FAMILY SIZE DYNAMICS IN WINTERING GEESE

Pratik R. Gupte, Kees Koffijberg, Gerhard J.D.M. Müskens, Martin Wikelski, Andrea Kölzsch

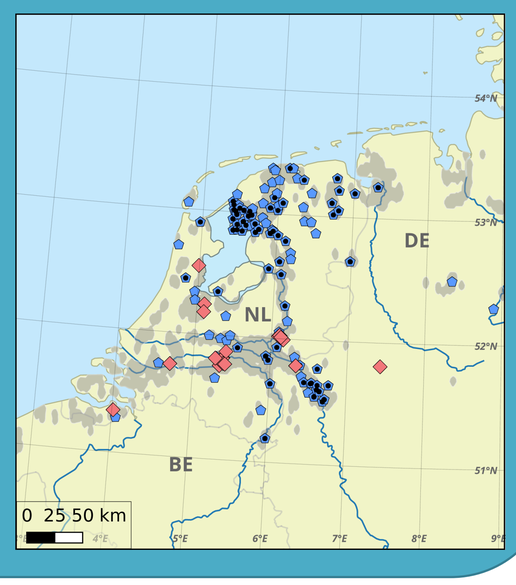
Max Planck Institute for Ornithology, Christian Albrechts University Kiel, SOVON Dutch Centre for Field Ornithology, Wageningen Environmental Research (Alterra)

Summary

Families of geese and swans often stay together through one or more migration events. How their social status influences migration timing, winter movements and space-use is not well understood.

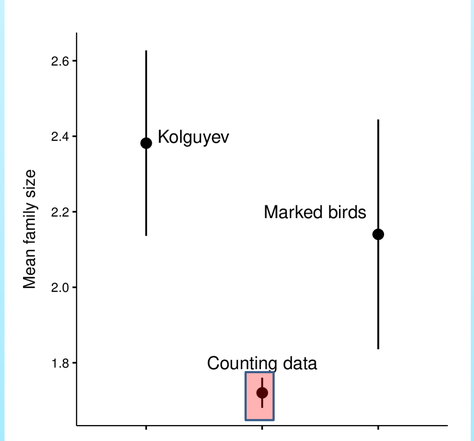
We explored family size dynamics of wintering greater white-fronted geese (*Anser a. albifrons*) using 17 years of observation data on foraging flocks and GPS tracks of 13 complete families.

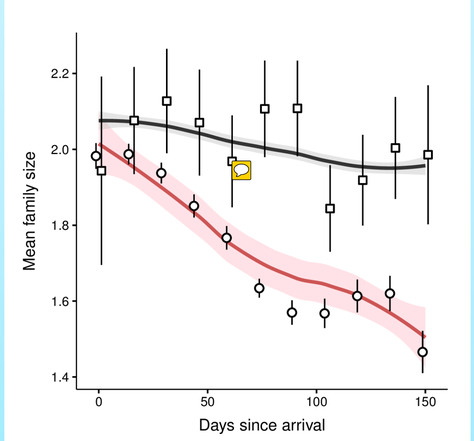
Our results suggest that white-fronted geese are differentially migratory by age and social class in both autumn and spring. This is important for consideration of the effects of climate and habitat change on large migrants that subsist in families long after hatching and their conservation and management.



Continuous family separation

During autumn migration family size decreased by 0.5-1 juveniles. Counting data show a further clear loss of juveniles throughout the winter, but some stay with their parents into spring migration.

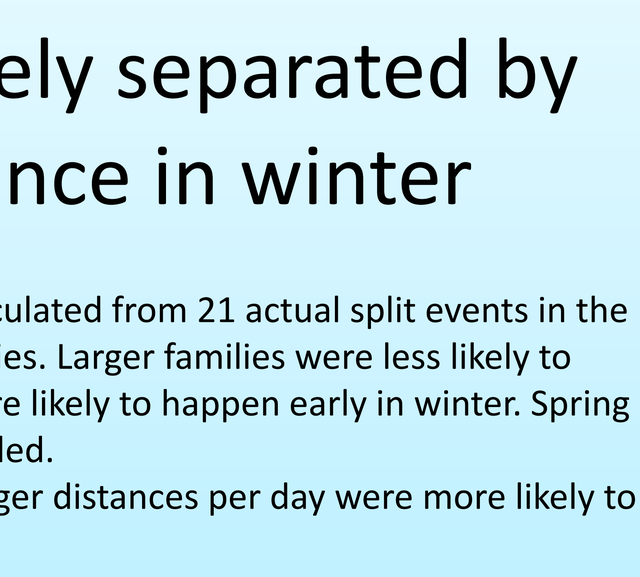




Large families winter further from breeding area

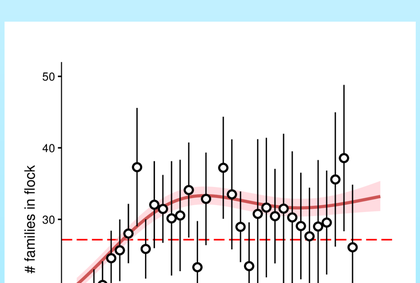
Between December and February, families with more juveniles wintered farther from the breeding grounds, where flocks were smaller.

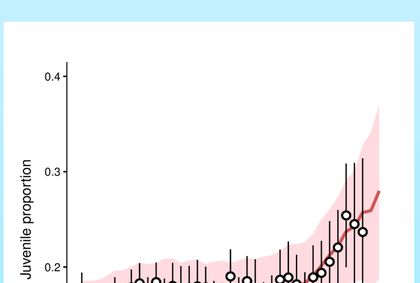
Linear Mixed Model
dist = famsize + arrday + (1|year) + (1|obs) + (1|habitat) + (1|ID)
p=0.01



Differential migration of families, juveniles and pairs

The number of families increases during the first winter weeks in the wintering area. Thus, families arrive later from autumn migration, young are possibly causing lower migration speed. The proportion of junvinles at the end of winter increases, indicating that adults and pairs without young commence spring migration earlier than families or separated juveniles.

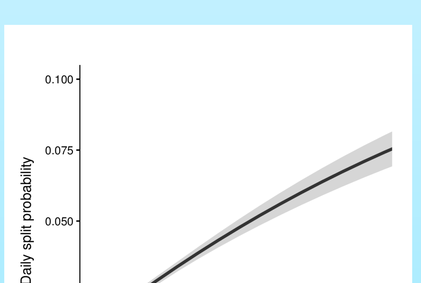




Families likely separated by disturbance in winter

Split probability was calculated from 21 actual split events in the GPS tracked goose families. Larger families were less likely to split and splits were more likely to happen early in winter. Spring migration was not included.
Families that moved longer distances per day were more likely to loose a member.

Linear Mixed Model
split = famsize + arrday + dailydist + (1|year) + (1|famID)
p<0.001



Contact:
akoelzsch@orn.mpg.de