Grazing effects of wintering geese on grassland yield: A long-term study from Northwest Germany

Heinz Düttmann

Niedersächsisches Ministerium für Umwelt, Energie und Klimaschutz

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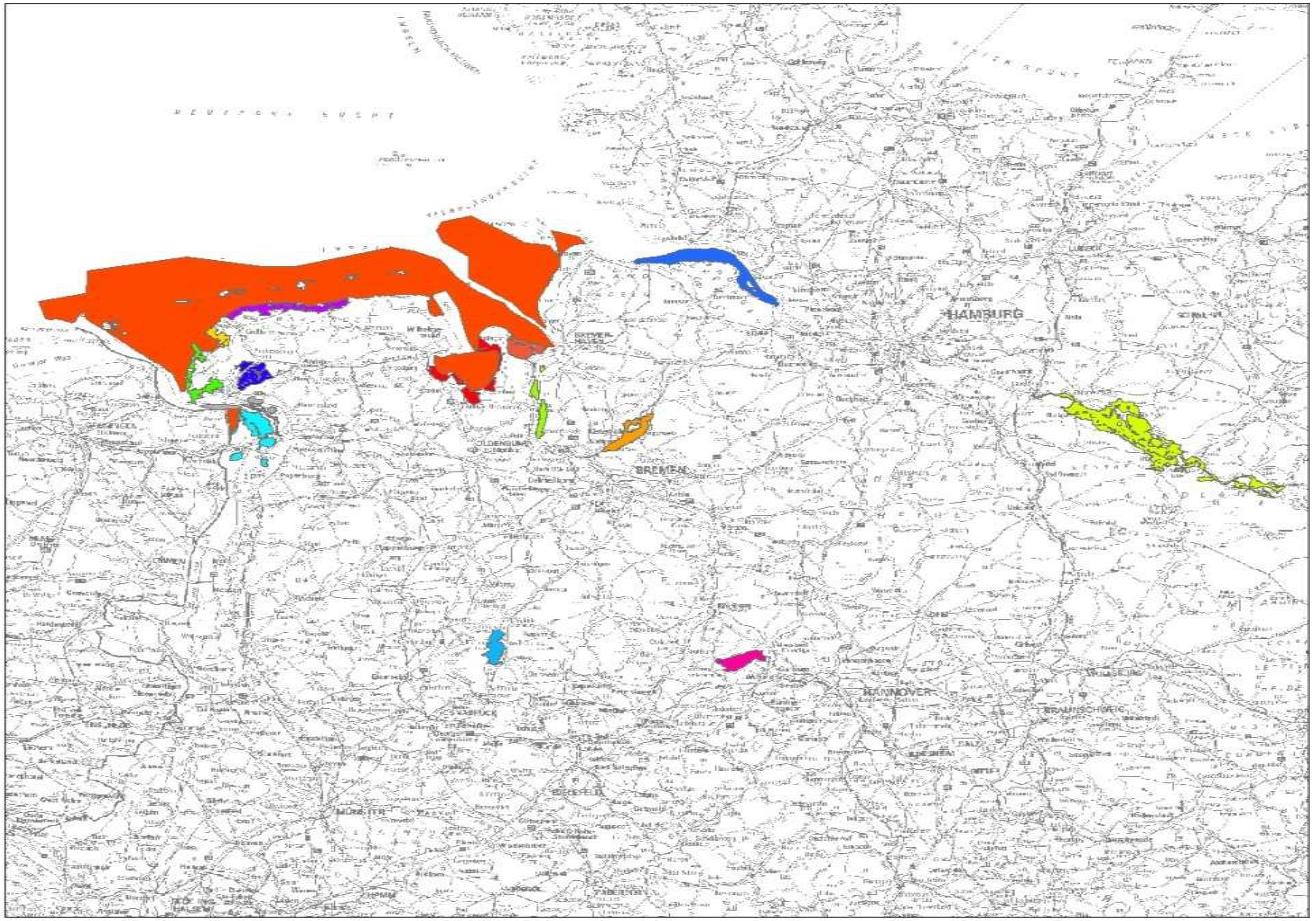
Main wintering sites of arctic geese protected under the Birds Directive

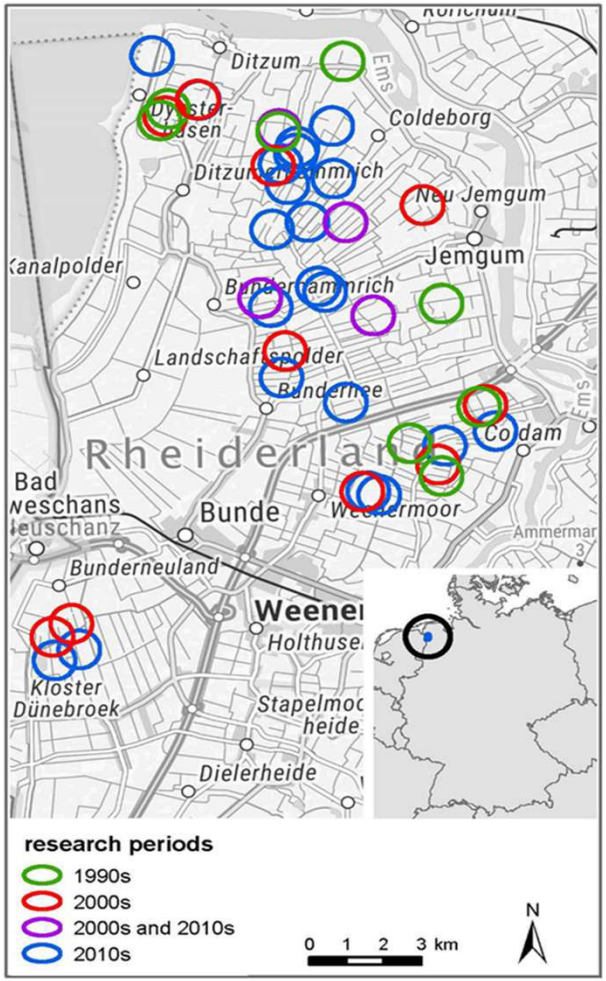


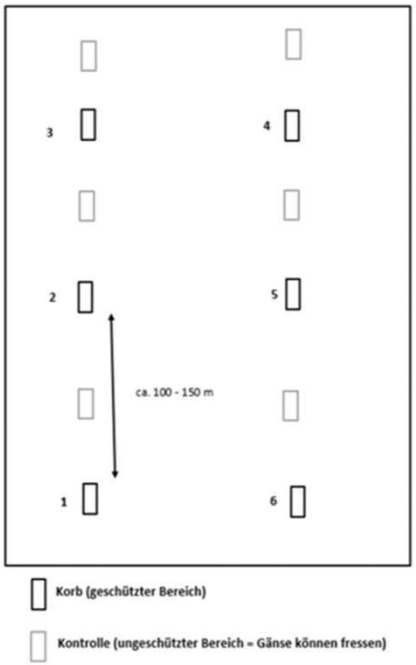
Art. 4, EU-Birds Directive:

Member States must designate Special Protection Areas (SPAs) for the survival of breeding bird species of Annex I and all migratory bird species.

