The influence of wind turbines and habitat structure on breeding parameters of the Ortolan bunting (*Emberiza hortulana*)

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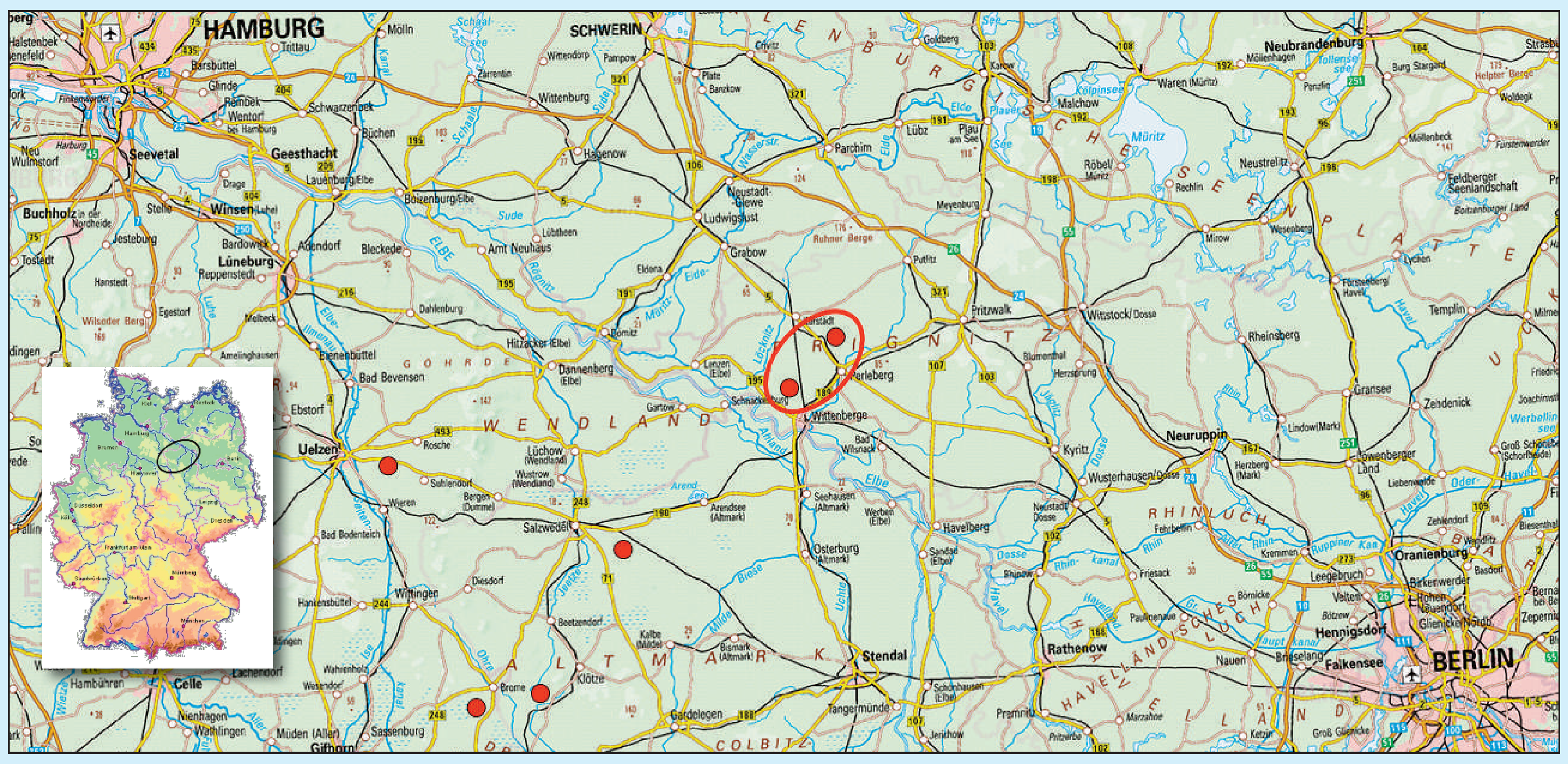
Introduction

The breeding density of the Ortolan (*Emberiza hortulana*) has massively decreased in many parts of Germany since the 1960s. The species is listed on the Red List of endangered species in Germany and in the Appendix 1 of the Council Directive 79/409/EEC on the conservation of wild birds. With the progressive expansion of wind farms also in ortolan habitats there was the need for a study of the effects of wind turbines on the spatial distribution of this species.



