

Figures & tables

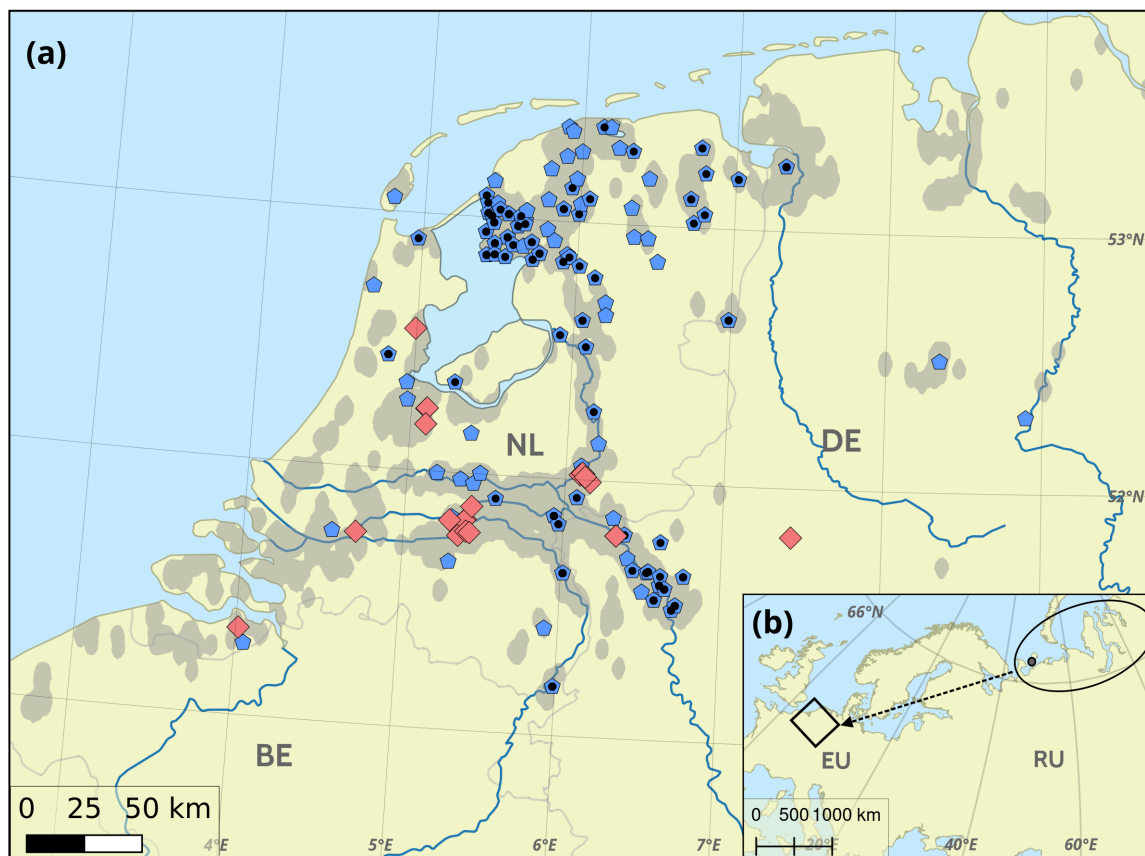


Fig. 1. (a). Wintering grounds of greater white-fronted geese *Anser a. albifrons* in the Netherlands and northern Germany, showing 123 sites (blue pentagons) where the age-ratio of 7,149 flocks was determined, a subset of 65 sites (black dots) where 51,037 successful families were recaptured in 1,884 flocks. Shaded area bounds 10,635 ring-resightings. 21 split events (red diamonds) were observed in 13 GPS tracked families. Observations correspond well with major rivers and waterbodies, marked in blue. Data were collected from 2000 - 2017. **(b).** Breeding grounds (ellipse) in Russia with Kolguyev island (dot) and general flyway (arrow) to wintering area (rectangle) (adapted from Madsen et al. 1999).