No avoidance of the the geese to the exclosures

Measurements of goose damages in grasslands of the Dollard Region





Study periods:
- 1996-1998
- 2008-2010
- 2016-2018

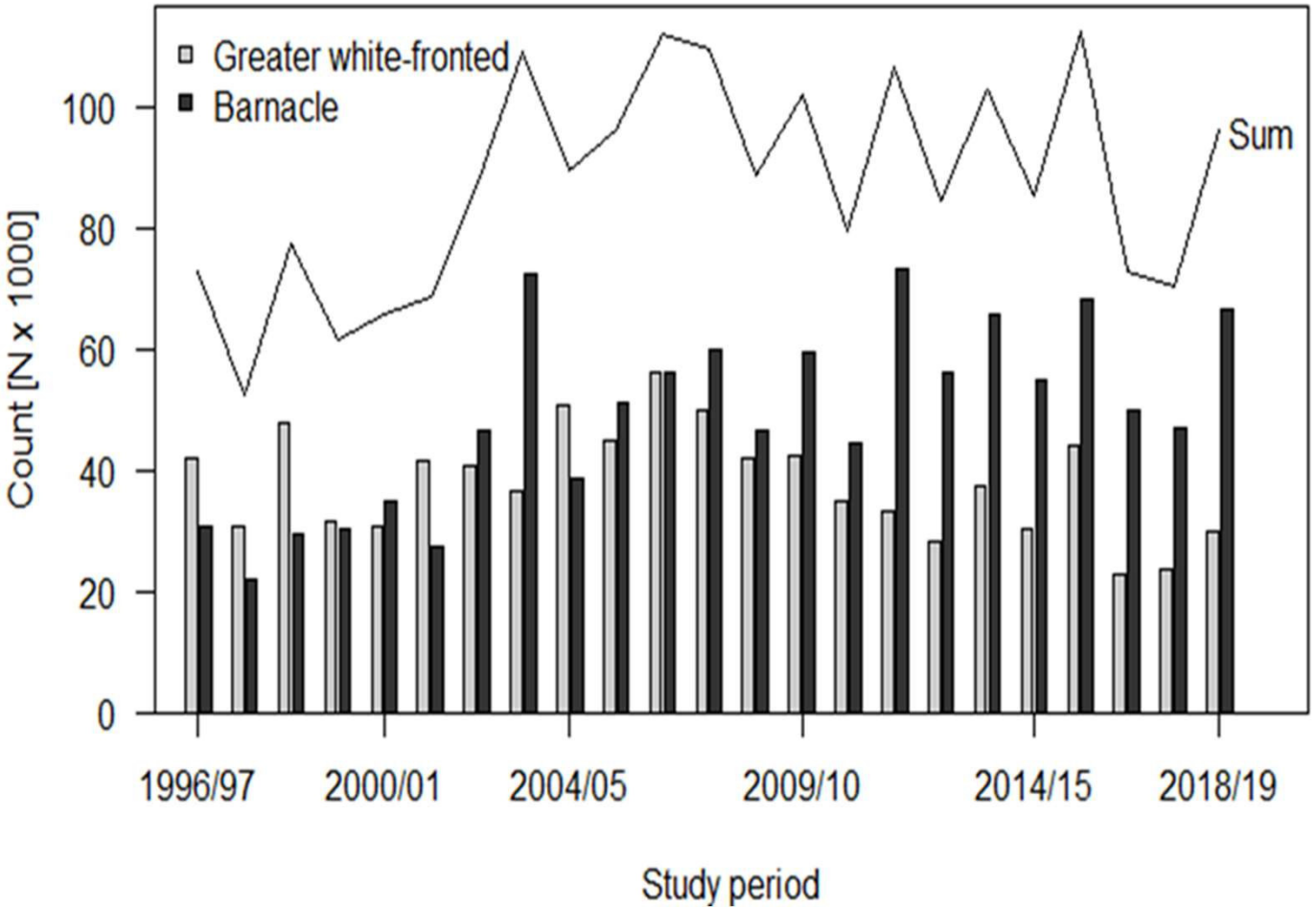
Investigated parameters:
- dry biomass
- energy content
- crude protein
- fiber content
- ash

Number of investigated fields:
(2) 6 -18

Monitoring of the wintering geese

- Weekly counts from mid-October until mid-May of the coming year by cars on different routes over the study site (ca. 10.000 ha)
- Geese monitoring was carried out in the same way over the whole study period (1996/97 – 2018/19)
- All geese were protocoled in field maps which enabled us to calculate the goose density within areas of 100 ha around the grazed and ungrazed plots

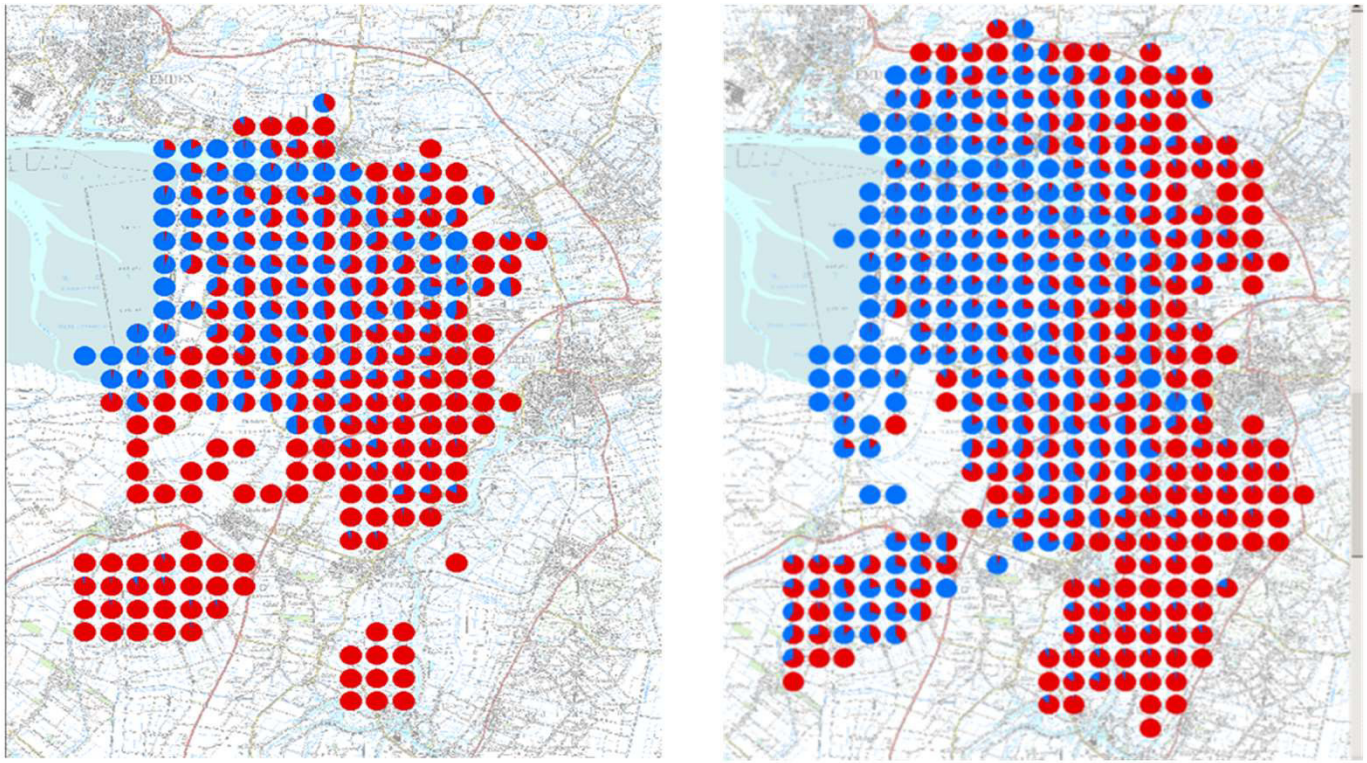
Changes in the maximum numbers of wintering geese



