1	0	0	0	0.5	3.2	3.7	7.9	15.1	14.5	44.1
	95% c.i.	0.7-17.4	0.1-21.5	0.5-8.8	0-0.3	0-0	0-0	0-0	0.1-1.1	0.4-7.2	0.3-8.0	1.3-14.6	1.4-28.9	4.7-89.5	4.7-89.5	
		11.5	23.4	3.5	0.3				1.1	4.8	7.9	14	30.2	89.5		

1.2.14 ~~1.2.12~~ Sandwich Tern

Table 12.5.15: Sandwich tern collision mortality for all three turbine options, calculated using stochastic CRM with Band Option 2. Monthly values are the mean and 95% confidence intervals (c.i.).

		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Turbine model	Stochastic CRM													
	Mean	0	0	0	0	0.4	0	0	0.4	0.1	0	0	0	0.3
1a	95% c.i.	0-0	0-0	0-0	0-0	0-0.1	0-0	0-0	0-0.3	0-0.2	0-0	0-0	0-0	0-0.6
	Mean	0	0	0	0	0.1	0	0	0.4	0.1	0	0	0	0.3
1b	95% c.i.	0-0	0-0	0-0	0-0	0-0.2	0-0	0-0	0-0.3	0-0.2	0-0	0-0	0-0	0-0.7
	Mean	0	0	0	0	0.1	0	0	0.4	0.1	0	0	0	0.3
2	95% c.i.	0-0	0-0	0-0	0-0	0-0.1	0-0	0-0	0-0.3	0-0.2	0-0	0-0	0-0	0-0.6

4.3 REFERENCES

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