BERWICK BANK WIND FARM

OFFSHORE ENVIRONMENTAL IMPACT ASSESSMENT

APPENDIX 11.1, ANNEX C: DESIGN-BASED ANALYSIS – POPULATION ESTIMATES FOR ALL BIRDS GROUPED BY SPECIES (BERWICK BANK DEVELOPMENT AREA PLUS 16KM BUFFER)

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Environmental Impact Assessment – Annex C
Final

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NOTE

This annex provides unapportioned (detections assigned to species only) density and population estimates for focal species within the Offshore Ornithology Study Area). Estimates presented for auk species do not account for availability bias. Further EIA/HRA assessments should rely on those that have this correction applied (see the Baseline Report and Annex F)

TABLES

Table 1: **Unapportioned density and population estimates of all common scoters in the Offshore Ornithology Study Area, calculated using design-based analysis**

All Common scoter	Density Estimate (birds/ km²)	Lower 95% CI (birds/ km²)	Upper 95% CI (birds/ km²)	Population Estimate (number)	Lower 95% CI (number)	Upper 95% CI (number)	SD	CV
Survey								
Mar-19	0	0	0	0	0	0	0	0
May-19	0	0	0	0	0	0	0	0
Jun-19	0	0	0.01	16	0	48	16	100.26%
Jul-19	0	0	0	0	0	0	0	0
Aug-19	0	0	0	0	0	0	0	0
Sep-19	0	0	0	0	0	0	0	0
Oct-19	0	0	0	0	0	0	0	0
Nov-19	0	0	0	0	0	0	0	0
Dec-19	0	0	0	0	0	0	0	0
Jan-20	0	0	0.01	9	0	27	9	94.56%
Feb-20	0	0	0	0	0	0	0	0
Mar-20	0	0	0	0	0	0	0	0
May S01 20	0	0	0	0	0	0	0	0
May S02 20	0	0	0	0	0	0	0	0
Jun-20	0	0	0	0	0	0	0	0
Jul-20	0	0	0	0	0	0	0	0
Aug-20	0	0	0	0	0	0	0	0
Sep-20	0	0	0	0	0	0	0	0
Oct-20	0	0	0	0	0	0	0	0
Nov-20	0	0	0	0	0	0	0	0
Dec-20	0	0	0	0	0	0	0	0
Jan-21	0	0	0	0	0	0	0	0
Feb-21	0	0	0	0	0	0	0	0
Apr S01 21	0	0	0	0	0	0	0	0
Apr S02 21	0	0	0	0	0	0	0	0

Table 2: **Unapportioned density and population estimates of all kittiwakes in the Offshore Ornithology Study Area, calculated using design-based analysis**

All Kittiwake	Density Estimate (birds/ km²)	Lower 95% CI (birds/ km²)	Upper 95% CI (birds/ km²)	Population Estimate (number)	Lower 95% CI (number)	Upper 95% CI (number)	SD	CV
Survey								
Mar-19	11.81	7.09	17.24	46965	28202	68584	10136	21.58%
May-19	2.52	1.93	3.14	10032	7666	12475	1243	12.38%
Jun-19	2.05	1.58	2.63	8153	6292	10464	1012	12.41%
Jul-19	3.69	3.16	4.48	14685	12560	17822	1317	8.97%
Aug-19	8.25	6.8	9.71	32806	27033	38625	2915	8.89%
Sep-19	1.62	1.17	2.05	6459	4669	8168	930	14.39%
Oct-19	1.34	0.7	2.58	5341	2799	10258	1925	36.04%
Nov-19	0.44	0.25	0.71	1759	981	2819	490	27.82%
Dec-19	0.52	0.26	0.86	2080	1025	3428	649	31.18%
Jan-20	2.09	1.34	2.92	8322	5336	11612	1541	18.52%
Feb-20	1.31	0.97	1.77	5227	3860	7048	837	16.01%
Mar-20	5.35	3.72	7.43	21272	14776	29570	3823	17.97%
May S01 20	2.67	1.71	3.78	10623	6807	15045	2137	20.11%
May S02 20	5.75	4.74	6.77	22876	18853	26924	2102	9.19%
Jun-20	5.04	4.27	5.8	20047	16989	23051	1575	7.85%
Jul-20	6.31	5.01	7.6	25101	19924	30245	2636	10.5%
Aug-20	9.24	7.41	11.33	36743	29488	45071	4045	11.01%
Sep-20	13.89	10.39	17.53	55261	41312	69728	7317	13.24%
Oct-20	1.72	1.13	2.5	6859	4499	9963	1437	20.95%
Nov-20	3.55	2.68	4.42	14108	10647	17569	1731	12.26%
Dec-20	2.38	1.25	4.03	9477	4976	16015	3072	32.41%
Jan-21	4.26	2.04	7.22	16947	8117	28727	5331	31.45%
Feb-21	1.02	0.39	1.85	4053	1532	7342	1608	39.68%
Apr S01 21	6.88	5.68	8.11	27350	22604	32262	2454	8.97%
Apr S02 21	8.4	4.79	13.26	33429	19042	52758	8797	26.31%

Table 3: **Unapportioned density and population estimates of all black-headed gulls in the Offshore Ornithology Study Area, calculated using design-based analysis**