98 % of all wintering geese belong to two species:

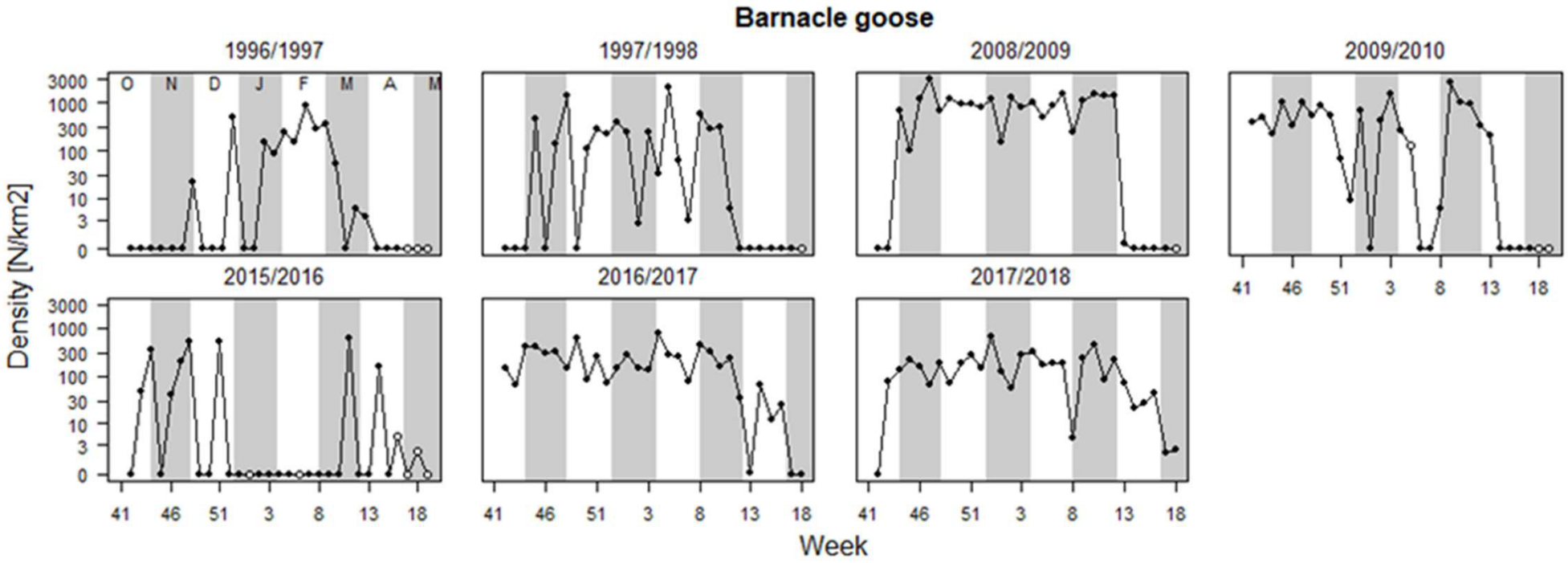
- Barnacle Goose
- Greater White-Fronted Goose

Competition between Barnacle and Gr. White-fronted Geese



Distribution of Barnacle Goose (blue) and Greater White-fronted Goose (red) in the Rheiderland area based on grid mapping. Size of a grid: 1 km² (Kruckenberg unpubl.)

Changes in the phenology of wintering Barnacle Geese

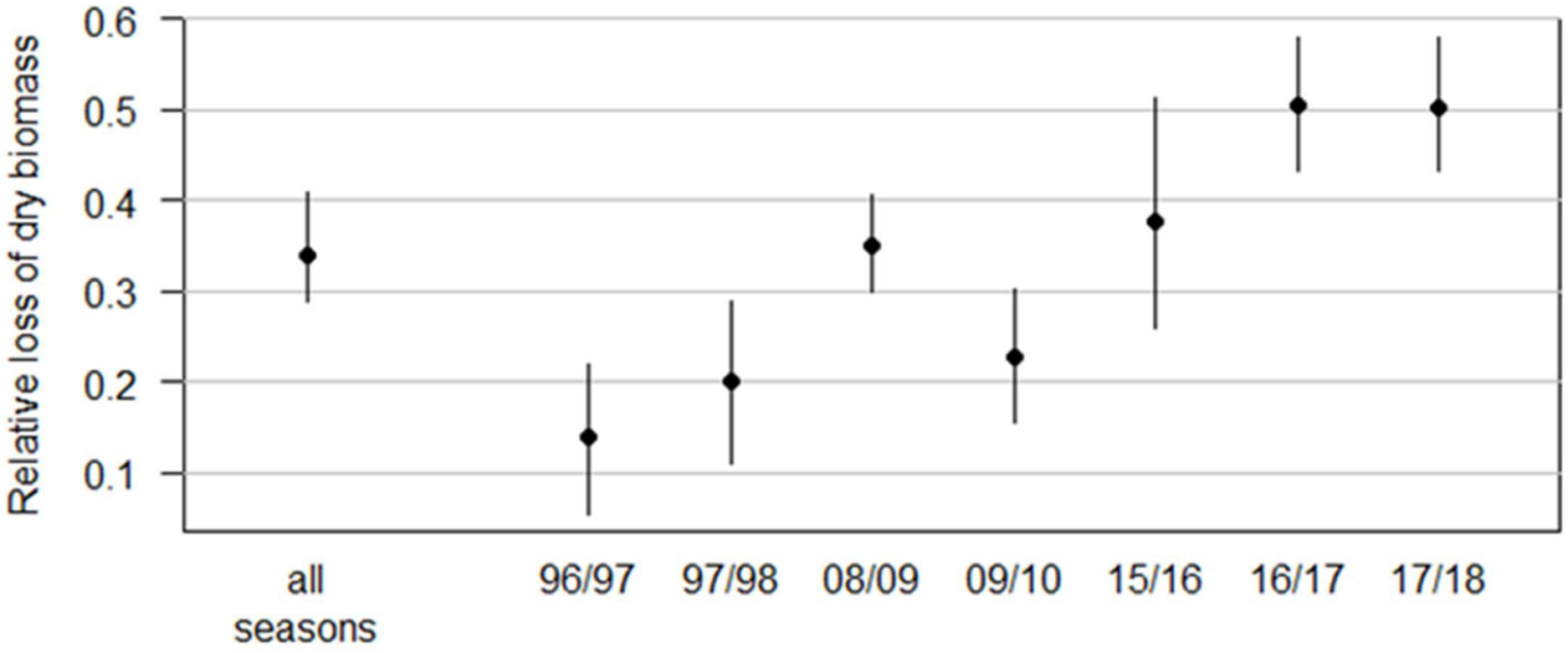


In contrast: No change in arrival and departure dates of Greater White-fronted Geese:

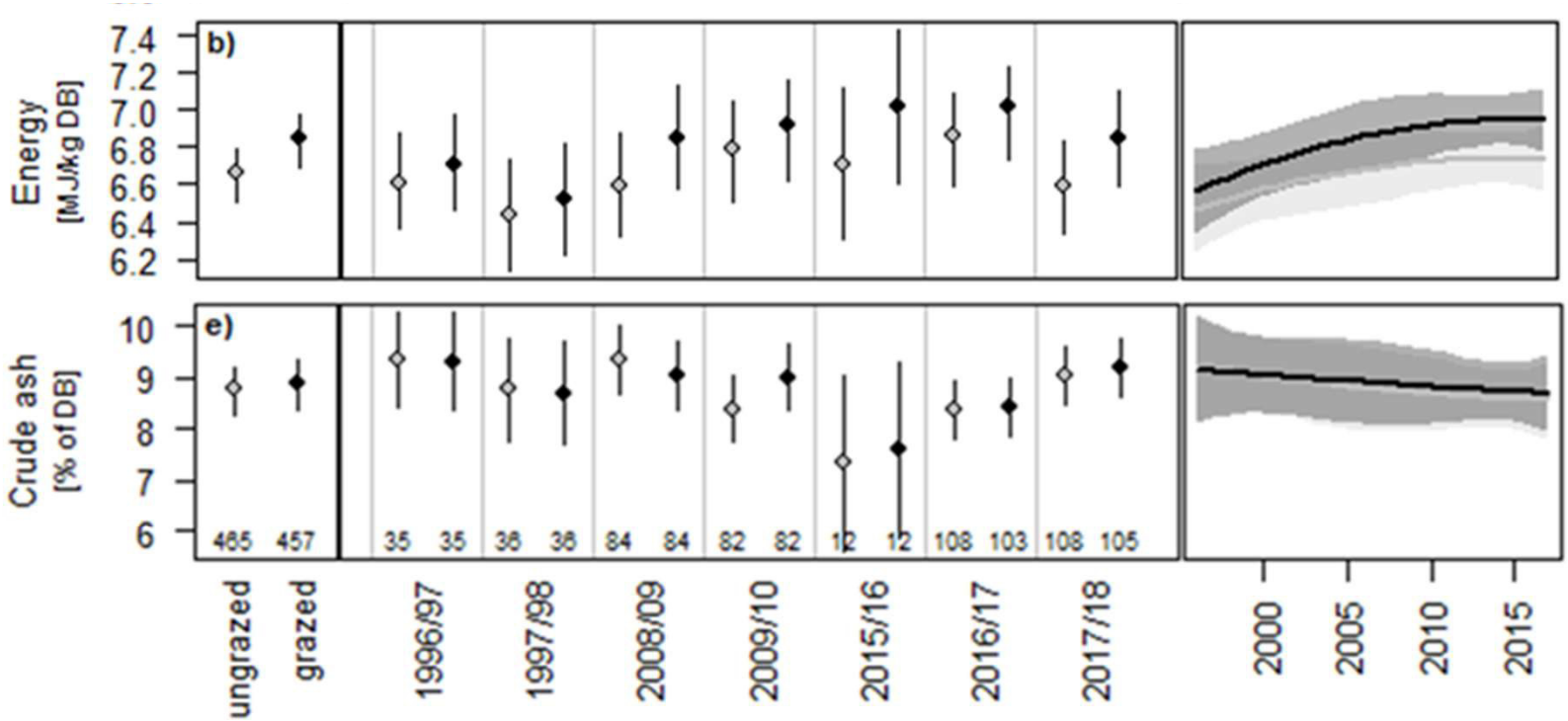
arrival: end of October, beginning of November

departure: mid/end of March)

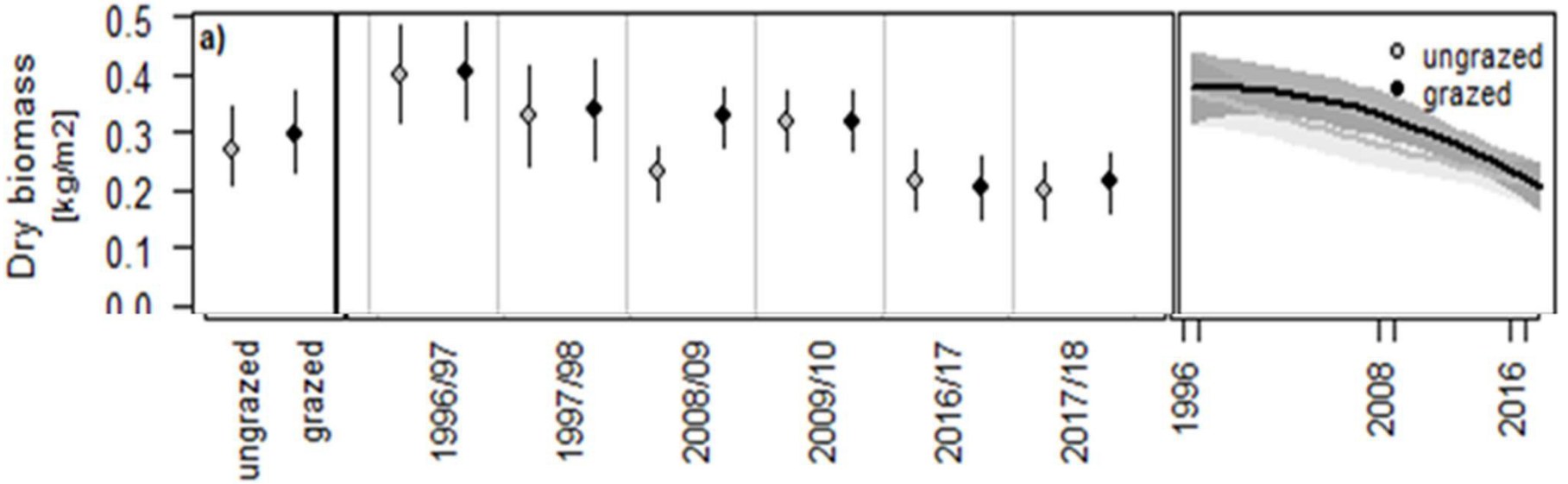
Relative loss of dry biomass over 20 years



