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Volume 7B Proposed Development (Offshore) Appendices

Appendix 6-1 Offshore Ornithology Baseline Characterisation Report Annex 3 Design-based Density and Abundance Estimates of Birds on Sea (Caledonia OWF)

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Volume 7B Appendix 6-1 Annex 3 Design-based Density and Abundance Estimates of Birds on Sea (Caledonia OWF)

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Acronyms and Abbreviations

CV	Coefficient of Variation
DAS	Digital Aerial Survey
LCI	Lower Confidence Interval
OWF	Offshore Wind Farm
UCI	Upper Confidence Interval

1 Introduction

- 1.1.1.1 This annex provides the design-based density and abundance estimates for birds recorded on sea in the Caledonia Offshore Wind Farm (OWF) (including the Caledonia North Site and Caledonia South Site) and relevant buffers (2km and 4km). The tables below provide both the unapportioned, and apportioned estimates, with an availability bias correction factor applied to the relevant species (common guillemot *Uria aalge*, razorbill *Alca torda* and puffin *Fratercula arctica*).
- 1.1.1.2 For each species recorded within the 24-month Digital Aerial Survey (DAS) the raw count, abundance estimate (number of birds), lower and upper confidence intervals (LCI and UCI), density (birds/km²) and the Coefficient of Variation (CV) as a measure of precision.
- 1.1.1.3 As per the NatureScot guidance (NatureScot, 2023¹), tables on species abundance and density have been ordered first by taxonomic species groupings, then by most abundant species within each grouping.

2 Species Accounts

2.1 Wildfowl

2.1.1 Unidentified species

Unidentified wader species

2.1.1.1 No unidentified wader species on sea were recorded in the Caledonia OWF.

2.1.2 Pink-footed goose

2.1.2.1 No pink-footed goose on sea were recorded in the Caledonia OWF.

2.1.3 Mallard

2.1.3.1 No mallard on sea were recorded in the Caledonia OWF.

2.2 Laridae

2.2.1 Unidentified species

Unidentified black-backed gull species

2.2.1.1 The density and population estimates of unidentified black backed gull species in the Caledonia OWF (plus the 2km buffer and plus the 4km buffer, calculated using design-based analysis) have been presented in Table 2-1.

Table 2-1: Density and population estimate of unidentified black-backed gull species on sea in the Caledonia OWF; plus 2km buffer and plus 4km buffer, calculated using design-based analysis.

Survey	Raw Count	Abundance Estimate			Density	CV
		Abundance	LCI	UCI		
Caledonia OWF						
Nov-21	1	6	1	17	0.01	1.00
Caledonia OWF (+2km)						
Nov-21	1	6	1	17	0.01	1.00
Caledonia OWF (+4km)						
Nov-21	1	6	1	17	0.01	1.00

Unidentified large gull species

2.2.1.2 The density and population estimates of unidentified large gull species in the Caledonia OWF (plus the 2km buffer and plus the 4km buffer, calculated using design-based analysis) have been presented in Table 2–2.

Table 2–2: Density and population estimate of unidentified large gull species on sea in the Caledonia OWF; plus 2km buffer and plus 4km buffer, calculated using design-based analysis.

Survey	Raw Count	Abundance Estimate			Density	CV
		Abundance	LCI	UCI		
Caledonia OWF						
Jul-21	2	12	2	29	0.03	0.71
Sep-21	2	12	2	29	0.03	0.71
Oct-21	4	23	6	53	0.05	0.50
Nov-21	6	35	6	87	0.08	0.41
Mar-22	1	5	1	16	0.01	1.00
Jul-22	8	47	8	129	0.11	0.35
Apr-23	1	6	1	17	0.01	1.00
Caledonia OWF (+2km)						
Jul-21	2	12	2	29	0.02	0.71
Sep-21	3	17	3	34	0.03	0.58
Oct-21	5	29	6	58	0.05	0.45
Nov-21	10	57	10	126	0.09	0.32
Mar-22	1	5	1	16	0.01	1.00
Jul-22	10	58	10	161	0.09	0.32
Oct-22	1	6	1	17	0.01	1.00
Apr-23	1	6	1	17	0.01	1.00
Caledonia OWF (+4km)						
Jul-21	2	12	2	30	0.01	0.71
Sep-21	4	23	6	41	0.03	0.50
Oct-21	5	29	6	59	0.03	0.45

Survey	Raw Count	Abundance Estimate			Density	CV
		Abundance	LCI	UCI		
Nov-21	14	81	29	146	0.09	0.27
Mar-22	1	5	1	16	0.01	1.00
Jul-22	12	70	12	205	0.08	0.29
Oct-22	1	6	1	18	0.01	1.00
Apr-23	1	6	1	17	0.01	1.00

Unidentified gull species

2.2.1.3 The density and population estimates of unidentified gull species in the Caledonia OWF (plus the 2km buffer and plus the 4km buffer, calculated using design-based analysis) have been presented in Table 2–3.

Table 2–3: Density and population estimate of unidentified gull species on sea in the Caledonia OWF; plus 2km buffer and plus 4km buffer, calculated using design-based analysis.

Survey	Raw Count	Abundance Estimate			Density	CV
		Abundance	LCI	UCI		
Caledonia OWF						
Jun-21	1	6	1	18	0.01	1.00
Aug-22	1	6	1	17	0.01	1.00
Caledonia OWF (+2km)						
Jun-21	1	6	1	17	0.01	1.00
Feb-22	1	5	1	16	0.01	1.00
Aug-22	1	6	1	17	0.01	1.00
Dec-22	1	6	1	18	0.01	1.00
Caledonia OWF (+4km)						
Jul-21	1	6	1	18	0.01	1.00
Aug-21	2	12	2	29	0.01	0.71
Feb-22	1	5	1	16	0.01	1.00
Aug-22	1	6	1	17	0.01	1.00
Dec-22	1	6	1	18	0.01	1.00

Unidentified fulmar and/or gull species

2.2.1.4 No unidentified fulmar and/or gull species on sea were recorded in Caledonia OWF.

2.2.2 Kittiwake

2.2.2.1 The density and population estimates of kittiwake in the Caledonia OWF (plus the 2km buffer and plus the 4km buffer, calculated using design-based analysis) have been presented in Table 2–4 and Table 2–5.

2.2.2.2 Table 2–4 includes the unapportioned density and population estimates of kittiwake, and Table 2–5 includes the apportioned density and population estimates of kittiwake.

Table 2–4: Unapportioned density and population estimate of kittiwake on sea in the Caledonia OWF; plus 2km buffer and plus 4km buffer, calculated using design-based analysis.

Survey	Raw Count	Abundance Estimate			Density	CV
		Abundance	LCI	UCI		
Caledonia OWF						
May-21	73	426	73	1,219	1.00	0.12
Jun-21	99	581	99	1,691	1.36	0.10
Jul-21	179	1,056	179	2,324	2.47	0.07
Aug-21	4	23	6	41	0.05	0.50
Sep-21	1	6	1	17	0.01	1.00
Oct-21	4	23	4	59	0.05	0.50
Nov-21	5	29	6	52	0.07	0.45
Dec-21	1	6	1	17	0.01	1.00
Feb-22	7	38	11	76	0.09	0.38
Mar-22	2	11	2	32	0.03	0.71
Apr-22	1	6	1	17	0.01	1.00
May-22	232	1,344	452	2,335	3.15	0.07
Jun-22	181	1,040	236	2,046	2.43	0.07
Jul-22	62	363	62	1,082	0.85	0.13
Sep-22	5	29	5	75	0.07	0.45

Survey	Raw Count	Abundance Estimate			Density	CV
		Abundance	LCI	UCI		
Oct-22	3	18	3	41	0.04	0.58
Nov-22	4	24	4	59	0.06	0.50
Feb-23	5	29	5	63	0.07	0.45
Mar-23	3	18	3	35	0.04	0.58
Apr-23	34	193	34	567	0.45	0.17
Caledonia OWF (+2km)						
May-21	75	431	75	1,212	0.67	0.12
Jun-21	115	667	115	1,746	1.04	0.09
Jul-21	326	1,888	326	4,217	2.93	0.06
Aug-21	9	51	29	80	0.08	0.33
Sep-21	75	431	75	1,269	0.67	0.12
Oct-21	7	40	12	81	0.06	0.38
Nov-21	8	46	8	92	0.07	0.35
Dec-21	1	6	1	17	0.01	1.00
Feb-22	15	80	38	129	0.12	0.26
Mar-22	3	16	3	37	0.02	0.58
Apr-22	40	227	40	669	0.35	0.16
May-22	382	2,185	1,047	3,324	3.40	0.05
Jun-22	313	1,793	424	3,524	2.79	0.06
Jul-22	97	559	97	1,480	0.87	0.10
Aug-22	2	11	2	34	0.02	0.71
Sep-22	12	69	12	150	0.11	0.29
Oct-22	5	29	5	64	0.05	0.45
Nov-22	5	29	5	75	0.05	0.45
Dec-22	1	6	1	18	0.01	1.00
Feb-23	7	40	11	80	0.06	0.38

Survey	Raw Count	Abundance Estimate			Density	CV
		Abundance	LCI	UCI		
Mar-23	5	29	6	52	0.05	0.45
Apr-23	35	198	35	578	0.31	0.17
Caledonia OWF (+4km)						
May-21	78	456	78	1,251	0.52	0.11
Jun-21	143	841	143	2,142	0.95	0.08
Jul-21	631	3,810	712	7,644	4.31	0.04
Aug-21	61	354	75	853	0.40	0.13
Sep-21	90	527	90	1,469	0.60	0.11
Oct-21	10	59	18	105	0.07	0.32
Nov-21	9	52	12	105	0.06	0.33
Dec-21	2	12	2	29	0.01	0.71
Feb-22	19	104	60	154	0.12	0.23
Mar-22	7	38	11	70	0.04	0.38
Apr-22	40	231	40	686	0.26	0.16
May-22	427	2,479	1,115	3,844	2.81	0.05
Jun-22	332	1,921	359	3,669	2.17	0.05
Jul-22	379	2,215	379	5,067	2.51	0.05
Aug-22	9	52	9	132	0.06	0.33
Sep-22	14	82	18	163	0.09	0.27
Oct-22	6	35	6	76	0.04	0.41
Nov-22	5	29	5	71	0.03	0.45
Dec-22	1	6	1	18	0.01	1.00
Feb-23	14	81	23	162	0.09	0.27
Mar-23	7	41	12	76	0.38	0.38
Apr-23	38	218	38	603	0.25	0.16

Table 2-5: Apportioned density and population estimate of kittiwake on sea in the Caledonia OWF; plus 2km buffer and plus 4km buffer, calculated using design-based analysis.

