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Volume 7B Proposed Development (Offshore) Appendices

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

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Volume 7B Appendix 6-1 Annex 1 Model-Based and Design-based Density and Abundance Estimates of All Birds (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 all birds recorded (in flight and on sea) in the Caledonia Offshore Wind Farm (OWF) (including the Caledonia North Site and Caledonia South Site) and relevant buffers (2km and 4km). Model-based density and abundance estimates have also been provided for common guillemot *Uria aalge*, razorbill *Alca torda* and puffin *Fratercula arctica*, and kittiwake *Rissa tridactyla*, as per the approach presented to NatureScot (01 July 2024) and agreed with NatureScot within in an email dated 07 August 2024. For the full justification see Volume 7B, Appendix 6-1: Offshore Ornithology Baseline Characterisation Report.
- 1.1.1.2 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*).
- 1.1.1.3 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.
- 1.1.1.4 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 Waterfowl

2.1.1 Unidentified Species

Unidentified wader species

2.1.1.1 The density and population estimates of unidentified wader 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 all unidentified wader species in the Caledonia OWF, plus a 2km buffer and plus a 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						
<i>None recorded</i>						
Caledonia OWF (+2km)						
<i>None recorded</i>						
Caledonia OWF (+4km)						
Jun-22	1	6	1	17	0.01	1.00

2.1.2 Pink-footed Goose

2.1.2.1 The density and population estimates of pink-footed goose 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 all pink-footed geese in the Caledonia OWF, plus a 2km buffer and plus a 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						
Jan-23	1	6	1	17	0.01	1.00
Caledonia OWF (+2km)						
Jan-23	1	6	1	17	0.01	1.00
Caledonia OWF (+4km)						
Jan-23	1	6	1	18	0.01	1.00

2.1.3 Mallard

2.1.3.1 The density and population estimates of mallard 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 all mallard in the Caledonia OWF, plus a 2km buffer and plus a 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						
Feb-22	2	11	2	32	0.03	0.71
Caledonia OWF (+2km)						
Feb-22	2	11	2	32	0.02	0.71
Caledonia OWF (+4km)						
Feb-22	2	11	2	33	0.01	0.71

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 2-4.

Table 2-4: Density and population estimate of all unidentified black-backed gull species in the Caledonia OWF; plus a 2km buffer and plus a 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	2	11	2	29	0.02	0.71
Caledonia OWF (+4km)						
Jul-21	1	6	1	18	0.01	1.00
Nov-21	2	12	2	29	0.01	0.71

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 2-5.

Table 2-5: Density and population estimate of all unidentified large gull species in the Caledonia OWF, plus a 2km buffer and plus a 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	4	47	0.05	0.50
Nov-21	8	46	8	93	0.11	0.35
Mar-22	1	5	1	16	0.01	1.00
Jul-22	8	47	8	129	0.11	0.35
Nov-22	1	6	1	18	0.01	1.00
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	12	69	17	126	0.11	0.29
Jan-22	1	6	1	17	0.01	1.00
Mar-22	1	5	1	16	0.01	1.00
Jul-22	10	58	10	167	0.09	0.32
Oct-22	1	6	1	17	0.01	1.00
Nov-22	1	6	1	17	0.01	1.00
Apr-23	1	6	1	17	0.01	1.00

Survey	Raw Count	Abundance Estimate			Density	CV
		Abundance	LCI	UCI		
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
Nov-21	16	93	47	151	0.11	0.25
Jan-22	1	6	1	17	0.01	1.00
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
Nov-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 2-6.

Table 2-6: Density and population estimate of all unidentified gull species in the Caledonia OWF, plus a 2km buffer and plus a 4km buffer, calculated using design-based analysis.

Survey	Raw Count	Abundance Estimate			Density	CV
		Abundance	LCI	UCI		
Caledonia OWF						
Jul-21	1	6	1	18	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 (+2km)						
May-21	1	6	1	17	0.01	1.00
Jul-21	1	6	1	17	0.01	1.00
Feb-22	1	5	1	16	0.01	1.00
Aug-22	2	11	2	29	0.02	0.71
Dec-22	2	11	2	29	0.02	0.71
Caledonia OWF (+4km)						
May-21	1	6	1	18	0.01	1.00
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	2	11	2	29	0.01	0.71
Dec-22	2	12	2	29	0.01	0.71

Unidentified Fulmar and/or Gull Species

2.2.1.4 The density and population estimates of unidentified fulmar and/or 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 2-7.

Table 2-7: Density and population estimate of all unidentified fulmar and/or gull species in the Caledonia OWF, plus a 2km buffer and plus a 4km buffer, calculated using design-based analysis.

Survey	Raw Count	Abundance Estimate			Density	CV
		Abundance	LCI	UCI		
Caledonia OWF						
Nov-22	1	6	1	18	0.01	1.00
Mar-23	1	6	1	18	0.01	1.00
Caledonia OWF (+2km)						
Nov-22	1	6	1	17	0.01	1.00
Mar-23	1	6	1	17	0.01	1.00
Caledonia OWF (+4km)						
Nov-22	2	12	2	29	0.01	0.71
Mar-23	1	6	1	18	0.01	1.00

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 model-based analysis for the breeding season (Mid-April to August) and design-based analysis for the non-breeding season (September to mid-April) have been presented in Table 2-8. Only the apportioned density and abundance estimates for kittiwake are presented, as the data approach relies on both design- and model-based estimates.

Table 2-8: Apportioned density and population estimate of all kittiwake in Caledonia North; plus 2km buffer and plus 4km buffer, calculated using model-based analysis for the breeding season (Mid-April to August) and design-based analysis for the non-breeding season (September to Mid-April). Not corrected for availability bias.

Survey	Abundance Estimate			Density
	Abundance	LCI	UCI	
Caledonia OWF				
May-21	308	163	609	0.75
Jun-21	535	290	1064	1.31
Jul-21	1086	469	2771	2.69
Aug-21	580	285	1282	1.42
Sep-21	70	36	110	0.16
Oct-21	204	98	322	0.48
Nov-21	430	198	708	1.01
Dec-21	58	18	104	0.14
Jan-22	41	12	69	0.10
Feb-22	76	18	146	0.18
Mar-22	75	29	139	0.18
Apr-22	153	85	285	0.37
May-22	614	271	1,460	1.50
Jun-22	1,222	552	2,918	2.99
Jul-22	1,355	656	3,029	3.31
Aug-22	350	193	639	0.85
Sep-22	139	51	278	0.33
Oct-22	53	15	99	0.12
Nov-22	59	10	136	0.14
Dec-22	14	2	40	0.03
Jan-23	12	2	29	0.03
Feb-23	81	14	178	0.19

Survey	Abundance Estimate			Density
	Abundance	LCI	UCI	
Mar-23	24	4	55	0.06
Apr-23	246	64	983	0.60
Caledonia OWF (+2km)				
May-21	494	250	1,040	0.78
Jun-21	881	458	1,898	1.41
Jul-21	1,868	762	5,427	3.03
Aug-21	945	451	2,192	1.51
Sep-21	741	144	1,998	1.15
Oct-21	345	231	479	0.54
Nov-21	578	265	876	0.90
Dec-21	121	64	183	0.19
Jan-22	40	17	74	0.06
Feb-22	120	45	211	0.19
Mar-22	106	45	180	0.16
Apr-22	248	204	1,015	0.39
May-22	1,002	131	512	1.60
Jun-22	1,992	427	2,491	3.18
Jul-22	2,210	888	4,877	3.52
Aug-22	572	1,035	5,200	0.91
Sep-22	225	93	398	0.35
Oct-22	140	52	250	0.22
Nov-22	87	17	198	0.14
Dec-22	27	4	74	0.04
Jan-23	17	3	35	0.03
Feb-23	109	28	217	0.17

Survey	Abundance Estimate			Density
	Abundance	LCI	UCI	
Mar-23	65	18	113	0.10
Apr-23	400	100	1,795	0.64
Caledonia OWF (+4km)				
May-21	704	351	1,510	0.82
Jun-21	1,271	651	2,765	1.48
Jul-21	2,605	1,063	7,587	2.97
Aug-21	1,350	639	3,148	1.57
Sep-21	925	219	2,329	1.05
Oct-21	498	317	696	0.56
Nov-21	832	449	1,258	0.94
Dec-21	158	84	233	0.18
Jan-22	46	17	81	0.05
Feb-22	161	76	258	0.18
Mar-22	227	114	351	0.26
Apr-22	350	179	750	0.41
May-22	1430	600	3,593	1.66
Jun-22	2842	1,278	6,929	3.30
Jul-22	3155	1,465	7,450	3.66
Aug-22	807	420	1,625	0.93
Sep-22	292	135	472	0.33
Oct-22	188	77	323	0.21
Nov-22	101	23	209	0.11
Dec-22	49	8	113	0.06
Jan-23	29	6	59	0.03
Feb-23	191	69	347	0.22

Survey	Abundance Estimate			Density
	Abundance	LCI	UCI	
Mar-23	95	35	161	0.11
Apr-23	549	137	2,455	0.62

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 8 and Table 2 9.

2.2.3.2 Table 2-9 includes the unapportioned density and population estimates of great black-backed gull, and Table 2-10 includes the apportioned density and population estimates of great black-backed gull.

Table 2-9: Unapportioned density and population estimate of all great black-backed gull in the Caledonia OWF, plus a 2km buffer and plus a 4km buffer, calculated using design-based analysis.

