Rampion 2 Wind Farm

Category 6: Environmental Statement

Volume 4, Appendix 12.2: Offshore and intertidal ornithology displacement analysis

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1.   Introduction

1.1   Purpose of this report

1.1.1   This report has been produced for the purpose of describing the displacement analysis methodology and results, which form part of the Environmental Impact Assessment (EIA) for the proposed Rampion 2 Offshore Wind Farm ('Rampion 2').

1.2   Project background

1.2.1   Rampion Extension Development (RED; 'the Applicant') is proposing to develop the Rampion 2 Offshore Wind Farm (OWF). Rampion 2 will be sited adjacent to the existing Rampion OWF, located in the English Channel, 14km off the coast of Brighton & Hove and approximately 30km east of the Isle of Wight. For the purposes of clarification, in this document, the existing Rampion OWF is referred to as 'Rampion 1' hereon in to enable clear differentiation with Rampion 2.

1.2.2   Rampion 2 will comprise both offshore and onshore infrastructure including offshore wind turbine generators (WTGs) and associated foundations and inter-array cabling, offshore substations, offshore export cables within a defined cable corridor, a landfall site, and an onshore substation for connection to the electricity transmission network. The offshore element of Rampion 2 will be located within an Area of Search adjacent to the west and south of the existing Rampion 1 project, together with a small link or 'bridge' area between the two areas for cabling. The location of Rampion 2 is illustrated in **Figure 12-2-1, Volume 3** of the ES (Document Reference 6.3.12).

1.2.3   APEM Ltd (hereafter APEM) was commissioned to undertake a study of offshore and intertidal ornithology that characterise the area that may be influenced by Rampion 2. A separate report (**Appendix 12.1: Offshore and intertidal ornithology baseline technical report, Volume 4** of the ES (Document Reference: 6.4.12.1)) provides the findings from offshore and intertidal ornithology data to determine the receptors that characterise the baseline and are of relevance to the assessment of potential impacts from Rampion 2. This technical appendix has been produced to support **Chapter 12: Offshore and intertidal ornithology, Volume 2** of the ES (Document Reference 6.2.12), to aid the assessment of the potential impact of displacement to seabirds from Rampion 2.

Displacement analysis

1.2.4   The presence of WTGs has the potential to directly disturb and displace seabirds that would normally reside within and around the area of sea where Rampion 2 is proposed. This in effect represents indirect habitat loss, potentially reducing the area available for those seabirds sensitive to disturbance to forage, loaf and / or moult in the way that they are currently able to within and around the Rampion 2 area. There is also the potential for the construction and decommissioning of WTGs, substations and cable laying to directly disturb and displace seabirds,

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though the nature of such potential impacts is more restricted spatially and temporally by virtue of the nature of those phases of the development.

1.3 Species of interest

1.3.1 Following consultation with Natural England and the RSPB through the Evidence Plan process (EPP), the following species were identified as the 'key' species for inclusion in Rampion 2 disturbance and displacement assessments (Expert Topic Group (ETG) Meeting 18/09/2020):

- Gannet (*Morus bassanus*);

- Guillemot (*Uria aalge*); and

- Razorbill (*Alca torda*).

1.3.2 This appendix presents the baseline data on the three key species screened in for the assessment of potential disturbance and displacement as a result of the construction, operation, and decommissioning phases of Rampion 2.

1.4 Displacement buffers

1.4.1 The main assessment on disturbance and displacement is found within **Chapter 12: Offshore and intertidal ornithology, Volume 2** of the ES (Document Reference 6.2.12). The scale of the potential displacement applied in this report is in response to guidance in the literature (Parker *et al.,* 2022; SNCBs, updated 2022) and comments received from Natural England and the RSPB through the EPP (ETG Meeting 18/09/2020).

1.4.2 Following the same generic guidance (Parker *et al.,* 2022; SNCBs, updated 2022), this report presents displacement matrices that consider gannet, guillemot and razorbill. These matrices present abundances for gannet within the Rampion 2 array area only and for guillemot and razorbill within the Rampion 2 array area plus a 2km buffer.

1.5 Data sources for displacement matrices

1.5.1 The data contributing to this appendix are from the 24 months of aerial digital surveys (April 2019 to March 2021) conducted by APEM of the Rampion 2 site plus a 4km buffer. Full details of the site-specific surveys can be found in **Appendix 12.1: Offshore and intertidal ornithology baseline technical report** of the ES (Document Reference 6.4.12.1). These data are inclusive of apportionment of unidentified birds and corrected for availability bias, where appropriate.