Survey	Abundance Estimate			Density
	Abundance	LCI	UCI	
Caledonia OWF				
May-21	426	73	1,219	1.00
Jun-21	581	99	1,691	1.36
Jul-21	1,062	180	2,342	2.48
Aug-21	23	6	41	0.05
Sep-21	6	1	17	0.01
Oct-21	23	4	59	0.05
Nov-21	29	6	52	0.07
Dec-21	6	1	17	0.01
Feb-22	38	11	76	0.09
Mar-22	11	2	32	0.03
Apr-22	6	1	17	0.01
May-22	1,344	452	2,335	3.14
Jun-22	1,040	236	2,046	2.43
Jul-22	363	62	1,082	0.85
Aug-22	5	1	14	0.01
Sep-22	29	5	75	0.07
Oct-22	18	3	41	0.04
Nov-22	24	4	59	0.06
Feb-23	29	5	63	0.07
Mar-23	18	3	35	0.04
Apr-23	193	34	567	0.45
Caledonia OWF (+2km)				
May-21	431	75	1,212	0.67

Survey	Abundance Estimate			Density
	Abundance	LCI	UCI	
Jun-21	667	115	1,746	1.04
Jul-21	1,894	327	4,234	2.94
Aug-21	51	29	80	0.08
Sep-21	431	75	1,269	0.67
Oct-21	40	12	81	0.06
Nov-21	46	8	92	0.07
Dec-21	6	1	17	0.01
Feb-22	82	38	136	0.13
Mar-22	16	3	37	0.02
Apr-22	227	40	669	0.35
May-22	2,185	1,047	3,324	3.39
Jun-22	1,793	424	3,524	2.78
Jul-22	559	97	1,480	0.87
Aug-22	17	3	51	0.03
Sep-22	69	12	150	0.11
Oct-22	29	5	64	0.05
Nov-22	29	5	75	0.05
Dec-22	8	1	23	0.01
Feb-23	40	11	80	0.06
Mar-23	29	6	52	0.05
Apr-23	198	35	578	0.31
Caledonia OWF (+4km)				
May-21	456	78	1,251	0.52
Jun-21	841	143	2,142	0.95
Jul-21	3,816	713	7,661	4.31

Survey	Abundance Estimate			Density
	Abundance	LCI	UCI	
Aug-21	366	77	882	0.41
Sep-21	527	90	1,469	0.60
Oct-21	59	18	105	0.07
Nov-21	52	12	105	0.06
Dec-21	12	2	29	0.01
Feb-22	106	60	159	0.12
Mar-22	38	11	70	0.04
Apr-22	231	40	686	0.26
May-22	2,479	1,115	3,844	2.80
Jun-22	1,921	359	3,669	2.17
Jul-22	2,215	379	5,067	2.50
Aug-22	58	10	149	0.07
Sep-22	82	18	163	0.09
Oct-22	35	6	76	0.04
Nov-22	29	5	71	0.03
Dec-22	7	1	20	0.01
Feb-23	81	23	162	0.09
Mar-23	41	12	76	0.05
Apr-23	218	38	603	0.25

2.2.3 Great black-backed gull

2.2.3.1 The density and population estimates of great black-backed gull in the Caledonia OWF (plus the 2km buffer and plus the 4km buffer, calculated using design-based analysis) have been presented in Table 2–6 and Table 2–7.

2.2.3.2 Table 2–6 includes the unapportioned density and population estimates of great black-backed gull, and Table 2–7 includes the apportioned density and population estimates of great black-backed gull.

Table 2–6: Unapportioned density and population estimate of great black-backed gull on sea in the Caledonia OWF; plus 2km buffer and plus 4km buffer, calculated using design-based analysis.

Survey	Raw Count	Abundance Estimate			Density	CV
		Abundance	LCI	UCI		
Caledonia OWF						
Sep-21	8	46	8	116	0.11	0.35
Oct-21	3	18	3	53	0.04	0.58
Nov-21	58	337	145	645	0.79	0.13
Dec-21	4	23	4	52	0.05	0.50
Jan-22	14	81	35	122	0.19	0.27
Feb-22	11	59	11	119	0.14	0.30
Sep-22	1	6	1	17	0.01	1.00
Oct-22	16	93	35	158	0.22	0.25
Nov-22	1	6	1	18	0.01	1.00
Jan-23	5	29	6	52	0.07	0.45
Feb-23	3	17	6	34	0.04	0.58
Caledonia OWF (+2km)						
Sep-21	23	132	34	247	0.21	0.21
Oct-21	18	104	18	231	0.16	0.24
Nov-21	97	555	315	875	0.86	0.10
Dec-21	4	23	4	46	0.04	0.50
Jan-22	23	131	63	200	0.20	0.21
Feb-22	17	91	38	145	0.14	0.24

Survey	Raw Count	Abundance Estimate			Density	CV
		Abundance	LCI	UCI		
Sep-22	2	12	2	29	0.02	0.71
Oct-22	22	128	64	192	0.20	0.21
Nov-22	3	17	3	46	0.03	0.58
Dec-22	1	6	1	18	0.01	1.00
Jan-23	11	64	17	122	0.10	0.30
Feb-23	5	29	6	57	0.05	0.45
Mar-23	2	12	2	23	0.02	0.71
Caledonia OWF (+4km)						
Sep-21	42	246	82	445	0.28	0.15
Oct-21	40	234	82	392	0.26	0.16
Nov-21	122	710	402	1,083	0.80	0.09
Dec-21	5	29	6	58	0.03	0.45
Jan-22	32	185	116	255	0.21	0.18
Feb-22	23	126	55	214	0.14	0.21
Sep-22	6	35	6	76	0.04	0.41
Oct-22	32	188	106	270	0.21	0.18
Nov-22	4	24	4	47	0.03	0.50
Dec-22	6	35	6	88	0.04	0.41
Jan-23	17	100	35	171	0.11	0.24
Feb-23	8	46	17	81	0.05	0.35
Mar-23	4	23	6	41	0.03	0.50

Table 2-7: Apportioned density and population estimate of great black-backed gull on sea in the Caledonia OWF; plus 2km buffer and plus 4km buffer, calculated using design-based analysis.

Survey	Abundance Estimate			Density
	Abundance	LCI	UCI	
Caledonia OWF				
Sep-21	58	10	145	0.14
Oct-21	32	7	87	0.07
Nov-21	375	152	740	0.88
Dec-21	23	4	52	0.05
Jan-22	81	35	122	0.19
Feb-22	59	11	119	0.14
Aug-22	1	-	3	-
Sep-22	6	1	17	0.01
Oct-22	93	35	158	0.22
Nov-22	6	1	18	0.01
Jan-23	29	6	52	0.07
Feb-23	17	6	34	0.04
Caledonia OWF (+2km)				
Sep-21	149	37	281	0.23
Oct-21	130	23	283	0.20
Nov-21	612	325	1,002	0.95
Dec-21	23	4	46	0.04
Jan-22	131	63	200	0.20
Feb-22	94	38	153	0.15
Sep-22	12	2	29	0.02
Oct-22	133	65	207	0.21
Nov-22	17	3	46	0.03
Dec-22	8	1	23	0.01

Survey	Abundance Estimate			Density
	Abundance	LCI	UCI	
Jan-23	64	17	122	0.10
Feb-23	29	6	57	0.05
Mar-23	12	2	23	0.02
Apr-23	4	1	10	0.01
Caledonia OWF (+4km)				
Sep-21	269	88	486	0.30
Oct-21	259	87	443	0.29
Nov-21	790	430	1,231	0.89
Dec-21	29	6	58	0.03
Jan-22	185	116	255	0.21
Feb-22	128	55	221	0.15
Sep-22	35	6	76	0.04
Oct-22	194	107	286	0.22
Nov-22	24	4	47	0.03
Dec-22	39	7	99	0.04
Jan-23	100	35	171	0.11
Feb-23	46	17	81	0.05
Mar-23	23	6	41	0.03
Apr-23	5	1	12	0.01

2.2.4 Herring gull

2.2.4.1 The density and population estimates of herring gull in the Caledonia OWF (plus the 2km buffer and plus the 4km buffer, calculated using design-based analysis) have been presented in Table 2–8 and Table 2–9.

2.2.4.2 Table 2–8 includes the unapportioned density and population estimates of herring gull, and Table 2–9 includes the apportioned density and population estimates of herring gull.

Table 2–8: Unapportioned density and population estimate of herring gull on sea in the Caledonia OWF; plus 2km buffer and plus 4km buffer, calculated using design-based analysis.

Survey	Raw Count	Abundance Estimate			Density	CV
		Abundance	LCI	UCI		
Caledonia OWF						
May-21	1	6	1	17	0.01	1.00
Jun-21	1	6	1	18	0.01	1.00
Oct-21	2	12	2	29	0.03	0.71
Nov-21	6	35	6	70	0.08	0.41
Feb-22	1	5	1	16	0.01	1.00
Mar-22	1	5	1	16	0.01	1.00
Jul-22	6	35	6	82	0.08	0.41
Oct-22	2	12	2	29	0.03	0.71
Nov-22	1	6	1	18	0.01	1.00
Dec-22	2	12	2	35	0.03	0.71
Mar-23	1	6	1	18	0.01	1.00
Caledonia OWF (+2km)						
May-21	1	6	1	17	0.01	1.00
Jun-21	1	6	1	17	0.01	1.00
Oct-21	2	12	2	29	0.02	0.71
Nov-21	12	69	23	126	0.11	0.29
Feb-22	1	5	1	16	0.01	1.00
Mar-22	1	5	1	16	0.01	1.00

Survey	Raw Count	Abundance Estimate			Density	CV
		Abundance	LCI	UCI		
Jul-22	7	40	12	86	0.06	0.38
Oct-22	2	12	2	29	0.02	0.71
Nov-22	1	6	1	17	0.01	1.00
Dec-22	2	12	2	35	0.02	0.71
Mar-23	1	6	1	17	0.01	1.00
Caledonia OWF (+4km)						
May-21	1	6	1	18	0.01	1.00
Jun-21	1	6	1	18	0.01	1.00
Jul-21	16	97	16	290	0.11	0.25
Oct-21	6	35	12	64	0.04	0.41
Nov-21	12	70	23	128	0.08	0.29
Feb-22	6	33	6	93	0.04	0.41
Mar-22	1	5	1	16	0.01	1.00
Jul-22	9	53	12	111	0.06	0.33
Oct-22	2	12	2	29	0.01	0.71
Nov-22	1	6	1	18	0.01	1.00
Dec-22	2	12	2	35	0.01	0.71
Mar-23	1	6	1	18	0.01	1.00

Table 2-9: Apportioned density and population estimate of herring gull on sea in the Caledonia OWF; plus 2km buffer and plus 4km buffer, calculated using design-based analysis.

Survey	Abundance Estimate			Density
	Abundance	LCI	UCI	
Caledonia OWF				
May-21	6	1	17	0.01
Jun-21	6	1	18	0.01
Jul-21	7	1	16	0.02
Oct-21	21	4	48	0.05
Nov-21	38	6	79	0.09
Feb-22	5	1	16	0.01
Mar-22	10	2	32	0.02
Jul-22	63	11	152	0.15
Oct-22	12	2	29	0.03
Nov-22	6	1	18	0.01
Dec-22	12	2	35	0.03
Mar-23	6	1	18	0.01
Apr-23	6	1	17	0.01
Caledonia OWF (+2km)				
May-21	6	1	17	0.01
Jun-21	6	1	17	0.01
Jul-21	12	2	16	0.02
Oct-21	15	3	35	0.02
Nov-21	75	24	142	0.12
Feb-22	5	1	17	0.01
Mar-22	10	2	32	0.02
Jul-22	77	20	175	0.12
Oct-22	13	2	31	0.02

Survey	Abundance Estimate			Density
	Abundance	LCI	UCI	
Nov-22	6	1	17	0.01
Dec-22	15	3	44	0.02
Mar-23	6	1	17	0.01
Apr-23	2	-	7	-
Caledonia OWF (+4km)				
May-21	6	1	18	0.01
Jun-21	6	1	18	0.01
Jul-21	106	18	309	0.12
Oct-21	39	13	72	0.04
Nov-21	77	25	143	0.09
Feb-22	34	6	96	0.04
Mar-22	10	2	32	0.01
Jul-22	102	21	237	0.12
Oct-22	12	2	31	0.01
Nov-22	6	1	18	0.01
Dec-22	13	2	39	0.02
Mar-23	6	1	18	0.01
Apr-23	1	-	5	-

2.2.5 Common gull

2.2.5.1 No common gull on sea were recorded in the Caledonia OWF.

2.2.6 Lesser black-backed gull

2.2.6.1 The density and population estimates of lesser black-backed gull in the Caledonia OWF (plus the 2km buffer and plus the 4km buffer, calculated using design-based analysis) have been presented in Table 2-10 and Table 2-11.