Survey	Raw Count	Abundance Estimate			Density	CV
		Abundance	LCI	UCI		
Caledonia OWF						
Sep-21	12	70	12	197	0.16	0.29
Oct-21	3	18	3	53	0.04	0.58
Nov-21	73	424	197	755	0.99	0.12
Dec-21	8	46	17	75	0.11	0.35
Jan-22	20	116	52	174	0.27	0.22
Feb-22	20	108	43	184	0.25	0.22
Sep-22	3	17	6	35	0.04	0.58
Oct-22	18	105	47	169	0.25	0.24
Nov-22	5	29	6	65	0.07	0.45
Dec-22	1	6	1	18	0.01	1.00
Jan-23	18	105	52	175	0.25	0.24
Feb-23	6	34	11	57	0.08	0.41

Survey	Raw Count	Abundance Estimate			Density	CV
		Abundance	LCI	UCI		
Caledonia OWF (+2km)						
Aug-21	3	17	3	51	0.03	0.58
Sep-21	41	235	46	465	0.37	0.16
Oct-21	23	133	23	311	0.21	0.21
Nov-21	119	681	383	1,058	1.06	0.09
Dec-21	11	63	29	97	0.10	0.30
Jan-22	37	211	114	303	0.33	0.16
Feb-22	34	182	96	284	0.28	0.17
Mar-22	1	5	1	16	0.01	1.00
Sep-22	8	46	12	92	0.07	0.35
Oct-22	27	157	99	227	0.24	0.19
Nov-22	16	93	64	116	0.14	0.25
Dec-22	8	47	18	88	0.07	0.35
Jan-23	24	139	58	238	0.22	0.20
Feb-23	10	57	29	86	0.09	0.32
Mar-23	3	17	3	35	0.03	0.58
Caledonia OWF (+4km)						
Aug-21	3	17	3	52	0.02	0.58
Sep-21	76	445	170	773	0.50	0.11
Oct-21	46	269	82	474	0.30	0.15
Nov-21	163	949	553	1,444	1.07	0.08
Dec-21	15	87	52	122	0.10	0.26
Jan-22	48	278	174	382	0.31	0.14
Feb-22	43	236	126	379	0.27	0.15
Mar-22	2	11	2	27	0.01	0.71

Survey	Raw Count	Abundance Estimate			Density	CV
		Abundance	LCI	UCI		
Sep-22	12	70	12	140	0.08	0.29
Oct-22	38	223	147	306	0.25	0.16
Nov-22	19	112	88	136	0.13	0.23
Dec-22	22	130	65	206	0.15	0.21
Jan-23	33	194	88	312	0.22	0.17
Feb-23	15	87	46	127	0.10	0.26
Mar-23	5	29	6	59	0.03	0.45

Table 2-10: Apportioned density and population estimate of all great black-backed gull in the Caledonia OWF, plus a 2km buffer and plus a 4km buffer, calculated using design-based analysis.

Survey	Abundance Estimate			Density
	Abundance	LCI	UCI	
Caledonia OWF				
Sep-21	81	14	215	0.19
Oct-21	32	7	87	0.07
Nov-21	473	189	923	1.11
Dec-21	46	10	98	0.11
Jan-22	116	41	186	0.27
Feb-22	108	22	216	0.25
Aug-22	1	0	3	0.00
Sep-22	18	3	46	0.04
Oct-22	105	37	187	0.25
Nov-22	34	8	78	0.08
Dec-22	7	1	21	0.02
Jan-23	105	35	186	0.25
Feb-23	34	9	68	0.08
Caledonia OWF (+2km)				
Aug-21	17	3	51	0.03
Sep-21	253	55	556	0.39
Oct-21	159	28	369	0.25
Nov-21	760	372	1,294	1.18
Dec-21	63	16	120	0.10
Jan-22	217	105	348	0.34
Feb-22	185	72	319	0.29
Mar-22	0	1	16	0.00
Aug-22	6	1	17	0.01

Survey	Abundance Estimate			Density
	Abundance	LCI	UCI	
Sep-22	47	10	104	0.07
Oct-22	162	71	265	0.25
Nov-22	98	47	193	0.15
Dec-22	51	14	99	0.08
Jan-23	140	40	256	0.22
Feb-23	58	17	103	0.09
Mar-23	18	3	41	0.03
Apr-23	4	1	10	0.01
Caledonia OWF (+4km)				
Aug-21	17	3	52	0.02
Sep-21	468	122	942	0.53
Oct-21	294	93	543	0.33
Nov-21	1,046	519	1,745	1.18
Dec-21	87	30	157	0.10
Jan-22	284	170	416	0.32
Feb-22	237	91	413	0.27
Mar-22	11	2	27	0.01
Aug-22	6	1	17	0.01
Sep-22	70	14	158	0.08
Oct-22	229	119	351	0.26
Nov-22	119	48	210	0.13
Dec-22	137	50	259	0.15
Jan-23	194	77	336	0.22
Feb-23	87	35	156	0.10
Mar-23	29	7	60	0.03

Survey	Abundance Estimate			Density
	Abundance	LCI	UCI	
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 2-11 and Table 2-12

2.2.4.2 Table 2-11 includes the unapportioned density and population estimates of herring gull, and Table 2-12 includes the apportioned density and population estimates of herring gull.

Table 2-11: Unapportioned density and population estimate of all herring gull in the Caledonia OWF, plus a 2km buffer and plus a 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
Sep-21	1	6	1	17	0.01	1.00
Oct-21	3	18	3	41	0.04	0.58
Nov-21	7	41	7	93	0.10	0.38
Dec-21	2	12	2	29	0.03	0.71
Jan-22	1	6	1	17	0.01	1.00
Feb-22	2	11	2	27	0.03	0.71
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	3	18	3	35	0.04	0.58
Dec-22	5	29	5	76	0.07	0.45
Feb-23	1	6	1	17	0.01	1.00

Survey	Raw Count	Abundance Estimate			Density	CV
		Abundance	LCI	UCI		
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
Sep-21	1	6	1	17	0.01	1.00
Oct-21	3	17	3	46	0.03	0.58
Nov-21	14	80	29	137	0.12	0.27
Dec-21	3	17	3	40	0.03	0.58
Jan-22	1	6	1	17	0.01	1.00
Feb-22	2	11	2	27	0.02	0.71
Mar-22	1	5	1	16	0.01	1.00
Jul-22	7	40	7	92	0.06	0.38
Oct-22	2	12	2	29	0.02	0.71
Nov-22	3	17	3	35	0.03	0.58
Dec-22	6	35	6	93	0.05	0.41
Feb-23	2	11	2	29	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
Sep-21	1	6	1	18	0.01	1.00
Oct-21	7	41	12	76	0.05	0.38
Nov-21	14	81	29	146	0.09	0.27
Dec-21	3	17	3	47	0.02	0.58

Survey	Raw Count	Abundance Estimate			Density	CV
		Abundance	LCI	UCI		
Jan-22	1	6	1	17	0.01	1.00
Feb-22	7	38	7	93	0.04	0.38
Mar-22	1	5	1	16	0.01	1.00
Jun-22	1	6	1	17	0.01	1.00
Jul-22	29	169	53	310	0.19	0.19
Oct-22	3	18	3	35	0.02	0.58
Nov-22	3	18	3	35	0.02	0.58
Dec-22	8	47	8	106	0.05	0.35
Feb-23	2	12	2	29	0.01	0.71
Mar-23	1	6	1	18	0.01	1.00

Table 2-12: Apportioned density and population estimate of all herring gull in the Caledonia OWF, plus a 2km buffer and plus a 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
Sep-21	6	1	17	0.01
Oct-21	27	5	66	0.06
Nov-21	45	7	99	0.11
Dec-21	12	2	29	0.03
Jan-22	6	1	17	0.01
Feb-22	10	2	32	0.02
Mar-22	10	2	32	0.02
Jul-22	63	11	152	0.15
Oct-22	12	2	29	0.03
Nov-22	20	3	48	0.05
Dec-22	32	5	82	0.08
Feb-23	6	1	17	0.01
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
Sep-21	6	1	17	0.01
Oct-21	21	4	52	0.03

Survey	Abundance Estimate			Density
	Abundance	LCI	UCI	
Nov-21	87	26	176	0.14
Dec-21	17	3	40	0.03
Jan-22	6	1	17	0.01
Feb-22	10	2	33	0.02
Mar-22	10	2	32	0.02
Jul-22	77	20	175	0.12
Oct-22	13	2	31	0.02
Nov-22	19	3	52	0.03
Dec-22	39	7	113	0.06
Feb-23	11	2	29	0.02
Mar-23	6	1	17	0.01
Apr-23	2	0	7	0.00
Caledonia OWF (+4km)				
May-21	6	1	18	0.01
Jun-21	6	1	18	0.01
Jul-21	106	18	309	0.12
Sep-21	6	1	18	0.01
Oct-21	45	14	90	0.05
Nov-21	90	27	176	0.10
Dec-21	17	3	47	0.02
Jan-22	6	1	17	0.01
Feb-22	39	7	112	0.04
Mar-22	10	2	32	0.01
Jun-22	6	1	17	0.01
Jul-22	219	41	494	0.25

Survey	Abundance Estimate			Density
	Abundance	LCI	UCI	
Oct-22	18	3	49	0.02
Nov-22	19	3	51	0.02
Dec-22	50	8	115	0.06
Feb-23	12	2	29	0.01
Mar-23	6	1	18	0.01
Apr-23	1	0	5	0.00

2.2.5 Common gull

2.2.5.1 The density and population estimates of common gull in the Caledonia OWF (plus the 2km buffer and plus the 4km buffer, calculated using design-based analysis) have been presented in Table 2-13 and Table 2-14.

2.2.5.2 Table 2-13 includes the unapportioned density and population estimates of common gull, and Table 2-14 includes the apportioned density and population estimates of herring gull.

Table 2-13: Unapportioned density and population estimate of all common gull in the Caledonia OWF, plus a 2km buffer and plus a 4km buffer, calculated using design-based analysis.

Survey	Raw Count	Abundance Estimate			Density	CV
		Abundance	LCI	UCI		
Caledonia OWF						
Aug-22	2	12	2	35	0.03	0.71
Dec-22	2	12	2	23	0.03	0.71
Caledonia OWF (+2km)						
Sep-21	8	46	8	115	0.07	0.35
Aug-22	2	11	2	34	0.02	0.71
Dec-22	2	12	2	29	0.02	0.71
Caledonia OWF (+4km)						
Sep-21	8	47	8	129	0.05	0.35
Nov-21	1	6	1	17	0.01	1.00
Aug-22	2	11	2	34	0.01	0.71
Dec-22	2	12	2	29	0.01	0.71

Table 2-14: Apportioned density and population estimate of all common gull in the Caledonia OWF, plus a 2km buffer and plus a 4km buffer, calculated using design-based analysis.