Displacement matrices are presented for each of the three species (gannet, guillemot and razorbill) representing the array area and the array area plus 2km buffer, where appropriate, separately for each bio-season. All birds (flying and sitting) were included in the abundance estimates represented within the bio-season mean peaks. Note that whilst barrier effects are considered separately in **Chapter 12: Offshore and intertidal ornithology, Volume 2** of the ES (Document Reference 6.2.12), it is recognised that a proportion of the birds

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recorded in wind farm areas may be transiting through the site and therefore potentially affected by barrier effects, rather than displacement from the wind farm area (SNCBs, updated 2022). Accordingly, including all birds in the displacement assessment is precautionary and likely to incorporate the potential impacts of barrier effects on these species to some extent too.

Presentation of displacement by bio-seasons

1.5.2   Bio-seasons are based on Furness (2015) for all species in this analysis. For guillemot, the bio-seasons have been modified from those presented in Furness (2015) by including March in the non-breeding bio-season. This modification was made due to a high number of guillemots moving through the survey area in the March 2021 survey, which cannot plausibly represent birds from local breeding colonies and is therefore deemed to represent a migratory pulse of birds (see **Appendix 12.1: Offshore and intertidal ornithology baseline technical report** of the ES (Document Reference 6.4.12.1)). The bio-seasons used for each species and the constituent months are presented in **Table 1-1**.

1.5.3   In order to provide a more visual approach to presenting data on the species considered for disturbance and displacement within the tables contained in this report, a colour coding has been used to represent different bio-seasons and combined / extended bio-seasons. For each species, the months defining each bio-season are different; the number of bio-seasons also varies between species. The colours used to define the bio-seasons are presented in **Table 1-1**.

Table 1-1   Bio-season colour coding.

Bio-season	Gannet	Guillemot	Razorbill
Return Migration (Green)	Dec – Mar	N/A	Jan – Mar
Migration-free Breeding (Purple)	Apr – Aug	N/A	Apr – Jul
Post-breeding Migration (Red)	Sept – Nov	N/A	Aug – Oct
Migration-free Winter (Grey/Blue)	N/A	N/A	Nov – Dec
Breeding (Pink)	N/A	Apr - Jul	N/A
Non-breeding (Yellow)	N/A	Aug – Mar	N/A

Bio-season mean peak

1.5.4   As per SNCB (updated 2022) guidance, displacement assessment is based on bio-season mean peak abundances. The peak abundance within a bio-season is the highest recorded abundance from surveys within a single bio-season. Mean peak abundance is the mean of peak abundances for each bio-season across years. The bio-season mean peak abundances used for these analyses are presented in **Table 1-2**.

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Table 1-2   Bio-season mean peak abundances used for displacement assessment.

| Bio-season | Mean Peak Abundance | | | |
| | Array area only | Array area plus 2km buffer | | |
	Gannet	Gannet	Guillemot	Razorbill
Return Migration	30	123	N/A	6,303
Migration-free Breeding	53	111	N/A	32
Post-breeding Migration	29	102	N/A	26
Migration-free Winter	N/A	N/A	N/A	1,193
Breeding	N/A	N/A	1,734	N/A
Non-breeding	N/A	N/A	5,723	N/A

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2. Results

2.1 Gannet displacement matrices

Table 2-1 **Gannet return migration displacement matrix (based on abundance of 30 for Rampion 2 array area only).**

Displacement (%)	Mortality Rates (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	1	1	1	1	2	2	2	3	3
20	0	0	0	0	0	0	1	1	2	2	3	4	4	5	5	6
30	0	0	0	0	0	0	1	2	3	4	4	5	6	7	8	9
40	0	0	0	0	0	1	1	2	4	5	6	7	8	9	11	12
50	0	0	0	0	1	1	1	3	4	6	7	9	10	12	13	15
60	0	0	0	1	1	1	2	4	5	7	9	11	12	14	16	18
70	0	0	0	1	1	1	2	4	6	8	10	12	14	17	19	21
80	0	0	0	1	1	1	2	5	7	9	12	14	17	19	21	24
90	0	0	1	1	1	1	3	5	8	11	13	16	19	21	24	27
100	0	0	1	1	1	1	3	6	9	12	15	18	21	24	27	30

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Table 2-2   Gannet migration-free breeding displacement matrix (based on abundance of 53 for Rampion 2 array area only).