2.2.6.2 Table 2-10 includes the unapportioned density and population estimates of lesser black-backed gull, and Table 2-11 includes the apportioned density and population estimates of lesser black-backed gull.

Table 2-10: Unapportioned density and population estimate of lesser black-backed gull on sea in the Caledonia OWF; plus 2km buffer and plus 4km buffer, calculated using design-based analysis.

Survey	Raw Count	Abundance Estimate			Density	CV
		Abundance	LCI	UCI		
Caledonia OWF						
Jul-22	4	23	4	70	0.05	0.50
Caledonia OWF (+2km)						
Jul-22	4	23	4	69	0.04	0.50
Caledonia OWF (+4km)						
Jul-21	2	12	2	36	0.01	0.71
Jul-22	4	23	4	70	0.03	0.50

Table 2-11: Apportioned density and population estimate of lesser black-backed gull on sea in the Caledonia OWF; plus 2km buffer and plus 4km buffer, calculated using design-based analysis.

Survey	Abundance Estimate			Density
	Abundance	LCI	UCI	
Caledonia OWF				
Jul-21	5	1	13	0.01
Jul-22	42	7	129	0.10
Caledonia OWF (+2km)				
Jul-21	-	1	13	-
Jul-22	44	7	141	0.07
Caledonia OWF (+4km)				
Jul-21	16	3	48	0.02
Jul-22	44	7	149	0.05

2.3 Sterninae

2.3.1 Unidentified species

Commic tern

2.3.1.1 The density and population estimates of commic tern in the Caledonia OWF (plus the 2km buffer and plus the 4km buffer, calculated using design-based analysis) have been presented in Table 2–12.

Table 2–12: Density and population estimate of unidentified commic tern species on sea in the Caledonia OWF; plus 2km buffer and plus 4km buffer, calculated using design-based analysis.

Survey	Raw Count	Abundance Estimate			Density	CV
		Abundance	LCI	UCI		
Caledonia OWF						
May-22	2	12	2	35	0.03	0.71
Caledonia OWF (+2km)						
May-22	2	11	2	34	0.02	0.71
Caledonia OWF (+4km)						
May-22	4	23	4	58	0.03	0.50

Unidentified tern species

2.3.1.2 The density and population estimates of unidentified tern species in the Caledonia OWF (plus the 2km buffer and plus the 4km buffer, calculated using design-based analysis) have been presented in Table 2–13.

Table 2–13: Density and population estimate of unidentified tern species on sea in the Caledonia OWF; plus 2km buffer and plus 4km buffer, calculated using design-based analysis.

Survey	Raw Count	Abundance Estimate			Density	CV
		Abundance	LCI	UCI		
Caledonia OWF						
<i>None recorded</i>						
Caledonia OWF (+2km)						
Jun-21	2	12	2	35	0.02	0.71
Caledonia OWF (+4km)						
Jun-21	2	12	2	36	0.01	0.71

2.3.2 Common tern

2.3.2.1 No common tern on sea were recorded in the Caledonia OWF.

2.3.3 Arctic tern

2.3.3.1 No Arctic tern on sea were recorded in the Caledonia OWF.

2.4 Stercorariidae

2.4.1 Great skua

2.4.1.1 The density and population estimates of great skua in the Caledonia OWF (plus the 2km buffer and plus the 4km buffer, calculated using design-based analysis) have been presented in Table 2–14 and Table 2–15.

2.4.1.2 Table 2–14 includes the unapportioned density and population estimates of great skua, and Table 2–15 includes the apportioned density and population estimates of great skua.

Table 2–14: Unapportioned density and population estimate of great skua on sea in the Caledonia OWF; plus 2km buffer and plus 4km buffer, calculated using design-based analysis.

Survey	Raw Count	Abundance Estimate			Density	CV
		Abundance	LCI	UCI		
Caledonia OWF						
Jun-21	1	6	1	18	0.01	1.00
Jul-21	3	18	3	53	0.04	0.50
Jul-22	1	6	1	18	0.01	1.00
Caledonia OWF (+2km)						
Jun-21	1	6	1	17	0.01	1.00
Jul-21	4	23	4	70	0.04	0.50
Jul-22	1	6	1	17	0.01	1.00
Caledonia OWF (+4km)						
Jun-21	1	6	1	18	0.01	1.00
Jul-21	6	36	6	97	0.04	0.41
Jul-22	1	6	1	18	0.01	1.00

Table 2-15: Apportioned density and population estimate of great skua on sea in the Caledonia OWF; plus 2km buffer and plus 4km buffer, calculated using design-based analysis.

Survey	Abundance Estimate			Density
	Abundance	LCI	UCI	
Caledonia OWF				
Jun-21	6	1	18	0.01
Jul-21	18	3	53	0.04
Jul-22	6	1	18	0.01
Caledonia OWF (+2km)				
Jun-21	6	1	17	0.01
Jul-21	23	4	70	0.04
Jul-22	6	1	17	0.01
Caledonia OWF (+4km)				
Jun-21	6	1	18	0.01
Jul-21	36	6	97	0.04
Jul-22	6	1	18	0.01

2.4.2 Arctic skua

2.4.2.1 No Arctic skua on sea were recorded in the Caledonia OWF.

2.6 Alcidae

2.6.1 Unidentified species

Unidentified guillemot and/or razorbill

2.6.1.1 The density and population estimates of unidentified guillemot and/or razorbill species in the Caledonia OWF (plus the 2km buffer and plus the 4km buffer, calculated using design-based analysis) have been presented in Table 2–16.

Table 2–16: Density and population estimate of unidentified guillemot and/or razorbill on sea in the Caledonia OWF; plus 2km buffer and plus 4km buffer, calculated using design-based analysis.

Survey	Raw Count	Abundance Estimate			Density	CV
		Abundance	LCI	UCI		
Caledonia OWF						
May-21	63	367	163	630	0.86	0.13
Jun-21	101	593	352	957	1.39	0.10
Jul-21	28	165	59	283	0.39	0.19
Aug-21	72	417	156	839	0.98	0.12
Sep-21	68	395	278	511	0.92	0.12
Oct-21	15	88	35	146	0.21	0.26
Nov-21	18	105	46	163	0.25	0.24
Dec-21	73	424	267	598	0.99	0.12
Jan-22	17	98	52	156	0.23	0.24
Feb-22	103	556	384	708	1.30	0.10
Mar-22	21	112	64	150	0.26	0.22
Apr-22	22	127	58	196	0.30	0.21
May-22	155	898	539	1,304	2.10	0.08
Jun-22	23	132	46	253	0.31	0.21
Jul-22	79	462	164	819	1.08	0.11
Aug-22	10	58	17	104	0.14	0.32
Sep-22	105	608	434	764	1.42	0.10

Survey	Raw Count	Abundance Estimate			Density	CV
		Abundance	LCI	UCI		
Oct-22	3	18	3	47	0.04	0.58
Nov-22	21	123	35	218	0.29	0.22
Dec-22	11	64	29	105	0.15	0.30
Jan-23	3	17	3	41	0.04	0.58
Feb-23	11	63	23	115	0.15	0.30
Mar-23	23	134	70	198	0.31	0.21
Apr-23	20	113	20	283	0.26	0.22
Caledonia OWF (+2km)						
May-21	124	712	327	1,270	1.11	0.09
Jun-21	220	1,276	626	2,094	1.98	0.07
Jul-21	53	307	127	510	0.48	0.14
Aug-21	146	833	360	1,575	1.29	0.08
Sep-21	109	626	454	809	0.97	0.10
Oct-21	34	196	98	300	0.30	0.17
Nov-21	21	120	46	200	0.19	0.22
Dec-21	132	756	573	945	1.17	0.09
Jan-22	22	126	57	211	0.20	0.21
Feb-22	162	868	713	1,024	1.35	0.08
Mar-22	32	170	106	239	0.26	0.18
Apr-22	36	204	79	346	0.32	0.17
May-22	235	1,344	864	1,830	2.09	0.07
Jun-22	35	201	86	350	0.31	0.17
Jul-22	152	875	495	1,324	1.36	0.08
Aug-22	22	126	57	217	0.20	0.21
Sep-22	172	993	693	1,287	1.54	0.08

Survey	Raw Count	Abundance Estimate			Density	CV
		Abundance	LCI	UCI		
Oct-22	4	23	4	47	0.04	0.50
Nov-22	24	139	58	226	0.22	0.20
Dec-22	13	76	35	128	0.12	0.28
Jan-23	4	23	4	52	0.04	0.50
Feb-23	14	80	34	131	0.12	0.27
Mar-23	35	203	122	289	0.32	0.17
Apr-23	25	142	40	306	0.22	0.20
Caledonia OWF (+4km)						
May-21	166	970	514	1,584	1.10	0.08
Jun-21	354	2,083	994	3,365	2.36	0.05
Jul-21	77	465	242	718	0.53	0.11
Aug-21	401	2,326	876	4,107	2.63	0.05
Sep-21	168	983	626	1,457	1.11	0.08
Oct-21	53	310	158	480	0.35	0.14
Nov-21	28	163	70	274	0.18	0.19
Dec-21	200	1,165	891	1,422	1.32	0.07
Jan-22	29	168	99	255	0.19	0.19
Feb-22	211	1,158	851	1,433	1.31	0.07
Mar-22	50	270	157	394	0.31	0.14
Apr-22	48	277	115	450	0.31	0.14
May-22	312	1,812	1,097	2,508	2.05	0.06
Jun-22	47	272	133	434	0.31	0.15
Jul-22	219	1,280	713	2,110	1.45	0.07
Aug-22	38	218	126	316	0.25	0.16
Sep-22	228	1,330	957	1,698	1.51	0.07

Survey	Raw Count	Abundance Estimate			Density	CV
		Abundance	LCI	UCI		
Oct-22	5	29	6	59	0.03	0.45
Nov-22	28	165	83	254	0.19	0.19
Dec-22	17	100	53	159	0.11	0.24
Jan-23	5	29	6	59	0.03	0.45
Feb-23	21	122	64	185	0.14	0.22
Mar-23	40	235	141	323	0.27	0.16
Apr-23	26	149	46	321	0.17	0.20

Unidentified auk species

2.6.1.2 The density and population estimates of unidentified auk species in the Caledonia OWF (plus the 2km buffer and plus the 4km buffer, calculated using design-based analysis) have been presented in Table 2–17.

Table 2–17: Density and population estimate of unidentified auk species on sea in the Caledonia OWF; plus 2km buffer and plus 4km buffer, calculated using design-based analysis.