Survey	Abundance Estimate			Density
	Abundance	LCI	UCI	
Caledonia OWF				
Aug-22	12	2	35	0.03
Dec-22	14	2	33	0.03
Caledonia OWF (+2km)				
Sep-21	46	8	115	0.07
Aug-22	11	2	34	0.02
Dec-22	13	2	31	0.02
Caledonia OWF (+4km)				
Sep-21	47	8	129	0.05
Nov-21	6	1	17	0.01
Aug-22	11	2	34	0.01
Dec-22	12	2	31	0.01

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 2-15 and Table 2-16.

2.2.6.2 Table 2-15 includes the unapportioned density and population estimates of lesser black-backed gull, and Table 2-16 includes the apportioned density and population estimates of lesser black-backed gull.

Table 2-15: Unapportioned density and population estimate of all lesser black-backed gull in the Caledonia OWF, plus a 2km buffer and plus a 4km buffer, calculated using design-based analysis.

Survey	Raw Count	Abundance Estimate			Density	CV
		Abundance	LCI	UCI		
Caledonia OWF						
Jun-22	2	11	2	34	0.03	0.71
Jul-22	4	23	4	70	0.05	0.50
Caledonia OWF (+2km)						
Jun-22	2	11	2	34	0.02	0.71
Jul-22	4	23	4	69	0.04	0.50
Caledonia OWF (+4km)						
Jul-21	3	18	3	48	0.02	0.58
May-22	1	6	1	17	0.01	1.00
Jun-22	2	12	2	35	0.01	0.71
Jul-22	6	35	6	94	0.04	0.41

Table 2-16: Apportioned density and population estimate of all lesser black-backed gull in the Caledonia OWF, plus a 2km buffer and plus a 4km buffer, calculated using design-based analysis.

Survey	Abundance Estimate			Density
	Abundance	LCI	UCI	
Caledonia OWF				
Jul-21	5	1	13	0.01
Jun-22	11	2	34	0.03
Jul-22	42	7	129	0.10
Caledonia OWF (+2km)				
Jun-22	11	2	34	0.02
Jul-22	44	7	141	0.07
Caledonia OWF (+4km)				
Jul-21	28	5	84	0.03
May-22	6	1	17	0.01
Jun-22	12	2	35	0.01
Jul-22	56	9	184	0.06

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 2-17.

Table 2-17: Density and population estimate of all unidentified commic tern species in the Caledonia OWF, plus a 2km buffer and plus a 4km buffer, calculated using design-based analysis.

Survey	Raw Count	Abundance Estimate			Density	CV
		Abundance	LCI	UCI		
Caledonia OWF						
Aug-21	2	12	2	35	0.03	0.71
May-22	4	23	4	70	0.05	0.50
Aug-22	1	6	1	17	0.01	1.00
Caledonia OWF (+2km)						
May-21	3	17	3	51	0.03	0.58
Aug-21	2	11	2	34	0.02	0.71
May-22	4	23	4	69	0.04	0.50
Aug-22	5	29	5	74	0.05	0.45
Caledonia OWF (+4km)						
May-21	3	18	3	53	0.02	0.58
Aug-21	2	12	2	35	0.01	0.71
May-22	6	35	6	93	0.04	0.41
Aug-22	8	46	11	92	0.05	0.35

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 2-18.

Table 2-18: Density and population estimate of all unidentified tern species in the Caledonia OWF, plus a 2km buffer and plus a 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)						
May-21	1	6	1	17	0.01	1.00
Jul-21	2	12	2	35	0.02	0.71
Caledonia OWF (+4km)						
May-21	1	6	1	18	0.01	1.00
Jul-21	2	12	2	36	0.01	0.71

2.3.2 Common tern

2.3.2.1 The density and population estimates of common tern in the Caledonia OWF (plus the 2km buffer and plus the 4km buffer, calculated using design-based analysis) have been presented in Table 2-19 and Table 2-20.

2.3.2.2 Table 2-19 includes the unapportioned density and population estimates of common tern, and Table 2-20 includes the apportioned density and population estimates of common tern.

Table 2-19: Unapportioned density and population estimate of all common tern 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						
Aug-21	3	17	3	52	0.04	0.58
Caledonia OWF (+2km)						
Aug-21	3	17	3	51	0.03	0.58
Caledonia OWF (+4km)						
Aug-21	3	17	3	52	0.02	0.58

Table 2-20: Apportioned density and population estimate of all common tern in the Caledonia OWF; plus 2km buffer and plus 4km buffer, calculated using design-based analysis.

Survey	Abundance	Abundance Estimate		Density
		LCI	UCI	
Caledonia OWF				
Aug-21	29	5	87	0.07
Aug-22	6	1	17	0.01
Caledonia OWF (+2km)				
Aug-21	28	5	85	0.04
Caledonia OWF (+4km)				
Aug-21	29	5	87	0.03

2.3.3 Arctic tern

2.3.3.1 The density and population estimates of Arctic tern in the Caledonia OWF (plus the 2km buffer and plus the 4km buffer, calculated using design-based analysis) have been presented in Table 2-21 and Table 2-22.

2.3.3.2 Table 2-21 includes the unapportioned density and population estimates of Arctic tern, and Table 2-22 includes the apportioned density and population estimates of Arctic tern.

Table 2-21: Unapportioned density and population estimate of all Arctic tern in the Caledonia OWF, plus a 2km buffer and plus a 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)						
May-21	7	40	7	98	0.06	0.38
Aug-22	5	29	5	69	0.05	0.45
Caledonia OWF (+4km)						
May-21	9	53	12	117	0.06	0.33
Aug-22	6	34	6	75	0.04	0.41

Table 2-22: Apportioned density and population estimate of all Arctic tern in the Caledonia OWF, plus a 2km buffer and plus a 4km buffer, calculated using design-based analysis.

Survey	Abundance Estimate			Density
	Abundance	LCI	UCI	
Caledonia OWF				
May-22	12	2	35	0.03
Caledonia OWF (+2km)				
May-21	69	11	172	0.11
May-22	11	2	34	0.02
Aug-22	58	10	138	0.09
Caledonia OWF (+4km)				
May-21	77	16	188	0.09
May-22	12	2	35	0.01
Aug-22	80	17	167	0.09

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 2-23 and Table 2-24.

2.4.1.2 Table 2-23 includes the unapportioned density and population estimates of great skua, and Table 2-24 includes the apportioned density and population estimates of great skua.

Table 2-23: Unapportioned density and population estimate of all great skua in the Caledonia OWF, plus a 2km buffer and plus a 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	2	12	2	29	0.03	0.71
Jul-21	4	24	4	65	0.06	0.50
Aug-21	4	23	4	64	0.05	0.50
Jul-22	2	12	2	35	0.03	0.71
Caledonia OWF (+2km)						
May-21	1	6	1	17	0.01	1.00
Jun-21	2	12	2	29	0.02	0.71
Jul-21	6	35	6	93	0.05	0.41
Aug-21	5	29	5	68	0.05	0.45
Jul-22	2	12	2	35	0.02	0.71
Caledonia OWF (+4km)						
May-21	1	6	1	18	0.01	1.00
Jun-21	2	12	2	29	0.01	0.71
Jul-21	10	60	10	133	0.07	0.32
Aug-21	6	35	6	81	0.04	0.41
Sep-21	1	6	1	18	0.01	1.00
Jul-22	2	12	2	35	0.01	0.71

Table 2-24: Apportioned density and population estimate of all great skua in the Caledonia OWF, plus a 2km buffer and plus a 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	12	2	36	0.03
Jul-21	24	4	71	0.06
Aug-21	23	4	58	0.05
Jul-22	12	2	36	0.03
Caledonia OWF (+2km)				
May-21	6	1	17	0.01
Jun-21	12	2	34	0.02
Jul-21	35	6	99	0.05
Aug-21	29	5	68	0.05
Jul-22	12	2	34	0.02
Caledonia OWF (+4km)				
May-21	6	1	18	0.01
Jun-21	12	2	36	0.01
Jul-21	60	12	145	0.07
Aug-21	35	6	75	0.04
Sep-21	6	1	18	0.01
Jul-22	12	2	36	0.01

2.4.2 Arctic skua

2.4.2.1 The density and population estimates of Arctic skua in the Caledonia OWF (plus the 2km buffer and plus the 4km buffer, calculated using design-based analysis) have been presented in Table 2-25 and Table 2-26.

2.4.2.2 Table 2-25 includes the unapportioned density and population estimates of Arctic skua, and Table 2-26 includes the apportioned density and population estimates of Arctic skua.

Table 2-25: Unapportioned density and population estimate of all Arctic skua in the Caledonia OWF, plus a 2km buffer and plus a 4km buffer, calculated using design-based analysis.

Survey	Raw Count	Abundance Estimate			Density	CV
		Abundance	LCI	UCI		
Caledonia OWF						
Aug-22	1	6	1	17	0.01	1.00
Caledonia OWF (+2km)						
Aug-22	2	11	2	29	0.02	0.71
Caledonia OWF (+4km)						
Aug-22	2	11	2	29	0.01	0.71

Table 2-26: Apportioned density and population estimate of all Arctic skua in the Caledonia OWF, plus a 2km buffer and plus a 4km buffer, calculated using design-based analysis.

Survey	Abundance Estimate			Density
	Abundance	LCI	UCI	
Caledonia OWF				
Aug-22	6	1	17	0.01
Caledonia OWF (+2km)				
Aug-22	11	2	29	0.02
Caledonia OWF (+4km)				
Aug-22	11	2	29	0.01

2.5 Alcidae

2.5.1 Unidentified species

Unidentified guillemot and/or razorbill

2.5.1.1 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 2-27.

Table 2-27: Density and population estimate of all unidentified guillemot and/or razorbill in the Caledonia OWF, plus a 2km buffer and plus a 4km buffer, calculated using design-based analysis.

