



# BERWICK BANK WIND FARM OFFSHORE ENVIRONMENTAL IMPACT ASSESSMENT

## APPENDIX 11.6, ANNEX D: INCOMBINATION MORTALITY SCENARIOS

**Document Status**

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5.5	Final	DMP Stats (Donovan & Caneco) / HiDef Aerial Surveying Ltd. (Macleod)	HiDef Aerial Surveying Ltd.	HiDef Aerial Surveying Ltd.	07 October 2022

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**Approval for Issue**

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**Table 1: Summary of in-combination mortality estimates for gannet and kittiwake. The totals were added to the Project alone totals and modelled using Population Viability Analysis.**

SPA	In-combination region	Impacts	Collisions scenario	Displacement Scenario	Gannet			Kittiwake		
					Predicted mortality (number of birds)		Displacement scenario	Predicted mortality (number of birds)		
					Adults	Immatures		Adults	Immatures	
Forth Islands	Forth and Tay	Collisions + displacement	Consented designs	Dev App	429.2	12.2	Dev App	27.4	2.6	
				Scop A	429.2	12.2	Scop A	22.0	2.2	
				Scop B	579.2	17.3	Scop B	33.9	3.5	
	North Sea	Collisions + displacement	Consented designs	Dev App	646.2	167.3	Dev App	36.0	6.7	
				Scop A	646.2	167.3	Scop A	32.0	7.1	
				Scop B	869.6	228.9	Scop B	46.6	9.6	
	Flamborough and Filey Coast	North Sea	Collisions + displacement	Consented designs	Dev App	348.8	35.8	Dev App	428.5	62.1
					Scop A	348.8	35.8	Scop A	448.3	71.9
					Scop B	483.3	48.3	Scop B	488.0	91.7
				As-built designs	Dev App	299.2	35.2	Dev App	393.6	52.9
					Scop A	299.2	35.2	Scop A	413.4	62.8
					Scop B	433.7	47.7	Scop B	453.1	82.6
Fowlsheugh		Forth & Tay	Collisions + displacement	Consented designs	Dev App	N/A	N/A	Dev App	54.9	5.9
					Scop A	N/A	N/A	Scop A	46.3	5.5
					Scop B	N/A	N/A	Scop B	66.8	8.1
	UK N Sea	Collisions + displacement	Consented designs	Dev App	N/A	N/A	Dev App	96.8	19.2	
				Scop A	N/A	N/A	Scop A	91.3	20.9	
				Scop B	N/A	N/A	Scop B	121.9	27.4	
	St Abb's Head to Fastcastle	Forth & Tay	Collisions + displacement	Consented designs	Dev App	N/A	N/A	Dev App	13.4	1.1
					Scop A	N/A	N/A	Scop A	10.7	1.0
					Scop B	N/A	N/A	Scop B	17.4	1.8
UK N Sea		Collisions + displacement	Consented designs	Dev App	N/A	N/A	Dev App	22.5	5.6	
				Scop A	N/A	N/A	Scop A	21.2	6.3	
				Scop B	N/A	N/A	Scop B	30.9	8.6	
North Rona & Sula Sgeir	North Sea	Collisions + displacement	Consented designs	Dev App	3.8	3.1	Dev App	N/A	N/A	
				Scop A	3.8	3.1	Scop A	N/A	N/A	
				Scop B	5.3	4.4	Scop B	N/A	N/A	
Fair Isle	North Sea	Collisions + displacement	Consented designs	Dev App	10.1	8.4	Dev App	N/A	N/A	
				Scop A	10.1	8.4	Scop A	N/A	N/A	
				Scop B	13.6	11.5	Scop B	N/A	N/A	
Noss	North Sea	Collisions + displacement	Consented designs	Dev App	33.7	27.6	Dev App	N/A	N/A	
				Scop A	33.7	27.6	Scop A	N/A	N/A	
				Scop B	46.1	37.7	Scop B	N/A	N/A	
Hermaness, Saxa Vord & Valla Field	North Sea	Collisions + displacement	Consented designs	Dev App	73.2	59.9	Dev App	N/A	N/A	
				Scop A	73.2	59.9	Scop A	N/A	N/A	
				Scop B	100.1	81.9	Scop B	N/A	N/A	
Buchan Ness to Collieston Coast	Forth & Tay	Collisions + displacement	Consented designs	Dev App	N/A	N/A	Dev App	3.1	1.7	
				Scop A	N/A	N/A	Scop A	4.3	2.3	
				Scop B	N/A	N/A	Scop B	6.5	3.6	
	UK N Sea	Collisions + displacement	Consented designs	Dev App	N/A	N/A	Dev App	57.1	18.8	
				Scop A	N/A	N/A	Scop A	63.7	22.1	
				Scop B	N/A	N/A	Scop B	76.9	28.7	
		As-built designs	Dev App	N/A	N/A	Dev App	52.3	16.3		
			Scop A	N/A	N/A	Scop A	58.9	19.6		
			Scop B	N/A	N/A	Scop B	72.1	26.2		