All Black-headed gull	Density Estimate (birds/ km²)	Lower 95% CI (birds/ km²)	Upper 95% CI (birds/ km²)	Population Estimate (number)	Lower 95% CI (number)	Upper 95% CI (number)	SD	CV
Survey								
Mar-19	0	0	0	0	0	0	0	0
May-19	0	0	0	0	0	0	0	0
Jun-19	0	0	0	0	0	0	0	0
Jul-19	0	0	0	0	0	0	0	0
Aug-19	0	0	0	0	0	0	0	0
Sep-19	0	0	0	0	0	0	0	0
Oct-19	0	0	0	0	0	0	0	0
Nov-19	0	0	0	0	0	0	0	0
Dec-19	0	0	0	0	0	0	0	0
Jan-20	0	0	0	0	0	0	0	0
Feb-20	0	0	0	0	0	0	0	0
Mar-20	0	0	0	0	0	0	0	0
May S01 20	0	0	0	0	0	0	0	0
May S02 20	0	0	0	0	0	0	0	0
Jun-20	0	0	0	0	0	0	0	0
Jul-20	0	0	0	0	0	0	0	0
Aug-20	0	0	0	0	0	0	0	0
Sep-20	0	0	0.01	9	0	24	8	98.71%
Oct-20	0	0	0	0	0	0	0	0
Nov-20	0	0	0	0	0	0	0	0
Dec-20	0	0	0.01	8	0	24	8	101.19%
Jan-21	0	0	0	0	0	0	0	0
Feb-21	0	0	0	0	0	0	0	0
Apr S01 21	0	0	0	0	0	0	0	0
Apr S02 21	0	0	0	0	0	0	0	0

Table 4: **Unapportioned density and population estimates of all little gulls in the Offshore Ornithology Study Area, calculated using design-based analysis**

All Little gull	Density Estimate (birds/ km²)	Lower 95% CI (birds/ km²)	Upper 95% CI (birds/ km²)	Population Estimate (number)	Lower 95% CI (number)	Upper 95% CI (number)	SD	CV
Survey								
Mar-19	0	0	0	0	0	0	0	0
May-19	0	0	0	0	0	0	0	0
Jun-19	0	0	0	0	0	0	0	0
Jul-19	0.01	0	0.02	41	15	71	16	37.17%
Aug-19	0.02	0.01	0.03	66	25	114	24	35.98%
Sep-19	0	0	0	0	0	0	0	0
Oct-19	0	0	0	0	0	0	0	0
Nov-19	0	0	0.01	16	0	45	15	93.92%
Dec-19	0	0	0	0	0	0	0	0
Jan-20	0	0	0.01	17	0	48	15	87.76%
Feb-20	0.01	0	0.02	26	0	67	18	67.37%
Mar-20	0	0	0	0	0	0	0	0
May S01 20	0	0	0	0	0	0	0	0
May S02 20	0	0	0	0	0	0	0	0
Jun-20	0	0	0	0	0	0	0	0
Jul-20	0.01	0	0.02	31	0	91	26	81.05%
Aug-20	0.06	0.03	0.11	255	112	449	85	33.19%
Sep-20	0.01	0	0.02	41	0	96	26	62.05%
Oct-20	0	0	0.01	9	0	24	8	92.97%
Nov-20	0	0	0	0	0	0	0	0
Dec-20	0.01	0	0.02	42	8	80	20	46.21%
Jan-21	0.01	0	0.02	25	0	72	24	95.07%
Feb-21	0	0	0	0	0	0	0	0
Apr S01 21	0	0	0	0	0	0	0	0
Apr S02 21	0.01	0	0.02	33	8	64	16	46.75%

Table 5: **Unapportioned density and population estimates of all common gulls in the Offshore Ornithology Study Area, calculated using design-based analysis**

All Common gull	Density Estimate (birds/ km²)	Lower 95% CI (birds/ km²)	Upper 95% CI (birds/ km²)	Population Estimate (number)	Lower 95% CI (number)	Upper 95% CI (number)	SD	CV
Survey								
Mar-19	0.01	0	0.02	31	7	63	15	48.28%
May-19	0	0	0.01	9	0	24	9	101.82%
Jun-19	0	0	0	0	0	0	0	0
Jul-19	0.01	0	0.02	33	0	75	19	55.36%
Aug-19	0.01	0	0.01	24	0	56	14	56.18%
Sep-19	0	0	0	0	0	0	0	0
Oct-19	0.03	0.01	0.06	125	41	251	55	44.06%
Nov-19	0.09	0.03	0.16	373	137	631	124	33.19%
Dec-19	0.07	0.02	0.14	291	74	577	135	46.17%
Jan-20	0.01	0	0.02	51	16	94	22	42.97%
Feb-20	0.03	0.01	0.05	118	55	206	39	32.91%
Mar-20	0	0	0.01	9	0	25	9	98.17%
May S01 20	0	0	0	0	0	0	0	0
May S02 20	0	0	0.01	9	0	24	9	100.33%
Jun-20	0	0	0	0	0	0	0	0
Jul-20	0.01	0	0.01	24	0	48	13	54.36%
Aug-20	0.04	0.03	0.06	176	104	254	38	21.2%
Sep-20	0.01	0	0.01	25	0	55	14	54.91%
Oct-20	0	0	0	0	0	0	0	0
Nov-20	0.01	0	0.01	24	0	56	13	53.92%
Dec-20	0.23	0.06	0.5	933	234	1980	443	47.44%
Jan-21	0.05	0.03	0.07	185	118	261	38	20.57%
Feb-21	0	0	0	0	0	0	0	0
Apr S01 21	0.01	0	0.01	24	0	52	13	52.96%
Apr S02 21	0.03	0.01	0.05	113	55	180	34	29.58%

