

Higher Biscovillack – Bird Survey Report – Appendices 1-3

14.11.2025

Contents

Appendix 1 – BBS results 17.06.25.....	2
Appendix 2 – VP survey maps	3
Breeding season – Buzzard.....	3
Breeding season – Greater black-backed gull	4
Breeding season – Herring gull	5
Breeding season – Hobby	6
Breeding season - Kestrel	7
Breeding season – Lesser black-backed gull.....	8
Breeding season - Sparrowhawk	9
Appendix 3 – Collision risk models	10
Breeding season - Buzzard	10
Breeding season – Greater black-backed gull	11
Breeding season – Herring gull	12
Breeding season – Kestrel.....	13
Breeding season – Sparrowhawk	14



Unit 2,
The Workshed,
Liskeard Cattle Market,
Liskeard
PL14 4BA

Tel: 0800 622 6828
email: office@westernecology.co.uk

Legend

- Survey area
- ⊕ Proposed turbine location

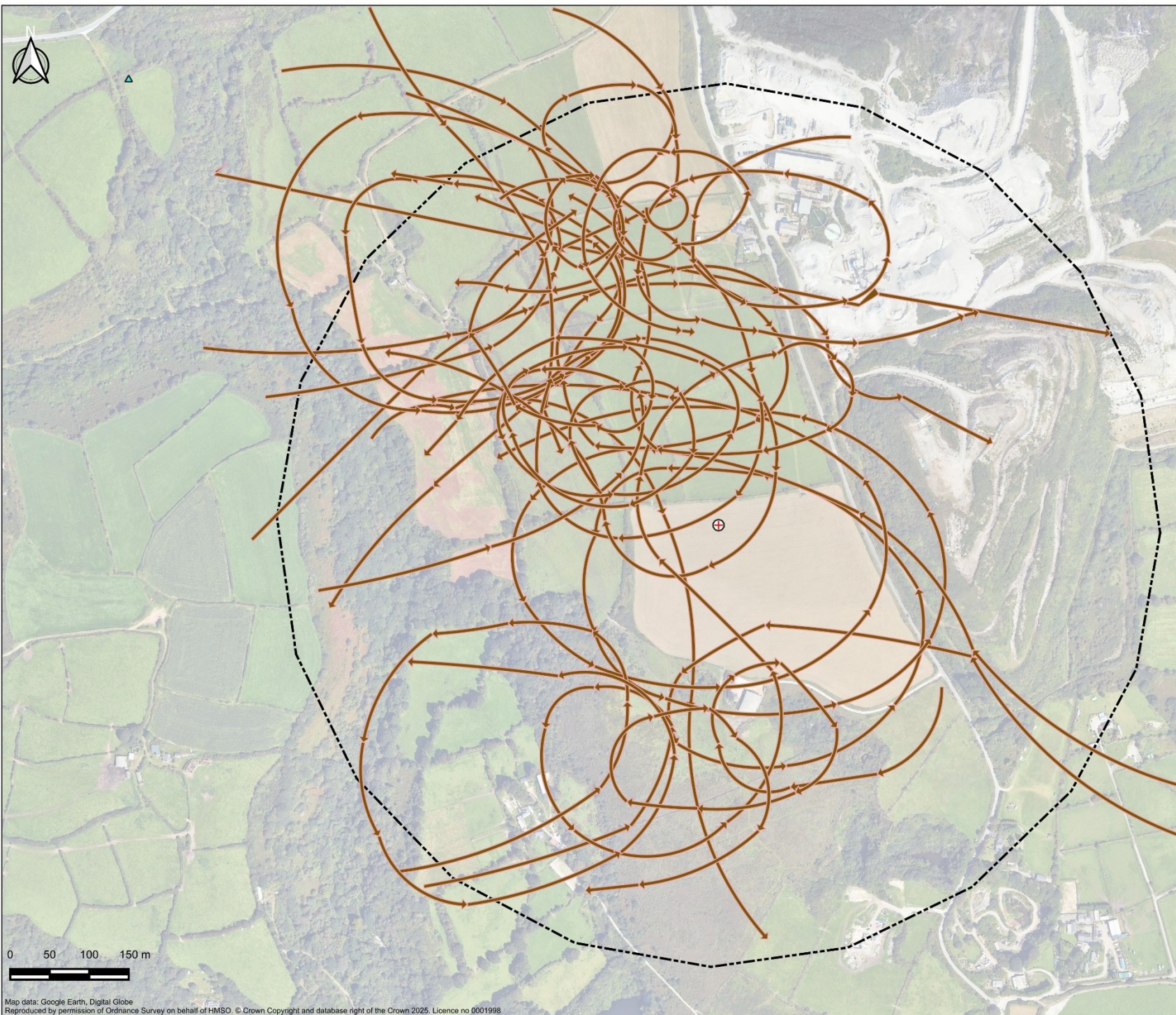
BTO Codes & Symbols

- S
- Calling
- = Alarming
- BC = blackcap
- BZ = buzzard
- CC = chiffchaff
- CH = chaffinch
- D. = dunnock
- GH = grasshopper warbler
- GO = goldfinch
- HS = house sparrow
- LI = linnet
- MP = meadow pipit
- R. = robin
- S. = skylark
- SC = stonechat
- SD = stockdove
- ST = song thrush
- WP = wood pigeon
- WR = wren
- WW = willow warbler

Title: Map 1. Bird survey map

Project: Land at Higher Biscovillack,
St Austell, Cornwall

Checked by: CDH
Version: 01
Date: 13/11/2025



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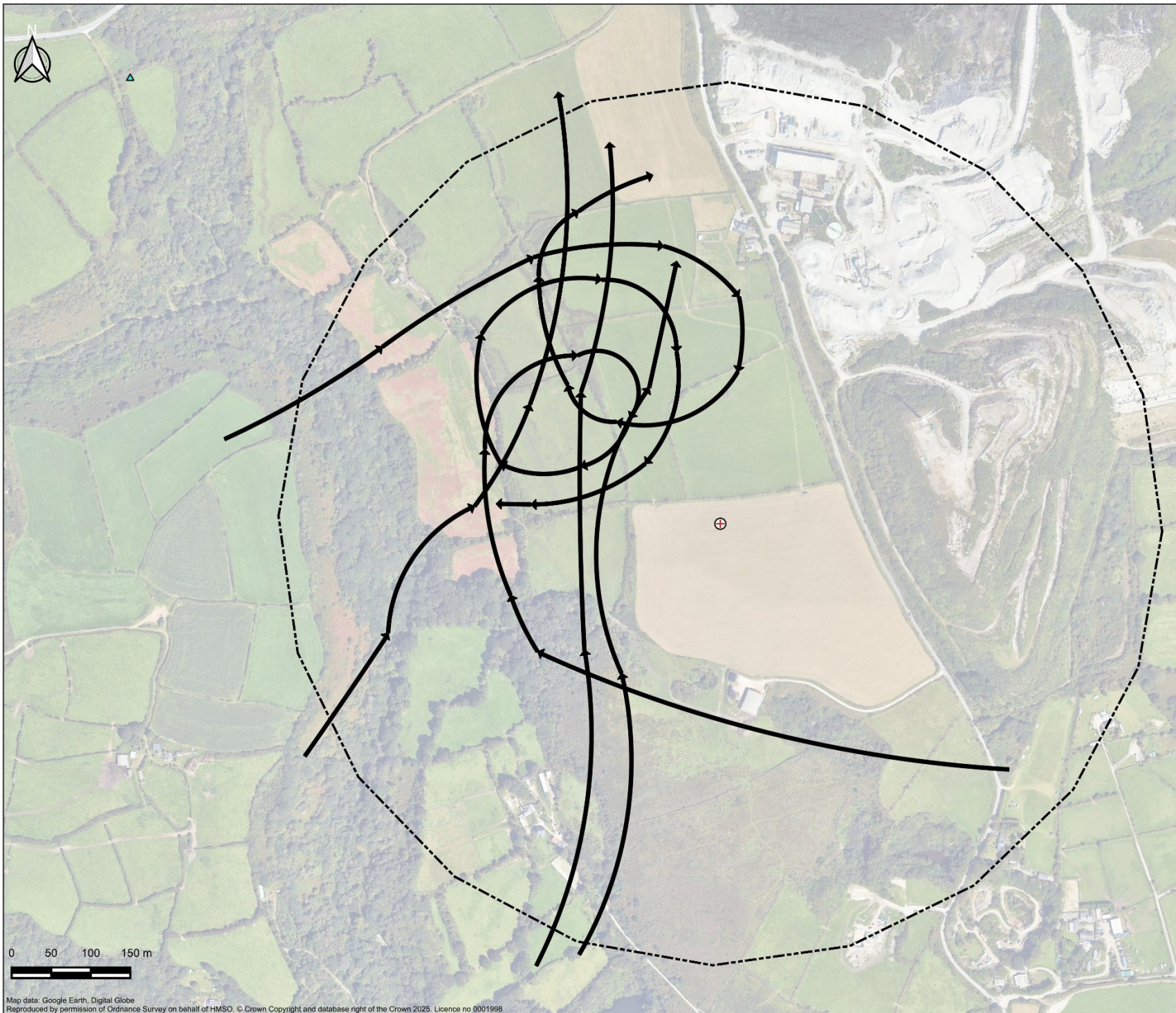
Legend