Displacement (%)	Mortality Rates (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
10	0	0	0	0	0	0	1	1	2	2	3	3	4	4	5	5
20	0	0	0	0	0	1	1	2	3	4	5	6	7	8	9	11
30	0	0	0	0	1	1	2	3	5	6	8	9	11	13	14	16
40	0	0	0	1	1	1	2	4	6	8	11	13	15	17	19	21
50	0	0	1	1	1	1	3	5	8	11	13	16	18	21	24	26
60	0	0	1	1	1	2	3	6	9	13	16	19	22	25	28	32
70	0	0	1	1	1	2	4	7	11	15	18	22	26	29	33	37
80	0	0	1	1	2	2	4	8	13	17	21	25	29	34	38	42
90	0	0	1	1	2	2	5	9	14	19	24	28	33	38	43	47
100	0	1	1	2	2	3	5	11	16	21	26	32	37	42	47	53

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Table 2-3   Gannet post-breeding migration displacement matrix (based on abundance of 29 for Rampion 2 array area only).

Displacement (%)	Mortality Rates (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	1	1	1	1	2	2	2	3	3
20	0	0	0	0	0	0	1	1	2	2	3	3	4	5	5	6
30	0	0	0	0	0	0	1	2	3	3	4	5	6	7	8	9
40	0	0	0	0	0	1	1	2	3	5	6	7	8	9	10	11
50	0	0	0	0	1	1	1	3	4	6	7	9	10	11	13	14
60	0	0	0	1	1	1	2	3	5	7	9	10	12	14	15	17
70	0	0	0	1	1	1	2	4	6	8	10	12	14	16	18	20
80	0	0	0	1	1	1	2	5	7	9	11	14	16	18	21	23
90	0	0	1	1	1	1	3	5	8	10	13	15	18	21	23	26
100	0	0	1	1	1	1	3	6	9	11	14	17	20	23	26	29

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Table 2-4 Gannet return migration displacement matrix (based on abundance of 123 for Rampion 2 array area plus 2km buffer).

Displacement (%)	Mortality Rates (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1
10	0	0	0	0	0	1	1	2	4	5	6	7	9	10	11	12
20	0	0	0	1	1	1	2	5	7	10	12	15	17	20	22	25
30	0	0	1	1	1	2	4	7	11	15	18	22	26	30	33	37
40	0	0	1	1	2	2	5	10	15	20	25	30	34	39	44	49
50	0	1	1	2	2	3	6	12	18	25	31	37	43	49	55	62
60	0	1	1	2	3	4	7	15	22	30	37	44	52	59	66	74
70	0	1	2	3	3	4	9	17	26	34	43	52	60	69	77	86
80	0	1	2	3	4	5	10	20	30	39	49	59	69	79	89	98
90	0	1	2	3	4	6	11	22	33	44	55	66	77	89	100	111
100	0	1	2	4	5	6	12	25	37	49	62	74	86	98	111	123

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Table 2-5   Gannet migration-free breeding displacement matrix (based on abundance of 111 for Rampion 2 array area plus 2km buffer).

Displacement (%)	Mortality Rates (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1
10	0	0	0	0	0	1	1	2	3	4	6	7	8	9	10	11
20	0	0	0	1	1	1	2	4	7	9	11	13	15	18	20	22
30	0	0	1	1	1	2	3	7	10	13	17	20	23	27	30	33
40	0	0	1	1	2	2	4	9	13	18	22	27	31	35	40	44
50	0	1	1	2	2	3	6	11	17	22	28	33	39	44	50	55
60	0	1	1	2	3	3	7	13	20	27	33	40	46	53	60	66
70	0	1	2	2	3	4	8	15	23	31	39	46	54	62	70	77
80	0	1	2	3	4	4	9	18	27	35	44	53	62	71	80	88
90	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	99
100	0	1	2	3	4	6	11	22	33	44	55	66	77	88	99	111

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Table 2-6 **Gannet post-breeding migration displacement matrix (based on abundance of 102 for Rampion 2 array area plus 2km buffer).**

Displacement (%)	Mortality Rates (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1
10	0	0	0	0	0	1	1	2	3	4	5	6	7	8	9	10
20	0	0	0	1	1	1	2	4	6	8	10	12	14	16	18	20
30	0	0	1	1	1	2	3	6	9	12	15	18	21	24	27	30
40	0	0	1	1	2	2	4	8	12	16	20	24	28	32	37	41
50	0	1	1	2	2	3	5	10	15	20	25	30	36	41	46	51
60	0	1	1	2	2	3	6	12	18	24	30	37	43	49	55	61
70	0	1	1	2	3	4	7	14	21	28	36	43	50	57	64	71
80	0	1	2	2	3	4	8	16	24	32	41	49	57	65	73	81
90	0	1	2	3	4	5	9	18	27	37	46	55	64	73	82	91
100	0	1	2	3	4	5	10	20	30	41	51	61	71	81	91	102

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2.2 Guillemot displacement matrices

Table 2-7   Guillemot breeding displacement matrix (based on abundance of 134 for Rampion 2 array area plus 2km buffer).