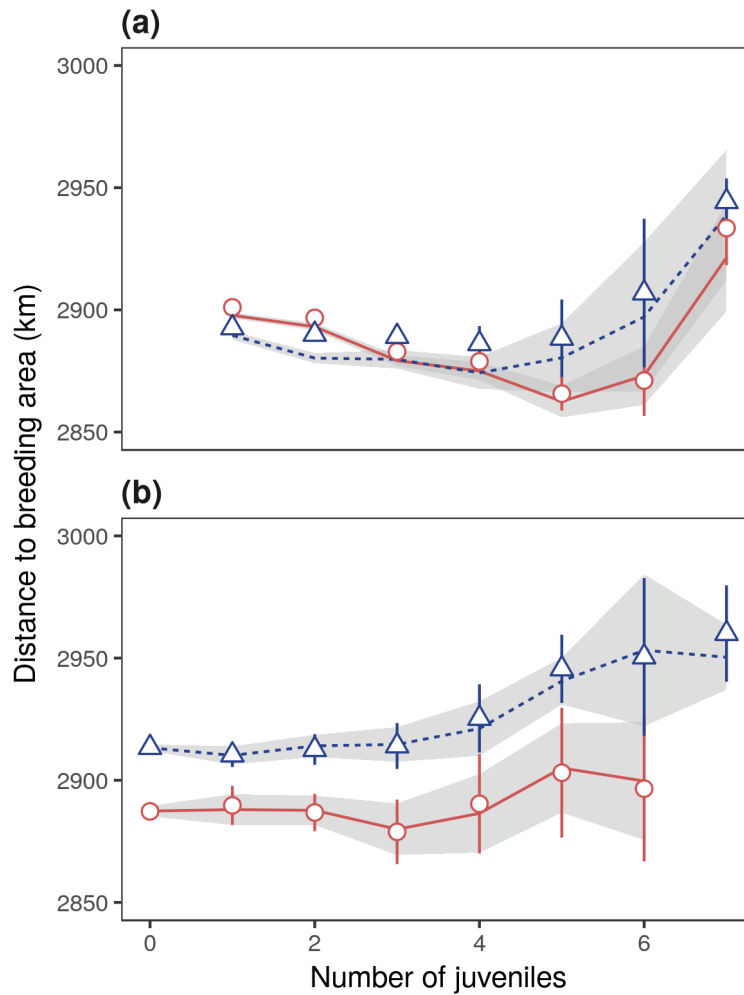


Fig. 2. LMM fits (lines), and mean distance of wintering sites from Kolguyev island (symbols) per number of juveniles in a family for **(a)** family size counts and **(b)** ring-resightings. Data and fit for records from < 60 days after arrival to the wintering grounds (red circles and solid lines), and data and fit for records 60 days after arrival (blue triangles and dashed lines), and 95% confidence intervals for the data (vertical lines) and fits (shaded grey area are shown).