Survey	Raw Count	Abundance Estimate			Density	CV
		Abundance	LCI	UCI		
Caledonia OWF						
May-21	64	373	163	653	0.87	0.13
Jun-21	117	687	429	1,045	1.61	0.09
Jul-21	28	165	65	283	0.39	0.19
Aug-21	72	417	150	828	0.98	0.12
Sep-21	70	406	278	551	0.95	0.12
Oct-21	27	158	76	252	0.37	0.19
Nov-21	22	128	64	192	0.30	0.21
Dec-21	73	424	273	592	0.99	0.12
Jan-22	21	122	75	174	0.29	0.22
Feb-22	103	556	405	708	1.30	0.10
Mar-22	26	139	102	177	0.33	0.20
Apr-22	24	138	81	201	0.32	0.20
May-22	155	898	562	1338	2.10	0.08
Jun-22	24	138	52	253	0.32	0.20
Jul-22	80	468	187	836	1.10	0.11
Aug-22	10	58	17	110	0.14	0.32
Sep-22	107	619	440	781	1.45	0.10

Survey	Raw Count	Abundance Estimate			Density	CV
		Abundance	LCI	UCI		
Oct-22	30	175	30	484	0.41	0.18
Nov-22	21	123	41	223	0.29	0.22
Dec-22	11	64	35	105	0.15	0.30
Jan-23	4	23	4	52	0.05	0.50
Feb-23	22	126	63	207	0.29	0.21
Mar-23	23	134	70	193	0.31	0.21
Apr-23	20	113	20	289	0.26	0.22
Caledonia OWF (+2km)						
May-21	129	741	373	1,270	1.15	0.09
Jun-21	243	1,409	777	2,355	2.19	0.06
Jul-21	53	307	139	533	0.48	0.14
Aug-21	146	833	377	1,581	1.29	0.08
Sep-21	112	643	477	827	1.00	0.09
Oct-21	50	288	133	455	0.45	0.14
Nov-21	25	143	63	234	0.22	0.20
Dec-21	132	756	578	950	1.17	0.09
Jan-22	26	149	74	234	0.23	0.20
Feb-22	163	874	713	1,029	1.36	0.08
Mar-22	37	196	133	260	0.30	0.16
Apr-22	38	216	96	352	0.34	0.16
May-22	235	1,344	881	1,819	2.09	0.07
Jun-22	36	206	97	350	0.32	0.17
Jul-22	156	898	512	1,347	1.40	0.08
Aug-22	22	126	51	212	0.20	0.21
Sep-22	175	1,010	727	1,327	1.57	0.08

Survey	Raw Count	Abundance Estimate			Density	CV
		Abundance	LCI	UCI		
Oct-22	63	367	63	804	0.57	0.13
Nov-22	24	139	52	238	0.22	0.20
Dec-22	13	76	35	134	0.12	0.28
Jan-23	5	29	6	52	0.05	0.45
Feb-23	26	149	80	246	0.23	0.20
Mar-23	38	220	139	295	0.34	0.16
Apr-23	25	142	40	312	0.22	0.20
Caledonia OWF (+4km)						
May-21	172	1,005	555	1,601	1.14	0.08
Jun-21	401	2,359	1,230	3,648	2.67	0.05
Jul-21	77	465	235	755	0.53	0.11
Aug-21	401	2,326	934	4,073	2.63	0.05
Sep-21	174	1,018	650	1,516	1.15	0.08
Oct-21	78	457	205	749	0.52	0.11
Nov-21	33	192	81	314	0.22	0.17
Dec-21	208	1,212	897	1,532	1.37	0.07
Jan-22	35	203	122	290	0.23	0.17
Feb-22	212	1,164	845	1,444	1.32	0.07
Mar-22	55	297	189	421	0.34	0.13
Apr-22	50	288	121	473	0.33	0.14
May-22	312	1,812	1,126	2,514	2.05	0.06
Jun-22	48	278	133	434	0.31	0.14
Jul-22	224	1,309	719	1,975	1.48	0.07
Aug-22	38	218	126	322	0.25	0.16
Sep-22	232	1,354	975	1,745	1.53	0.07

Survey	Raw Count	Abundance Estimate			Density	CV
		Abundance	LCI	UCI		
Oct-22	83	488	112	976	0.55	0.11
Nov-22	30	177	88	259	0.20	0.18
Dec-22	17	100	53	159	0.11	0.24
Jan-23	6	35	12	65	0.04	0.41
Feb-23	36	208	110	330	0.24	0.17
Mar-23	44	258	164	341	0.29	0.15
Apr-23	27	155	46	339	0.18	0.19

Unidentified auk species

2.5.1.2 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 2-28.

Table 2-28: Density and population estimate of all unidentified auk species in the Caledonia OWF, plus a 2km buffer and plus a 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	6	47	0.05	0.50
Jul-21	19	112	59	165	0.26	0.23
Aug-21	51	295	98	596	0.69	0.14
Sep-21	3	17	3	46	0.04	0.58
Oct-21	11	64	23	117	0.15	0.30
Jan-22	1	6	1	17	0.01	1.00
Feb-22	1	5	1	16	0.01	1.00
Mar-22	3	16	3	43	0.04	0.58
Apr-22	6	35	12	63	0.08	0.41
May-22	15	87	35	156	0.20	0.26
Jun-22	3	17	3	40	0.04	0.58
Jul-22	10	58	23	94	0.14	0.32
Aug-22	4	23	6	52	0.05	0.50
Sep-22	24	139	29	295	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

Survey	Raw Count	Abundance Estimate			Density	CV
		Abundance	LCI	UCI		
Mar-23	2	12	2	29	0.03	0.71
Apr-23	1	6	1	17	0.01	1.00
Caledonia OWF (+2km)						
May-21	5	29	5	57	0.05	0.45
Jun-21	7	41	7	87	0.06	0.38
Jul-21	37	214	116	330	0.33	0.16
Aug-21	94	536	194	964	0.83	0.10
Sep-21	9	52	9	98	0.08	0.33
Oct-21	14	81	29	144	0.13	0.27
Jan-22	1	6	1	17	0.01	1.00
Feb-22	3	16	3	38	0.02	0.58
Mar-22	3	16	3	42	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	150	0.13	0.26
Aug-22	8	46	17	74	0.07	0.35
Sep-22	40	231	110	375	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	85	0.06	0.38

Survey	Raw Count	Abundance Estimate			Density	CV
		Abundance	LCI	UCI		
Caledonia OWF (+4km)						
May-21	6	35	6	76	0.04	0.41
Jun-21	10	59	18	106	0.07	0.32
Jul-21	44	266	163	398	0.30	0.15
Aug-21	190	1,102	354	1,903	1.25	0.07
Sep-21	12	70	23	129	0.08	0.29
Oct-21	16	94	35	158	0.11	0.25
Jan-22	1	6	1	17	0.01	1.00
Feb-22	3	16	3	44	0.02	0.58
Mar-22	3	16	3	38	0.02	0.58
Apr-22	19	110	52	167	0.12	0.23
May-22	24	139	58	226	0.16	0.20
Jun-22	8	46	8	98	0.05	0.35
Jul-22	16	94	41	158	0.11	0.25
Aug-22	8	46	17	80	0.05	0.35
Sep-22	46	268	123	420	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 auk and/or shearwater species

2.5.1.3 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 2-29.

Table 2-29: Density and population estimate of all unidentified auk and/ or shearwater species in the Caledonia OWF, plus a 2km buffer and plus a 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	3	18	3	41	0.04	0.58
Jul-21	7	41	7	88	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	5	29	5	69	0.05	0.45
Jun-21	14	81	14	174	0.13	0.27
Jul-21	12	70	12	151	0.11	0.29
Apr-22	1	6	1	17	0.01	1.00
May-22	9	51	23	92	0.08	0.33
Jun-22	4	23	4	52	0.04	0.50
Aug-22	1	6	1	17	0.01	1.00
Sep-22	74	427	74	1275	0.66	0.12
Mar-23	3	17	3	46	0.03	0.58
Apr-23	1	6	1	17	0.01	1.00

Survey	Raw Count	Abundance Estimate			Density	CV
		Abundance	LCI	UCI		
Caledonia OWF (+4km)						
May-21	10	58	18	111	0.07	0.32
Jun-21	14	82	14	171	0.09	0.27
Jul-21	13	78	18	169	0.09	0.28
Apr-22	2	12	2	29	0.01	0.71
May-22	9	52	23	93	0.06	0.33
Jun-22	5	29	6	58	0.03	0.45
Aug-22	1	6	1	17	0.01	1.00
Sep-22	74	432	74	1290	0.49	0.12
Mar-23	4	23	4	53	0.03	0.50
Apr-23	1	6	1	17	0.01	1.00

2.5.2 Common guillemot

- 2.5.2.1 The density and population estimates of common guillemot in the Caledonia OWF (plus the 2km buffer and plus the 4km buffer), calculated using model-based analysis have been presented in Table 2-30 and Table 2-31.
- 2.5.2.2 Table 2-30 presents 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. Only the apportioned density and abundance estimates for guillemot are presented, as the data approach uses model-based estimates.
- 2.5.2.3 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 model-based analysis) has also been included in Table 2-31.

Table 2-30. Apportioned density and population estimate of all guillemot in the Caledonia OWF, plus a 2km buffer and plus a 4km buffer, calculated using model-based analysis. Not corrected for availability bias.