Methods

The study took place in 2004 at 5 wind farms with adjacent reference areas in Lower Saxony, Saxony-Anhalt and Brandenburg.
The fllowing parameters were mapped during 8 surveys between May and June:

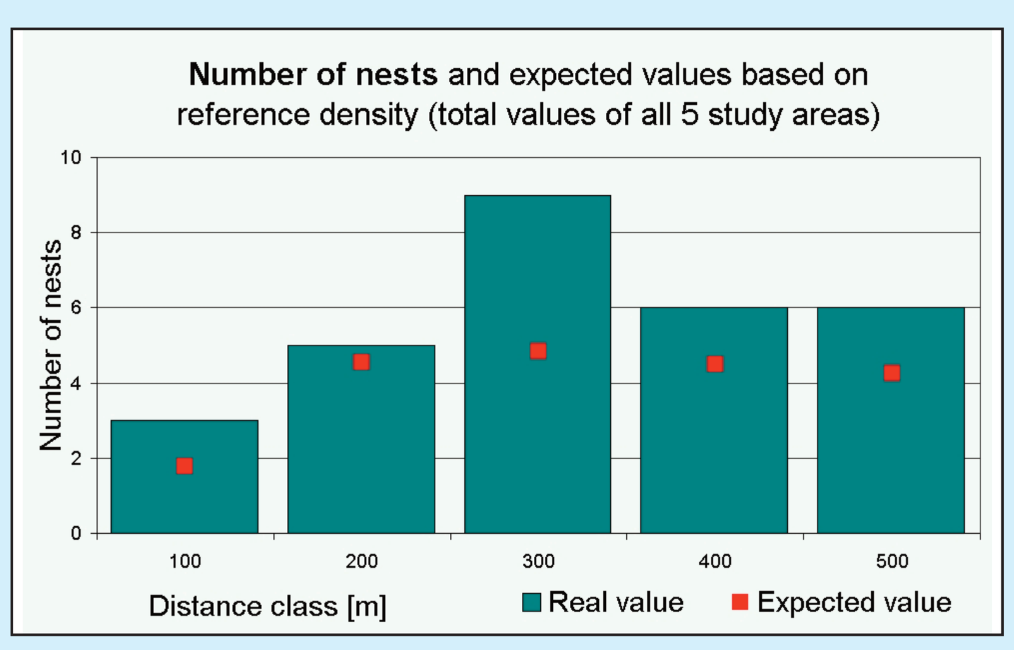
- Territory size, nest location and mating status (Observation time at least 2-3 hours per ortolan)
- Distances to the next wind turbine
- Agricultural land use
- Tree species of the song perch
- Distance to the next hedge, tree line or wood
- Type, length, height and width of the next wood habitat
- Surface of adjecent paths/streets