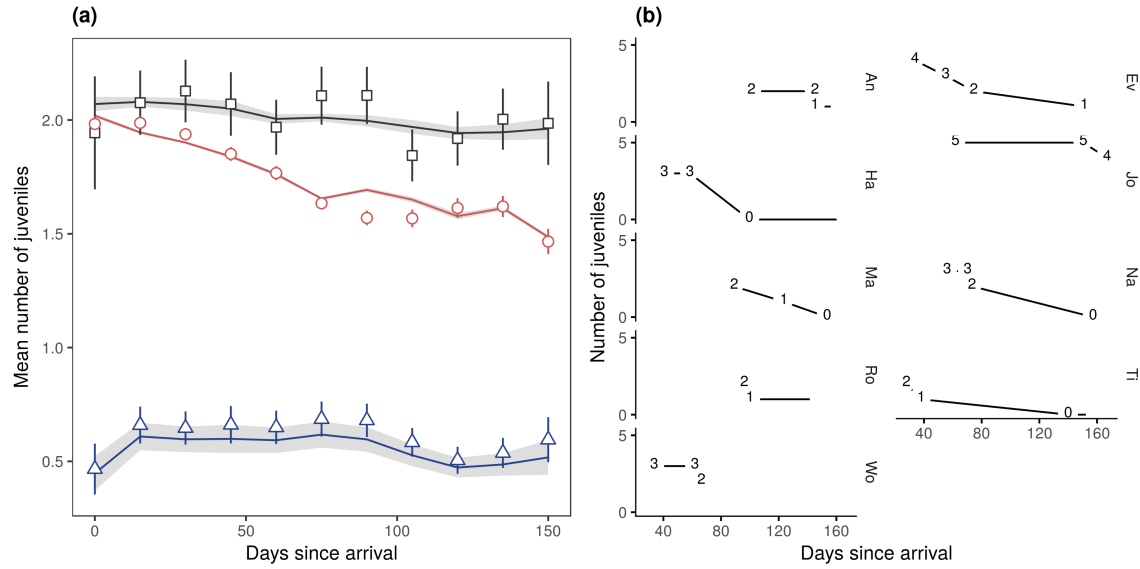


Fig. 3. (a). GLMM fits (lines) and mean number of juveniles per family every 15 days since goose autumn arrival (shapes) for each dataset. Successful families in flocks (red circles and line), neckband-resightings including unsuccessful pairs (blue triangles and line), and neckband-resightings with only successful pairs (black squares and line). **(b).** Number of juveniles in each family (name in box) which split, at the start of the tracking period, and following each subsequent juvenile split (numbers in circles).