Table 6: **Unapportioned density and population estimates of all great black-backed gulls in the Offshore Ornithology Study Area, calculated using design-based analysis**

All Great black-backed gull	Density Estimate (birds/ km²)	Lower 95% CI (birds/ km²)	Upper 95% CI (birds/ km²)	Population Estimate (number)	Lower 95% CI (number)	Upper 95% CI (number)	SD	CV
Survey								
Mar-19	0	0	0.01	13	0	30	9	67.02%
May-19	0	0	0	0	0	0	0	0
Jun-19	0.03	0.01	0.06	117	24	256	62	52.89%
Jul-19	0.01	0	0.02	32	0	65	17	50.89%
Aug-19	0	0	0.01	9	0	26	8	91.4%
Sep-19	0	0	0.01	8	0	24	8	101.85%
Oct-19	0	0	0	0	0	0	0	0
Nov-19	0.06	0.02	0.12	252	78	460	102	40.47%
Dec-19	0.02	0	0.03	63	15	123	31	48.43%
Jan-20	0	0	0	0	0	0	0	0
Feb-20	0	0	0.01	17	0	40	11	68.32%
Mar-20	0	0	0.01	9	0	25	9	99.97%
May S01 20	0	0	0	0	0	0	0	0
May S02 20	0	0	0	0	0	0	0	0
Jun-20	0	0	0.01	9	0	24	8	95.28%
Jul-20	0.02	0.01	0.04	75	24	143	31	40.46%
Aug-20	0	0	0.01	17	0	40	12	68.65%
Sep-20	0	0	0	0	0	0	0	0
Oct-20	0	0	0	0	0	0	0	0
Nov-20	0.01	0	0.02	40	12	78	17	40.91%
Dec-20	0.1	0.06	0.15	407	228	606	98	23.99%
Jan-21	0.06	0.03	0.09	221	107	374	70	31.34%
Feb-21	0	0	0.01	9	0	24	9	100.19%
Apr S01 21	0	0	0	0	0	0	0	0
Apr S02 21	0	0	0	0	0	0	0	0

Table 7: **Unapportioned density and population estimates of all herring gulls in the Offshore Ornithology Study Area, calculated using design-based analysis**

All Herring gull	Density Estimate (birds/ km²)	Lower 95% CI (birds/ km²)	Upper 95% CI (birds/ km²)	Population Estimate (number)	Lower 95% CI (number)	Upper 95% CI (number)	SD	CV
Survey								
Mar-19	0	0	0.01	19	0	39	10	52.53%
May-19	0	0	0.01	17	0	48	17	98.9%
Jun-19	0.47	0.27	0.68	1874	1060	2688	405	21.59%
Jul-19	0.21	0.14	0.28	822	576	1111	138	16.74%
Aug-19	0.2	0.1	0.32	788	384	1254	228	28.94%
Sep-19	0	0	0.01	8	0	24	8	99.32%
Oct-19	0	0	0.01	8	0	23	7	92.96%
Nov-19	0.36	0.05	0.76	1443	205	3039	726	50.32%
Dec-19	0.16	0.01	0.41	643	46	1628	453	70.43%
Jan-20	0.01	0	0.02	41	8	85	21	49.95%
Feb-20	0.01	0	0.01	25	0	55	14	56.76%
Mar-20	0	0	0.01	9	0	25	9	97.1%
May S01 20	0	0	0.01	8	0	23	8	101.56%
May S02 20	0	0	0.01	8	0	24	8	96.19%
Jun-20	0.05	0.01	0.1	195	47	410	92	47.06%
Jul-20	1.1	0.69	1.5	4364	2763	5984	840	19.25%
Aug-20	0.16	0.07	0.26	640	273	1052	203	31.68%
Sep-20	0.06	0.03	0.09	220	110	348	64	28.77%
Oct-20	0.01	0	0.01	26	4	48	13	48.56%
Nov-20	0.02	0	0.05	86	20	182	43	49.74%
Dec-20	1.25	0.38	2.17	4974	1519	8638	1882	37.84%
Jan-21	0.15	0.06	0.28	580	238	1126	236	40.61%
Feb-21	0.01	0	0.02	41	0	96	25	60.84%
Apr S01 21	0	0	0.01	17	0	40	12	69.73%
Apr S02 21	0.01	0	0.03	58	8	127	31	53.45%

Table 8: **Unapportioned density and population estimates of all lesser black-backed gulls in the Offshore Ornithology Study Area, calculated using design-based analysis**