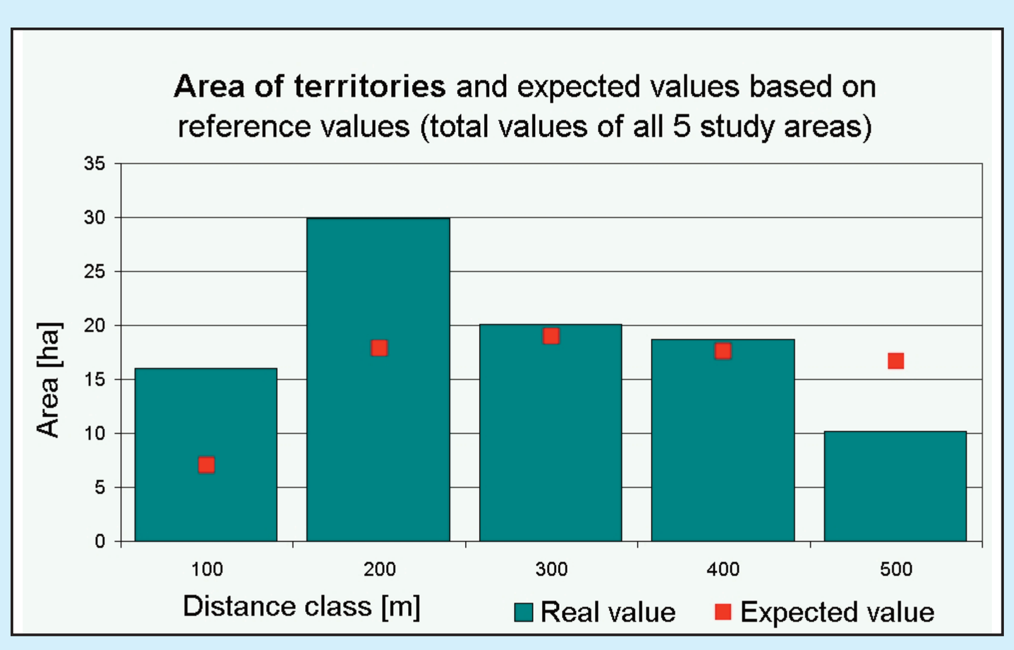
RESULTS

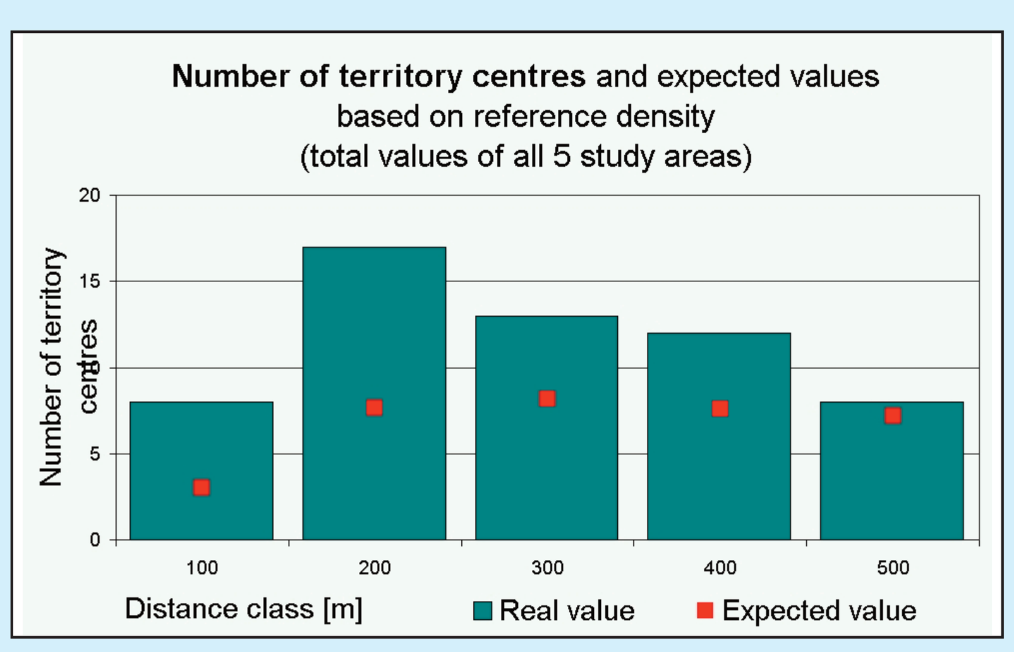
Impact Gradient Design and comparison with reference data:
(expected values in the windfarm were calculated according to data from reference areas and compared to real values with T-Test)