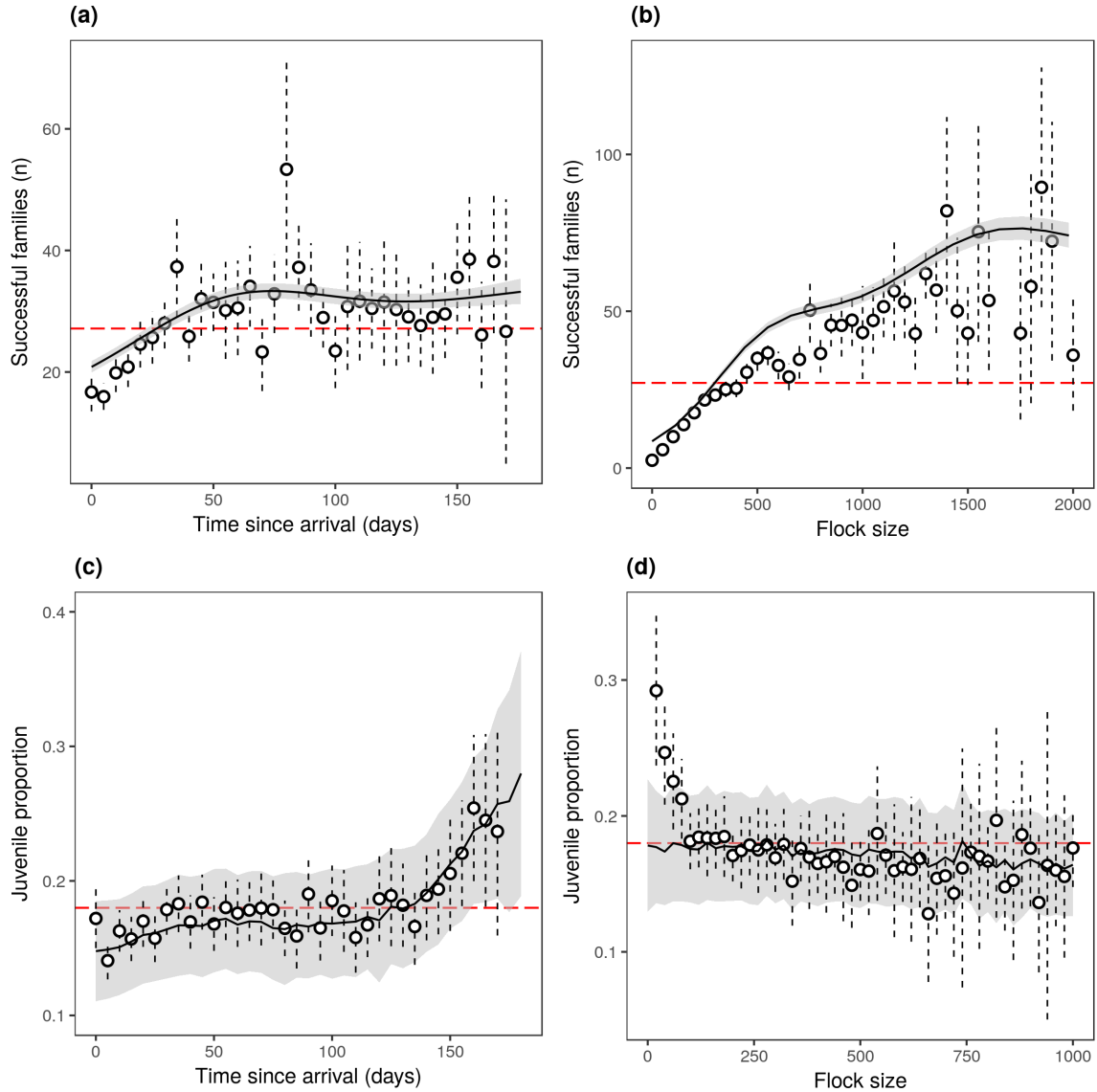


Fig. 4. GAMM fits (solid black lines), data (circles), 95% confidence intervals for data (vertical dashed lines) and fits (shaded grey areas), and overall observed mean response value (horizontal dashed red line) for **(a)** Mean number of successful families in flocks every 5 days after autumn arrival; **(b)** Mean number of families in flocks, in increments of 50 individuals; **(c)** Mean proportion of first-winter juveniles in flocks every 5 days; **(d)** Mean juvenile proportion of flocks, in increments of 20 individuals. Means and proportions were pooled across all years. Note that in C days since arrival was modelled as a smoothed covariate using thin plate splines, and 4 knots. Conditional fits shown in (c) and (d).

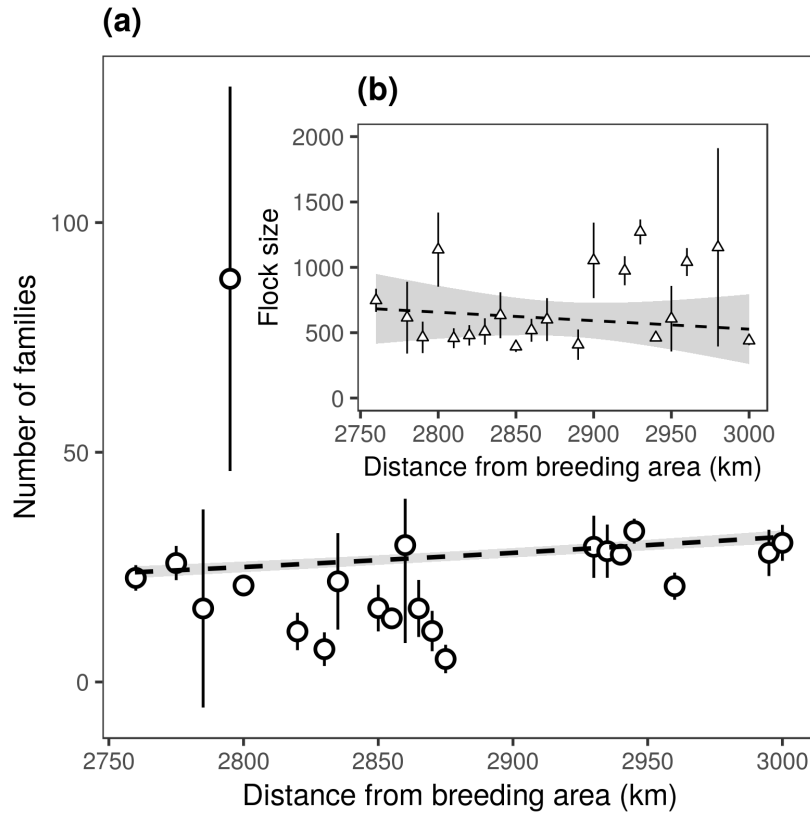


Fig. 5. GAMM fit (dashed line), data (circles), and 95% confidence intervals for data (vertical lines) and fits (shaded grey area) for **(a)** Mean number of families in flocks at distances from Kolguyev Island, in increments of 5km, and **(b)** Mean flock size at distances from Kolguyev Island, in increments of 25km. Sites to the north-east of the study site are approximately 500 km nearer to Kolguyev than sites in the south-west.