Survey	Raw Count	Abundance Estimate			Density	CV
		Abundance	LCI	UCI		
Caledonia OWF						
May-21	3	17	3	41	0.04	0.58
Jun-21	4	23	4	47	0.05	0.50
Jul-21	18	106	59	159	0.25	0.24
Aug-21	51	295	98	602	0.69	0.14
Sep-21	3	17	3	46	0.04	0.58
Oct-21	11	64	18	111	0.15	0.30
Feb-22	1	5	1	16	0.01	1.00
Mar-22	3	16	3	37	0.04	0.58
Apr-22	6	35	6	63	0.08	0.41
May-22	15	87	41	156	0.20	0.26
Jun-22	3	17	3	46	0.04	0.58
Jul-22	10	58	23	99	0.14	0.32
Aug-22	4	23	4	46	0.05	0.50
Sep-22	24	139	24	284	0.33	0.20
Oct-22	2	12	2	35	0.03	0.71
Nov-22	1	6	1	18	0.01	1.00
Dec-22	1	6	1	18	0.01	1.00
Jan-23	1	6	1	17	0.01	1.00
Feb-23	1	6	1	17	0.01	1.00
Mar-23	2	12	2	29	0.03	0.71

Survey	Raw Count	Abundance Estimate			Density	CV
		Abundance	LCI	UCI		
Apr-23	1	6	1	17	0.01	1.00
Caledonia OWF (+2km)						
May-21	5	29	5	63	0.05	0.45
Jun-21	7	41	7	81	0.06	0.38
Jul-21	36	209	116	330	0.32	0.17
Aug-21	94	536	200	953	0.83	0.10
Sep-21	9	52	11	103	0.08	0.33
Oct-21	14	81	29	138	0.13	0.27
Feb-22	3	16	3	43	0.02	0.58
Mar-22	3	16	3	37	0.02	0.58
Apr-22	11	62	23	108	0.10	0.30
May-22	20	114	57	183	0.18	0.22
Jun-22	7	40	7	80	0.06	0.38
Jul-22	15	86	35	144	0.13	0.26
Aug-22	7	40	11	69	0.06	0.38
Sep-22	40	231	104	364	0.36	0.16
Oct-22	2	12	2	35	0.02	0.71
Nov-22	1	6	1	17	0.01	1.00
Dec-22	3	18	3	35	0.03	0.58
Jan-23	1	6	1	17	0.01	1.00
Feb-23	1	6	1	17	0.01	1.00
Mar-23	2	12	2	29	0.02	0.71
Apr-23	7	40	7	79	0.06	0.38
Caledonia OWF (+4km)						
May-21	6	35	6	76	0.04	0.41

Survey	Raw Count	Abundance Estimate			Density	CV
		Abundance	LCI	UCI		
Jun-21	10	59	18	106	0.07	0.32
Jul-21	43	260	151	386	0.29	0.15
Aug-21	190	1,102	429	1,949	1.25	0.07
Sep-21	12	70	18	129	0.08	0.29
Oct-21	16	94	35	158	0.11	0.25
Feb-22	3	16	3	44	0.02	0.58
Mar-22	3	16	3	38	0.02	0.58
Apr-22	18	104	46	167	0.12	0.24
May-22	24	139	70	232	0.16	0.20
Jun-22	8	46	8	98	0.05	0.35
Jul-22	16	94	47	164	0.11	0.25
Aug-22	7	40	11	75	0.05	0.38
Sep-22	46	268	123	426	0.30	0.15
Oct-22	3	18	3	47	0.02	0.58
Nov-22	2	12	2	29	0.01	0.71
Dec-22	3	18	3	35	0.02	0.58
Jan-23	1	6	1	18	0.01	1.00
Feb-23	2	12	2	35	0.01	0.71
Mar-23	5	29	6	59	0.03	0.45
Apr-23	10	57	23	98	0.06	0.32

Unidentified auks and/or shearwater species

2.6.1.3 The density and population estimates of unidentified auk and/or shearwater species in the Caledonia OWF (plus the 2km buffer and plus the 4km buffer, calculated using design-based analysis) have been presented in Table 2–18.

Table 2–18: Density and population estimate of unidentified auks and/or shearwater species on sea in the Caledonia OWF; plus 2km buffer and plus 4km buffer, calculated using design-based analysis.

Survey	Raw Count	Abundance Estimate			Density	CV
		Abundance	LCI	UCI		
Caledonia OWF						
May-21	2	12	2	35	0.03	0.71
Jun-21	2	12	2	35	0.03	0.71
Jul-21	7	41	7	94	0.10	0.38
Apr-22	1	6	1	17	0.01	1.00
May-22	6	35	12	64	0.08	0.41
Jun-22	2	11	2	29	0.03	0.71
Sep-22	1	6	1	17	0.01	1.00
Mar-23	2	12	2	35	0.03	0.71
Apr-23	1	6	1	17	0.01	1.00
Caledonia OWF (+2km)						
May-21	4	23	4	57	0.04	0.50
Jun-21	13	75	13	174	0.12	0.28
Jul-21	11	64	12	139	0.10	0.30
Apr-22	1	6	1	17	0.01	1.00
May-22	9	51	17	92	0.08	0.33
Jun-22	2	11	2	29	0.02	0.71
Aug-22	1	6	1	17	0.01	1.00
Sep-22	74	427	74	1,270	0.66	0.12
Mar-23	3	17	3	41	0.03	0.58

Survey	Raw Count	Abundance Estimate			Density	CV
		Abundance	LCI	UCI		
Caledonia OWF (+4km)						
May-21	6	35	6	82	0.04	0.41
Jun-21	13	76	13	171	0.09	0.28
Jul-21	12	72	18	157	0.08	0.29
Apr-22	2	12	2	29	0.01	0.71
May-22	9	52	17	93	0.06	0.33
Jun-22	2	12	2	29	0.01	0.71
Aug-22	1	6	1	17	0.01	1.00
Sep-22	74	432	74	1,290	0.49	0.12
Mar-23	4	23	4	53	0.03	0.50
Apr-23	1	6	1	17	0.01	1.00

2.6.2 Common guillemot

- 2.6.2.1 The density and population estimates of common guillemot in the Caledonia OWF (plus the 2km buffer and plus the 4km buffer, calculated using design-based analysis) have been presented in Table 2-19 and Table 2-20.
- 2.6.2.2 Table 2-19 includes the unapportioned density and population estimates of common guillemot, and Table 2-20 includes the apportioned density and population estimates of common guillemot.
- 2.6.2.3 The availability bias-corrected density and population estimate of all common guillemot in the Caledonia OWF (plus the 2km buffer and plus the 4km buffer, calculated using design-based analysis) has also been included in Table 2-21.

Table 2-19: Unapportioned density and population estimate of common guillemot on sea in the Caledonia OWF; plus 2km buffer and plus 4km buffer, calculated using design-based analysis. Not corrected for availability bias.

Survey	Raw Count	Abundance Estimate			Density	CV
		Abundance	LCI	UCI		
Caledonia OWF						
May-21	799	4,659	3,067	6,256	10.90	0.04
Jun-21	406	2,383	1,661	3,193	5.58	0.05
Jul-21	1,083	6,387	2,672	12,556	14.95	0.03
Aug-21	35	203	127	289	0.48	0.17
Sep-21	166	963	627	1,311	2.25	0.08
Oct-21	88	515	328	737	1.21	0.11
Nov-21	150	871	732	1,034	2.04	0.08
Dec-21	9	52	23	81	0.12	0.33
Jan-22	42	243	93	405	0.57	0.15
Feb-22	60	324	221	443	0.76	0.13
Mar-22	21	112	64	161	0.26	0.22
Apr-22	80	461	259	679	1.08	0.11
May-22	1,458	8,448	5,388	12,086	19.77	0.03
Jun-22	974	5,597	3,201	8,534	13.10	0.03
Jul-22	689	4,030	2,404	5,738	9.43	0.04
Aug-22	49	282	92	525	0.66	0.14
Sep-22	385	2,228	1,250	3,461	5.21	0.05
Oct-22	21	123	47	228	0.29	0.22
Nov-22	2	12	2	29	0.03	0.71
Dec-22	35	205	111	299	0.48	0.17
Jan-23	62	361	210	507	0.84	0.13
Feb-23	87	499	293	781	1.17	0.11
Mar-23	264	1,540	1,097	1,995	3.60	0.06

Survey	Raw Count	Abundance Estimate			Density	CV
		Abundance	LCI	UCI		
Apr-23	246	1,394	436	2,976	3.26	0.06
Caledonia OWF (+2km)						
May-21	1,428	8,204	5,355	11,048	12.75	0.03
Jun-21	616	3,573	2,494	4,820	5.55	0.04
Jul-21	1,769	10,247	3,852	20,466	15.92	0.02
Aug-21	50	285	194	388	0.44	0.14
Sep-21	489	2,807	1,418	4,771	4.36	0.05
Oct-21	146	842	536	1,112	1.31	0.08
Nov-21	268	1,533	1,270	1,853	2.38	0.06
Dec-21	14	80	40	126	0.12	0.27
Jan-22	64	366	200	560	0.57	0.13
Feb-22	94	504	311	724	0.78	0.10
Mar-22	30	159	96	228	0.25	0.18
Apr-22	117	664	352	1004	1.03	0.09
May-22	2,325	13,300	8,643	17,905	20.67	0.02
Jun-22	1,627	9,322	5,626	13,138	14.49	0.02
Jul-22	1,210	6,967	4,082	10,577	10.83	0.03
Aug-22	111	635	412	881	0.99	0.09
Sep-22	1,298	7,491	2,101	16,315	11.64	0.03
Oct-22	61	355	111	775	0.55	0.13
Nov-22	4	23	6	41	0.04	0.50
Dec-22	56	327	233	420	0.51	0.13
Jan-23	88	511	331	697	0.79	0.11
Feb-23	152	868	560	1,211	1.35	0.08
Mar-23	374	2,165	1,436	2,848	3.36	0.05
Apr-23	329	1,865	873	3,515	2.90	0.06

Survey	Raw Count	Abundance Estimate			Density	CV
		Abundance	LCI	UCI		
Caledonia OWF (+4km)						
May-21	1,830	10,695	7,007	14,114	12.10	0.02
Jun-21	797	4,689	3,112	6,431	5.31	0.04
Jul-21	2,406	14,527	5,760	26,409	16.44	0.02
Aug-21	95	551	406	708	0.62	0.10
Sep-21	800	4,682	2,400	7,696	5.30	0.04
Oct-21	249	1,457	972	1,984	1.65	0.06
Nov-21	405	2,358	1,828	2,893	2.67	0.05
Dec-21	18	105	58	163	0.12	0.24
Jan-22	85	493	272	713	0.56	0.11
Feb-22	134	736	461	1,060	0.83	0.09
Mar-22	54	292	167	432	0.33	0.14
Apr-22	152	876	484	1,315	0.99	0.08
May-22	3,040	17,651	11,467	24,136	19.97	0.02
Jun-22	2,094	12,119	7,431	17,096	13.71	0.02
Jul-22	2,310	13,501	6,897	20,736	15.28	0.02
Aug-22	156	896	580	1,252	1.01	0.08
Sep-22	2,033	11,863	4,447	23,522	13.42	0.02
Oct-22	94	553	141	1,135	0.63	0.10
Nov-22	13	77	29	136	0.09	0.28
Dec-22	81	478	318	625	0.54	0.11
Jan-23	126	741	494	1,035	0.84	0.09
Feb-23	201	1,164	747	1,627	1.32	0.07
Mar-23	466	2,736	1,896	3,517	3.10	0.05
Apr-23	378	2,169	1,113	3,862	2.45	0.05

Table 2-20: Apportioned density and population estimate of common guillemot on sea in the Caledonia OWF; plus 2km buffer and plus 4km buffer, calculated using design-based analysis. Not corrected for availability bias.

