

Dataset	Type	Records	Sites	Spatial extent (°)	Temporal extent
A	Flock counts	7,149	123	4.0 - 8.8 E, 51.1 - 53.4 N	2000 - 2017
B	Family counts	51,037	65	4.8 - 7.3 E, 51.1 - 53.4 N	2000 - 2017
C	Marked geese	10,635	8,416	2.7 - 9.7 E, 50.9 - 53.9 N	2000 - 2017
D	Family GPS tracks	13 ^a ; 32,630 ^b	32,630	3.9 - 7.9 E, 51.3 - 54.3 N	2013 ^c , 2014 ^d , 2016 ^e

a: Number of families, b: Number of half hourly positions, c: 3 families, d: 4 families, e: 5 families

Table 1: Spatial and temporal range of datasets used.

Model	Type	Dataset	Response	Fixed effects	Random effects	Records used	Cohen's f^2
1	GLMM	B	5	1, 5	8, 9, 10	20,160 ^a ; 14,018 ^b	3.22 ^a ; 4.74 ^b
1	GLMM	C	5	1, 5	8, 11	3,289 ^a ; 7,320 ^b	4.87 ^a ; 4.43 ^b
2.a	GLMM	B	1	3, 5, 7	8, 9, 10	34,179	0.09
2.a	GLMM	C	1	5, 7	8, 11	10,426	7.72 ^c ; 0.62 ^d
2.b	GAMM	A	2	3, 5, 7	8, 9, 10	837	9.36
3	GLMM	A	3	5, 6, 7	8, 9, 10	5,700	0.199
4	GAMM	A	4	5, 6, 7	8, 9, 10	5,659	0.52

Effects: 1: Number of juveniles per family, 2: Number of families, 3: Flock size, 4: Proportion of juveniles, 5: Days since autumn arrival, 6: Distance to breeding grounds, 7: Predation index, 8: Breeding year, 9 Observer, 10: Habitat type, 11: Goose identity

a: ≤ 60 days after arrival, b: ≥ 60 days after arrival, c: All families, d: Only successful families

Table 2: Models and inputs based on observation data.

Model	Type	Response	Fixed effects	Random effects	Records used	Effect size
5.a	GLMM	1	2, 3, 4, 5, 6, 7	9	1,009 ^a	0.08
5.b	GLMM	1	3, 8	9	21,271 ^b	0.0004

Effects: 1: Split occurrence, 2: Family size, 3: Days since autumn arrival, 4: Daily number of flights, 5: Cumulative number of previous flights, 6: Daily distance travelled, 7: Cumulative distance previously travelled, 8: Time since last take-off, 9: Family identity

a: Daily positions, b: Half-hourly positions

Table 3: Models and inputs based on GPS tracking data.