SPA	In-combination region	Impacts	Collisions scenario	Displacement Scenario	Gannet			Kittiwake				
					Predicted mortality (number of birds)		Displacement scenario	Predicted mortality (number of birds)				
					Adults	Immatures		Adults	Immatures			
East Caithness Cliffs	UK N Sea	Collisions + displacement	Consented designs	Dev App	N/A	N/A	Dev App	273.5	73.7			
				Scop A	N/A	N/A	Scop A	262.4	81.3			
				Scop B	N/A	N/A	Scop B	370.0	108.6			
				As-built designs	Dev App	N/A	N/A	Dev App	258.1	65.6		
					Scop A	N/A	N/A	Scop A	246.9	73.2		
					Scop B	N/A	N/A	Scop B	354.5	100.5		
			North Caithness Cliffs	UK N Sea	Collisions + displacement	Consented designs	Dev App	N/A	N/A	Dev App	35.3	15.4
							Scop A	N/A	N/A	Scop A	39.6	18.0
							Scop B	N/A	N/A	Scop B	52.3	23.5
As-built designs	Dev App	N/A				N/A	Dev App	31.4	13.4			
	Scop A	N/A				N/A	Scop A	35.8	16.0			
	Scop B	N/A				N/A	Scop B	48.5	21.5			
Troup, Pennan & Lion's Head	UK N Sea	Collisions + displacement	Consented designs	Dev App	N/A	N/A	Dev App	57.0	23.1			
				Scop A	N/A	N/A	Scop A	61.4	26.7			
				Scop B	N/A	N/A	Scop B	84.1	35.2			
			As-built designs	Dev App	N/A	N/A	Dev App	51.4	20.1			
				Scop A	N/A	N/A	Scop A	55.7	23.7			
				Scop B	N/A	N/A	Scop B	78.4	32.2			
Farne Islands	UK N Sea	Collisions + displacement	Consented designs	Dev App	N/A	N/A	Dev App	10.0	5.1			
				Scop A	N/A	N/A	Scop A	11.8	6.0			
				Scop B	N/A	N/A	Scop B	15.5	7.8			
Coquet Island	UK N Sea	Collisions + displacement	Consented designs	Dev App	N/A	N/A	Dev App	1.4	0.7			
				Scop A	N/A	N/A	Scop A	1.6	0.8			
				Scop B	N/A	N/A	Scop B	2.1	1.1			
West Westray	UK N Sea	Collisions + displacement	Consented designs	Dev App	N/A	N/A	Dev App	35.1	17.7			
				Scop A	N/A	N/A	Scop A	41.5	20.8			
				Scop B	N/A	N/A	Scop B	54.2	27.2			
			As-built designs	Dev App	N/A	N/A	Dev App	30.5	15.3			
				Scop A	N/A	N/A	Scop A	36.8	18.4			
				Scop B	N/A	N/A	Scop B	49.6	24.8			

**Table 2: Summary of in-combination mortality estimates for the auks. The totals were added to the Project alone totals and modelled using Population Viability Analysis.**