Survey	Abundance Estimate			Density
	Abundance	LCI	UCI	
Caledonia OWF				
May-21	5,340	3,683	8,361	13.07
Jun-21	2,962	2,112	4,453	7.54
Jul-21	8,343	4,309	18,106	19.81
Aug-21	825	512	1,365	2.21
Sep-21	2,153	1,302	3,682	5.41
Oct-21	887	595	1,393	2.17
Nov-21	1,030	708	1,630	2.55
Dec-21	513	343	824	1.24
Jan-22	296	185	504	0.72
Feb-22	724	488	1,195	1.79
Mar-22	418	261	716	1.03
Apr-22	1,236	840	2,052	2.99
May-22	7,731	5,611	12,229	19.07
Jun-22	5,788	3,810	9,603	14.14
Jul-22	4,900	3,390	7,411	12.86
Aug-22	368	226	623	0.92
Sep-22	2,778	1,469	5,793	8.22
Oct-22	404	214	836	1.00
Nov-22	69	36	149	0.17
Dec-22	270	197	422	0.64
Jan-23	340	219	586	0.85
Feb-23	1,217	825	1,913	2.96
Mar-23	1,697	1,168	2,543	3.98

Survey	Abundance Estimate			Density
	Abundance	LCI	UCI	
Apr-23	1,199	594	2,755	2.97
Caledonia OWF (+2km)				
May-21	8,807	5,920	13,977	13.97
Jun-21	5,414	3,771	8,151	8.88
Jul-21	12,465	6,580	26,274	19.31
Aug-21	1,709	1,057	2,835	2.91
Sep-21	3,795	2,261	6,556	6.16
Oct-21	1,482	961	2,404	2.35
Nov-21	1,768	1,201	2,755	2.85
Dec-21	851	562	1,346	1.35
Jan-22	488	296	838	0.77
Feb-22	1,235	816	2,004	1.99
Mar-22	716	438	1,215	1.15
Apr-22	2,016	1,335	3,341	3.20
May-22	13,489	9,600	20,783	21.61
Jun-22	9,528	6,108	15,864	15.18
Jul-22	9,721	6,748	14,443	16.32
Aug-22	690	421	1,158	1.13
Sep-22	7,028	3,673	14,001	12.37
Oct-22	698	366	1,420	1.13
Nov-22	119	61	251	0.19
Dec-22	420	300	643	0.66
Jan-23	595	380	1,010	0.96
Feb-23	1,964	1,314	3,079	3.11
Mar-23	2,483	1,694	3,737	3.83
Apr-23	2,090	960	5,343	3.34

Survey	Abundance Estimate			Density
	Abundance	LCI	UCI	
Caledonia OWF (+4km)				
May-21	12,258	8,084	19,909	13.94
Jun-21	8,295	5,635	12,953	9.58
Jul-21	16,147	8,805	32,831	18.14
Aug-21	2,913	1,767	4,929	3.42
Sep-21	5,667	3,333	10,056	6.53
Oct-21	2,080	1,329	3,427	2.38
Nov-21	2,601	1,748	4,100	3.00
Dec-21	1,239	807	2,015	1.42
Jan-22	684	407	1,197	0.78
Feb-22	1,812	1,176	3,000	2.09
Mar-22	1,052	633	1,819	1.21
Apr-22	2,868	1,864	4,838	3.30
May-22	19,979	14,023	31,347	23.15
Jun-22	13,466	8,532	22,558	15.44
Jul-22	15,918	11,032	23,756	18.64
Aug-22	1,107	666	1,914	1.28
Sep-22	12,709	6,636	24,921	15.05
Oct-22	1,028	533	2,106	1.19
Nov-22	174	88	370	0.20
Dec-22	587	414	912	0.67
Jan-23	883	561	1,495	1.02
Feb-23	2,739	1,813	4,360	3.12
Mar-23	3,207	2,165	4,914	3.60
Apr-23	2,994	1,339	7,790	3.45

Table 2-31: Availability bias-corrected density and population estimate of all common guillemot in the Caledonia OWF, plus a 2km buffer and plus a 4km buffer, calculated using model-based analysis.

Survey	Abundance Estimate			Density
	Abundance	LCI	UCI	
Caledonia OWF				
May-21	6,622	4,567	10,367	16.20
Jun-21	3,673	2,619	5,522	9.35
Jul-21	10,345	5,344	22,451	24.56
Aug-21	1,023	635	1,692	2.75
Sep-21	2,669	1,615	4,566	6.70
Oct-21	1,100	738	1,728	2.69
Nov-21	1,277	878	2,022	3.16
Dec-21	636	425	1,022	1.54
Jan-22	367	229	626	0.90
Feb-22	898	605	1,482	2.22
Mar-22	519	323	888	1.28
Apr-22	1,532	1,042	2,545	3.70
May-22	9,587	6,957	15,164	23.65
Jun-22	7,177	4,724	11,908	17.54
Jul-22	6,076	4,203	9,189	15.95
Aug-22	457	281	773	1.15
Sep-22	3,445	1,822	7,184	10.20
Oct-22	501	266	1,037	1.24
Nov-22	86	45	185	0.21
Dec-22	335	244	523	0.79
Jan-23	422	272	727	1.05
Feb-23	1,509	1,024	2,373	3.67
Mar-23	2,104	1,449	3,153	4.93
Apr-23	1,487	737	3,417	3.69

Survey	Abundance Estimate			Density
	Abundance	LCI	UCI	
Caledonia OWF (+2km)				
May-21	10,920	7,341	17,331	17.33
Jun-21	6,714	4,676	10,107	11.01
Jul-21	15,457	8,159	32,579	23.95
Aug-21	2,120	1,311	3,515	3.61
Sep-21	4,705	2,804	8,129	7.64
Oct-21	1,838	1,192	2,982	2.92
Nov-21	2,193	1,489	3,416	3.53
Dec-21	1,055	697	1,669	1.68
Jan-22	605	368	1,039	0.96
Feb-22	1,532	1,012	2,485	2.46
Mar-22	888	543	1,507	1.43
Apr-22	2,500	1,655	4,143	3.97
May-22	16,727	11,905	25,771	26.79
Jun-22	11,814	7,574	19,672	18.82
Jul-22	12,053	8,367	17,909	20.24
Aug-22	856	522	1,436	1.40
Sep-22	8,715	4,555	17,361	15.34
Oct-22	865	454	1,761	1.40
Nov-22	147	75	311	0.24
Dec-22	520	372	797	0.82
Jan-23	738	471	1,252	1.19
Feb-23	2,435	1,629	3,819	3.86
Mar-23	3,079	2,100	4,634	4.75
Apr-23	2,592	1,191	6,625	4.14

Survey	Abundance Estimate			Density
	Abundance	LCI	UCI	
Caledonia OWF (+4km)				
May-21	15,199	10,024	24,687	17.28
Jun-21	10,286	6,988	16,062	11.88
Jul-21	20,022	10,918	40,710	22.50
Aug-21	3,612	2,191	6,112	4.25
Sep-21	7,028	4,133	12,469	8.10
Oct-21	2,579	1,647	4,250	2.95
Nov-21	3,225	2,168	5,084	3.72
Dec-21	1,537	1,001	2,499	1.76
Jan-22	848	505	1,485	0.97
Feb-22	2,247	1,458	3,720	2.59
Mar-22	1,304	785	2,255	1.50
Apr-22	3,557	2,311	5,999	4.10
May-22	24,774	17,388	38,871	28.71
Jun-22	16,698	10,580	27,972	19.15
Jul-22	19,738	13,680	29,458	23.11
Aug-22	1,373	826	2,373	1.59
Sep-22	15,759	8,229	30,901	18.66
Oct-22	1,275	661	2,612	1.47
Nov-22	216	110	459	0.25
Dec-22	728	513	1,131	0.83
Jan-23	1,095	696	1,854	1.27
Feb-23	3,396	2,248	5,407	3.87
Mar-23	3,977	2,685	6,094	4.46
Apr-23	3,713	1,661	9,660	4.27

2.5.3 Razorbill

2.5.3.1 The density and population estimates of razorbill in the Caledonia OWF (plus the 2km buffer and plus the 4km buffer), calculated using model-based analysis have been presented in Table 2-32 and Table 2-33.

2.5.3.2 Table 2-32 presents the density and population estimates of razorbill in the Caledonia OWF (plus the 2km buffer and plus the 4km buffer), calculated using design- and model-based analysis. Only the apportioned density and abundance estimates for razorbill are presented, as the data approach relies on both design- and model-based estimates.

2.5.3.3 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 2-33.

Table 2-32: Apportioned density and population estimate of all razorbill in the Caledonia OWF, plus a 2km buffer and plus a 4km buffer, calculated using model-based analysis for the breeding season (April to mid-August) and design-based analysis for the non-breeding season (Mid-August to March). Not corrected for availability bias.

Survey	Abundance Estimate			Density
	Abundance	LCI	UCI	
Caledonia OWF				
May-21	419	255	697	1.03
Jun-21	502	249	1030	1.21
Jul-21	838	512	1440	2.01
Aug-21	299	185	478	0.72
Sep-21	193	100	301	0.45
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	47	9	100	0.11
Apr-22	398	234	689	0.96
May-22	1102	672	1842	2.65
Jun-22	91	57	146	0.22
Jul-22	529	306	928	1.27

Survey	Abundance Estimate			Density
	Abundance	LCI	UCI	
Aug-22	149	80	283	0.37
Sep-22	1,731	805	2,821	4.05
Oct-22	7	1	24	0.02
Nov-22	116	34	211	0.27
Dec-22	38	8	72	0.09
Jan-23	80	29	133	0.19
Feb-23	201	91	361	0.47
Mar-23	302	166	440	0.71
Apr-23	289	108	820	0.69
Caledonia OWF (+2km)				
May-21	713	431	1,204	1.15
Jun-21	799	386	1,678	1.26
Jul-21	1,299	768	2,322	2.04
Aug-21	470	286	769	0.74
Sep-21	372	239	510	0.58
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	77	33	131	0.12
Apr-22	636	371	1116	1.01
May-22	1734	1041	2951	2.74
Jun-22	143	88	235	0.23
Jul-22	831	473	1498	1.31
Aug-22	251	132	485	0.41

Survey	Abundance Estimate			Density
	Abundance	LCI	UCI	
Sep-22	2,682	1,707	3,857	4.16
Oct-22	45	7	128	0.07
Nov-22	159	52	295	0.25
Dec-22	94	33	166	0.15
Jan-23	104	47	176	0.16
Feb-23	283	133	463	0.44
Mar-23	366	183	590	0.57
Apr-23	443	151	1,461	0.69
Caledonia OWF (+4km)				
May-21	-	-	-	-
Jun-21	-	-	-	-
Jul-21	-	-	-	-
Aug-21	-	-	-	-
Sep-21	566	350	810	0.64
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	122	50	211	0.14
Apr-22	-	-	-	-
May-22	-	-	-	-
Jun-22	-	-	-	-
Jul-22	-	-	-	-
Aug-22	-	-	-	-
Sep-22	3,395	2,092	4,797	3.84

Survey	Abundance Estimate			Density
	Abundance	LCI	UCI	
Oct-22	51	8	133	0.06
Nov-22	192	52	358	0.22
Dec-22	120	61	184	0.14
Jan-23	123	60	200	0.14
Feb-23	416	230	624	0.47
Mar-23	537	307	785	0.61
April-23	-	-	-	-

Table 2-33: Availability bias-corrected density and population estimate of all razorbill in the Caledonia OWF, plus a 2km buffer and plus a 4km buffer, calculated using model-based analysis for the breeding season (April to mid-August) and design-based analysis for the non-breeding season (Mid-August to March).