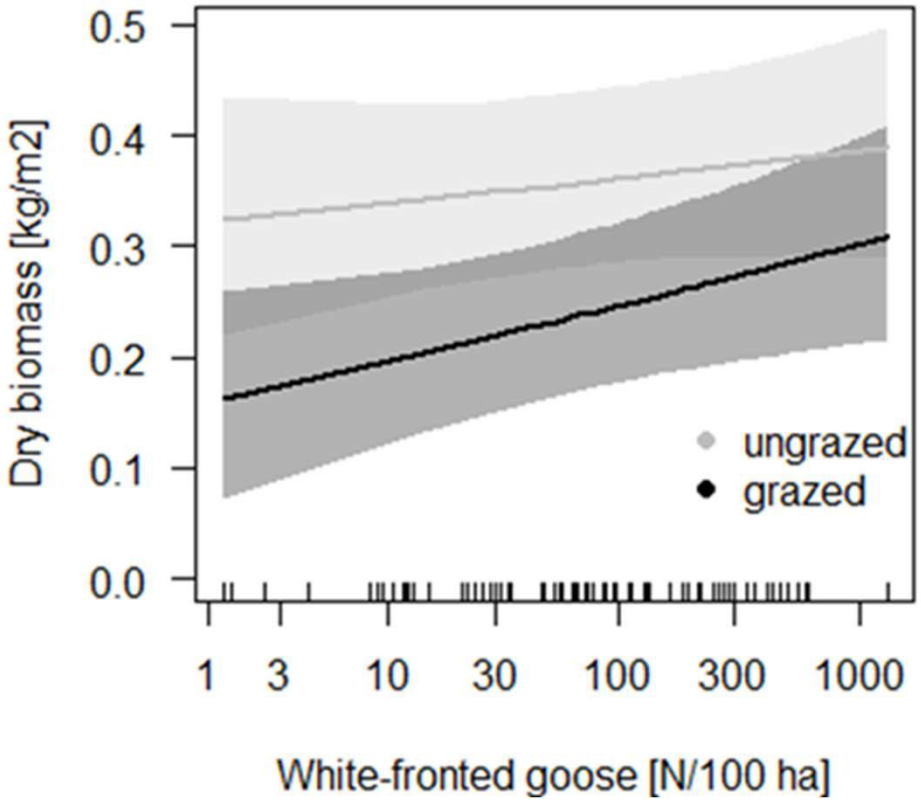
Quality of the herbage of the first cut

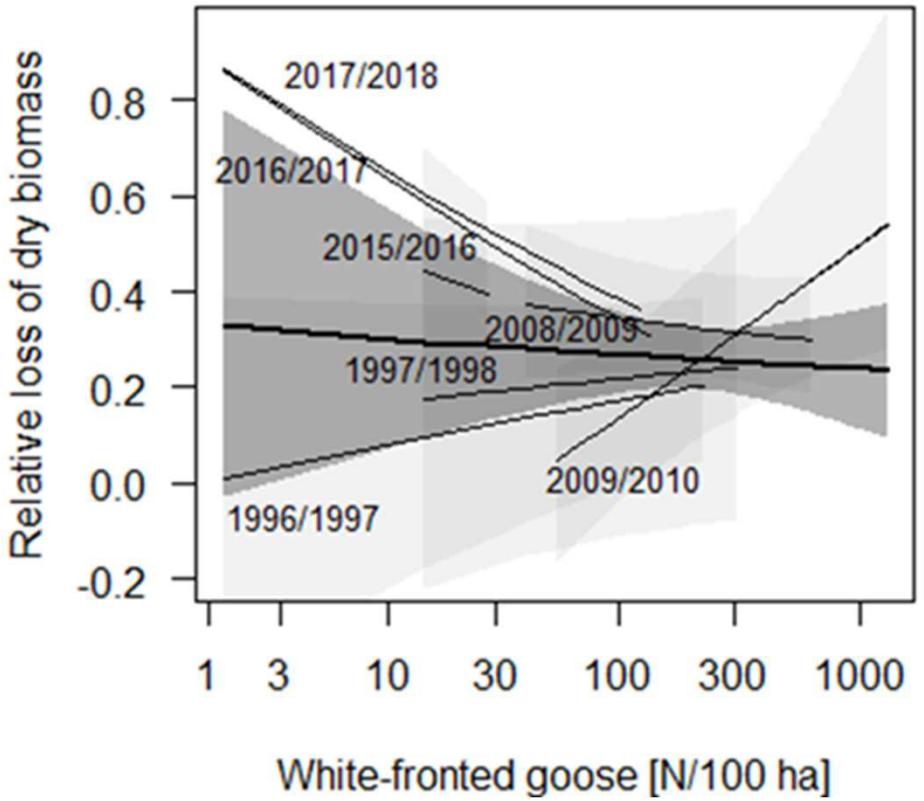


Biomass yields of the second cut

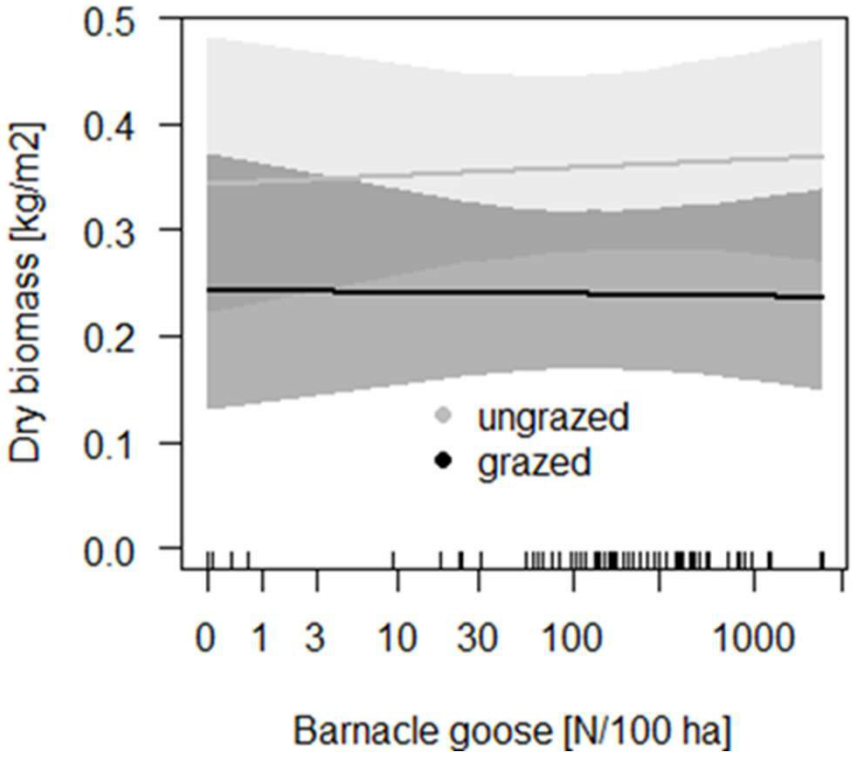


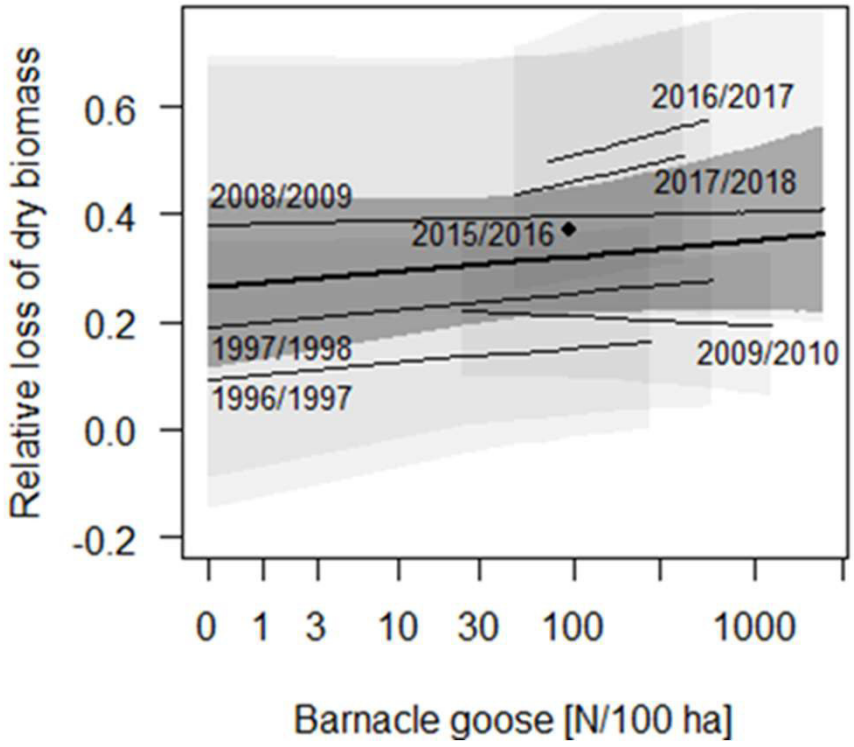