All Lesser black-backed gull	Density Estimate (birds/ km²)	Lower 95% CI (birds/ km²)	Upper 95% CI (birds/ km²)	Population Estimate (number)	Lower 95% CI (number)	Upper 95% CI (number)	SD	CV
Survey								
Mar-19	0	0	0	0	0	0	0	0
May-19	0	0	0.01	17	0	40	11	67.49%
Jun-19	0.04	0.02	0.06	144	72	233	41	27.9%
Jul-19	0.06	0.04	0.08	248	172	338	43	17.2%
Aug-19	0.03	0.02	0.05	129	70	199	34	25.63%
Sep-19	0	0	0.01	17	0	48	16	95.67%
Oct-19	0	0	0	0	0	0	0	0
Nov-19	0	0	0	0	0	0	0	0
Dec-19	0	0	0	0	0	0	0	0
Jan-20	0	0	0	0	0	0	0	0
Feb-20	0	0	0	0	0	0	0	0
Mar-20	0	0	0	0	0	0	0	0
May S01 20	0	0	0.01	22	0	76	22	99.61%
May S02 20	0	0	0	0	0	0	0	0
Jun-20	0.01	0	0.03	49	8	104	27	54.19%
Jul-20	0.22	0.16	0.28	875	638	1111	120	13.64%
Aug-20	0.06	0.03	0.11	246	103	458	91	36.87%
Sep-20	0	0	0	0	0	0	0	0
Oct-20	0	0	0	0	0	0	0	0
Nov-20	0	0	0	0	0	0	0	0
Dec-20	0	0	0.01	8	0	24	8	95.72%
Jan-21	0	0	0	0	0	0	0	0
Feb-21	0	0	0	0	0	0	0	0
Apr S01 21	0	0	0.01	9	0	24	8	95.14%
Apr S02 21	0	0	0	0	0	0	0	0

Table 9: **Unapportioned density and population estimates of all common terns in the Offshore Ornithology Study Area, calculated using design-based analysis**

All Common tern	Density Estimate (birds/ km²)	Lower 95% CI (birds/ km²)	Upper 95% CI (birds/ km²)	Population Estimate (number)	Lower 95% CI (number)	Upper 95% CI (number)	SD	CV
Survey								
Mar-19	0	0	0	0	0	0	0	0
May-19	0	0	0	0	0	0	0	0
Jun-19	0	0	0	0	0	0	0	0
Jul-19	0.01	0	0.02	24	0	75	24	98.65%
Aug-19	0.01	0	0.02	32	8	61	14	43.74%
Sep-19	0	0	0	0	0	0	0	0
Oct-19	0	0	0	0	0	0	0	0
Nov-19	0	0	0	0	0	0	0	0
Dec-19	0	0	0	0	0	0	0	0
Jan-20	0	0	0	0	0	0	0	0
Feb-20	0	0	0	0	0	0	0	0
Mar-20	0	0	0	0	0	0	0	0
May S01 20	0	0	0.01	8	0	22	7	98.49%
May S02 20	0	0	0.01	9	0	24	8	90.67%
Jun-20	0	0	0	0	0	0	0	0
Jul-20	0.01	0	0.04	55	0	157	47	86.61%
Aug-20	0.07	0.02	0.13	272	80	529	117	42.93%
Sep-20	0.05	0.01	0.09	180	59	351	75	41.24%
Oct-20	0	0	0	0	0	0	0	0
Nov-20	0	0	0	0	0	0	0	0
Dec-20	0	0	0	0	0	0	0	0
Jan-21	0	0	0	0	0	0	0	0
Feb-21	0	0	0	0	0	0	0	0
Apr S01 21	0	0	0	0	0	0	0	0
Apr S02 21	0.01	0	0.02	33	0	78	19	57%

Table 10: Unapportioned density and population estimates of all Arctic terns in the Offshore Ornithology Study Area, calculated using design-based analysis

All Arctic tern	Density Estimate (birds/ km²)	Lower 95% CI (birds/ km²)	Upper 95% CI (birds/ km²)	Population Estimate (number)	Lower 95% CI (number)	Upper 95% CI (number)	SD	CV
Survey								
Mar-19	0	0	0	0	0	0	0	0
May-19	0	0	0.01	8	0	24	8	95.99%
Jun-19	0	0	0	0	0	0	0	0
Jul-19	0.08	0.05	0.13	327	184	517	85	25.86%
Aug-19	0.07	0.04	0.1	271	155	410	66	24.16%
Sep-19	0	0	0	0	0	0	0	0
Oct-19	0	0	0	0	0	0	0	0
Nov-19	0	0	0	0	0	0	0	0
Dec-19	0	0	0	0	0	0	0	0
Jan-20	0	0	0	0	0	0	0	0
Feb-20	0	0	0	0	0	0	0	0
Mar-20	0	0	0	0	0	0	0	0
May S01 20	0	0	0.01	8	0	22	7	90.98%
May S02 20	0.02	0	0.04	64	8	145	36	55.44%
Jun-20	0.01	0	0.02	47	16	91	21	44.2%
Jul-20	0.02	0.01	0.04	90	24	167	40	44.51%
Aug-20	0.05	0.01	0.11	184	40	425	111	60.27%
Sep-20	0.02	0	0.05	96	8	207	51	53.28%
Oct-20	0	0	0	0	0	0	0	0
Nov-20	0	0	0	0	0	0	0	0
Dec-20	0	0	0	0	0	0	0	0
Jan-21	0	0	0	0	0	0	0	0
Feb-21	0	0	0	0	0	0	0	0
Apr S01 21	0	0	0	0	0	0	0	0
Apr S02 21	0.02	0	0.05	60	0	191	59	97.12%

Table 11: Unapportioned density and population estimates of all great skuas in the Offshore Ornithology Study Area, calculated using design-based analysis