Survey	Abundance Estimate			Density
	Abundance	LCI	UCI	
Caledonia OWF				
May-21	490	299	815	1.20
Jun-21	551	273	1130	1.33
Jul-21	973	595	1673	2.34
Aug-21	350	216	560	0.84
Sep-21	231	121	358	0.54
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	55	11	117	0.13
Apr-22	437	258	757	1.05
May-22	1280	780	2140	3.08
Jun-22	100	63	162	0.24
Jul-22	606	351	1064	1.46
Aug-22	174	93	331	0.43
Sep-22	2,093	974	3,408	4.90
Oct-22	9	1	29	0.02
Nov-22	139	41	252	0.33
Dec-22	46	9	87	0.11
Jan-23	97	36	161	0.23
Feb-23	236	109	419	0.55
Mar-23	360	200	521	0.84

Survey	Abundance Estimate			Density
	Abundance	LCI	UCI	
Apr-23	304	114	863	0.72
Caledonia OWF (+2km)				
May-21	835	504	1409	1.34
Jun-21	876	423	1841	1.39
Jul-21	1510	893	2699	2.37
Aug-21	550	334	900	0.87
Sep-21	449	289	612	0.70
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	93	39	155	0.14
Apr-22	699	408	1,226	1.11
May-22	2,014	1,209	3,427	3.18
Jun-22	158	97	259	0.25
Jul-22	953	542	1,717	1.50
Aug-22	294	155	567	0.47
Sep-22	3,232	2,065	4,636	5.02
Oct-22	54	9	155	0.08
Nov-22	191	63	354	0.30
Dec-22	114	40	201	0.18
Jan-23	126	56	213	0.19
Feb-23	334	160	542	0.52
Mar-23	432	220	690	0.67
Apr-23	466	159	1,537	0.73

Survey	Abundance Estimate			Density
	Abundance	LCI	UCI	
Caledonia OWF (+4km)				
May-21	-	-	-	-
Jun-21	-	-	-	-
Jul-21	-	-	-	-
Aug-21	-	-	-	-
Sep-21	684	424	974	0.77
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	147	61	252	0.17
Apr-22	-	-	-	-
May-22	-	-	-	-
Jun-22	-	-	-	-
Jul-22	-	-	-	-
Aug-22	-	-	-	-
Sep-22	4,094	2,531	5,772	4.63
Oct-22	61	10	161	0.07
Nov-22	231	63	427	0.26
Dec-22	146	74	223	0.16
Jan-23	149	72	242	0.17
Feb-23	494	276	738	0.56
Mar-23	634	368	919	0.72
Apr-23	-	-	-	-

2.5.4 Puffin

- 2.5.4.1 The density and population estimates of puffin in the Caledonia OWF (plus the 2km buffer and plus the 4km buffer), calculated using model-based analysis have been presented in Table 2-34 and Table 2-35.
- 2.5.4.2 Table 2-34 presents the density and population estimates of puffin in the Caledonia OWF (plus the 2km buffer and plus the 4km buffer), calculated using design- and model-based analysis. Only the apportioned density and abundance estimates for puffin are presented, as the data approach relies on both design- and model-based estimates.
- 2.5.4.3 The availability bias-corrected density and population estimate of 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 2-35.

Table 2-34: Apportioned density and population estimate of all puffin in Caledonia OWF; plus 2km buffer and plus 4km buffer, calculated using model-based analysis for the breeding season (April to mid-August) and design-based analysis for the non-breeding season (Mid-August to March). Not corrected for availability bias.

Survey	Abundance Estimate			Density
	Abundance	LCI	UCI	
Caledonia OWF				
May-21	235	146	386	0.57
Jun-21	212	116	403	0.51
Jul-21	303	175	535	0.72
Aug-21	1,925	1,201	3,167	4.52
Sep-21	76	41	113	0.18
Oct-21	179	73	297	0.42
Apr-22	483	274	852	1.17
May-22	500	328	775	1.20
Jun-22	53	29	103	0.13
Jul-22	102	50	212	0.24
Aug-22	308	166	563	0.75
Sep-22	1,269	627	2,031	2.97
Jan-23	17	3	53	0.04
Feb-23	29	6	53	0.07

Survey	Abundance Estimate			Density
	Abundance	LCI	UCI	
Mar-23	54	18	95	0.13
Apr-23	28	5	58	0.07
Caledonia OWF (+2km)				
May-21	381	231	638	0.62
Jun-21	331	178	633	0.53
Jul-21	456	260	822	0.72
Aug-21	2,830	1,765	4,642	4.47
Sep-21	105	52	175	0.16
Oct-21	211	85	353	0.33
Mar-22	12	2	36	0.02
Apr-22	766	431	1,364	1.23
May-22	786	506	1,235	1.26
Jun-22	90	47	182	0.15
Jul-22	154	75	318	0.24
Aug-22	508	269	944	0.83
Sep-22	2,084	1,266	2,990	3.24
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	580	344	991	0.68
Jun-21	484	258	935	0.56
Jul-21	641	358	1,181	0.74
Aug-21	3,977	2,482	6,513	4.58

Survey	Abundance Estimate			Density
	Abundance	LCI	UCI	
Sep-21	148	95	214	0.17
Oct-21	240	103	393	0.27
Mar-22	11	2	34	0.01
Apr-22	1,115	625	2,007	1.29
May-22	1,155	736	1,834	1.34
Jun-22	140	69	306	0.17
Jul-22	218	106	452	0.25
Aug-22	780	407	1471	0.92
Sep-22	3,001	1,745	4,345	3.39
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 2-35: Availability bias-corrected density and population estimate of all puffin in the Caledonia OWF, plus a 2km buffer and plus a 4km buffer, calculated using model-based analysis for the breeding season (April to mid-August) and design-based analysis for the non-breeding season (Mid-August to March).

Survey	Abundance Estimate			Density
	Abundance	LCI	UCI	
Caledonia OWF				
May-21	268	166	440	0.65
Jun-21	230	126	437	0.55
Jul-21	332	192	588	0.79
Aug-21	2,194	1,369	3,611	5.16
Sep-21	89	48	132	0.21
Oct-21	208	85	346	0.49
Apr-22	551	312	971	1.33
May-22	570	374	884	1.37
Jun-22	58	32	112	0.14
Jul-22	113	55	235	0.27
Aug-22	351	190	642	0.86
Sep-22	1,477	730	2,360	3.45
Jan-23	20	4	62	0.05
Feb-23	34	7	62	0.08
Mar-23	63	21	111	0.15
Apr-23	-	-	-	-
Caledonia OWF (+2km)				
May-21	435	263	727	0.70
Jun-21	359	194	687	0.57
Jul-21	500	285	902	0.79
Aug-21	3,226	2,012	5,292	5.09
Sep-21	122	61	204	0.19

Survey	Abundance Estimate			Density
	Abundance	LCI	UCI	
Oct-21	245	99	411	0.38
Mar-22	14	2	42	0.02
Apr-22	873	491	1,555	1.40
May-22	896	577	1408	1.44
Jun-22	98	51	199	0.16
Jul-22	171	84	353	0.27
Aug-22	580	307	1,076	0.94
Sep-22	2,426	1,475	3,477	3.77
Jan-23	20	4	62	0.03
Feb-23	47	13	81	0.07
Mar-23	75	20	131	0.12
Apr-23	-	-	-	-
Caledonia OWF (+4km)				
May-21	661	393	1,130	0.78
Jun-21	525	280	1,015	0.61
Jul-21	703	393	1,296	0.81
Aug-21	4,534	2,829	7,425	5.22
Sep-21	172	110	250	0.19
Oct-21	280	120	458	0.32
Mar-22	13	4	40	0.02
Apr-22	1,271	712	2,288	1.47
May-22	1,316	839	2,091	1.53
Jun-22	153	76	334	0.18
Jul-22	242	118	501	0.28
Aug-22	890	464	1,677	1.04

Survey	Abundance Estimate			Density
	Abundance	LCI	UCI	
Sep-22	3,492	2,032	5,051	3.95
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	-	-	-	-

2.5.5 Black guillemot

- 2.5.5.1 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 2-36 and Table 2-37.
- 2.5.5.2 Table 2-36 includes the unapportioned density and population estimates of black guillemot, and Table 2-37 includes the apportioned density and population estimates of black guillemot.

Table 2-36: Unapportioned density and population estimate of all black guillemot in the Caledonia OWF, plus a 2km buffer and plus a 4km buffer, calculated using design-based analysis. Not corrected for availability bias.

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
Jun-22	2	11	2	29	0.02	0.71
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 2-37: Apportioned density and population estimate of all black guillemot in the Caledonia OWF, plus a 2km buffer and plus a 4km buffer, calculated using design-based analysis. Not corrected for availability bias.

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

2.6 Gaviidae

2.6.1 Red-throated diver

- 2.6.1.1 The density and population estimates of red-throated diver in the Caledonia OWF (plus the 2km buffer and plus the 4km buffer, calculated using design-based analysis) have been presented in Table 2-38 and Table 2-39.
- 2.6.1.2 Table 2-38 includes the unapportioned density and population estimates of red-throated diver, and Table 2-39 includes the apportioned density and population estimates of red-throated diver.

Table 2-38: Unapportioned density and population estimate of all red-throated diver 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						
Oct-22	1	6	1	18	0.01	1.00
Caledonia OWF (+2km)						
Oct-22	1	6	1	17	0.01	1.00
Caledonia OWF (+4km)						
Oct-22	1	6	1	18	0.01	1.00

Table 2-39: Apportioned density and population estimate of all red-throated diver in the Caledonia OWF, plus a 2km buffer and plus a 4km buffer, calculated using design-based analysis.

Survey	Abundance Estimate			Density
	Abundance	LCI	UCI	
Caledonia OWF				
Oct-22	6	1	18	0.01
Caledonia OWF (+2km)				
Oct-22	6	1	17	0.01
Caledonia OWF (+4km)				
Oct-22	6	1	18	0.01

2.6.2 Great northern diver

2.6.2.1 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 2-40 and Table 2-41.