- VP survey area
- Proposed turbine location
- VP surveyor location
- BZ flight lines

Title: Breeding season VP - Buzzard
flight lines

Project: Land at Higher Biscovillack,
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PL14 4BA

Tel: 0800 622 6828
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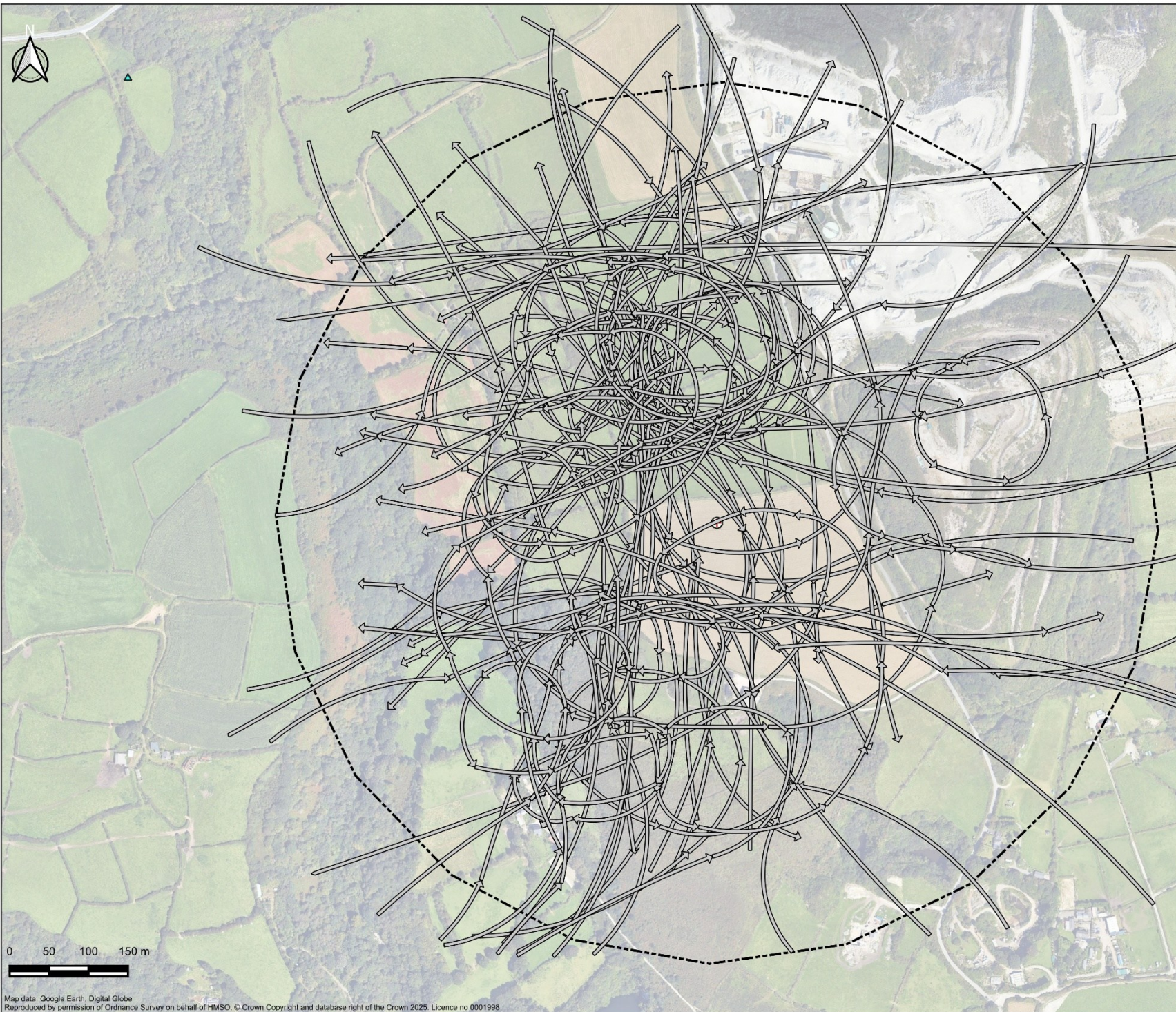
Legend