All Great skua	Density Estimate (birds/ km²)	Lower 95% CI (birds/ km²)	Upper 95% CI (birds/ km²)	Population Estimate (number)	Lower 95% CI (number)	Upper 95% CI (number)	SD	CV
Survey								
Mar-19	0	0	0	0	0	0	0	0
May-19	0	0	0.01	8	0	24	8	99.44%
Jun-19	0	0	0	0	0	0	0	0
Jul-19	0.01	0	0.01	32	9	57	14	41.96%
Aug-19	0	0	0	0	0	0	0	0
Sep-19	0	0	0.01	16	0	40	11	68.21%
Oct-19	0	0	0	0	0	0	0	0
Nov-19	0	0	0	0	0	0	0	0
Dec-19	0	0	0	0	0	0	0	0
Jan-20	0	0	0	0	0	0	0	0
Feb-20	0	0	0	0	0	0	0	0
Mar-20	0	0	0.01	8	0	25	8	99.28%
May S01 20	0	0	0	0	0	0	0	0
May S02 20	0	0	0	0	0	0	0	0
Jun-20	0	0	0.01	9	0	24	8	94.86%
Jul-20	0	0	0	0	0	0	0	0
Aug-20	0	0	0.01	17	0	40	11	64.79%
Sep-20	0.01	0	0.01	24	0	55	13	54.02%
Oct-20	0.01	0	0.02	40	8	87	21	50.53%
Nov-20	0.01	0.01	0.02	57	24	88	18	30.8%
Dec-20	0.01	0	0.02	32	8	64	17	51.07%
Jan-21	0	0	0	0	0	0	0	0
Feb-21	0	0	0	0	0	0	0	0
Apr S01 21	0	0	0	0	0	0	0	0
Apr S02 21	0	0	0	0	0	0	0	0

Table 12: Unapportioned density and population estimates of all little auks in the Offshore Ornithology Study Area, calculated using design-based analysis

All Little auk	Density Estimate (birds/ km²)	Lower 95% CI (birds/ km²)	Upper 95% CI (birds/ km²)	Population Estimate (number)	Lower 95% CI (number)	Upper 95% CI (number)	SD	CV
Survey								
Mar-19	0	0	0.01	13	0	31	9	66.62%
May-19	0	0	0	0	0	0	0	0
Jun-19	0	0	0	0	0	0	0	0
Jul-19	0	0	0	0	0	0	0	0
Aug-19	0	0	0	0	0	0	0	0
Sep-19	0	0	0	0	0	0	0	0
Oct-19	0.01	0	0.01	23	0	58	16	70.47%
Nov-19	0.02	0	0.04	66	8	147	37	55.76%
Dec-19	0	0	0.01	15	0	38	11	70.17%
Jan-20	0.03	0.01	0.06	135	59	231	43	31.81%
Feb-20	0.03	0.01	0.05	113	32	210	45	39.74%
Mar-20	0	0	0	0	0	0	0	0
May S01 20	0	0	0	0	0	0	0	0
May S02 20	0	0	0	0	0	0	0	0
Jun-20	0	0	0	0	0	0	0	0
Jul-20	0	0	0	0	0	0	0	0
Aug-20	0	0	0	0	0	0	0	0
Sep-20	0	0	0	0	0	0	0	0
Oct-20	0	0	0	0	0	0	0	0
Nov-20	0.03	0.01	0.05	119	48	192	37	30.9%
Dec-20	0.15	0.09	0.21	579	347	845	136	23.37%
Jan-21	0.09	0.05	0.13	356	210	521	78	21.92%
Feb-21	0.01	0	0.03	49	0	104	28	57.29%
Apr S01 21	0	0	0	0	0	0	0	0
Apr S02 21	0	0	0	0	0	0	0	0

Table 13: Unapportioned density and population estimates of all guillemots in the Offshore Ornithology Study Area, calculated using design-based analysis

All Guillemot	Density Estimate (birds/km²)	Lower 95% CI (birds/km²)	Upper 95% CI (birds/km²)	Population Estimate (number)	Lower 95% CI (number)	Upper 95% CI (number)	SD	CV
Survey								
Mar-19	5.72	4.44	7.11	22761	17673	28289	2766	12.15%
May-19	19.38	16.18	22.68	77091	64367	90192	6733	8.73%
Jun-19	4.2	3.23	5.18	16704	12830	20607	2024	12.12%
Jul-19	17.21	12.88	21.55	68441	51216	85717	8983	13.12%
Aug-19	28.86	19.86	38.97	114798	78987	155001	19209	16.73%
Sep-19	3.63	3.12	4.21	14450	12408	16748	1111	7.69%
Oct-19	4.33	2.24	7.33	17217	8920	29136	5134	29.82%
Nov-19	1.39	0.95	2.03	5534	3797	8079	1071	19.34%
Dec-19	2.58	1.52	3.97	10264	6065	15770	2524	24.59%
Jan-20	8.6	6.6	10.79	34194	26257	42930	4554	13.32%
Feb-20	4.86	3.91	5.94	19321	15562	23622	2087	10.8%
Mar-20	16.22	12.53	20	64525	49827	79544	7555	11.71%
May S01 20	22.48	18.36	26.41	89407	73006	105044	8233	9.21%
May S02 20	17.75	14.53	21.28	70583	57777	84638	7364	10.43%
Jun-20	20.99	17.97	24.07	83464	71485	95746	6132	7.35%
Jul-20	7.26	5.92	8.71	28862	23543	34652	2866	9.93%
Aug-20	23.79	20.24	27.94	94631	80517	111134	7715	8.15%
Sep-20	34.18	26.37	42.82	135956	104879	170306	16704	12.29%
Oct-20	7.85	4.77	10.99	31241	18960	43720	6552	20.97%
Nov-20	5.78	3.72	8.25	23003	14790	32804	4497	19.55%
Dec-20	13.94	10.4	17.82	55441	41360	70889	7344	13.25%
Jan-21	6.81	5.96	7.61	27068	23709	30261	1702	6.29%
Feb-21	3.23	2.45	3.98	12837	9729	15842	1516	11.8%
Apr S01 21	18.45	14.84	22.34	73382	59039	88855	7661	10.44%
Apr S02 21	45.43	36.31	56.63	180697	144416	225223	20660	11.43%