2.6.2.2 Table 2-40 includes the unapportioned density and population estimates of great northern diver, and Table 2-41 includes the apportioned density and population estimates of great northern diver.

Table 2-40: Unapportioned density and population estimate of all great northern diver in the Caledonia OWF, plus a 2km buffer and plus a 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 2-41: Apportioned density and population estimate of all great northern diver in the Caledonia OWF, plus a 2km buffer and plus a 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

2.7 Procelleriidae

2.7.1 Unidentified species

Unidentified fulmar and/or gull species

2.7.1.1 The density and population estimates of unidentified fulmar and/or 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 2-42.

Table 2-42: Density and population estimate of all unidentified fulmar and/or gull species in the Caledonia OWF, plus a 2km buffer and plus a 4km buffer, calculated using design-based analysis (Repeated from Table 2-7).

Survey	Raw Count	Abundance Estimate			Density	CV
		Abundance	LCI	UCI		
Caledonia OWF						
Nov-22	1	6	1	18	0.01	1.00
Mar-23	1	6	1	18	0.01	1.00
Caledonia OWF (+2km)						
Nov-22	1	6	1	17	0.01	1.00
Mar-23	1	6	1	17	0.01	1.00
Caledonia OWF (+4km)						
Nov-22	2	12	2	29	0.01	0.71
Mar-23	1	6	1	18	0.01	1.00

Unidentified small shearwater species

2.7.1.2 The density and population estimates of unidentified small 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 2-43.

Table 2-43: Density and population estimate of all unidentified small shear water species in the Caledonia OWF, plus a 2km buffer and plus a 4km buffer, calculated using design-based analysis.

Survey	Raw Count	Abundance Estimate			Density	CV
		Abundance	LCI	UCI		
Caledonia OWF						
Aug-22	1	6	1	17	0.01	1.00
Caledonia OWF (+2km)						
Aug-22	1	6	1	17	0.01	1.00
Sep-22	1	6	1	17	0.01	1.00
Caledonia OWF (+4km)						
Aug-22	1	6	1	17	0.01	1.00
Sep-22	1	6	1	18	0.01	1.00

Unidentified shearwater species

2.7.1.3 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 2-44.

Table 2-44: Density and population estimate of all unidentified shearwater species in the Caledonia OWF, plus a 2km buffer and plus a 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

Unidentified auk and/ or shearwater species

2.7.1.4 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 2-45.

Table 2-45: Density and population estimate of all unidentified auk and/ or shearwater species in the Caledonia OWF, plus a 2km buffer and plus a 4km buffer, calculated using design-based analysis (Repeated from Table 2-29).

Survey	Raw Count	Abundance Estimate			Density	CV
		Abundance	LCI	UCI		
Caledonia OWF						
May-21	2	12	2	35	0.03	0.71
Jun-21	3	18	3	41	0.04	0.58
Jul-21	7	41	7	88	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	5	29	5	69	0.05	0.45
Jun-21	14	81	14	174	0.13	0.27
Jul-21	12	70	12	151	0.11	0.29
Apr-22	1	6	1	17	0.01	1.00
May-22	9	51	23	92	0.08	0.33
Jun-22	4	23	4	52	0.04	0.50
Aug-22	1	6	1	17	0.01	1.00
Sep-22	74	427	74	1275	0.66	0.12
Mar-23	3	17	3	46	0.03	0.58

Survey	Raw Count	Abundance Estimate			Density	CV
		Abundance	LCI	UCI		
Apr-23	1	6	1	17	0.01	1.00
Caledonia OWF (+4km)						
May-21	10	58	18	111	0.07	0.32
Jun-21	14	82	14	171	0.09	0.27
Jul-21	13	78	18	169	0.09	0.28
Apr-22	2	12	2	29	0.01	0.71
May-22	9	52	23	93	0.06	0.33
Jun-22	5	29	6	58	0.03	0.45
Aug-22	1	6	1	17	0.01	1.00
Sep-22	74	432	74	1290	0.49	0.12
Mar-23	4	23	4	53	0.03	0.50
Apr-23	1	6	1	17	0.01	1.00

2.7.2 Fulmar

2.7.2.1 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 2-46 and Table 2-47.

2.7.2.2 Table 2-46 includes the unapportioned density and population estimates of fulmar, and Table 2-47 includes the apportioned density and population estimates of fulmar.

Table 2-46: Unapportioned density and population estimate of all fulmar in the Caledonia OWF, plus a 2km buffer and plus a 4km buffer, calculated using design-based analysis.

Survey	Raw Count	Abundance Estimate			Density	CV
		Abundance	LCI	UCI		
Caledonia OWF						
May-21	43	251	181	315	0.59	0.15
Jun-21	40	235	141	346	0.55	0.16
Jul-21	466	2,748	714	6,511	6.43	0.05
Aug-21	138	799	602	1,030	1.87	0.09
Sep-21	50	290	203	383	0.68	0.14
Oct-21	3	18	3	47	0.04	0.58
Nov-21	122	709	122	1,847	1.66	0.09
Dec-21	85	493	296	720	1.15	0.11
Jan-22	25	145	87	203	0.34	0.20
Feb-22	36	194	113	297	0.45	0.17
Mar-22	8	43	16	75	0.10	0.35
Apr-22	48	276	48	530	0.65	0.14
May-22	20	116	75	162	0.27	0.22
Jun-22	96	552	276	862	1.29	0.10
Jul-22	705	4,124	2,351	6,147	9.65	0.04
Aug-22	44	254	150	363	0.59	0.15
Sep-22	18	104	52	162	0.24	0.24
Nov-22	125	735	512	1,000	1.72	0.09
Dec-22	41	240	100	410	0.56	0.16
Jan-23	14	82	47	134	0.19	0.27
Feb-23	15	86	52	121	0.20	0.26
Mar-23	49	286	158	420	0.67	0.14
Apr-23	13	74	34	119	0.17	0.28

Survey	Raw Count	Abundance Estimate			Density	CV
		Abundance	LCI	UCI		
Caledonia OWF (+2km)						
May-21	76	437	345	534	0.68	0.11
Jun-21	68	394	249	563	0.61	0.12
Jul-21	629	3,644	1,170	8,058	5.66	0.04
Aug-21	220	1,255	896	1,586	1.95	0.07
Sep-21	65	373	270	477	0.58	0.12
Oct-21	7	40	7	81	0.06	0.38
Nov-21	155	886	206	1,985	1.38	0.08
Dec-21	129	739	447	1,088	1.15	0.09
Jan-22	47	269	171	371	0.42	0.15
Feb-22	56	300	198	407	0.47	0.13
Mar-22	13	69	32	106	0.11	0.28
Apr-22	61	346	125	607	0.54	0.13
May-22	45	257	149	412	0.40	0.15
Jun-22	149	854	493	1,243	1.33	0.08
Jul-22	1,096	6,311	3,783	9,270	9.81	0.03
Aug-22	71	406	275	555	0.63	0.12
Sep-22	34	196	110	294	0.30	0.17
Nov-22	196	1,136	840	1,472	1.77	0.07
Dec-22	63	368	198	607	0.57	0.13
Jan-23	25	145	93	209	0.23	0.20
Feb-23	22	126	74	177	0.20	0.21
Mar-23	67	388	197	591	0.60	0.12
Apr-23	24	136	51	244	0.21	0.20
Caledonia OWF (+4km)						

Survey	Raw Count	Abundance Estimate			Density	CV
		Abundance	LCI	UCI		
May-21	91	532	392	672	0.60	0.10
Jun-21	105	618	429	818	0.70	0.10
Jul-21	790	4,770	1,678	9,890	5.40	0.04
Aug-21	285	1,653	1,149	2,147	1.87	0.06
Sep-21	113	661	509	837	0.75	0.09
Oct-21	12	70	12	146	0.08	0.29
Nov-21	180	1,048	297	2,235	1.19	0.07
Dec-21	187	1,090	740	1,509	1.23	0.07
Jan-22	55	319	203	435	0.36	0.13
Feb-22	80	439	296	604	0.50	0.11
Mar-22	28	151	86	227	0.17	0.19
Apr-22	70	404	179	669	0.46	0.12
May-22	51	296	157	482	0.33	0.14
Jun-22	204	1,181	677	1,765	1.34	0.07
Jul-22	1,631	9,532	4,342	15,617	10.79	0.02
Aug-22	114	655	465	850	0.74	0.09
Sep-22	47	274	169	391	0.31	0.15
Oct-22	4	24	4	59	0.03	0.50
Nov-22	252	1,486	1,032	1,922	1.68	0.06
Dec-22	87	513	295	761	0.58	0.11
Jan-23	53	312	194	470	0.35	0.14
Feb-23	37	214	145	278	0.24	0.16
Mar-23	96	564	317	834	0.64	0.10
Apr-23	39	224	121	344	0.25	0.16

Table 2-47: Apportioned density and population estimate of all fulmar in the Caledonia OWF, plus a 2km buffer and plus a 4km buffer, calculated using design-based analysis.