Survey	Abundance Estimate			Density
	Abundance	LCI	UCI	
Caledonia OWF				
May-21	5,025	3,222	6,908	11.75
Jun-21	2,941	1,986	4,102	6.88
Jul-21	6,662	2,778	13,038	15.58
Aug-21	435	223	739	1.02
Sep-21	1,324	880	1,793	3.10
Oct-21	644	375	950	1.51
Nov-21	976	778	1,197	2.28
Dec-21	346	235	445	0.81
Jan-22	335	143	547	0.78
Feb-22	730	525	947	1.71
Mar-22	220	127	309	0.51
Apr-22	551	301	811	1.29
May-22	9,336	5,922	13,370	21.83
Jun-22	5,754	3,251	8,855	13.46
Jul-22	4,503	2,573	6,578	10.53
Aug-22	332	103	622	0.78
Sep-22	2,664	1,548	4,048	6.23
Oct-22	152	52	304	0.35
Nov-22	55	11	119	0.13
Dec-22	266	139	403	0.62
Jan-23	380	214	553	0.89
Feb-23	552	312	881	1.29
Mar-23	1,675	1,162	2,216	3.92

Survey	Abundance Estimate			Density
	Abundance	LCI	UCI	
Apr-23	1,496	455	3,230	3.50
Caledonia OWF (+2km)				
May-21	8,903	5,663	12,320	13.82
Jun-21	4,780	3,067	6,820	7.42
Jul-21	10,760	4,066	21,353	16.71
Aug-21	745	408	1,221	1.16
Sep-21	3,418	1,829	5,607	5.31
Oct-21	1,091	654	1,497	1.69
Nov-21	1,653	1,316	2,053	2.57
Dec-21	611	489	777	0.95
Jan-22	480	254	748	0.74
Feb-22	1,106	789	1,474	1.72
Mar-22	309	189	445	0.48
Apr-22	803	407	1,230	1.25
May-22	14,635	9,488	19,727	22.72
Jun-22	9,570	5,719	13,589	14.86
Jul-22	7,828	4,553	11,905	12.15
Aug-22	739	456	1,060	1.15
Sep-22	8,676	2,601	18,584	13.47
Oct-22	386	117	846	0.60
Nov-22	67	26	110	0.10
Dec-22	403	267	545	0.63
Jan-23	535	335	752	0.83
Feb-23	936	589	1,326	1.45
Mar-23	2,369	1,550	3,158	3.68
Apr-23	2,017	915	3,836	3.13

Survey	Abundance Estimate			Density
	Abundance	LCI	UCI	
Caledonia OWF (+4km)				
May-21	11,640	7,486	15,689	13.16
Jun-21	6,546	3,998	9,402	7.40
Jul-21	15,226	6,093	27,548	17.22
Aug-21	2,113	1,078	3,266	2.39
Sep-21	5,639	2,976	9,155	6.38
Oct-21	1,833	1,155	2,574	2.07
Nov-21	2,521	1,898	3,167	2.85
Dec-21	979	796	1,184	1.11
Jan-22	647	363	944	0.73
Feb-22	1,551	1,021	2,132	1.75
Mar-22	526	305	776	0.59
Apr-22	1,057	557	1,606	1.20
May-22	19,410	12,527	26,581	21.95
Jun-22	12,443	7,572	17,647	14.07
Jul-22	14,767	7,584	22,844	16.70
Aug-22	1,074	681	15,13	1.21
Sep-22	13,400	5,243	26,238	15.15
Oct-22	596	149	1,229	0.67
Nov-22	160	81	261	0.18
Dec-22	576	366	782	0.65
Jan-23	771	500	1,099	0.87
Feb-23	1,267	799	1,795	1.43
Mar-23	2,983	2,028	3,888	3.37
Apr-23	2,340	1,173	4,210	2.65

Table 2-21: Availability bias-corrected density and population estimate of common guillemot on sea in the Caledonia OWF; plus 2km buffer and plus 4km buffer, calculated using design-based analysis.

Survey	Abundance Estimate			Density
	Abundance	LCI	UCI	
Caledonia OWF				
May-21	6,588	4,225	9,056	15.41
Jun-21	3,856	2,603	5,377	9.02
Jul-21	8,734	3,642	17,093	20.42
Aug-21	570	292	969	1.33
Sep-21	1,736	1,153	2,350	4.06
Oct-21	844	492	1,246	1.97
Nov-21	1,280	1,020	1,569	2.99
Dec-21	454	308	584	1.06
Jan-22	439	188	717	1.03
Feb-22	957	688	1,241	2.24
Mar-22	288	167	405	0.67
Apr-22	722	394	1,064	1.69
May-22	12,240	7,764	17,528	28.62
Jun-22	7,543	4,262	11,609	17.64
Jul-22	5,904	3,373	8,624	13.81
Aug-22	435	136	816	1.02
Sep-22	3,492	2,030	5,307	8.17
Oct-22	199	68	399	0.46
Nov-22	72	14	156	0.17
Dec-22	349	183	529	0.82
Jan-23	498	280	725	1.16
Feb-23	724	409	1,155	1.69
Mar-23	2,196	1,523	2,906	5.14

Survey	Abundance Estimate			Density
	Abundance	LCI	UCI	
Apr-23	1,961	597	4,235	4.59
Caledonia OWF (+2km)				
May-21	11,671	7,424	16,151	18.12
Jun-21	6,267	4,021	8,941	9.73
Jul-21	14,107	5,330	27,993	21.90
Aug-21	976	534	1,601	1.52
Sep-21	4,481	2,398	7,351	6.96
Oct-21	1,430	858	1,962	2.22
Nov-21	2,167	1,725	2,691	3.36
Dec-21	800	642	1,018	1.24
Jan-22	629	333	980	0.98
Feb-22	1,450	1,034	1,932	2.25
Mar-22	405	248	583	0.63
Apr-22	1,052	534	1,613	1.63
May-22	19,186	12,439	25,862	29.79
Jun-22	12,546	7,498	17,815	19.48
Jul-22	10,263	5,969	15,607	15.93
Aug-22	969	597	1,390	1.50
Sep-22	11,374	3,409	24,364	17.66
Oct-22	507	153	1,109	0.79
Nov-22	88	34	144	0.14
Dec-22	529	350	714	0.82
Jan-23	702	440	986	1.09
Feb-23	1,227	772	1,738	1.91
Mar-23	3,106	2,032	4,140	4.82
Apr-23	2,644	1,200	5,029	4.10

Survey	Abundance Estimate			Density
	Abundance	LCI	UCI	
Caledonia OWF (+4km)				
May-21	15,260	9,814	20,568	17.26
Jun-21	8,582	5,241	12,327	9.70
Jul-21	19,962	7,987	36,116	22.57
Aug-21	2,770	1,413	4,281	3.13
Sep-21	7,392	3,901	12,002	8.36
Oct-21	2,404	1,515	3,374	2.72
Nov-21	3,305	2,488	4,152	3.74
Dec-21	1,283	1,044	1,552	1.45
Jan-22	848	476	1,237	0.96
Feb-22	2,034	1,339	2,795	2.30
Mar-22	689	399	1,017	0.78
Apr-22	1,386	731	2,105	1.57
May-22	25,447	16,423	34,848	28.77
Jun-22	16,313	9,927	23,135	18.45
Jul-22	19,360	9,943	29,948	21.89
Aug-22	1,408	893	1,984	1.59
Sep-22	17,567	6,874	34,398	19.86
Oct-22	781	196	1,612	0.88
Nov-22	209	107	343	0.24
Dec-22	755	480	1,025	0.85
Jan-23	1,011	656	1,441	1.14
Feb-23	1,661	1,047	2,354	1.88
Mar-23	3,911	2,659	5,097	4.42
Apr-23	3,067	1,538	5,519	3.47

2.6.4 Razorbill

- 2.6.4.1 The density and population estimates of razorbill in the Caledonia OWF (plus the 2km buffer and plus the 4km buffer, calculated using design-based analysis) have been presented in Table 2–22 and Table 2–23.
- 2.6.4.2 Table 2–22 includes the unapportioned density and population estimates of razorbill, and Table 2–23 includes the apportioned density and population estimates of razorbill.
- 2.6.4.3 The availability bias-corrected density and population estimate of all razorbill in the Caledonia OWF (plus the 2km buffer and plus the 4km buffer, calculated using design-based analysis) has also been included in Table 2–24.

Table 2–22: Unapportioned density and population estimate of razorbill on sea in the Caledonia OWF; plus 2km buffer and plus 4km buffer, calculated using design-based analysis. Not corrected for availability bias.

Survey	Raw Count	Abundance Estimate			Density	CV
		Abundance	LCI	UCI		
Caledonia OWF						
May-21	63	367	245	478	0.86	0.13
Jun-21	49	288	170	429	0.67	0.14
Jul-21	126	743	419	1,197	1.74	0.09
Aug-21	35	203	104	307	0.48	0.17
Sep-21	23	133	70	197	0.31	0.21
Oct-21	6	35	18	53	0.08	0.41
Dec-21	4	23	6	52	0.05	0.50
Jan-22	3	17	3	41	0.04	0.58
Feb-22	23	124	59	194	0.29	0.21
Mar-22	4	21	4	43	0.05	0.50
Apr-22	55	317	127	570	0.74	0.13
May-22	204	1,182	550	2,138	2.77	0.07
Jun-22	17	98	52	144	0.23	0.24
Jul-22	65	380	246	509	0.89	0.12
Aug-22	20	115	58	184	0.27	0.22

Survey	Raw Count	Abundance Estimate			Density	CV
		Abundance	LCI	UCI		
Sep-22	248	1,435	648	2,378	3.36	0.06
Oct-22	1	6	1	18	0.01	1.00
Nov-22	4	24	6	47	0.06	0.50
Dec-22	5	29	6	53	0.07	0.45
Jan-23	13	76	29	122	0.18	0.28
Feb-23	26	149	80	247	0.35	0.20
Mar-23	72	423	270	575	0.48	0.12
Apr-23	56	317	62	725	0.59	0.13
Caledonia OWF (+2km)						
May-21	129	741	488	977	1.15	0.09
Jun-21	90	522	313	783	0.81	0.11
Jul-21	195	1,130	626	1,830	1.76	0.07
Aug-21	51	291	171	417	0.45	0.14
Sep-21	52	299	184	413	0.46	0.14
Oct-21	8	46	23	69	0.07	0.35
Dec-21	6	34	11	57	0.05	0.41
Jan-22	7	40	11	69	0.06	0.38
Feb-22	44	236	155	306	0.37	0.15
Mar-22	7	37	16	58	0.06	0.38
Apr-22	89	505	238	862	0.78	0.11
May-22	287	1,642	910	2,626	2.55	0.06
Jun-22	24	138	92	183	0.21	0.20
Jul-22	138	795	507	1,094	1.24	0.09
Aug-22	55	315	200	458	0.49	0.13
Sep-22	390	2,251	1,368	3,238	3.50	0.05

Survey	Raw Count	Abundance Estimate			Density	CV
		Abundance	LCI	UCI		
Oct-22	7	41	7	117	0.06	0.38
Nov-22	9	52	12	104	0.08	0.33
Dec-22	13	76	29	128	0.12	0.28
Jan-23	17	99	46	163	0.15	0.24
Feb-23	39	223	120	343	0.35	0.16
Mar-23	50	289	162	428	0.45	0.14
Apr-23	77	437	119	873	0.68	0.11
Caledonia OWF (+4km)						
May-21	178	1,040	684	1,426	1.18	0.07
Jun-21	150	883	482	1,394	1.00	0.08
Jul-21	294	1,775	1,195	2,451	2.01	0.06
Aug-21	61	354	186	540	0.40	0.13
Sep-21	79	462	281	655	0.52	0.11
Oct-21	10	59	35	82	0.07	0.32
Dec-21	6	35	12	64	0.04	0.41
Jan-22	8	46	23	75	0.05	0.35
Feb-22	59	324	242	401	0.37	0.13
Mar-22	12	65	27	108	0.07	0.29
Apr-22	139	801	461	1,263	0.91	0.08
May-22	403	2,340	1,295	3,640	2.65	0.05
Jun-22	33	191	110	260	0.22	0.17
Jul-22	194	1,134	719	1,613	1.28	0.07
Aug-22	60	345	184	528	0.39	0.13
Sep-22	503	2,935	1,762	4,143	3.32	0.04
Oct-22	8	47	8	123	0.05	0.35

Survey	Raw Count	Abundance Estimate			Density	CV
		Abundance	LCI	UCI		
Nov-22	15	88	18	171	0.10	0.26
Dec-22	17	100	53	147	0.11	0.24
Jan-23	20	118	59	188	0.13	0.22
Feb-23	59	342	208	486	0.39	0.13
Mar-23	72	423	270	575	0.48	0.12
Apr-23	89	511	172	953	0.58	0.11

Table 2-23: Apportioned density and population estimate of razorbill on sea in the Caledonia OWF; plus 2km buffer and plus 4km buffer, calculated using design-based analysis. Not corrected for availability bias.