SPA	In-combination region	Impacts	Displacement scenario	Guillemot Predicted mortality (number of birds)			Razorbill Predicted mortality (number of birds)			Puffin Predicted mortality (number of birds)	
				Adults	Immatures	Displacement scenario	Adults	Immatures	Displacement scenario	Adults	Immatures
Forth Islands	Forth & Tay	Displacement	Dev App	N/A	N/A	Dev App	10.0	8.8	Dev App	N/A	N/A
			Scop A	N/A	N/A	Scop A	34.2	30.6	Scop A	N/A	N/A
			Scop B	N/A	N/A	Scop B	58.3	51.7	Scop B	N/A	N/A
	UK N Sea	Displacement	Dev App	45.4	43.5	Dev App	13.7	11.0	Dev App	39.2	45.1
			Scop A	109.3	109.4	Scop A	38.7	33.1	Scop A	141.2	162.4
			Scop B	218.4	213.8	Scop B	71.6	59.4	Scop B	235.3	270.6
Fowlsheugh	Forth & Tay	Displacement	Dev App	N/A	N/A	Dev App	11.3	9.6	Dev App	N/A	N/A
			Scop A	N/A	N/A	Scop A	38.2	33.0	Scop A	N/A	N/A
			Scop B	N/A	N/A	Scop B	65.3	56.0	Scop B	N/A	N/A
	UK N Sea	Displacement	Dev App	64.9	60.9	Dev App	16.4	12.5	Dev App	N/A	N/A
			Scop A	170.1	161.9	Scop A	44.5	36.7	Scop A	N/A	N/A
			Scop B	325.9	308.1	Scop B	83.8	66.8	Scop B	N/A	N/A
St Abb's Head to Fastcastle	Forth & Tay	Displacement	Dev App	N/A	N/A	Dev App	0.6	0.4	Dev App	N/A	N/A
			Scop A	N/A	N/A	NS low	1.4	1.0	Scop A	N/A	N/A
			Scop B	N/A	N/A	NS high	2.9	2.0	Scop B	N/A	N/A
	UK N Sea	Displacement	Dev App	23.9	22.7	Dev App	2.3	1.4	Dev App	N/A	N/A
			Scop A	60.1	58.5	NS low	3.5	2.2	Scop A	N/A	N/A
			Scop B	117.6	112.8	NS high	9.1	5.6	Scop B	N/A	N/A
Buchan Ness to Collieston Coast	Forth & Tay	Displacement	Dev App	1.1	1.4	Dev App	N/A	N/A	Dev App	N/A	N/A
			Scop A	3.0	3.9	Scop A	N/A	N/A	Scop A	N/A	N/A
			Scop B	5.7	7.3	Scop B	N/A	N/A	Scop B	N/A	N/A
	UK N Sea	Displacement	Dev App	3.6	3.3	Dev App	N/A	N/A	Dev App	N/A	N/A
			Scop A	9.2	8.5	Scop A	N/A	N/A	Scop A	N/A	N/A
			Scop B	17.9	16.3	Scop B	N/A	N/A	Scop B	N/A	N/A
Troup, Pennan & Lion's Head	UK N Sea	Displacement	Dev App	6.5	4.8	Dev App	3.3	2.0	Dev App	N/A	N/A
			Scop A	15.3	11.3	NS low	4.6	2.9	Scop A	N/A	N/A
			Scop B	30.9	22.8	NS high	12.4	7.5	Scop B	N/A	N/A
East Caithness Cliffs	UK N Sea	Displacement	Dev App	N/A	N/A	Dev App	44.1	29.6	Dev App	N/A	N/A
			Scop A	N/A	N/A	NS low	107.7	76.7	Scop A	N/A	N/A
			Scop B	N/A	N/A	NS high	213.6	147.8	Scop B	N/A	N/A
Farne Islands	UK N Sea	Displacement	Dev App	0.0	0.0	Dev App	0.4	0.2	Dev App	1.2	1.8
			Scop A	0.0	0.0	NS low	0.4	0.3	Scop A	4.4	6.3
			Scop B	0.0	0.0	NS high	1.3	0.8	Scop B	7.4	10.5
Flamborough and Filey Coast	UK N Sea	Displacement	Dev App	N/A	N/A	Dev App	38.9	10.0	Dev App	0.0	0.0
			Scop A	N/A	N/A	NS low	99.0	12.0	Scop A	0.0	0.0
			Scop B	N/A	N/A	NS high	192.3	35.9	Scop B	0.0	0.0
North Caithness Cliffs	UK N Sea	Displacement	Dev App	N/A	N/A	Dev App	N/A	N/A	Dev App	8.2	8.5
			Scop A	N/A	N/A	Scop A	N/A	N/A	Scop A	29.4	30.6
			Scop B	N/A	N/A	Scop B	N/A	N/A	Scop B	49.0	51.0
Hoy	UK N Sea	Displacement	Dev App	N/A	N/A	Dev App	N/A	N/A	Dev App	0.0	0.0
			Scop A	N/A	N/A	Scop A	N/A	N/A	Scop A	0.0	0.0
			Scop B	N/A	N/A	Scop B	N/A	N/A	Scop B	0.0	0.0

**Table 3: Summary of in-combination mortality estimates for the herring gull. The totals were added to the Project alone totals and modelled using Population Viability Analysis.**

SPA	In-combination region	Impacts	Collisions scenario	Predicted mortality (number of birds)	
				Adults	Immatures
Forth Islands	UK N Sea	Collisions alone	Consented designs	5.0	2.3
	Forth & Tay	Collisions alone	Consented designs	0.5	0.4
Fowlsheugh	UK N Sea	Collisions alone	Consented designs	2.3	0.4
	UK N Sea	Collisions alone	Consented designs	0.3	0.2