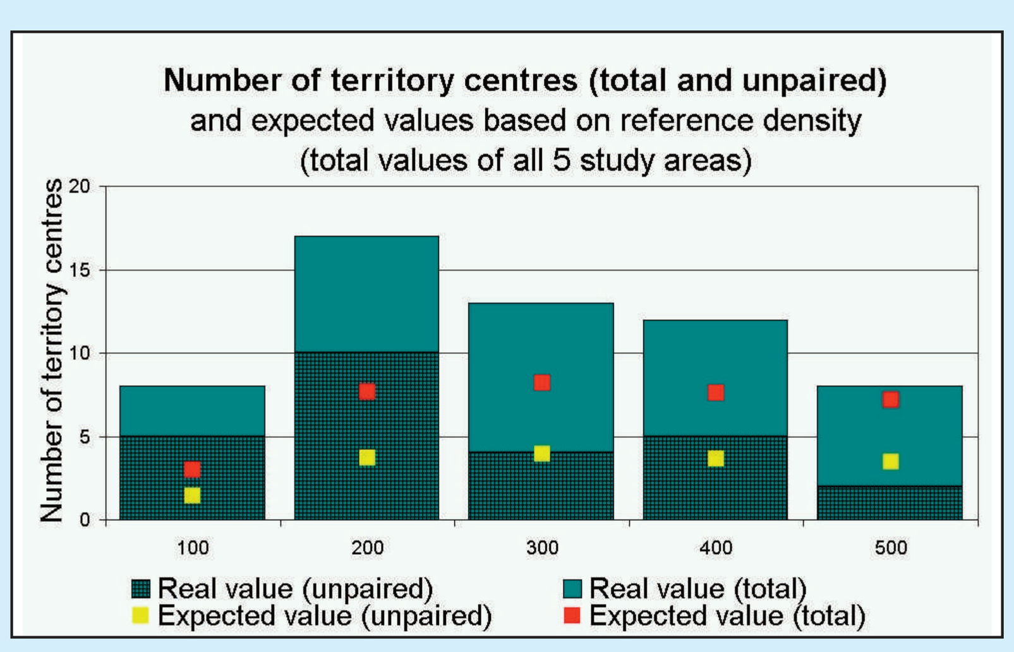
No significant influence of the distance to the next wind turbine on:

- Number of nests
- Territory area size
- Number of territories









Logistic regression for different habitat parameters:

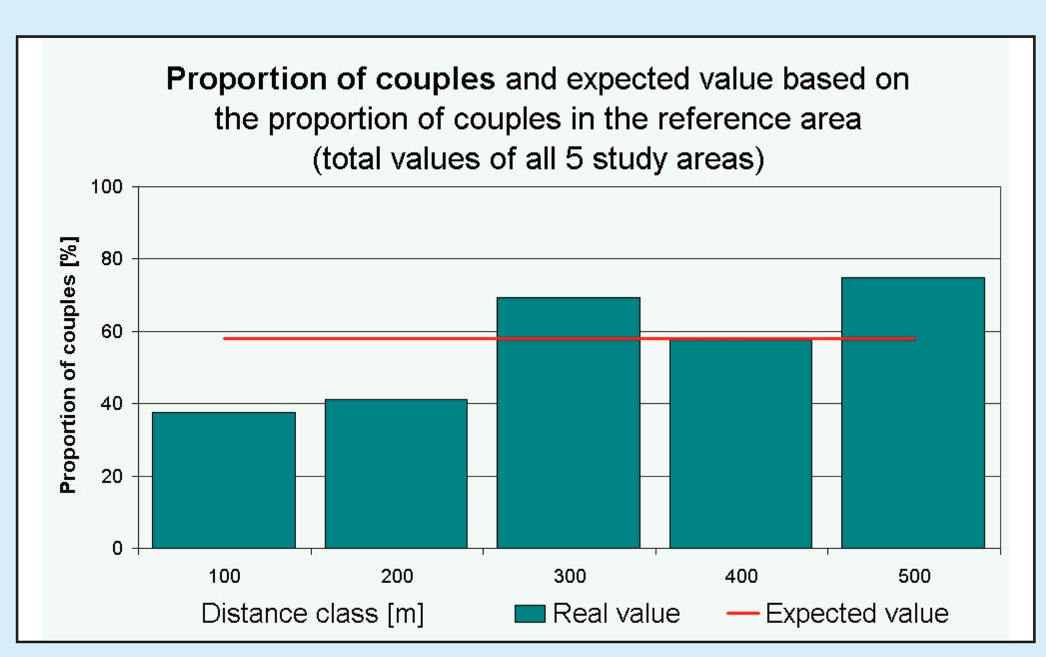
<u>Significant influence on the distribution of territories:</u>

