

USE OF 3D PROBABILITY MODEL OF A BIRD - WIND TURBINE COLLISION FOR THE PURPOSE OF THE FUTURE WIND FARM “ŠUŠARA FIELDS”



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INTRODUCTION

- © Bird monitoring is entry stage of EIA study for every future wind farm, and also one of the most important steps regarding the preservation of the local ornithofauna



INTRODUCTION

© Bird monitoring focus - Migrating species

© Monitoring concerns

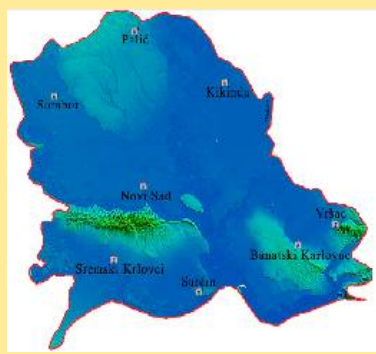
© Barrier effects

© Rout deviations of migratory species

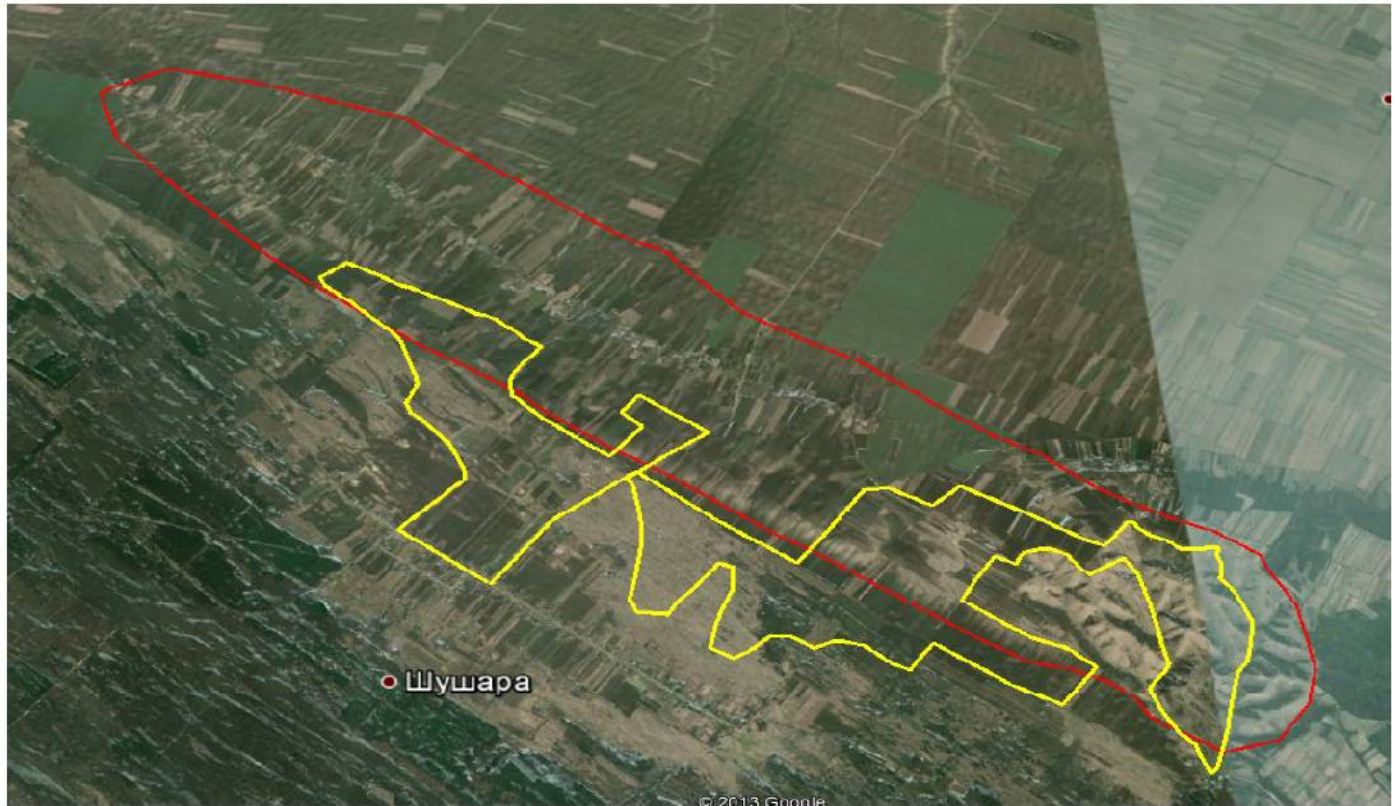
© Disruption of habits of residential species

