APPENDIX 7-5a

ADDENDUM COLLISION RISK MODEL (CRM)

Planning and Environmental Consultants

Appendix 7-5a - Revised Collision Risk Assessment

Umma More Renewable Energy Development

TABLE OF TABLES

1. RESULTS

Table 1-1 Model input values[1]. Updated values shown in bold text.

Species	Model	Period	Bird seconds at PCH (Apr 2019 – Mar 2021)	Updated bird seconds at PCH (Apr 2019 – Mar 2021 + Oct 2022 – Mar 2025)
Peregrine	random	All	1,006	1,650
Lapwing	random	Winter	206,909	242,630
Black-headed Gull	random	Breeding	77,176	78,136
Black-headed Gull	random	Winter	262[2]	46,222
Mallard	random	All	1,021	4,553
Teal	random	Winter	64	64
Snipe	random	Winter	464	8,825
Kestrel	random	All	6,253	15,039
Buzzard	random	All	15,150	59,582
Sparrowhawk	random	All	884	1,902
Golden Plover	random	Winter	No CRM undertaken	457,234
Snipe	random	Breeding	No CRM undertaken	3,725
Lapwing	random	Breeding	No CRM undertaken	2,120

[1] *Model input values are largely unchanged, the key updates are to the recorded seconds at possible collision height (PCH), number of survey seconds and bird availability. Update collision risk guidance reviewed (NatureScot, 2024). Please refer to the EIAR Appendix 7-5 for further discussion on model inputs.*
[2] *Note: Black-headed gull flights BH006 – BH010 were omitted from the CRM as they were predictably associated/concentrated in an area of habitat over 500m from the nearest turbine on a single day, and therefore not random in nature.*

The predicted number of transits per year and the collision risk is presented in Table 1-2, along with the final predicted number of collisions per year. Note that for birds that both flap and glide, the average collision risk percentage between flapping and gliding is taken.

Table 1-2 Results of Updated CRM. Updated results shown in bold text.

Species	Survey Period	Model	Transits	Collision Risk			Collision Rate			One Bird Collision
				flapping	gliding	overall	without avoidance	avoidance factor	with avoidance	
Peregrine Falcon	All	random	149.5	5.17%	5%	5.08%	7.6	98%	**0.152**	7 years
Lapwing	Winter	random	21407	4.57%	no gliding flight	4.57%	978.1	98%	**19.562**	<1 year
Black-headed Gull	Breeding	random	9556.6	4.91%	4.72%	4.82%	460.24	98%	**9.205**	<1 year
Black-headed Gull	Winter	random	4625.4	4.91%	4.72%	4.82%	222.76	98%	**4.455**	<1 year
Mallard	All	random	758.2	4.86%	no gliding flight	4.86%	36.88	98%	**0.738**	1 year
Teal	Winter	random	10.7	4.28%	no gliding flight	4.28%	0.46	98%	**0.009**	109 years
Snipe	Winter	random	445.1	4.07%	no gliding flight	4.07%	18.11	98%	**0.362**	3 years
Kestrel	All	random	1031.4	4.91%	4.83%	4.87%	50.23	95%	**2.512**	<1 year
Buzzard	All	random	4836.3	5.61%	5.44%	5.52%	267.08	98%	**5.342**	<1 year
Sparrowhawk	All	random	126.7	4.87%	4.81%	4.84%	6.13	98%	**0.123**	8 years
Golden Plover	Winter	random	63794.3	4.25%	no gliding flight	4.25%	2710.51	99.6%	**10.842**	<1 year
Snipe	Breeding	random	579.2	4.07%	no gliding flight	4.07%	23.57	98%	**0.471**	2 years
Lapwing	Breeding	random	226.1	4.57%	no gliding flight	4.57%	10.33	98%	**0.207**	5 years

Table 1-4 below provides a comparison of the collision risk model as outlined in the EIAR as lodged, compared to the updated collision risk model which includes the most up to date survey data (from October 2022 to March 2025). The impact assessment for each species listed in the table below is provided in Section 7.5.2 of the EIAR as lodged. The effect of the collision mortality from the Wind Farm Site was accessed in relation to the county population[3] and the background mortality for each species. The percentage increase in background mortality as outlined in the EIAR, as lodged, and updated increase in background mortality are presented in Table 1-4 below. This change is then assessed to establish if there is a significant change in the collision risk impact for each species.

Table 1-3 Comparison of Results.

Species	Survey Period	Collision Risk (Apr19 – Mar21) (birds per year)	Updated Collision Risk (Apr19 – Mar21 + Oct22 – Mar25) (birds per year)	Difference (birds per year)	Change in Background Mortality (Original → Updated Collision Risk)	Change to Impact Assessment
Peregrine	All	0.144	0.152	+ 0.008	2.4% → 2.42%	No change (low (Percival, 2003)/long-term slight negative (EPA, 2022))
Lapwing	Winter	15.27	19.562	+ 4.292	1.8% → 2.30%	No change (low (Percival, 2003)/long-term slight negative (EPA, 2022))
Black-headed Gull	Breeding	9.357	9.205	- 0.152	8.99% → 8.63%	No change (low (Percival, 2003)/long-term slight negative (EPA, 2022))
Black-headed Gull	Winter	0.025	4.455	+ 4.43	0.05% → 8.08%	No significant change (low (Percival, 2003)/long-term slight negative (EPA, 2022))
Mallard	All	0.172	0.738	+ 0.566	0.15% → 0.628%	No change (very low (Percival, 2003)/long-term not significant negative (EPA, 2022))
Teal	Winter	0.009	0.009	No change	No change	No change (very low (Percival, 2003)/long-term not significant negative (EPA, 2022))
Snipe	Winter	0.047	0.362	+ 0.315	0.038% → 0.29%	No change (very low (Percival, 2003)/long-term not significant negative (EPA, 2022))
Kestrel	All	1.11	2.512	+ 1.402	0.7% → 2.23%	No significant change (low (Percival, 2003)/long-term slight negative (EPA, 2022))
Buzzard	All	1.559	5.342	+ 3.783	3%[4] → 19.43%	No significant change (low (Percival, 2003)/long-term slight negative (EPA, 2022))
Sparrowhawk	All	0.05	0.123	+ 0.075	0.03% → 0.17%	No change (very low (Percival, 2003)/long-term not significant negative (EPA, 2022))

[3] *Note: Updated population estimates have been used to calculate the updated background mortality for relevant species (see EIAR Addendum for information on population estimates).*
[4] *Note: Change in background mortality for buzzard calculated incorrectly in EIAR as submitted (wrong county population figure used).*