Impact of wintering Gr. White-fronted geese on grassland yields



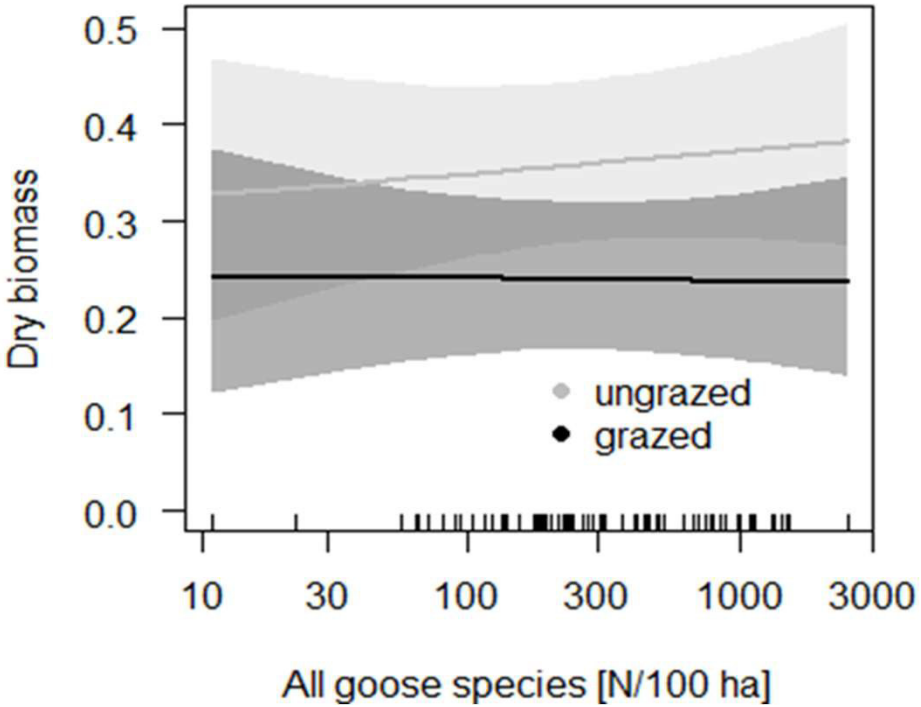


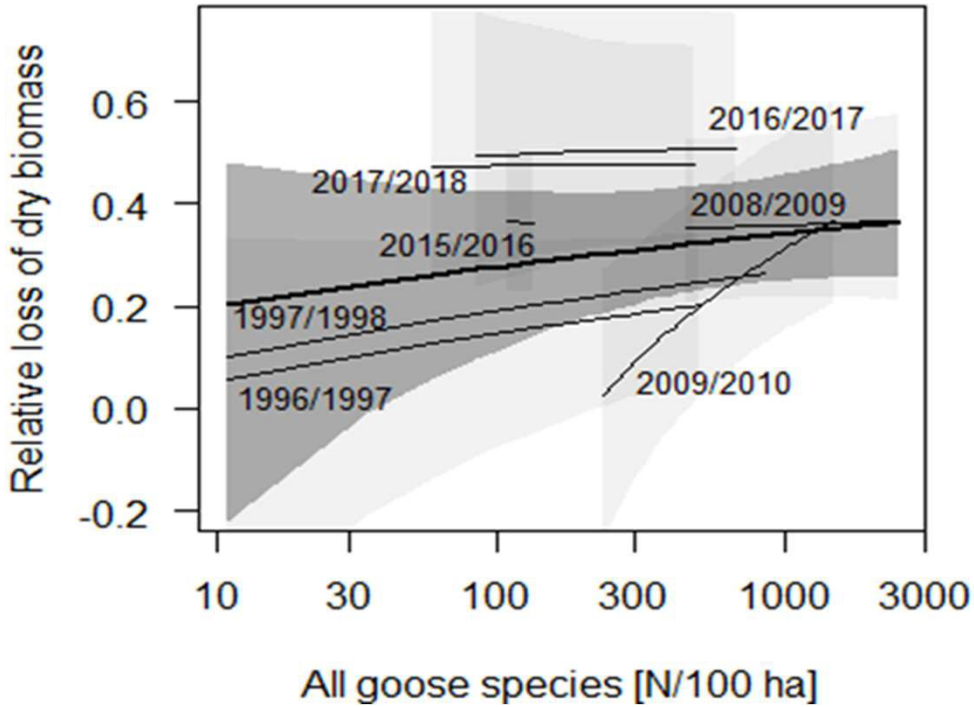
Impact of wintering Barnacle Geese on grassland yields