Displacement (%)	Mortality Rates (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1
10	0	0	0	0	1	1	1	3	4	5	7	8	9	11	12	13
20	0	0	1	1	1	1	3	5	8	11	13	16	19	21	24	27
30	0	0	1	1	2	2	4	8	12	16	20	24	28	32	36	40
40	0	1	1	2	2	3	5	11	16	21	27	32	37	43	48	54
50	0	1	1	2	3	3	7	13	20	27	33	40	47	54	60	67
60	0	1	2	2	3	4	8	16	24	32	40	48	56	64	72	80
70	0	1	2	3	4	5	9	19	28	37	47	56	66	75	84	94
80	0	1	2	3	4	5	11	21	32	43	54	64	75	86	96	107
90	0	1	2	4	5	6	12	24	36	48	60	72	84	96	108	120
100	0	1	3	4	5	7	13	27	40	54	67	80	94	107	120	134

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Table 2-8   Guillemot non-breeding displacement matrix (based on abundance of 5,723 for Rampion 2 array area plus 2km buffer).

Displacement (%)	Mortality Rates (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	1	1	2	2	3	6	11	17	23	29	34	40	46	52	57
10	0	6	11	17	23	29	57	114	172	229	286	343	401	458	515	572
20	0	11	23	34	46	57	114	229	343	458	572	687	801	916	1,030	1,145
30	0	17	34	52	69	86	172	343	515	687	858	1,030	1,202	1,374	1,545	1,717
40	0	23	46	69	92	114	229	458	687	916	1,145	1,374	1,602	1,831	2,060	2,289
50	0	29	57	86	114	143	286	572	858	1,145	1,431	1,717	2,003	2,289	2,575	2,862
60	0	34	69	103	137	172	343	687	1,030	1,374	1,717	2,060	2,404	2,747	3,090	3,434
70	0	40	80	120	160	200	401	801	1,202	1,602	2,003	2,404	2,804	3,205	3,606	4,006
80	0	46	92	137	183	229	458	916	1,374	1,831	2,289	2,747	3,205	3,663	4,121	4,578
90	0	52	103	155	206	258	515	1,030	1,545	2,060	2,575	3,090	3,606	4,121	4,636	5,151
100	0	57	114	172	229	286	572	1,145	1,717	2,289	2,862	3,434	4,006	4,578	5,151	5,723

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2.3 Razorbill displacement matrices

Table 2-9 Razorbill return migration displacement matrix (based on abundance of 6,303 for Rampion 2 array area plus 2km buffer).

Displacement (%)	Mortality Rates (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	1	1	2	3	3	6	13	19	25	32	38	44	50	57	63
10	0	6	13	19	25	32	63	126	189	252	315	378	441	504	567	630
20	0	13	25	38	50	63	126	252	378	504	630	756	882	1,008	1,134	1,261
30	0	19	38	57	76	95	189	378	567	756	945	1,134	1,324	1,513	1,702	1,891
40	0	25	50	76	101	126	252	504	756	1,008	1,261	1,513	1,765	2,017	2,269	2,521
50	0	32	63	95	126	158	315	630	945	1,261	1,576	1,891	2,206	2,521	2,836	3,151
60	0	38	76	113	151	189	378	756	1,134	1,513	1,891	2,269	2,647	3,025	3,403	3,782
70	0	44	88	132	176	221	441	882	1,324	1,765	2,206	2,647	3,088	3,530	3,971	4,412
80	0	50	101	151	202	252	504	1,008	1,513	2,017	2,521	3,025	3,530	4,034	4,538	5,042
90	0	57	113	170	227	284	567	1,134	1,702	2,269	2,836	3,403	3,971	4,538	5,105	5,672
100	0	63	126	189	252	315	630	1,261	1,891	2,521	3,151	3,782	4,412	5,042	5,672	6,303

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Table 2-10 Razorbill migration-free breeding displacement matrix (based on abundance of 32 for Rampion 2 array area plus 2km buffer).