Table 14: Unapportioned density and population estimates of all razorbills in the Offshore Ornithology Study Area, calculated using design-based analysis

All Razorbill	Density Estimate (birds/km²)	Lower 95% CI (birds/km²)	Upper 95% CI (birds/km²)	Population Estimate (number)	Lower 95% CI (number)	Upper 95% CI (number)	SD	CV
Survey								
Mar-19	0.93	0.68	1.24	3705	2686	4932	581	15.68%
May-19	1.02	0.84	1.23	4072	3360	4895	398	9.77%
Jun-19	0.27	0.16	0.38	1074	626	1509	228	21.19%
Jul-19	1.6	0.84	2.34	6350	3336	9308	1539	24.22%
Aug-19	1.85	1.26	2.5	7378	5022	9942	1300	17.62%
Sep-19	1.04	0.83	1.22	4130	3317	4871	403	9.75%
Oct-19	2.17	0.93	3.52	8622	3716	14016	2828	32.8%
Nov-19	0.32	0.07	0.67	1289	263	2652	629	48.76%
Dec-19	0.56	0.29	0.88	2242	1154	3512	636	28.36%
Jan-20	0.95	0.64	1.29	3784	2564	5144	684	18.07%
Feb-20	0.58	0.42	0.75	2308	1672	2991	337	14.58%
Mar-20	3.11	2.23	3.98	12386	8854	15844	1741	14.05%
May S01 20	0.92	0.69	1.18	3673	2732	4696	521	14.18%
May S02 20	0.66	0.43	0.9	2613	1728	3590	488	18.66%
Jun-20	0.58	0.45	0.72	2320	1809	2849	263	11.33%
Jul-20	1.41	0.97	1.86	5621	3840	7385	898	15.96%
Aug-20	2.41	1.79	3.12	9594	7135	12416	1349	14.06%
Sep-20	10.9	7.31	14.57	43364	29069	57936	7292	16.81%
Oct-20	0.92	0.53	1.36	3667	2103	5416	840	22.89%
Nov-20	0.3	0.2	0.41	1177	797	1640	226	19.16%
Dec-20	0.96	0.6	1.34	3803	2372	5322	761	19.99%
Jan-21	1.94	1.43	2.47	7702	5694	9832	1060	13.76%
Feb-21	0.65	0.47	0.87	2598	1887	3470	427	16.42%
Apr S01 21	2.65	2.03	3.42	10559	8079	13586	1479	14.01%
Apr S02 21	1.2	1	1.4	4761	3971	5556	402	8.44%

Table 15: Unapportioned density and population estimates of all puffins in the Offshore Ornithology Study Area, calculated using design-based analysis

All Puffin	Density Estimate (birds/km²)	Lower 95% CI (birds/km²)	Upper 95% CI (birds/km²)	Population Estimate (number)	Lower 95% CI (number)	Upper 95% CI (number)	SD	CV
Survey								
Mar-19	1.02	0.78	1.26	4070	3103	5023	514	12.62%
May-19	1.43	1.22	1.61	5680	4853	6398	392	6.9%
Jun-19	1.11	0.55	1.8	4422	2200	7158	1320	29.84%
Jul-19	2.22	1.64	3.04	8822	6520	12077	1456	16.49%
Aug-19	1.76	1.26	2.33	6999	5029	9252	1068	15.26%
Sep-19	0.79	0.52	1.11	3130	2061	4415	629	20.08%
Oct-19	0.19	0.11	0.28	738	456	1101	167	22.54%
Nov-19	0.02	0	0.03	70	16	137	32	45.49%
Dec-19	0	0	0	0	0	0	0	0
Jan-20	0.01	0	0.03	58	16	105	25	43.1%
Feb-20	0.04	0.02	0.06	168	95	255	41	24.01%
Mar-20	0.39	0.24	0.55	1562	960	2199	318	20.33%
May S01 20	0.76	0.52	1.05	3026	2071	4180	533	17.61%
May S02 20	0.27	0.21	0.33	1076	839	1324	129	11.91%
Jun-20	0.45	0.32	0.61	1803	1272	2414	284	15.72%
Jul-20	1.04	0.71	1.46	4138	2836	5825	792	19.13%
Aug-20	1.26	1	1.52	4996	3997	6029	523	10.47%
Sep-20	6.63	5.51	7.77	26355	21927	30889	2245	8.52%
Oct-20	0.08	0.06	0.12	336	224	462	62	18.39%
Nov-20	0.11	0.06	0.16	420	240	628	98	23.24%
Dec-20	0.01	0.01	0.03	57	24	103	21	35.52%
Jan-21	0.02	0.01	0.03	65	24	112	24	36.58%
Feb-21	0.19	0.11	0.29	755	454	1163	187	24.69%
Apr S01 21	0.89	0.58	1.26	3553	2317	5022	728	20.48%
Apr S02 21	2.53	1.92	3.15	10076	7647	12511	1207	11.98%

