Table S1. Representative parameterizations of the simulation model, including the best fit parameters.

	Disorientation probability	Disoriented flight directionality	Disorientation distance (σ)	Stabilization time [min]	Density increase factor
Model 1 (best fit)	High (a=0.95)	Weak (κ=0.1)	1500	34	19
Model 2	High (a=0.95)	Moderate (κ=0.2)	1500	51	42
Model 3	High (a=0.95)	None (κ=0)	1500	24	8.0
Model 4	Low (a=0.5)	Moderate (κ=0.2)	1500	6.5	3.0
Model 5	Low (a=0.5)	Weak (κ=0.1)	1500	6.7	2.3

Stabilization time is defined as the time required to reach 95% of the steady state peak density at the lights, for a migratory ground speed of 10 m/s. Density increase factor is a multiplicative factor relative to the baseline migration density ρ.

Table S2. Ranking of parameterizations of the migratory flow model (see Equation 2 for parameter definitions).

Rank	a	σ	κ	Explained variance
1	0.95	1500	0.1	0.513
2	0.95	1750	0.1	0.511
3	0.98	1250	0.1	0.510
4	0.95	1250	0.1	0.506
5	0.95	2000	0.1	0.506
6	0.98	1500	0.1	0.505
7	0.98	1000	0.1	0.502
8	0.98	1750	0.1	0.497
9	0.98	2000	0.1	0.489
10	0.95	1000	0.1	0.484
11	0.85	1250	0.2	0.480
12	0.85	1500	0.2	0.478
13	0.85	1750	0.2	0.473
14	0.85	1000	0.2	0.470
15	0.75	2000	0.3	0.469
16	0.85	2000	0.2	0.467
17	0.75	1750	0.3	0.466
18	0.75	1500	0.3	0.463
19	0.98	750	0.1	0.461
20	0.75	1250	0.3	0.457
21	0.98	500	0.2	0.449
22	0.65	2000	0.4	0.448
23	0.75	1000	0.3	0.443
24	0.65	1750	0.4	0.443
25	0.95	750	0.2	0.439
26	0.65	1500	0.4	0.436
27	0.95	750	0.1	0.435
28	0.75	750	0.4	0.434
29	0.65	1000	0.5	0.434
30	0.85	750	0.2	0.433
31	0.95	500	0.2	0.432
32	0.75	2000	0.2	0.431
33	0.55	1500	0.7	0.431
34	0.65	1250	0.5	0.430
35	0.55	1250	0.7	0.430
36	0.75	500	0.5	0.430
37	0.55	1750	0.7	0.429
38	0.85	2000	0.1	0.429
39	0.55	2000	0.6	0.429
40	0.95	250	0.6	0.429
41	0.85	1750	0.1	0.427
42	0.65	750	0.6	0.427
43	0.55	2000	0.7	0.427
44	0.85	250	0.8	0.426
45	0.55	1750	0.6	0.425