Displacement (%)	Mortality Rates (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	1	1	1	2	2	2	3	3	3
20	0	0	0	0	0	0	1	1	2	3	3	4	4	5	6	6
30	0	0	0	0	0	0	1	2	3	4	5	6	7	8	9	10
40	0	0	0	0	1	1	1	3	4	5	6	8	9	10	12	13
50	0	0	0	0	1	1	2	3	5	6	8	10	11	13	14	16
60	0	0	0	1	1	1	2	4	6	8	10	12	13	15	17	19
70	0	0	0	1	1	1	2	4	7	9	11	13	16	18	20	22
80	0	0	1	1	1	1	3	5	8	10	13	15	18	21	23	26
90	0	0	1	1	1	1	3	6	9	12	14	17	20	23	26	29
100	0	0	1	1	1	2	3	6	10	13	16	19	22	26	29	32

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Table 2-11   Razorbill post-breeding migration displacement matrix (based on abundance of 26 for Rampion 2 array area plus 2km buffer).

Displacement (%)	Mortality Rates (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	1	1	1	1	2	2	2	2	3
20	0	0	0	0	0	0	1	1	2	2	3	3	4	4	5	5
30	0	0	0	0	0	0	1	2	2	3	4	5	5	6	7	8
40	0	0	0	0	0	1	1	2	3	4	5	6	7	8	9	10
50	0	0	0	0	1	1	1	3	4	5	6	8	9	10	12	13
60	0	0	0	0	1	1	2	3	5	6	8	9	11	12	14	15
70	0	0	0	1	1	1	2	4	5	7	9	11	13	14	16	18
80	0	0	0	1	1	1	2	4	6	8	10	12	14	16	18	21
90	0	0	0	1	1	1	2	5	7	9	12	14	16	18	21	23
100	0	0	1	1	1	1	3	5	8	10	13	15	18	21	23	26

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Table 2-12   Razorbill migration-free winter displacement matrix (based on abundance of 1,193 for Rampion 2 array area plus 2km buffer).

Displacement (%)	Mortality Rates (%)															
	0	1	2	3	4	5	10	20	30	40	50	60	70	80	90	100
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	1	1	2	4	5	6	7	8	10	11	12
10	0	1	2	4	5	6	12	24	36	48	60	72	84	95	107	119
20	0	2	5	7	10	12	24	48	72	95	119	143	167	191	215	239
30	0	4	7	11	14	18	36	72	107	143	179	215	251	286	322	358
40	0	5	10	14	19	24	48	95	143	191	239	286	334	382	429	477
50	0	6	12	18	24	30	60	119	179	239	298	358	418	477	537	596
60	0	7	14	21	29	36	72	143	215	286	358	429	501	573	644	716
70	0	8	17	25	33	42	84	167	251	334	418	501	585	668	752	835
80	0	10	19	29	38	48	95	191	286	382	477	573	668	763	859	954
90	0	11	21	32	43	54	107	215	322	429	537	644	752	859	966	1,074
100	0	12	24	36	48	60	119	239	358	477	596	716	835	954	1,074	1,193

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3. Glossary of terms and abbreviations

Table 3-1   Glossary of terms and abbreviations

Term (acronym)	Definition
DCO	An order made under the Planning Act 2008 granting development consent for one or more Nationally Significant Infrastructure Projects (NSIP).
EPP	Evidence Plan Process
ETG	Expert Topic Group
ES	Environmental Statement
km	Kilometres
RED	Rampion Extension Development Limited (the Applicant)
RSPB	Royal Society for the Protection of Birds
SSSI	Site of Special Scientific Interest
OWF	Offshore Wind Farm
WTG	Wind Turbine Generators

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4. References

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.

Parker, J., Fawcett, A., Banks, A., Rowson, T., Allen, S., Rowell, H., Harwood, A., Ludgate, C., Humphrey, O., Axelsson, M., Baker, A. & Copley, V. (2022). Offshore Wind Marine Environmental Assessments: Best Practice Advice for Evidence and Data Standards. Phase III: Expectations for data analysis and presentation at examination for offshore wind applications. Natural England. Version 1.2. 140 pp

Statutory Nature Conservation Bodies (updated 2022). Advice on how to present assessment information on the extent and potential consequences of seabird displacement from Offshore Wind Farm (OWF) developments.

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