Table 16: Unapportioned density and population estimates of all red-throated divers in the Offshore Ornithology Study Area, calculated using design-based analysis

All Red-throated diver	Density Estimate (birds/km²)	Lower 95% CI (birds/km²)	Upper 95% CI (birds/km²)	Population Estimate (number)	Lower 95% CI (number)	Upper 95% CI (number)	SD	CV
Survey								
Mar-19	0	0	0	0	0	0	0	0
May-19	0.01	0	0.02	41	8	87	20	49.26%
Jun-19	0	0	0.01	17	0	40	12	67.73%
Jul-19	0	0	0	0	0	0	0	0
Aug-19	0	0	0	0	0	0	0	0
Sep-19	0	0	0	0	0	0	0	0
Oct-19	0	0	0.01	8	0	25	8	96.78%
Nov-19	0	0	0.01	8	0	25	8	96.38%
Dec-19	0	0	0	0	0	0	0	0
Jan-20	0	0	0	0	0	0	0	0
Feb-20	0	0	0.01	8	0	24	8	95.37%
Mar-20	0	0	0	0	0	0	0	0
May S01 20	0	0	0	0	0	0	0	0
May S02 20	0.01	0	0.02	33	0	79	20	60.9%
Jun-20	0	0	0	0	0	0	0	0
Jul-20	0	0	0	0	0	0	0	0
Aug-20	0	0	0	0	0	0	0	0
Sep-20	0	0	0	0	0	0	0	0
Oct-20	0	0	0	0	0	0	0	0
Nov-20	0.02	0	0.06	98	16	221	52	52.91%
Dec-20	0.01	0	0.02	33	0	78	19	58.34%
Jan-21	0.01	0	0.02	32	0	88	25	79.18%
Feb-21	0	0	0.01	9	0	32	9	100.36%
Apr S01 21	0	0	0	0	0	0	0	0
Apr S02 21	0	0	0.01	8	0	24	8	92.23%

Table 17: Unapportioned density and population estimates of all fulmars in the Offshore Ornithology Study Area, calculated using design-based analysis

All Fulmar	Density Estimate (birds/km²)	Lower 95% CI (birds/km²)	Upper 95% CI (birds/km²)	Population Estimate (number)	Lower 95% CI (number)	Upper 95% CI (number)	SD	CV
Survey								
Mar-19	0.16	0.12	0.21	634	461	828	92	14.46%
May-19	0.07	0.05	0.1	289	180	414	62	21.23%
Jun-19	0.04	0.01	0.09	177	48	359	84	47.53%
Jul-19	0.05	0.04	0.07	211	142	284	39	18.12%
Aug-19	0.06	0.04	0.08	225	152	303	40	17.62%
Sep-19	0.05	0.03	0.07	183	103	264	42	22.92%
Oct-19	0.01	0	0.02	53	20	87	18	32.72%
Nov-19	0.13	0.09	0.18	528	367	706	92	17.3%
Dec-19	0.13	0.09	0.17	507	358	682	86	16.8%
Jan-20	0.12	0.09	0.16	494	344	634	75	15.15%
Feb-20	0.04	0.02	0.06	167	91	247	41	24.57%
Mar-20	0.08	0.05	0.12	321	199	462	71	21.96%
May S01 20	0.05	0.02	0.07	180	93	290	50	27.41%
May S02 20	0.03	0.02	0.05	131	63	210	38	28.42%
Jun-20	0.07	0.05	0.09	273	183	364	47	16.94%
Jul-20	0.05	0.03	0.07	185	112	265	41	21.87%
Aug-20	0.09	0.06	0.12	354	229	487	64	17.95%
Sep-20	0.68	0.58	0.79	2720	2289	3161	220	8.09%
Oct-20	0.24	0.17	0.33	974	662	1299	157	16.03%
Nov-20	0	0	0	0	0	0	0	0
Dec-20	0.36	0.28	0.47	1444	1114	1881	190	13.15%
Jan-21	0.11	0.07	0.15	432	290	582	75	17.35%
Feb-21	0.12	0.08	0.17	489	321	679	97	19.79%
Apr S01 21	0.03	0.02	0.05	128	64	202	37	28.75%
Apr S02 21	0.11	0.07	0.14	422	295	560	69	16.18%

Table 18: Unapportioned density and population estimates of all Manx shearwaters in the Offshore Ornithology Study Area, calculated using design-based analysis