- VP survey area
- Proposed turbine location
- VP surveyor location
- GB flight lines

Title: Breeding season VP - Greater
black-backed gull flight lines

Project: Land at Higher Biscovillack,
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Liskeard
PL14 4BA

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Legend

- VP survey area
- Proposed turbine location
- VP surveyor location
- HG flight lines

Title: Breeding season VP - Herring
gull flight lines

Project: Land at Higher Biscovillack,
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Liskeard
PL14 4BA

Tel: 0800 622 6828
email: office@westernecology.co.uk

Legend

- VP survey area
- Proposed turbine location
- VP surveyor location
- HY flight lines

Title: Breeding season VP - Hobby
flight lines

Project: Land at Higher Biscovillack,
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Liskeard Cattle Market,
Liskeard
PL14 4BA

Tel: 0800 622 6828
email: office@westernecology.co.uk

Legend

- VP survey area
- Proposed turbine location
- VP surveyor location
- K. flight lines

Title: Breeding season VP - Kestrel
flight lines

Project: Land at Higher Biscovillack,
St Austell, Cornwall

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The Workshed,
Liskeard Cattle Market,
Liskeard
PL14 4BA

Tel: 0800 622 6828
email: office@westernecology.co.uk

Legend

- VP survey area
- Proposed turbine location
- VP surveyor location
- LB flight lines

Title: Breeding season VP - Lesser
black-backed gull flight lines

Project: Land at Higher Biscovillack,
St Austell, Cornwall

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Liskeard
PL14 4BA

Tel: 0800 622 6828
email: office@westernecology.co.uk

Legend

- VP survey area
- Proposed turbine location
- VP surveyor location
- SH flight lines

Title: Breeding season VP -
Sparrowhawk flight lines

Project: Land at Higher Biscovillack,
St Austell, Cornwall

Checked by: CDH
Version: 01
Date: 13/11/2025

Breeding season - Buzzard

COLLISION RISK MODEL				Required input data is in		orange boxes		Calculated output is in		blue boxes		green boxes		boxes are for information only, to show variables used at each stage					
				Value	Units					Value	Units								
Bird data				Windfarm data				Turbine data											
Species name		Buzzard		Site name		HBV		Model		Vestas 4.2									
Bird length		L	0.54	m	Latitude		50.36	degrees	Hub height		76.5	m							
Wingspan		W	1.2	m	No of turbines		T	1	Rotor radius		R	59	m						
Bird flight speed		v	1.2	m s ⁻¹	Width of windfarm		w		km	No of blades		b	3						
Flight type, flapping or gliding		flapping								Rotation speed		Ω	15	rpm					
% of flights upwind/downwind		50%		50%						Max blade width		C	4	m					
Nocturnal activity ranking 1-5		1								Blade pitch		λ	25	degrees					
Nocturnal activity factor		f _{act}	0%								Risk height range		18-136		m				
normal approach				Set to 'normal approach' to use survey data on bird density															
				Set to 'birds on migration' to use 'Migrant collision risk' sheet in place of Stage A															
Stage A																			
Daytime bird density		D _h	birds/km ²		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	year ave		
Proportion at rotor risk height		Q _{zk}	61.84%		0	0	0	0	0.01713	0.01713	0.01713	0.01713	0.01713	0	0	0	0.0071		
At latitude 50.4		Daylight hours per month		265.3	280.5	367.1	412.6	478.3	490.3	494.6	449.8	380.5	334.4	272.1	251.5	4477.1			
		Nighttime hours per month		478.7	391.5	376.9	307.4	265.7	229.7	249.4	294.2	339.5	409.6	447.9	492.5	4282.9			
Stage B																			
No of turbines		T	1																
Rotor radius		R	59 m																
		Total rotor frontal area		10936															
Nocturnal activity factor		f _{act}	0%																
Bird flight speed		v	1.2 m s ⁻¹		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	year total		
		Projected number of rotor transits		0.0	0.0	0.0	0.0	2.0	2.1	2.1	1.9	1.6	0.0	0.0	0.0	10			
Stage C																			
No of blades		b	3		Bird length		l	0.54	m										
Rotation speed		Ω	15 rpm		Wingspan		w	1.2	m										
Rotor radius		R	59 m		Bird flight speed		v	1.2	m s ⁻¹										
Max blade width		C	4 m		Flight type		flapping		50%	50%									
Pitch		λ	25 degrees		% of flights upwind/downwind														
Blade profile		see Blade profile sheet																	
		Single transit risk		upwind	13.05%														
				downwind	6.80%														
				weighted mean	9.92%														
Stage D																			
Proportion of time operational		Q _{av}			85.0%	85.0%	85.0%	85.0%	85.0%	85.0%	85.0%	85.0%	85.0%	85.0%	85.0%	85.0%	85.0%		
		Collision rates before avoidance														year total			
		0.00		0.00	0.00	0.00	0.00	0.17	0.18	0.18	0.16	0.14	0.00	0.00	0.00	1			
Stage E																			
Allow for large array correction?		No																	
Width of windfarm		w	0 km																
		large correction		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	per year			
		Collision rates allowing for avoidance																	
Avoidance rates modelled		95.00%	100.00%	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.00	0.00	0.00	0.0			
		98.00%	100.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0			
		99.00%	100.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0			
		99.50%	100.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0			