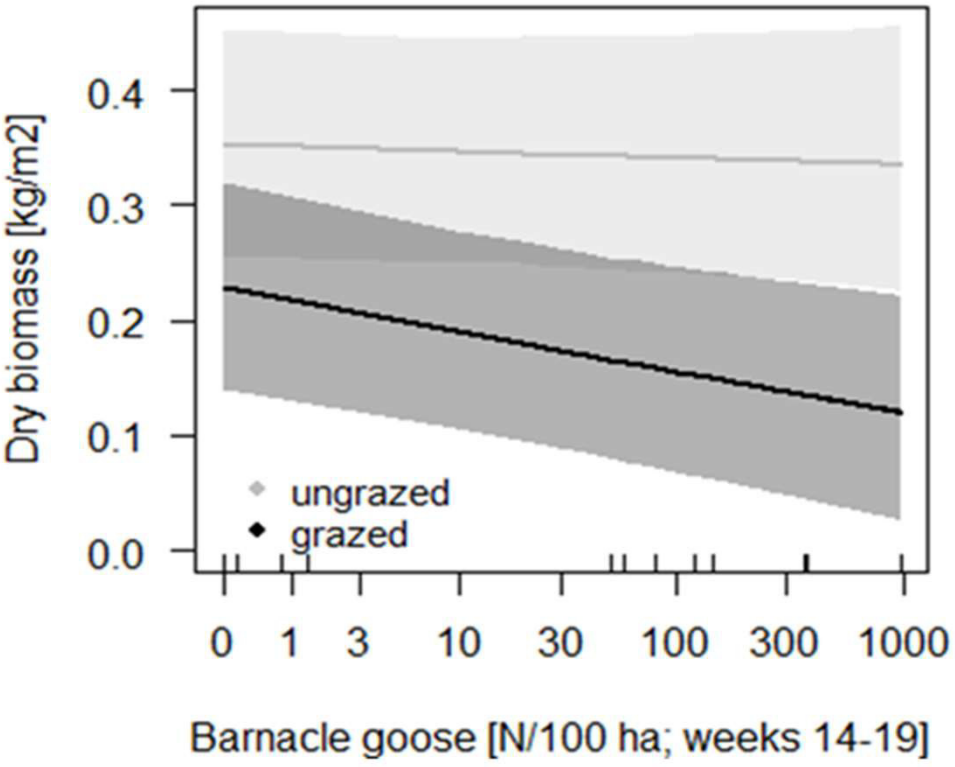


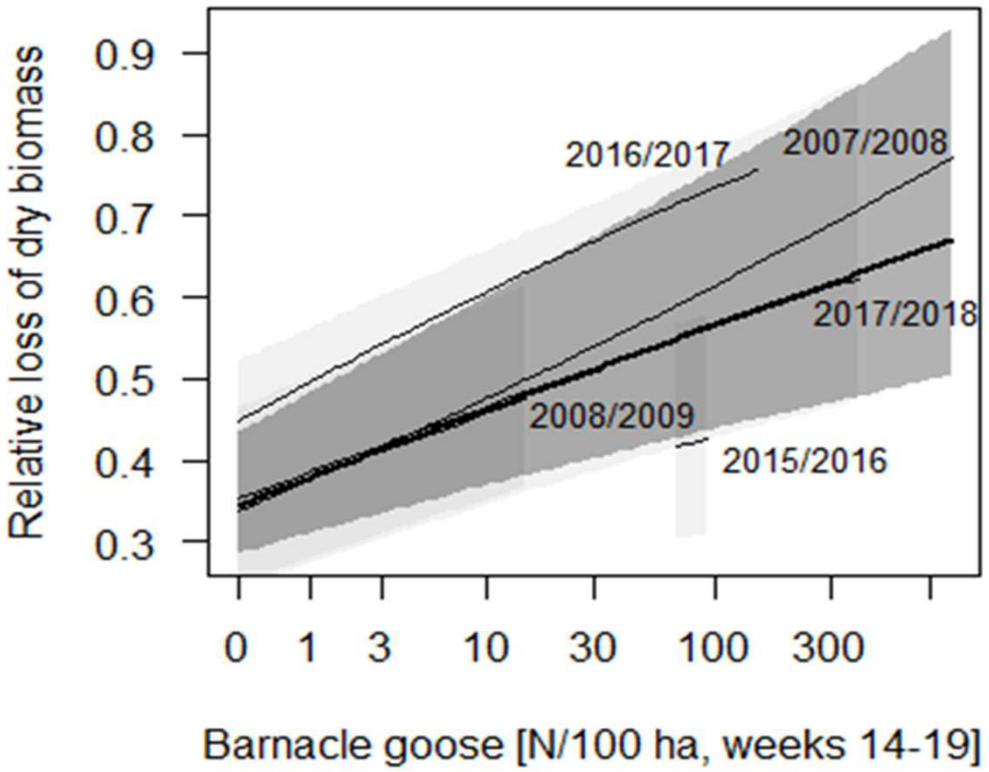
Impact of all wintering geese on grassland yields