All Manx shearwater	Density Estimate (birds/km²)	Lower 95% CI (birds/km²)	Upper 95% CI (birds/km²)	Population Estimate (number)	Lower 95% CI (number)	Upper 95% CI (number)	SD	CV
Survey								
Mar-19	0	0	0	0	0	0	0	0
May-19	0	0	0	0	0	0	0	0
Jun-19	0.02	0	0.04	73	16	146	35	47.41%
Jul-19	0	0	0	0	0	0	0	0
Aug-19	0	0	0.01	9	0	25	8	95.01%
Sep-19	0.01	0	0.02	22	0	71	22	99.63%
Oct-19	0	0	0	0	0	0	0	0
Nov-19	0	0	0	0	0	0	0	0
Dec-19	0	0	0	0	0	0	0	0
Jan-20	0	0	0	0	0	0	0	0
Feb-20	0	0	0	0	0	0	0	0
Mar-20	0	0	0	0	0	0	0	0
May S01 20	0	0	0	0	0	0	0	0
May S02 20	0	0	0	0	0	0	0	0
Jun-20	0.01	0.01	0.02	56	24	95	19	32.33%
Jul-20	0.01	0	0.03	40	0	110	32	80.93%
Aug-20	0.02	0	0.06	68	0	221	62	90.65%
Sep-20	0	0	0	0	0	0	0	0
Oct-20	0	0	0	0	0	0	0	0
Nov-20	0	0	0	0	0	0	0	0
Dec-20	0	0	0	0	0	0	0	0
Jan-21	0	0	0	0	0	0	0	0
Feb-21	0	0	0	0	0	0	0	0
Apr S01 21	0	0	0	0	0	0	0	0
Apr S02 21	0	0	0	0	0	0	0	0

Table 19: Unapportioned density and population estimates of all gannets in the Offshore Ornithology Study Area, calculated using design-based analysis

All Gannet	Density Estimate (birds/ km²)	Lower 95% CI (birds/ km²)	Upper 95% CI (birds/ km²)	Population Estimate (number)	Lower 95% CI (number)	Upper 95% CI (number)	SD	CV
Survey								
Mar-19	0.25	0.17	0.34	982	657	1359	178	18.04%
May-19	0.69	0.53	0.89	2743	2092	3546	366	13.31%
Jun-19	1.19	0.99	1.4	4738	3929	5574	435	9.18%
Jul-19	3.14	2.8	3.5	12499	11138	13929	693	5.54%
Aug-19	4.08	3.43	4.77	16223	13624	18981	1402	8.64%
Sep-19	2.3	2.02	2.58	9160	8029	10264	595	6.49%
Oct-19	1.33	0.85	2.02	5291	3379	8015	1224	23.13%
Nov-19	0.26	0.13	0.41	1030	507	1650	297	28.84%
Dec-19	0.03	0	0.08	105	8	306	80	76.43%
Jan-20	0.01	0	0.02	35	8	72	18	50.23%
Feb-20	0	0	0.01	17	0	40	11	61.96%
Mar-20	0.2	0.13	0.27	788	535	1067	131	16.53%
May S01 20	0.6	0.46	0.75	2380	1849	2991	291	12.2%
May S02 20	1.1	0.89	1.31	4380	3552	5218	427	9.74%
Jun-20	1.33	1.05	1.69	5272	4174	6708	644	12.22%
Jul-20	3.24	2.85	3.68	12901	11318	14644	843	6.53%
Aug-20	1.83	1.48	2.22	7296	5898	8844	750	10.27%
Sep-20	1.84	1.57	2.11	7301	6228	8391	585	8.01%
Oct-20	0.84	0.66	1.06	3328	2622	4231	434	13.02%
Nov-20	1.11	0.85	1.38	4421	3381	5502	561	12.67%
Dec-20	0.36	0.18	0.58	1415	729	2300	400	28.23%
Jan-21	0.09	0.06	0.13	352	230	511	73	20.69%
Feb-21	0.05	0.02	0.09	202	72	370	78	38.61%
Apr S01 21	0.51	0.42	0.62	2041	1674	2461	202	9.87%
Apr S02 21	1.38	0.81	2.2	5485	3213	8769	1494	27.24%

Table 20: Unapportioned density and population estimates of all shags in the Offshore Ornithology Study Area, calculated using design-based analysis

All Shag	Density Estimate (birds/ km²)	Lower 95% CI (birds/ km²)	Upper 95% CI (birds/ km²)	Population Estimate (number)	Lower 95% CI (number)	Upper 95% CI (number)	SD	CV
Survey								
Mar-19	0	0	0	0	0	0	0	0
May-19	0	0	0	0	0	0	0	0
Jun-19	0.01	0	0.02	24	0	72	25	103.39%
Jul-19	0	0	0	0	0	0	0	0
Aug-19	0	0	0	0	0	0	0	0
Sep-19	0	0	0	0	0	0	0	0
Oct-19	0	0	0	0	0	0	0	0
Nov-19	0	0	0	0	0	0	0	0
Dec-19	0	0	0	0	0	0	0	0
Jan-20	0	0	0	0	0	0	0	0
Feb-20	0	0	0	0	0	0	0	0
Mar-20	0	0	0	0	0	0	0	0
May S01 20	0	0	0	0	0	0	0	0
May S02 20	0	0	0	0	0	0	0	0
Jun-20	0	0	0	0	0	0	0	0
Jul-20	0	0	0	0	0	0	0	0
Aug-20	0	0	0	0	0	0	0	0
Sep-20	0	0	0	0	0	0	0	0
Oct-20	0	0	0	0	0	0	0	0
Nov-20	0	0	0	0	0	0	0	0
Dec-20	0	0	0.01	9	0	24	9	93.91%
Jan-21	0	0	0	0	0	0	0	0
Feb-21	0	0	0	0	0	0	0	0
Apr S01 21	0	0	0	0	0	0	0	0
Apr S02 21	0	0	0	0	0	0	0	0

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