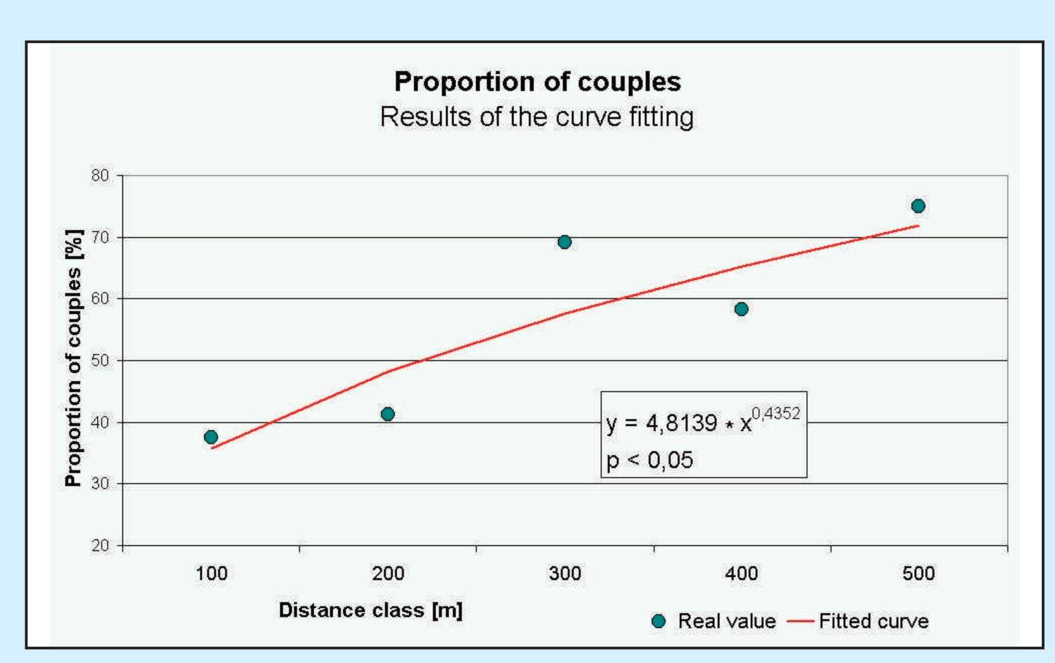
- Distance to the next wood habitat (short distance preferred)
- Tree species (preference of oaks)
- Land usage (preference of winter cereal, pea and potatoe)
- Distance to the next ortolan territory (short distance preferred)

<u>No significant influence on the distribution of territories:</u>

- Distance to the next wind turbine
- Type of wood habitat (hedge, tree row, wood etc.)
- Length, height and width of the hedges/tree rows
- Surface of adjacent paths/streets

Proportion of couples and mating status:
Number of couples in relation to unpaired males increased significantly with growing distance to the next wind turbine (curve fitting).
The proportion of couples in the first 200 m around the wind turbines was lower than in the reference area.





Conclusion

The distance to the next wind turbine had no significant influence on the number and distribution of nests and territories. Other parameters like agricultural land use, tree species or distance to the next hedge could be determined as habitat parameters with significant influence on the distribution of ortolan territories.
The lower proportion of couples next to the turbines was due to a surplus of unpaired males in the proximity of wind turbines. But as the sample size of ortolan couples located in the wind farms was generally low (especially in the 100 metre-zone) further studies concerning the mating status are needed to exclude a negative influence of the turbines.