Breeding season – Greater black-backed gull

COLLISION RISK MODEL				Required input data is in		orange	boxes																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														
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Breeding season – Herring gull

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				Value	Units					Value	Units					Value	Units						
Bird data				Herring gull				Windfarm data				Turbine data				Vestas 4.2							
Species name				Herring gull				Site name		HBV		Model		Vestas 4.2									
Bird length		L	0.6	m				Latitude		50.36		degrees		Hub height		76.5		m					
Wingspan		W	1.4	m				No of turbines		T		1		Rotor radius		R		59					
Bird flight speed		v	12.8	m s ⁻¹				Width of windfarm		w		km		No of blades		b		3					
Flight type, flapping or gliding		flapping												Rotation speed		Ω		15					
% of flights upwind/downwind		50%		50%										Max blade width		C		4					
Nocturnal activity ranking 1-5		3												Blade pitch		λ		25					
Nocturnal activity factor		f _{act}	50%										Risk height range				18-136						
normal approach				Set to 'normal approach' to use survey data on bird density																			
				Set to 'birds on migration' to use 'Migrant collision risk' sheet in place of Stage A																			
Stage A								Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	year ave			
Daytime bird density		D _h	birds/km ²				0	0	0	0	0.081	0.081	0.081	0.081	0.081	0	0	0	0	0.0338			
Proportion at rotor risk height		Q _{rh}	77.16%																				
At latitude 50.4				Daylight hours per month		265.3		280.5	367.1	412.6	478.3	490.3	494.6	449.8	380.5	334.4	272.1	251.5	4477.1				
				Nighttime hours per month		478.7		391.5	376.3	307.4	265.7	229.7	249.4	294.2	339.5	409.6	447.9	492.5	4282.9				
Stage B																							
No of turbines		T	1																				
Rotor radius		R	59		m																		
				Total rotor frontal		10936																	
Nocturnal activity factor		f _{act}	50%																				
Bird flight speed		v	12.8		m s ⁻¹				Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	year total		
				Projected number of rotor transi		0.0		0.0	0.0	0.0	0.0	163.1	161.5	165.3	159.3	146.9	0.0	0.0	0.0	796			
Stage C																							
No of blades		b	3						Bird length		l		0.6		m								
Rotation speed		Ω	15		rpm				Wingspan		w		1.4		m								
Rotor radius		R	59		m				Bird flight speed		v		12.8		m s ⁻¹								
Max blade width		C	4		m				Flight type				flapping		50%		50%						
Pitch		λ	25		degrees				% of flights upwind/downwind														
Blade profile				see Blade profile sheet																			
				Single transit risk		upwind		13.05%															
				downwind		6.80%																	
				weighted mean		9.92%																	
Stage D								Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	year ave			
Proportion of time operational		Q _o					85.0%	85.0%	85.0%	85.0%	85.0%	85.0%	85.0%	85.0%	85.0%	85.0%	85.0%	85.0%	85.0%	85.0%			
				Collision rates before avoidance																year total			
				0.00		0.00		0.00		0.00		13.76		13.62		13.94		13.44		12.39			
																				0.00			
Stage E																							
Allow for large array correction?		No																					
Width of windfarm		w	0		km																		
				large correction						Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	per year	
				Collision rates allowing for avoidance																			
Avoidance rates modelled		95.00%		100.00%		0.00		0.00	0.00	0.00	0.69	0.68	0.70	0.67	0.62	0.00	0.00	0.00	0.00	3.4			
		98.00%		100.00%		0.00		0.00	0.00	0.00	0.28	0.27	0.28	0.27	0.25	0.00	0.00	0.00	0.00	1.3			
		99.00%		100.00%		0.00		0.00	0.00	0.00	0.14	0.14	0.14	0.13	0.12	0.00	0.00	0.00	0.00	0.7			
		99.50%		100.00%		0.00		0.00	0.00	0.00	0.07	0.07	0.07	0.07	0.06	0.00	0.00	0.00	0.00	0.3			