Survey	Abundance Estimate			Density
	Abundance	LCI	UCI	
Caledonia OWF				
May-21	396	257	528	0.93
Jun-21	355	203	551	0.83
Jul-21	775	436	1,243	1.81
Aug-21	435	182	785	1.02
Sep-21	183	98	269	0.43
Oct-21	44	21	68	0.10
Dec-21	153	61	286	0.36
Jan-22	23	5	55	0.05
Feb-22	279	140	414	0.65
Mar-22	41	8	82	0.10
Apr-22	379	147	681	0.89
May-22	1,306	605	2,365	3.05
Jun-22	101	53	149	0.24
Jul-22	425	263	584	0.99
Aug-22	135	65	218	0.32
Sep-22	1,716	803	2,781	4.01
Oct-22	7	1	24	0.02
Nov-22	110	33	193	0.26
Dec-22	38	8	72	0.09
Jan-23	80	29	133	0.19
Feb-23	165	85	279	0.39
Mar-23	273	161	382	0.64

Survey	Abundance Estimate			Density
	Abundance	LCI	UCI	
Apr-23	340	65	787	0.80
Caledonia OWF (+2km)				
May-21	804	516	1,089	1.25
Jun-21	698	385	1,108	1.08
Jul-21	1,187	661	1,909	1.84
Aug-21	760	359	1,313	1.18
Sep-21	364	237	485	0.57
Oct-21	60	28	93	0.09
Dec-21	259	135	351	0.40
Jan-22	52	14	92	0.08
Feb-22	518	393	623	0.80
Mar-22	72	32	113	0.11
Apr-22	611	275	1,056	0.95
May-22	1,807	999	2,893	2.81
Jun-22	142	94	189	0.22
Jul-22	893	565	1,231	1.39
Aug-22	366	221	551	0.57
Sep-22	2,607	1,693	3,688	4.05
Oct-22	45	7	128	0.07
Nov-22	153	51	278	0.24
Dec-22	94	33	166	0.15
Jan-23	104	47	176	0.16
Feb-23	241	126	376	0.37
Mar-23	316	175	475	0.49
Apr-23	473	125	953	0.73

Survey	Abundance Estimate			Density
	Abundance	LCI	UCI	
Caledonia OWF (+4km)				
May-21	1,132	731	1,585	1.28
Jun-21	1,233	619	2,038	1.39
Jul-21	1,860	1,264	2,557	2.10
Aug-21	1,358	494	2,491	1.54
Sep-21	556	348	779	0.63
Oct-21	74	42	106	0.08
Dec-21	326	165	465	0.37
Jan-22	60	31	99	0.07
Feb-22	683	536	806	0.77
Mar-22	117	49	194	0.13
Apr-22	966	531	1,542	1.09
May-22	2,573	1,415	4,009	2.91
Jun-22	196	112	268	0.22
Jul-22	1,240	791	1,777	1.40
Aug-22	413	216	638	0.47
Sep-22	3,315	2,077	4,621	3.75
Oct-22	51	8	133	0.06
Nov-22	182	51	329	0.21
Dec-22	120	61	184	0.14
Jan-23	123	60	200	0.14
Feb-23	372	222	536	0.42
Mar-23	461	289	636	0.52
Apr-23	551	181	1,039	0.62

Table 2–24: Availability bias-corrected density and population estimate of razorbill on sea in the Caledonia OWF; plus 2km buffer and plus 4km buffer, calculated using design-based analysis.

Survey	Abundance Estimate			Density
	Abundance	LCI	UCI	
Caledonia OWF				
May-21	479	312	639	1.12
Jun-21	430	246	667	1.01
Jul-21	938	528	1,505	2.19
Aug-21	527	221	951	1.23
Sep-21	221	119	326	0.52
Oct-21	53	25	83	0.12
Dec-21	185	74	346	0.43
Jan-22	28	6	67	0.07
Feb-22	338	170	502	0.79
Mar-22	50	10	100	0.12
Apr-22	459	179	825	1.07
May-22	1,582	732	2,864	3.70
Jun-22	122	64	181	0.29
Jul-22	514	319	707	1.20
Aug-22	164	79	264	0.38
Sep-22	2,078	972	3,368	4.86
Oct-22	9	1	29	0.02
Nov-22	133	40	234	0.31
Dec-22	46	9	87	0.11
Jan-23	97	36	161	0.23
Feb-23	200	103	337	0.47
Mar-23	331	195	463	0.77
Apr-23	412	78	953	0.96

Survey	Abundance Estimate			Density
	Abundance	LCI	UCI	
Caledonia OWF (+2km)				
May-21	974	625	1,319	1.51
Jun-21	846	466	1,342	1.31
Jul-21	1,437	800	2,312	2.23
Aug-21	921	435	1,590	1.43
Sep-21	441	287	588	0.68
Oct-21	72	34	112	0.11
Dec-21	314	163	425	0.49
Jan-22	63	17	112	0.10
Feb-22	627	476	754	0.97
Mar-22	87	38	137	0.14
Apr-22	739	334	1,279	1.15
May-22	2,188	1,210	3,504	3.40
Jun-22	172	113	229	0.27
Jul-22	1,082	685	1,491	1.68
Aug-22	444	268	667	0.69
Sep-22	3,157	2,051	4,467	4.90
Oct-22	54	9	155	0.08
Nov-22	185	62	337	0.29
Dec-22	114	40	201	0.18
Jan-23	126	56	213	0.19
Feb-23	291	153	455	0.45
Mar-23	383	212	575	0.59
Apr-23	572	151	1,154	0.89

Survey	Abundance Estimate			Density
	Abundance	LCI	UCI	
Caledonia OWF (+4km)				
May-21	1,371	885	1,920	1.55
Jun-21	1,493	750	2,468	1.69
Jul-21	2,253	1,531	3,096	2.55
Aug-21	1,644	598	3,016	1.86
Sep-21	674	422	944	0.76
Oct-21	90	50	129	0.10
Dec-21	395	200	563	0.45
Jan-22	73	37	120	0.08
Feb-22	827	649	977	0.94
Mar-22	142	60	235	0.16
Apr-22	1,170	643	1,867	1.32
May-22	3,116	1,713	4,855	3.52
Jun-22	237	136	325	0.27
Jul-22	1,502	957	2,152	1.70
Aug-22	501	262	773	0.57
Sep-22	4,015	2,516	5,597	4.54
Oct-22	61	10	161	0.07
Nov-22	221	61	398	0.25
Dec-22	146	74	223	0.16
Jan-23	149	72	242	0.17
Feb-23	451	269	649	0.51
Mar-23	559	350	770	0.63
Apr-23	667	220	1,258	0.75

2.6.5 Puffin

- 2.6.5.1 The density and population estimates of puffin in the Caledonia OWF (plus the 2km buffer and plus the 4km buffer, calculated using design-based analysis) have been presented in Table 2–25 and Table 2–26.
- 2.6.5.2 Table 2–25 includes the unapportioned density and population estimates of puffin, and Table 2–26 includes the apportioned density and population estimates of puffin.
- 2.6.5.3 The availability bias-corrected density and population estimate of all puffin in the Caledonia OWF (plus the 2km buffer and plus the 4km buffer, calculated using design-based analysis) has also been included in Table 2–27.

Table 2–25: Unapportioned density and population estimate of puffin on sea in the Caledonia OWF; plus 2km buffer and plus 4km buffer, calculated using design-based analysis. Not corrected for availability bias.

Survey	Raw Count	Abundance Estimate			Density	CV
		Abundance	LCI	UCI		
Caledonia OWF						
May-21	43	251	122	408	0.59	0.15
Jun-21	36	211	76	387	0.49	0.17
Jul-21	43	254	106	454	0.59	0.15
Aug-21	370	2,142	1,019	3,438	5.01	0.05
Sep-21	13	75	41	110	0.18	0.28
Oct-21	28	164	70	269	0.38	0.19
Apr-22	88	507	242	858	1.19	0.11
May-22	107	620	394	863	1.45	0.10
Jun-22	9	52	9	121	0.12	0.33
Jul-22	26	152	88	222	0.36	0.20
Aug-22	59	340	208	478	0.8	0.13
Sep-22	211	1,221	619	1,921	2.86	0.07
Jan-23	3	17	3	52	0.04	0.58
Feb-23	5	29	6	52	0.07	0.45
Mar-23	9	53	18	93	0.12	0.33

Survey	Raw Count	Abundance Estimate			Density	CV
		Abundance	LCI	UCI		
Apr-23	5	28	5	57	0.07	0.45
Caledonia OWF (+2km)						
May-21	73	419	282	586	0.65	0.12
Jun-21	50	290	104	499	0.45	0.14
Jul-21	73	423	243	631	0.66	0.12
Aug-21	462	2,636	1,381	4,177	4.10	0.05
Sep-21	18	103	52	172	0.16	0.24
Oct-21	34	196	81	323	0.30	0.17
Mar-22	2	11	2	32	0.02	0.71
Apr-22	140	794	431	1,236	1.23	0.08
May-22	157	898	572	1,207	1.4	0.08
Jun-22	14	80	29	160	0.12	0.27
Jul-22	26	150	75	230	0.23	0.20
Aug-22	95	543	332	755	0.84	0.10
Sep-22	340	1,962	1,218	2,753	3.05	0.05
Jan-23	3	17	3	52	0.03	0.58
Feb-23	7	40	11	69	0.06	0.38
Mar-23	11	64	17	110	0.10	0.30
Apr-23	8	45	17	79	0.07	0.35
Caledonia OWF (+4km)						
May-21	102	596	392	842	0.67	0.10
Jun-21	80	471	253	718	0.53	0.11
Jul-21	103	622	405	869	0.70	0.10
Aug-21	562	3,260	1,862	4,815	3.69	0.04
Sep-21	25	146	94	211	0.17	0.20

Survey	Raw Count	Abundance Estimate			Density	CV
		Abundance	LCI	UCI		
Oct-21	39	228	100	369	0.26	0.16
Mar-22	2	11	2	32	0.01	0.71
Apr-22	194	1,119	669	1,626	1.27	0.07
May-22	204	1,184	662	1,666	1.34	0.07
Jun-22	24	139	58	231	0.16	0.20
Jul-22	37	216	140	310	0.24	0.16
Aug-22	137	787	454	1,189	0.89	0.09
Sep-22	490	2,859	1,698	4,056	3.24	0.05
Oct-22	4	24	6	41	0.03	0.5
Jan-23	5	29	5	76	0.03	0.45
Feb-23	7	41	12	75	0.05	0.38
Mar-23	14	82	35	135	0.09	0.27
Apr-23	10	57	23	98	0.06	0.32

Table 2-26: Apportioned density and population estimate of puffin on sea in the Caledonia OWF; plus 2km buffer and plus 4km buffer, calculated using design-based analysis. Not corrected for availability bias.