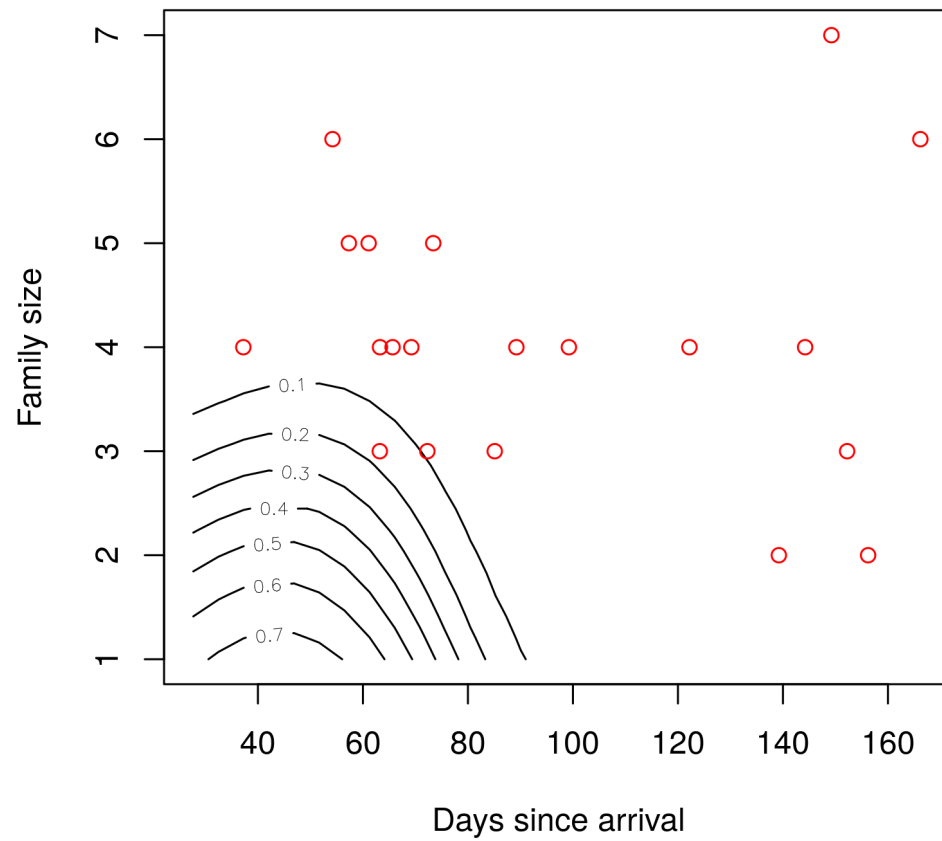


Fig. 6. GAMM fit contours of split probability (solid black lines), and split occurrences (red circles) in relation to days since arrival and family size.

Type	Records	Sites	Spatial extent
Age-ratio counts	7,149	123	4.0° - 8.8°E, 51.1° - 53.4°N
Family sizes	51,037	65	4.8° - 7.3°E, 51.1° - 53.4°N
Ring-sighting data	10,635	8,416	2.7° - 9.7°E, 50.9° - 53.9°N
Family sizes on Kolguyev	116	26	49°E, 69°N
GPS tracking of families	32,630 ^a , 13 ^b	32,630	3.9° - 7.9°E, 51.3° - 54.3°N
a: Half-hourly family positions, b: Number of families tracked			

Table 1: Datasets of goose observations and tracking.

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