Survey	Abundance Estimate			Density
	Abundance	LCI	UCI	
Caledonia OWF				
May-21	251	164	350	0.59
Jun-21	234	124	358	0.55
Jul-21	2,748	683	6,517	6.43
Aug-21	798	561	1,071	1.87
Sep-21	290	162	435	0.68
Oct-21	18	3	47	0.04
Nov-21	709	150	1,830	1.66
Dec-21	493	290	719	1.15
Jan-22	145	64	237	0.34
Feb-22	194	92	297	0.45
Mar-22	43	13	81	0.10
Apr-22	277	61	582	0.65
May-22	116	58	197	0.27
Jun-22	551	264	902	1.29
Jul-22	4,123	1,896	6,732	9.64
Aug-22	254	131	369	0.59
Sep-22	104	35	185	0.24
Nov-22	740	480	1,044	1.73
Dec-22	240	102	427	0.56
Jan-23	82	31	157	0.19
Feb-23	86	41	138	0.20
Mar-23	292	147	460	0.68
Apr-23	74	17	147	0.17

Survey	Abundance Estimate			Density
	Abundance	LCI	UCI	
Caledonia OWF (+2km)				
May-21	436	293	598	0.68
Jun-21	395	243	574	0.61
Jul-21	3,643	1,066	8,266	5.66
Aug-21	1,255	873	1,626	1.95
Sep-21	374	224	545	0.58
Oct-21	41	7	92	0.06
Nov-21	886	236	2,081	1.38
Dec-21	739	441	1,134	1.15
Jan-22	269	139	429	0.42
Feb-22	300	177	439	0.47
Mar-22	69	29	117	0.11
Apr-22	346	113	641	0.54
May-22	258	115	452	0.40
Jun-22	853	429	1,318	1.32
Jul-22	6,310	3,484	10,358	9.80
Aug-22	406	189	670	0.63
Sep-22	196	80	329	0.30
Nov-22	1,141	824	1,510	1.77
Dec-22	368	175	618	0.57
Jan-23	145	79	221	0.23
Feb-23	126	66	183	0.20
Mar-23	393	198	638	0.61
Apr-23	136	34	272	0.21

Survey	Abundance Estimate			Density
	Abundance	LCI	UCI	
Caledonia OWF (+4km)				
May-21	531	339	748	0.60
Jun-21	618	406	847	0.70
Jul-21	4,770	1,510	10,035	5.39
Aug-21	1,653	1,126	2,141	1.87
Sep-21	661	416	942	0.75
Oct-21	71	12	158	0.08
Nov-21	1,048	288	2,247	1.19
Dec-21	1,090	728	1,538	1.23
Jan-22	319	177	487	0.36
Feb-22	439	269	615	0.50
Mar-22	152	75	227	0.17
Apr-22	404	150	721	0.46
May-22	297	127	517	0.34
Jun-22	1,180	665	1,782	1.33
Jul-22	9,533	3,887	16,136	10.78
Aug-22	655	356	1,011	0.74
Sep-22	274	140	420	0.31
Oct-22	24	4	70	0.03
Nov-22	1,497	998	1,988	1.69
Dec-22	513	277	802	0.58
Jan-23	312	164	476	0.35
Feb-23	215	134	295	0.24
Mar-23	569	288	877	0.64
Apr-23	224	97	396	0.25

2.7.3 Sooty shearwater

2.7.3.1 The density and population estimates of sooty shearwater in the Caledonia OWF (plus the 2km buffer and plus the 4km buffer, calculated using design-based analysis) have been presented in Table 2-48 and Table 2-49.

2.7.3.2 Table 2-48 includes the unapportioned density and population estimates of sooty shearwater, and Table 2-49 includes the apportioned density and population estimates of sooty shearwater.

Table 2-48: Unapportioned density and population estimate of all sooty shearwater in the Caledonia OWF, plus a 2km buffer and plus a 4km buffer, calculated using design-based analysis.

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

Table 2-49: Apportioned density and population estimate of all sooty shearwater in the Caledonia OWF, plus a 2km buffer and plus a 4km buffer, calculated using design-based analysis.

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

2.7.5 Manx shearwater

2.7.5.1 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 2-50 and Table 2-51.

2.7.5.2 Table 2-50 includes the unapportioned density and population estimates of Manx shearwater, and Table 2-51 includes the apportioned density and population estimates of Manx shearwater.

Table 2-50: Unapportioned density and population estimate of all Manx shearwater in the Caledonia OWF, plus a 2km buffer and plus a 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
Jul-21	2	12	2	29	0.03	0.71
May-22	8	46	8	116	0.11	0.35
Caledonia OWF (+2km)						
Jun-21	9	52	9	122	0.08	0.33
Jul-21	3	17	6	35	0.03	0.58
May-22	8	46	8	120	0.07	0.35
Caledonia OWF (+4km)						
May-21	1	6	1	18	0.01	1.00
Jun-21	15	88	15	235	0.10	0.26
Jul-21	3	18	6	36	0.02	0.58
May-22	9	52	9	134	0.06	0.33

Table 2-51: Apportioned density and population estimate of all Manx shearwater in the Caledonia OWF, plus a 2km buffer and plus a 4km buffer, calculated using design-based analysis.

Survey	Abundance Estimate			Density
	Abundance	LCI	UCI	
Caledonia OWF				
Jun-21	12	2	30	0.03
Jul-21	12	2	29	0.03
May-22	47	8	133	0.11
Caledonia OWF (+2km)				
Jun-21	54	9	149	0.08
Jul-21	17	6	35	0.03
May-22	45	8	132	0.07
Caledonia OWF (+4km)				
May-21	6	1	18	0.01
Jun-21	89	15	239	0.10
Jul-21	18	3	36	0.02
May-22	52	9	140	0.06

2.8 Sulidae

2.8.1 Gannet

2.8.1.1 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 2-52.

Table 2-52: Density and population estimate of all gannet in the Caledonia OWF, plus a 2km buffer and plus a 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	3	17	3	35	0.04	0.58
Jun-21	68	399	217	663	0.93	0.12
Jul-21	18	106	18	271	0.25	0.24
Aug-21	27	156	93	237	0.37	0.19
Sep-21	40	232	99	383	0.54	0.16
Oct-21	66	386	252	527	0.90	0.12
Nov-21	9	52	23	81	0.12	0.33
Dec-21	4	23	4	46	0.05	0.50
Jan-22	2	12	2	29	0.03	0.71
Feb-22	2	11	2	32	0.03	0.71
Mar-22	1	5	1	16	0.01	1.00
Apr-22	4	23	6	40	0.05	0.50
May-22	13	75	13	191	0.18	0.28
Jun-22	173	994	224	1,977	2.33	0.08
Jul-22	30	175	105	269	0.41	0.18
Aug-22	7	40	12	75	0.09	0.38
Sep-22	52	301	145	475	0.70	0.14
Oct-22	10	58	10	123	0.14	0.32
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	3	17	3	34	0.04	0.58
Apr-23	14	79	14	227	0.18	0.27

Survey	Raw Count	Abundance Estimate			Density	CV
		Abundance	LCI	UCI		
Caledonia OWF (+2km)						
May-21	11	63	34	98	0.10	0.30
Jun-21	91	528	273	835	0.82	0.10
Jul-21	21	122	21	266	0.19	0.22
Aug-21	49	280	171	394	0.44	0.14
Sep-21	66	379	230	545	0.59	0.12
Oct-21	91	525	375	692	0.82	0.10
Nov-21	13	74	34	114	0.11	0.28
Dec-21	4	23	4	52	0.04	0.50
Jan-22	2	11	2	29	0.02	0.71
Feb-22	4	21	4	64	0.03	0.5
Mar-22	1	5	1	16	0.01	1.00
Apr-22	5	28	11	45	0.04	0.45
May-22	17	97	23	212	0.15	0.24
Jun-22	225	1,289	487	2,212	2.00	0.07
Jul-22	44	253	127	403	0.39	0.15
Aug-22	11	63	34	97	0.10	0.30
Sep-22	85	491	317	646	0.76	0.11
Oct-22	18	105	29	210	0.16	0.24
Nov-22	1	6	1	17	0.01	1.00
Dec-22	3	18	3	35	0.03	0.58
Jan-23	2	12	2	29	0.02	0.71
Feb-23	6	34	11	63	0.05	0.41
Mar-23	1	6	1	17	0.01	1.00
Apr-23	14	79	14	232	0.12	0.27

Survey	Raw Count	Abundance Estimate			Density	CV
		Abundance	LCI	UCI		
Caledonia OWF (+4km)						
May-21	14	82	35	140	0.09	0.27
Jun-21	114	671	353	1,065	0.76	0.09
Jul-21	33	199	78	362	0.23	0.17
Aug-21	71	412	267	557	0.47	0.12
Sep-21	99	579	398	784	0.66	0.10
Oct-21	125	732	486	977	0.83	0.09
Nov-21	16	93	41	151	0.11	0.25
Dec-21	4	23	4	52	0.03	0.50
Jan-22	2	12	2	29	0.01	0.71
Feb-22	5	27	5	71	0.03	0.45
Mar-22	1	5	1	16	0.01	1.00
Apr-22	12	69	17	156	0.08	0.29
May-22	21	122	41	238	0.14	0.22
Jun-22	258	1,493	666	2,448	1.69	0.06
Jul-22	72	421	210	660	0.48	0.12
Aug-22	11	63	29	103	0.07	0.30
Sep-22	104	607	379	829	0.69	0.10
Oct-22	47	276	76	600	0.31	0.15
Nov-22	2	12	2	29	0.01	0.71
Dec-22	4	24	4	53	0.03	0.50
Jan-23	3	18	3	35	0.02	0.58
Feb-23	8	46	17	75	0.05	0.35
Mar-23	1	6	1	18	0.01	1.00
Apr-23	15	86	15	235	0.10	0.26

2.9 Turdidae

2.9.1 Unidentified thrush species

2.9.1.1 The density and population estimates of unidentified thrush species in the Caledonia OWF (plus the 2km buffer and plus the 4km buffer, calculated using design-based analysis) have been presented in Table 2-53.

Table 2-53: Density and population estimate of all unidentified thrush species in the Caledonia OWF, plus a 2km buffer and plus a 4km buffer, calculated using design-based analysis.

Survey	Raw Count	Abundance Estimate			Density	CV
		Abundance	LCI	UCI		
Caledonia OWF						
Oct-22	17	99	18	245	0.23	0.24
Caledonia OWF (+2km)						
Oct-22	114	664	114	1,736	1.03	0.09
Caledonia OWF (+4km)						
Oct-22	289	1,699	382	3,321	1.92	0.06

2.10 Passeriformes

2.10.1 Unidentified passerine species

2.10.1.1 The density and population estimates of unidentified passerine species in the Caledonia OWF (plus the 2km buffer and plus the 4km buffer, calculated using design-based analysis) have been presented in Table 2-54.

Table 2-54: Density and population estimate of all unidentified passerine species in the Caledonia OWF, plus a 2km buffer and plus a 4km buffer, calculated using design-based analysis.

Survey	Raw Count	Abundance Estimate			Density	CV
		Abundance	LCI	UCI		
Caledonia OWF						
Oct-22	16	93	16	257	0.22	0.25
Caledonia OWF (+2km)						
Oct-22	17	99	17	274	0.15	0.24
Caledonia OWF (+4km)						
Oct-22	78	459	78	894	0.52	0.11

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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