

Effects of Extensive Year-round Grazing on Breeding Bird Communities in Northern Germany

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Introduction

- Extensive year-round grazing systems with low stocking rates and abandonment of fertilization and tillage operations have been established as a cost-effective and practicable tool for grassland conservation in Germany. However, the effects of the system on ecological communities, especially on fauna, have rarely been investigated.
- Our study, which was carried out in the eastern and central part of the federal state of Schleswig-Holstein in Northern Germany, aimed to answer the question how breeding bird communities of year-round grazing conservation areas differ from those of conventionally managed agricultural reference sites.

Materials and methods

- Ten extensive year-round grazing areas and ten comparable neighboring conventionally used agricultural sites were chosen for investigations (paired sampling design).
- Land use of the reference sites was similar to formerly agricultural management of the grazing sites. Year-round grazing conservation areas were grazed with stocking rates of 0.3 to 0.6 livestock units per hectare. Due to conservation measures, seven grazing areas contained periodical or permanent waters, whereas on the reference sites there were no waters.
- Breeding bird populations were determined by territory mapping during April to July 2009. In order to analyze breeding bird communities, several ecological parameters were calculated (see results). Differences between year-round grazing and reference areas were analyzed by two-sample t-tests as well as by sign tests of pairwise differences between grazing and reference sites.

Results and Discussion

- Species diversity and total abundance of (threatened) species was higher in the grazing areas compared to the reference sites (Table).
- Significant differences in abundance could be detected for Tree Pipit (*Anthus trivialis*) and Skylark (*Alauda arvensis*), which reached higher abundances on the year-round grazing areas.
- The guild of ground nesting birds showed a higher abundance and species diversity in the grazing areas compared to the reference sites. In the grazing areas on average 19.1 % of all territories belonged to water birds.
- Differences between study sites may be caused by a more appropriate vegetation structure and a better food supply in year-round grazing sites (abandonment of fertilization, herbicides, tillage).

Parameter	Grazing sites	Reference sites	t	Pr > t
Species/10 ha	5.27	1.38	-4.79	0.0001*
Shannon index	0.91	0.41	-4.89	0.0001*
Total territories/10 ha	10.87	2.81	-4.96	0.0001*
Threatened species /10 ha	1.62	0.55	-4.52	0.0003*
Total territories/10 ha threatened species	4.10	1.06	-4.63	0.0002*

*: significant for Pr < 0.05

Conclusions

- Establishment of extensive year-round grazing seems to be a reasonable tool to support species diversity and populations of (threatened) farmland bird species.
- Water bodies created on grazing sites should enrich composition of bird communities, however, extent depends on type of waters.



Year-round grazing site