Breeding season – Kestrel

COLLISION RISK MODEL			Required input data is in		orange	boxes	Calculated output is in		blue	boxes	green		boxes are for information only, to show variables used at each stage							
			Value	Units					Value	Units					Value	Units				
Bird data			Windfarm data				Turbine data													
Species name		Kestrel	Site name				HBV				Model				Vestas 4.2					
Bird length	L	0.34	m	Latitude				50.4	degrees	Hub height				76.5	m					
Wingspan	W	0.76	m	No of turbines				T	1	Rotor radius				R	59	m				
Bird flight speed	v	10.1	m s ⁻¹	Width of windfarm				w		km	No of blades				b	3				
Flight type, flapping or gliding		flapping									Rotation speed				o	15	rpm			
% of flights upwind/downwind		50%	50%									Max blade width				C	4	m		
Nocturnal activity ranking 1-5		1									Blade pitch				λ	25	degrees			
Nocturnal activity factor	f _{act}	0%									Risk height range				18-136 m					
normal approach			Set to 'normal approach' to use survey data on bird density																	
			Set to 'birds on migration' to use 'Migrant collision risk' sheet in place of Stage A																	
Stage A																				
Daytime bird density	D _a	birds/km ²	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	year ave					
Proportion at rotor risk height	Q _{rh}	52.49%	0	0	0	0	0.01234	0.01234	0.01234	0.01234	0.01234	0	0	0	0.0051					
At latitude 50.4		Daylight hours per month	265.3	280.5	367.1	412.6	478.3	490.3	494.6	449.8	380.5	334.4	272.1	251.5	4477.1					
		Nighttime hours per month	478.7	391.5	376.9	307.4	265.7	229.7	249.4	294.2	339.5	409.6	447.9	492.5	4282.9					
Stage B																				
No of turbines	T	1																		
Rotor radius	R	59 m																		
		Total rotor frontal	10936																	
Nocturnal activity factor	f _{act}	0%																		
Bird flight speed	v	10.1 m s ⁻¹	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	year total					
		Projected number of rotor trans	0.0	0.0	0.0	0.0	10.4	10.7	10.8	9.8	8.3	0.0	0.0	0.0	50					
Stage C																				
No of blades	b	3	Bird length		L	0.34	m													
Rotation speed	o	15 rpm	Wingspan		w	0.76	m													
Rotor radius	R	59 m	Bird flight speed		v	10.1	m s ⁻¹													
Max blade width	C	4 m	Flight type			flapping														
Pitch	λ	25 degrees	% of flights upwind/downwind			50%	50%													
Blade profile		see Blade profile sheet																		
		Single transit risk	13.05%																	
		upwind																		
		downwind	6.80%																	
		weighted mean	9.92%																	
Stage D																				
Proportion of time operational	Q _o		85.0%	85.0%	85.0%	85.0%	85.0%	85.0%	85.0%	85.0%	85.0%	85.0%	85.0%	85.0%	85.0%					
			Collision rates before avoidance												year total					
			0.00	0.00	0.00	0.00	0.88	0.90	0.91	0.83	0.70	0.00	0.00	0.00	4					
Stage E																				
Allow for large array correction?		No																		
Width of windfarm	w	0 km																		
		large correction	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	per year					
Avoidance rates modelled		95.00%	100.00%	0.00	0.00	0.00	0.00	0.04	0.05	0.05	0.04	0.04	0.00	0.00	0.00	0.2				
		98.00%	100.00%	0.00	0.00	0.00	0.00	0.02	0.02	0.02	0.02	0.01	0.00	0.00	0.00	0.1				
		99.00%	100.00%	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.00	0.00	0.00	0.0				
		99.50%	100.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0				

[illegible]