Survey	Abundance Estimate			Density
	Abundance	LCI	UCI	
Caledonia OWF				
May-21	252	122	412	0.59
Jun-21	214	76	395	0.50
Jul-21	259	108	462	0.61
Aug-21	2,390	1,099	3,951	5.59
Sep-21	76	41	113	0.18
Oct-21	179	73	297	0.42
Apr-22	523	245	891	1.22
May-22	627	397	876	1.47
Jun-22	52	9	122	0.12
Jul-22	154	89	225	0.36
Aug-22	351	210	497	0.82
Sep-22	1,257	625	1,996	2.94
Jan-23	17	3	53	0.04
Feb-23	29	6	53	0.07
Mar-23	54	18	95	0.13
Apr-23	28	5	58	0.07
Caledonia OWF (+2km)				
May-21	421	282	592	0.65
Jun-21	298	105	520	0.46
Jul-21	433	250	644	0.67
Aug-21	3,076	1,539	4,976	4.78
Sep-21	105	52	175	0.16

Survey	Abundance Estimate			Density
	Abundance	LCI	UCI	
Oct-21	211	85	353	0.33
Mar-22	12	2	36	0.02
Apr-22	821	441	1,286	1.28
May-22	907	576	1,222	1.41
Jun-22	80	29	161	0.12
Jul-22	152	76	233	0.24
Aug-22	560	336	786	0.87
Sep-22	2,072	1,264	2,955	3.22
Jan-23	17	3	53	0.03
Feb-23	40	11	70	0.06
Mar-23	65	17	112	0.10
Apr-23	46	17	81	0.07
Caledonia OWF (+4km)				
May-21	599	393	850	0.68
Jun-21	481	255	741	0.54
Jul-21	634	414	885	0.72
Aug-21	4,123	2,188	6,363	4.66
Sep-21	148	95	214	0.17
Oct-21	240	103	393	0.27
Mar-22	11	2	34	0.01
Apr-22	1,165	689	1,702	1.32
May-22	1,195	666	1,684	1.35
Jun-22	140	58	233	0.16
Jul-22	217	141	312	0.25
Aug-22	805	458	1,226	0.91

Survey	Abundance Estimate			Density
	Abundance	LCI	UCI	
Sep-22	2,972	1,740	4,275	3.36
Oct-22	25	6	42	0.03
Jan-23	29	5	77	0.03
Feb-23	41	12	76	0.05
Mar-23	83	35	139	0.09
Apr-23	58	23	100	0.07

Table 2-27: Availability bias-corrected density and population estimate of puffin on sea in the Caledonia OWF; plus 2km buffer and plus 4km buffer, calculated using design-based analysis.

Survey	Abundance Estimate			Density
	Abundance	LCI	UCI	
Caledonia OWF				
May-21	294	142	480	0.69
Jun-21	249	89	460	0.58
Jul-21	302	126	538	0.71
Aug-21	2,784	1,280	4,603	6.51
Sep-21	89	48	132	0.21
Oct-21	208	85	346	0.49
Apr-22	610	285	1,038	1.43
May-22	731	463	1,020	1.71
Jun-22	61	11	142	0.14
Jul-22	179	103	263	0.42
Aug-22	408	245	578	0.96
Sep-22	1,465	728	2,325	3.43
Jan-23	20	4	62	0.05
Feb-23	34	7	62	0.08
Mar-23	63	21	111	0.15
Apr-23	33	6	67	0.08
Caledonia OWF (+2km)				
May-21	491	329	689	0.76
Jun-21	347	122	605	0.54
Jul-21	504	291	750	0.78
Aug-21	3,583	1,793	5,797	5.56
Sep-21	122	61	204	0.19
Oct-21	245	99	411	0.38

Survey	Abundance Estimate			Density
	Abundance	LCI	UCI	
Mar-22	14	2	42	0.02
Apr-22	957	514	1,498	1.49
May-22	1,057	671	1,424	1.64
Jun-22	94	34	188	0.15
Jul-22	177	88	271	0.27
Aug-22	652	392	916	1.01
Sep-22	2,414	1,473	3,442	3.75
Jan-23	20	4	62	0.03
Feb-23	47	13	81	0.07
Mar-23	75	20	131	0.12
Apr-23	53	20	94	0.08
Caledonia OWF (+4km)				
May-21	698	457	990	0.79
Jun-21	561	297	863	0.63
Jul-21	739	483	1,031	0.84
Aug-21	4,803	2,548	7,413	5.43
Sep-21	172	110	250	0.19
Oct-21	280	120	458	0.32
Mar-22	13	2	40	0.02
Apr-22	1,358	803	1,982	1.54
May-22	1,392	776	1,962	1.57
Jun-22	163	68	271	0.18
Jul-22	253	164	364	0.29
Aug-22	938	534	1,428	1.06
Sep-22	3,463	2,027	4,981	3.92

Survey	Abundance Estimate			Density
	Abundance	LCI	UCI	
Oct-22	29	7	49	0.03
Jan-23	34	6	90	0.04
Feb-23	48	14	89	0.05
Mar-23	97	41	161	0.11
Apr-23	68	27	117	0.08

2.6.6 Black guillemot

2.6.6.1 The density and population estimates of black guillemot in the Caledonia OWF (plus the 2km buffer and plus the 4km buffer, calculated using design-based analysis) have been presented in Table 2–28 and Table 2–29.

2.6.6.2 Table 2–28 includes the unapportioned density and population estimates of black guillemot, and Table 2–29 includes the apportioned density and population estimates of black guillemot.

Table 2–28: Unapportioned density and population estimate of black guillemot on sea in the Caledonia OWF; plus 2km buffer and plus 4km buffer, calculated using design-based analysis.

Survey	Raw Count	Abundance Estimate			Density	CV
		Abundance	LCI	UCI		
Caledonia OWF						
Jun-21	1	6	1	18	0.01	1.00
Jun-22	1	6	1	17	0.01	1.00
Caledonia OWF (+2km)						
Jun-21	1	6	1	17	0.01	1.00
Apr-22	1	6	1	17	0.01	1.00
Caledonia OWF (+4km)						
Jun-21	1	6	1	18	0.01	1.00
Apr-22	1	6	1	17	0.01	1.00
Jun-22	2	12	2	29	0.01	0.71

Table 2–29: Apportioned density and population estimate of black guillemot on sea in the Caledonia OWF; plus 2km buffer and plus 4km buffer, calculated using design-based analysis.

Survey	Abundance Estimate			Density
	Abundance	LCI	UCI	
Caledonia OWF				
Jun-21	6	1	18	0.01
Jun-22	6	1	17	0.01
Caledonia OWF (+2km)				
Jun-21	6	1	18	0.01
Apr-22	6	1	18	0.01
Jun-22	11	2	29	0.02
Caledonia OWF (+4km)				
Jun-21	6	1	19	0.01
Apr-22	6	1	18	0.01
Jun-22	12	2	29	0.01

2.7 Gaviidae

2.7.1 Red-throated diver

2.7.1.1 No red-throated diver on sea were recorded at Caledonia OWF.

2.7.2 Great northern diver

2.7.2.1 The density and population estimates of great northern diver in the Caledonia OWF (plus the 2km buffer and plus the 4km buffer, calculated using design-based analysis) have been presented in Table 2–30 and Table 2–31.

2.7.2.2 Table 2–30 includes the unapportioned density and population estimates of great northern diver, and Table 2–31 includes the apportioned density and population estimates of great northern diver.

Table 2-30: Unapportioned density and population estimate of great northern diver on sea in the Caledonia OWF; plus 2km buffer and plus 4km buffer, calculated using design-based analysis.

Survey	Raw Count	Abundance Estimate			Density	CV
		Abundance	LCI	UCI		
Caledonia OWF						
Jun-21	1	6	1	18	0.01	1.00
Nov-21	1	6	1	17	0.01	1.00
Caledonia OWF (+2km)						
Jun-21	1	6	1	17	0.01	1.00
Nov-21	1	6	1	17	0.01	1.00
Caledonia OWF (+4km)						
Jun-21	1	6	1	18	0.01	1.00
Nov-21	1	6	1	17	0.01	1.00

Table 2-31: Apportioned density and population estimate of great northern diver on sea in the Caledonia OWF; plus 2km buffer and plus 4km buffer, calculated using design-based analysis.

Survey	Abundance Estimate			Density
	Abundance	LCI	UCI	
Caledonia OWF				
Jun-21	6	1	18	0.01
Nov-21	6	1	17	0.01
Caledonia OWF (+2km)				
Jun-21	6	1	17	0.01
Nov-21	6	1	17	0.01
Caledonia OWF (+4km)				
Jun-21	6	1	18	0.01
Nov-21	6	1	17	0.01

2.8 Procellariidae

2.8.1 Unidentified species

Unidentified fulmar and/or gull species

2.8.1.1 No unidentified fulmar and/or gull species on sea were recorded in the Caledonia OWF.

Unidentified small shearwater species

2.8.1.2 No unidentified small shearwater species on sea were recorded in the Caledonia OWF.

Unidentified shearwater species

2.8.1.3 The density and population estimates of unidentified shearwater species in the Caledonia OWF (plus the 2km buffer and plus the 4km buffer, calculated using design-based analysis) have been presented in Table 2–32.

Table 2–32: Density and population estimate of unidentified shearwater species on sea in the Caledonia OWF; plus 2km buffer and plus 4km buffer, calculated using design-based analysis.

Survey	Raw Count	Abundance Estimate			Density	CV
		Abundance	LCI	UCI		
Caledonia OWF						
<i>None recorded</i>						
Caledonia OWF (+2km)						
Sep-22	1	6	1	17	0.01	1.00
Caledonia OWF (+4km)						
Sep-22	1	6	1	18	0.01	1.00

2.8.2 Fulmar

2.8.2.1 The density and population estimates of fulmar in the Caledonia OWF (plus the 2km buffer and plus the 4km buffer, calculated using design-based analysis) have been presented in Table 2–33 and Table 2–34.

2.8.2.2 Table 2–33 includes the unapportioned density and population estimates of fulmar, and Table 2–34 includes the apportioned density and population estimates of fulmar.

Table 2-33: Unapportioned density and population estimate of fulmar on sea in the Caledonia OWF; plus 2km buffer and plus 4km buffer, calculated using design-based analysis.

Survey	Raw Count	Abundance Estimate			Density	CV
		Abundance	LCI	UCI		
Caledonia OWF						
May-21	13	76	47	117	0.18	0.28
Jun-21	20	117	59	182	0.27	0.22
Jul-21	370	2,182	370	5,650	5.11	0.05
Aug-21	12	69	17	133	0.16	0.29
Sep-21	35	203	116	302	0.48	0.17
Oct-21	2	12	2	29	0.03	0.71
Nov-21	80	465	80	1,342	1.09	0.11
Dec-21	4	23	6	46	0.05	0.50
Jan-22	6	35	6	75	0.08	0.41
Feb-22	20	108	49	167	0.25	0.22
Mar-22	2	11	2	27	0.03	0.71
Apr-22	26	150	26	334	0.35	0.2
May-22	11	64	29	122	0.15	0.3
Jun-22	26	149	69	253	0.35	0.2
Jul-22	475	2,778	1,024	4,849	6.50	0.05
Aug-22	4	23	4	46	0.05	0.50
Sep-22	12	69	23	127	0.16	0.29
Nov-22	9	53	9	118	0.12	0.33
Dec-22	2	12	2	35	0.03	0.71
Jan-23	2	12	2	29	0.03	0.71
Feb-23	1	6	1	17	0.01	1.00
Mar-23	28	163	88	245	0.38	0.19
Apr-23	6	34	6	68	0.08	0.41

Survey	Raw Count	Abundance Estimate			Density	CV
		Abundance	LCI	UCI		
Caledonia OWF (+2km)						
May-21	26	149	98	213	0.23	0.20
Jun-21	27	157	81	249	0.24	0.19
Jul-21	480	2,780	521	7,003	4.32	0.05
Aug-21	19	108	51	177	0.17	0.23
Sep-21	44	253	155	367	0.39	0.15
Oct-21	5	29	5	63	0.05	0.45
Nov-21	99	566	99	1,498	0.88	0.10
Dec-21	9	52	17	92	0.08	0.33
Jan-22	8	46	8	103	0.07	0.35
Feb-22	26	139	70	214	0.22	0.2
Mar-22	2	11	2	27	0.02	0.71
Apr-22	28	159	28	346	0.25	0.19
May-22	22	126	46	246	0.20	0.21
Jun-22	54	309	120	510	0.48	0.14
Jul-22	771	4,439	2,188	7,848	6.90	0.04
Aug-22	20	114	23	235	0.18	0.22
Sep-22	26	150	63	254	0.23	0.20
Nov-22	16	93	23	174	0.14	0.25
Dec-22	5	29	6	58	0.05	0.45
Jan-23	3	17	3	35	0.03	0.58
Feb-23	3	17	3	34	0.03	0.58
Mar-23	38	220	116	353	0.34	0.16
Apr-23	11	62	11	142	0.10	0.30