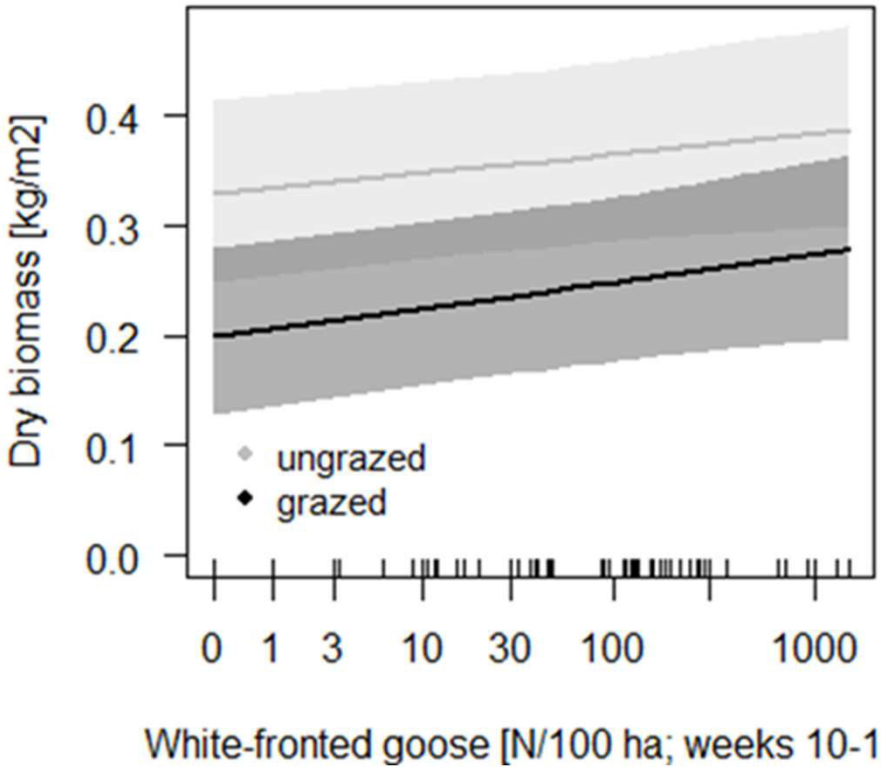


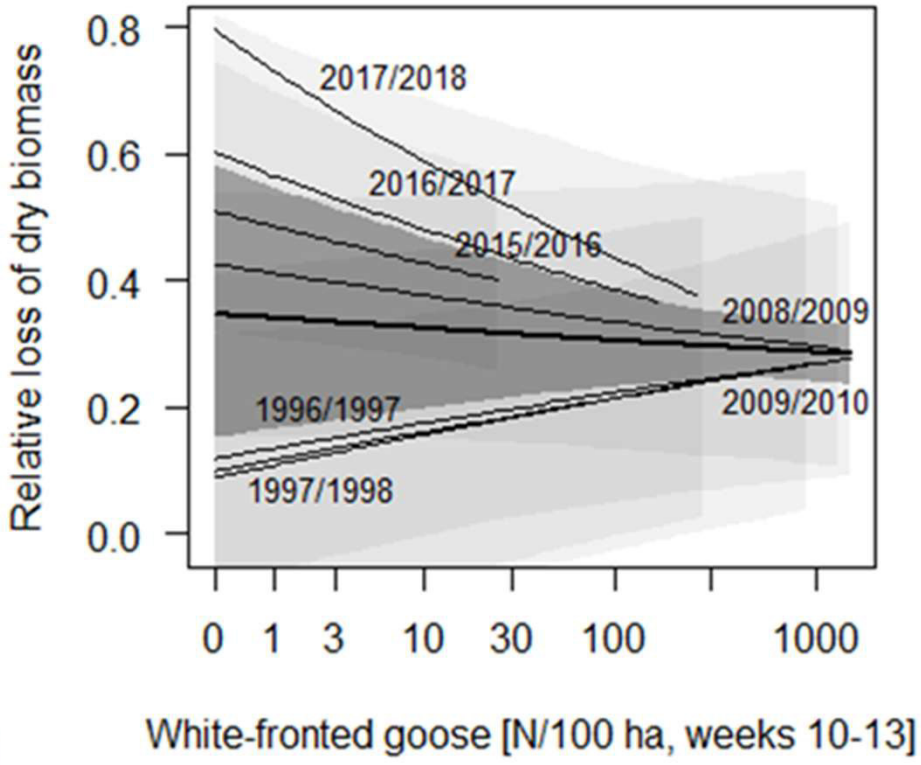
Impact of Barnacle Geese in late spring on grassland yields





Impact of Gr. White-fronted Geese in spring on grassland yields





Summary and Conclusion

- Goose-dependent yield losses at first harvest increased over the last 20 years from ca. 15 % to ca. 50 %.

- The increase in yield loss corresponds with changes in the numbers and the migratory behaviour of the Barnacle Goose

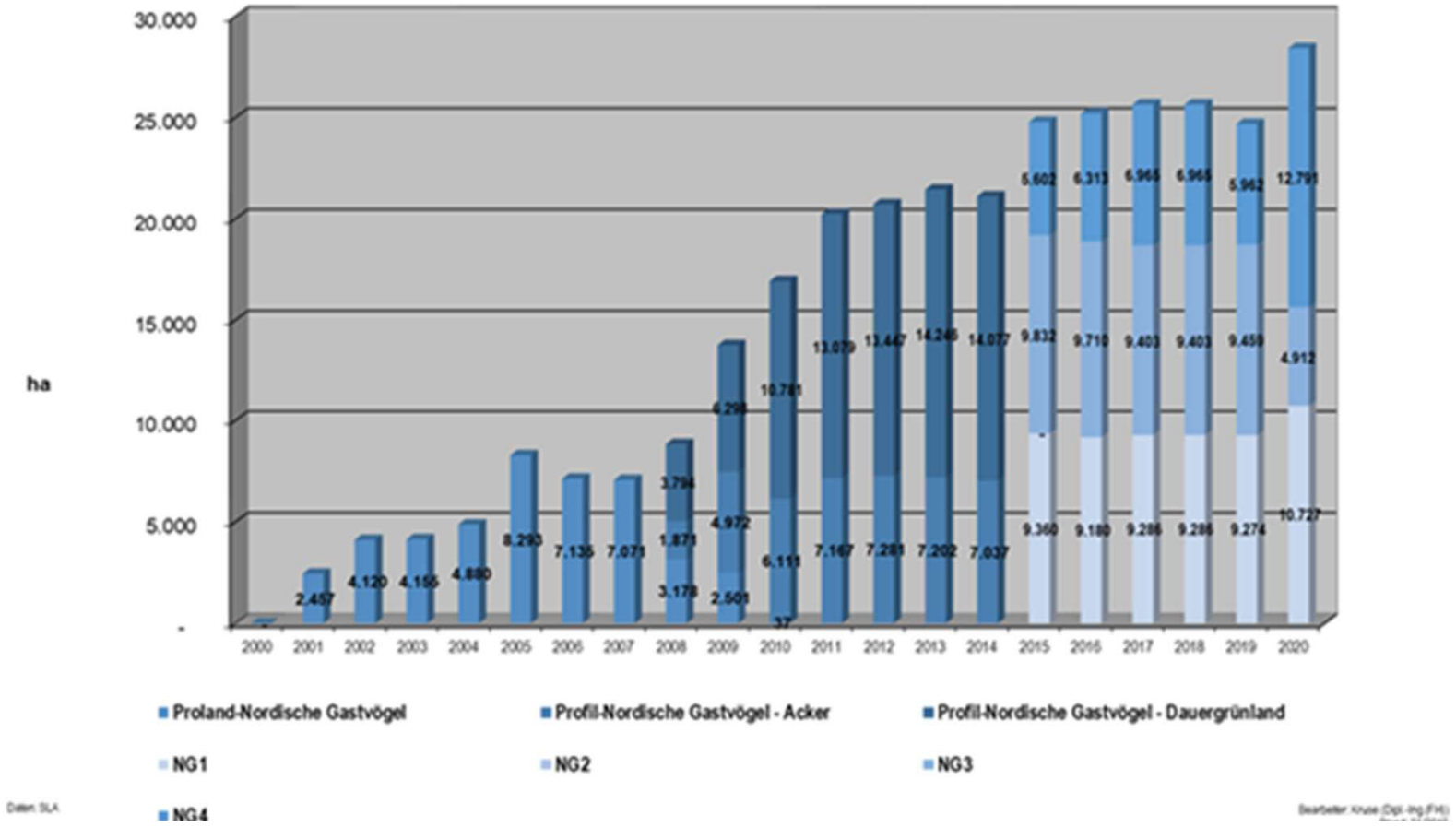
- The yield reductions correlate positively with the density of Barnacle Goose in April but not with the density of Gr. White-fronted Goose

- The energy content of grass samples generally increased with years whereby in all years grazed plots possessed higher rates than ungrazed ones

- Goose grazing did not affect the second cut of grass nor did we find a contamination of the herbage with goose droppings

- The present study forms the basis for a comprehensible system of compensation payments to affected farmers.

Development of farmland managed with AES for arctic geese in Lower Saxony




Thank you for
your attention!
Foto: G.-M. Heinze