Survey	Raw Count	Abundance Estimate			Density	CV
		Abundance	LCI	UCI		
Caledonia OWF (+4km)						
May-21	29	169	94	257	0.19	0.19
Jun-21	46	271	188	365	0.31	0.15
Jul-21	603	3,641	785	8,429	4.12	0.04
Aug-21	23	133	70	209	0.15	0.21
Sep-21	79	462	281	673	0.52	0.11
Oct-21	10	59	10	129	0.07	0.32
Nov-21	108	629	108	1,554	0.71	0.1
Dec-21	14	82	41	128	0.09	0.27
Jan-22	9	52	9	110	0.06	0.33
Feb-22	39	214	126	313	0.24	0.16
Mar-22	4	22	5	38	0.02	0.50
Apr-22	32	185	35	381	0.21	0.18
May-22	23	134	52	250	0.15	0.21
Jun-22	74	428	231	677	0.48	0.12
Jul-22	1,191	6,961	2,028	12,799	7.88	0.03
Aug-22	37	213	80	385	0.24	0.16
Sep-22	34	198	93	321	0.22	0.17
Oct-22	2	12	2	35	0.01	0.71
Nov-22	18	106	29	200	0.12	0.24
Dec-22	7	41	12	71	0.05	0.38
Jan-23	11	65	35	100	0.07	0.30
Feb-23	7	41	12	69	0.05	0.38
Mar-23	55	323	164	487	0.37	0.13
Apr-23	18	103	40	195	0.12	0.24

Table 2–34: Apportioned density and population estimate of fulmar on sea in the Caledonia OWF; plus 2km buffer and plus 4km buffer, calculated using design-based analysis.

Survey	Abundance Estimate			Density
	Abundance	LCI	UCI	
Caledonia OWF				
May-21	76	47	117	0.18
Jun-21	117	59	182	0.27
Jul-21	2,182	370	5,650	5.10
Aug-21	69	17	133	0.16
Sep-21	203	116	302	0.47
Oct-21	12	2	29	0.03
Nov-21	465	80	1,342	1.09
Dec-21	23	6	46	0.05
Jan-22	35	6	75	0.08
Feb-22	108	49	167	0.25
Mar-22	11	2	27	0.03
Apr-22	150	26	334	0.35
May-22	64	29	122	0.15
Jun-22	149	69	253	0.35
Jul-22	2,778	1,024	4,849	6.50
Aug-22	23	4	46	0.05
Sep-22	69	23	127	0.16
Nov-22	53	9	118	0.12
Dec-22	12	2	35	0.03
Jan-23	12	2	29	0.03
Feb-23	6	1	17	0.01
Mar-23	163	88	245	0.38
Apr-23	34	6	68	0.08

Survey	Abundance Estimate			Density
	Abundance	LCI	UCI	
Caledonia OWF (+2km)				
May-21	149	98	213	0.23
Jun-21	157	81	249	0.24
Jul-21	2,780	521	7,003	4.32
Aug-21	108	51	177	0.17
Sep-21	253	155	367	0.39
Oct-21	29	5	63	0.05
Nov-21	566	99	1,498	0.88
Dec-21	52	17	92	0.08
Jan-22	46	8	103	0.07
Feb-22	139	70	214	0.22
Mar-22	11	2	27	0.02
Apr-22	159	28	346	0.25
May-22	126	46	246	0.20
Jun-22	309	120	510	0.48
Jul-22	4,439	2,188	7,848	6.89
Aug-22	114	23	235	0.18
Sep-22	150	63	254	0.23
Nov-22	93	23	174	0.14
Dec-22	29	6	58	0.05
Jan-23	17	3	35	0.03
Feb-23	17	3	34	0.03
Mar-23	220	116	353	0.34
Apr-23	62	11	142	0.10

Survey	Abundance Estimate			Density
	Abundance	LCI	UCI	
Caledonia OWF (+4km)				
May-21	169	94	257	0.19
Jun-21	271	188	365	0.31
Jul-21	3,641	785	8,429	4.12
Aug-21	133	70	209	0.15
Sep-21	462	281	673	0.52
Oct-21	59	10	129	0.07
Nov-21	629	108	1,554	0.71
Dec-21	82	41	128	0.09
Jan-22	52	9	110	0.06
Feb-22	214	126	313	0.24
Mar-22	22	5	38	0.02
Apr-22	185	35	381	0.21
May-22	134	52	250	0.15
Jun-22	428	231	677	0.48
Jul-22	6,961	2,028	12,799	7.87
Aug-22	213	80	385	0.24
Sep-22	198	93	321	0.22
Oct-22	12	2	35	0.01
Nov-22	106	29	200	0.12
Dec-22	41	12	71	0.05
Jan-23	65	35	100	0.07
Feb-23	41	12	69	0.05
Mar-23	323	164	487	0.37
Apr-23	103	40	195	0.12

2.8.3 Sooty shearwater

2.8.3.1 No sooty shearwater on sea were recorded in the Caledonia OWF.

2.8.4 Manx shearwater

2.8.4.1 The density and population estimates of Manx shearwater in the Caledonia OWF (plus the 2km buffer and plus the 4km buffer, calculated using design-based analysis) have been presented in Table 2–35 and Table 2–36

2.8.4.2 Table 2–35 includes the unapportioned density and population estimates of Manx shearwater, and Table 2–36 includes the apportioned density and population estimates of Manx shearwater.

Table 2–35: Unapportioned density and population estimate of all Manx shearwater in the Caledonia OWF; plus 2km buffer and plus 4km buffer, calculated using design-based analysis.

Survey	Raw Count	Abundance Estimate			Density	CV
		Abundance	LCI	UCI		
Caledonia OWF						
Jun-21	2	12	2	29	0.03	0.71
May-22	6	35	6	104	0.08	0.41
Caledonia OWF (+2km)						
Jun-21	7	41	7	116	0.06	0.38
Jul-21	3	17	6	35	0.03	0.58
May-22	6	34	6	103	0.05	0.41
Caledonia OWF (+4km)						
May-21	1	6	1	18	0.01	1.00
Jun-21	9	53	9	147	0.06	0.33
Jul-21	3	18	3	36	0.02	0.58
May-22	6	35	6	105	0.04	0.41

Table 2–36: Apportioned density and population estimate of Manx shearwater on sea in the Caledonia OWF; plus 2km buffer and plus 4km buffer, calculated using design-based analysis.

Survey	Abundance Estimate			Density
	Abundance	LCI	UCI	
Caledonia OWF				
Jul-21	12	2	29	0.03
May-22	35	6	104	0.08
Caledonia OWF (+2km)				
Jun-21	42	7	119	0.06
Jul-21	17	6	35	0.03
May-22	34	6	103	0.05
Caledonia OWF (+4km)				
May-21	6	1	18	0.01
Jun-21	54	9	150	0.06
Jul-21	18	3	36	0.02
May-22	35	6	105	0.04

2.9 Sulidae

2.9.1 Gannet

2.9.1.1 The density and population estimates of gannet species in the Caledonia OWF (plus the 2km buffer and plus the 4km buffer, calculated using design-based analysis) have been presented in Table 2–37.

Table 2–37: Density and population estimate of gannet on sea in the Caledonia OWF; plus 2km buffer and plus 4km buffer, calculated using design-based analysis. No apportionment required for this species.

Survey	Raw Count	Abundance Estimate			Density	CV
		Abundance	LCI	UCI		
Caledonia OWF						
May-21	2	12	2	29	0.03	0.71
Jun-21	47	276	141	464	0.65	0.15
Jul-21	12	71	12	201	0.17	0.29
Aug-21	9	52	9	122	0.12	0.33
Sep-21	20	116	35	209	0.27	0.22
Oct-21	34	199	123	281	0.47	0.17
Nov-21	2	12	2	29	0.03	0.71
Dec-21	2	12	2	35	0.03	0.71
Jan-22	1	6	1	17	0.01	1.00
Feb-22	2	11	2	32	0.03	0.71
Apr-22	1	6	1	17	0.01	1.00
May-22	12	70	12	185	0.16	0.29
Jun-22	84	483	98	1,057	1.13	0.11
Jul-22	15	88	41	140	0.21	0.26
Aug-22	1	6	1	17	0.01	1.00
Sep-22	21	122	46	208	0.29	0.22
Oct-22	2	12	2	29	0.03	0.71
Feb-23	2	11	2	29	0.03	0.71

Survey	Raw Count	Abundance Estimate			Density	CV
		Abundance	LCI	UCI		
Apr-23	8	45	8	136	0.11	0.35
Caledonia OWF (+2km)						
May-21	3	17	6	34	0.03	0.58
Jun-21	59	342	151	586	0.53	0.13
Jul-21	14	81	14	220	0.13	0.27
Aug-21	19	108	51	194	0.17	0.23
Sep-21	34	195	92	304	0.3	0.17
Oct-21	48	277	179	369	0.43	0.14
Nov-21	4	23	4	46	0.04	0.50
Dec-21	2	11	2	34	0.02	0.71
Jan-22	1	6	1	17	0.01	1.00
Feb-22	4	21	4	64	0.03	0.50
Apr-22	1	6	1	17	0.01	1.00
May-22	16	92	17	212	0.14	0.25
Jun-22	132	756	292	1,301	1.17	0.09
Jul-22	24	138	63	219	0.21	0.20
Aug-22	3	17	3	34	0.03	0.58
Sep-22	34	196	104	300	0.30	0.17
Oct-22	4	23	4	52	0.04	0.50
Feb-23	4	23	4	51	0.04	0.50
Apr-23	8	45	8	136	0.07	0.35
Caledonia OWF (+4km)						
May-21	4	23	6	41	0.03	0.50
Jun-21	68	400	200	659	0.45	0.12
Jul-21	19	115	19	272	0.13	0.23

Survey	Raw Count	Abundance Estimate			Density	CV
		Abundance	LCI	UCI		
Aug-21	24	139	58	238	0.16	0.20
Sep-21	60	351	222	486	0.40	0.13
Oct-21	66	386	263	527	0.44	0.12
Nov-21	5	29	5	64	0.03	0.45
Dec-21	2	12	2	35	0.01	0.71
Jan-22	1	6	1	17	0.01	1.00
Feb-22	4	22	4	66	0.02	0.50
Apr-22	3	17	3	46	0.02	0.58
May-22	18	105	23	226	0.12	0.24
Jun-22	157	909	446	1,551	1.03	0.08
Jul-22	38	222	105	362	0.25	0.16
Aug-22	3	17	3	34	0.02	0.58
Sep-22	42	245	128	373	0.28	0.15
Oct-22	17	100	17	259	0.11	0.24
Nov-22	1	6	1	18	0.01	1.00
Feb-23	4	23	4	52	0.03	0.50
Apr-23	9	52	9	149	0.06	0.33

2.10 Turdidae

2.10.1 Unidentified thrush species

2.10.1.1 No unidentified thrush species on sea were recorded in the Caledonia OWF.

2.11 Passeriformes

2.11.1 Unidentified passerine species

2.11.1.1 No unidentified passerine species on sea were recorded in the Caledonia OWF.

3 References

¹ NatureScot (2023) 'Guidance Note 2: Guidance to support Offshore Wind Applications: Advice for Marine Ornithology Baseline Characterisation Surveys and Reporting'. Available at: <https://www.nature.scot/doc/guidance-note-2-guidance-support-offshore-wind-applications-advice-marine-ornithology-baseline> (Accessed 01/07/2024)

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