© Potential collision risks





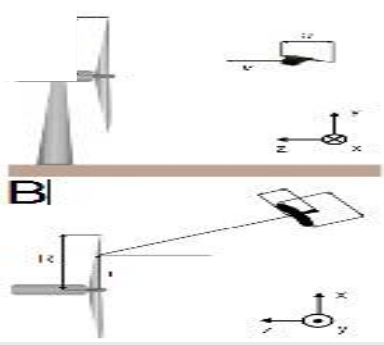
LOCALITY





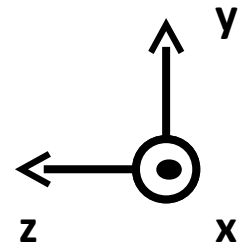
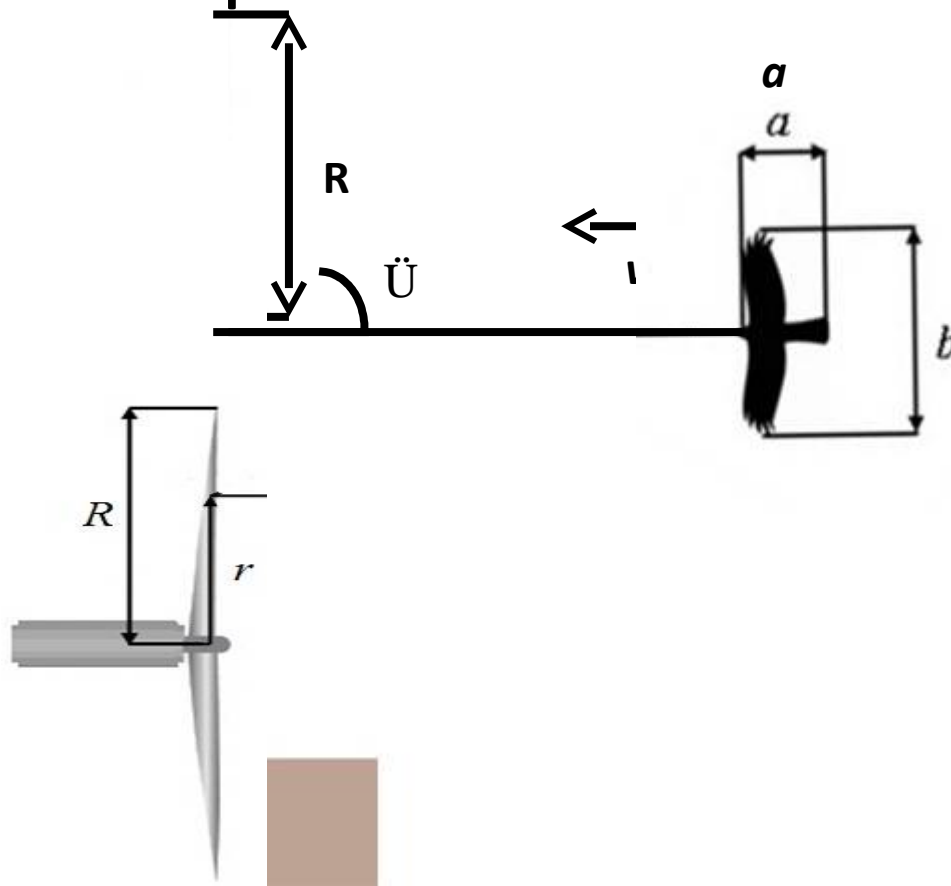
MONITORING

- ❖ Monitoring was performed from early autumn 2011 until the late spring 2013
- ❖ Transects were predefined and chosen in manner to cover the whole territory of the farm
- ❖ Locality was investigated combining stationary observation of the terrain from one of the predetermined vantage points, as well as from the car, while relocating from one to another vantage point
- ❖ Selected vantage points were located within as well as outside the territory of the wind farm
- ❖ Equipment consisted of binoculars, gps and high resolution camera



3D COLISION MODEL

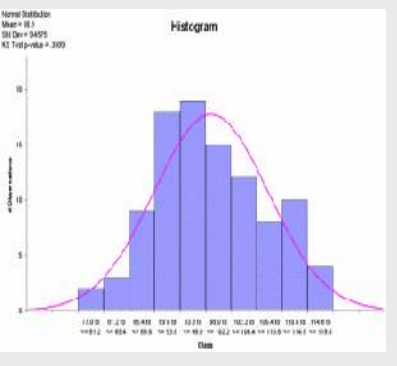
© Description:





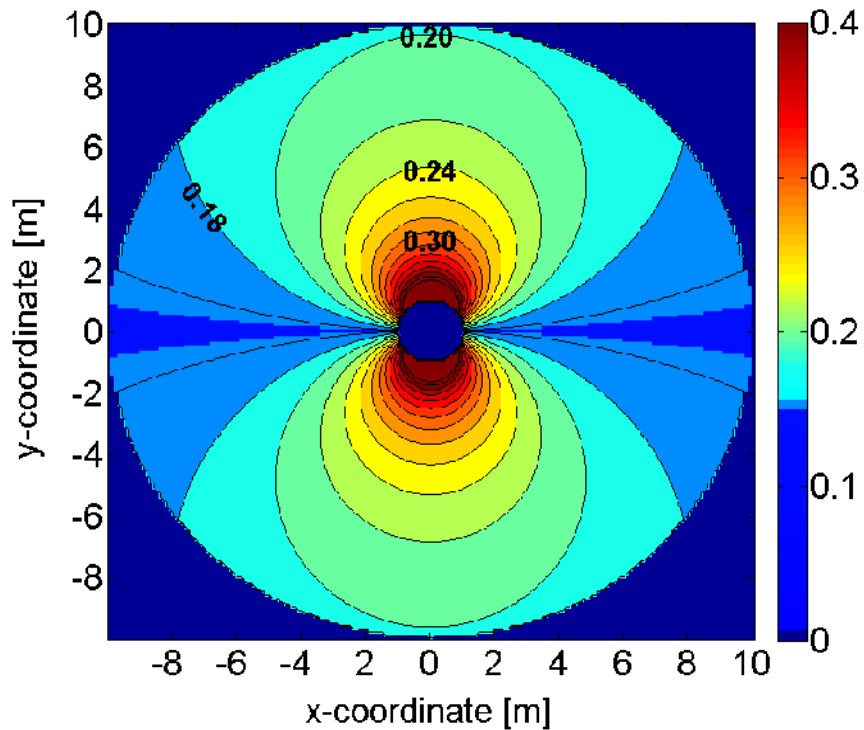
RESULTS

- ▶ 74 different bird species were spotted, from 13 different orders.
- ▶ From the IBA list of 25 species, presence of only 12 species was noted.
- ▶ Majority of the species (44 of them) was from the Passeriformes order.
- ▶ Only 5 species of bird of prey were detected, all of them listed in IUCN base as the species with least concern (LC) status
- ▶ Nest inspection showed that only several species from the order of Passeriformes had nesting habits in the wider vicinity of the wind farm territory.

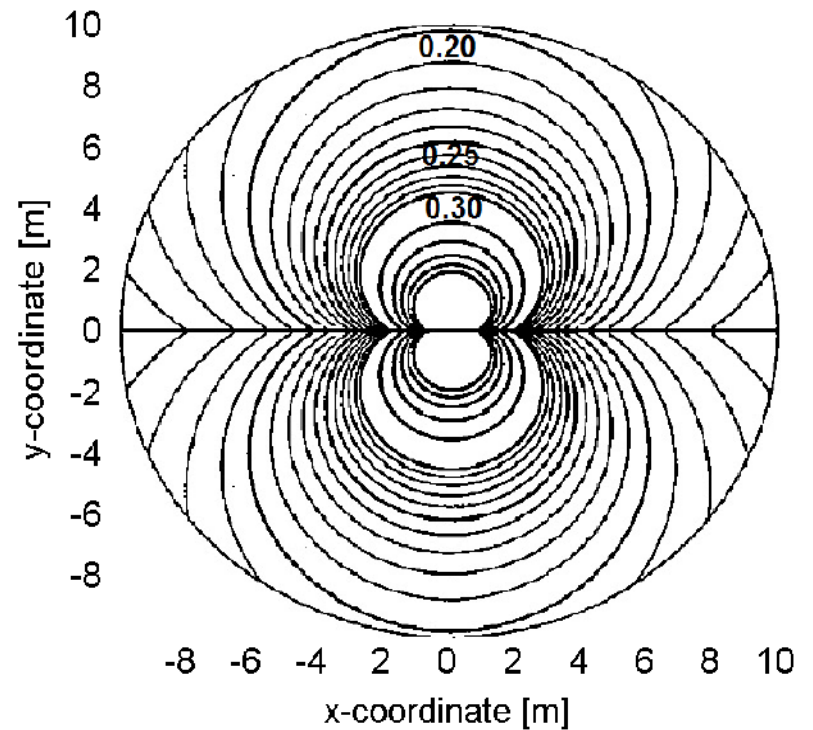


RESULTS

Collision probability map
 3D model, $\gamma = 0$, $\beta = 30$



Collision probability map,
 results presented in (Tucker 1996)





RESULTS

- ▶ Very useful ecological assessment tool for the preliminary estimation of the potential impacts
- ▶ Collision probability is highest in the vicinity of the hub, and it is decreasing toward the rim of the rotor disc area
- ▶ Angle of incidence and rotor blade pitch angle – most relevant factors



RESULTS

- ▶ Using this model with the relevant monitoring data - possible to calculate optimal wind farm layout (maximum wind generation output, maintaining minimum impact on the ornithofauna)
- ▶ In combination with the radar systems 3D model can serve as the real time control mechanism

The background features a close-up of green leaves with prominent veins, overlaid with a semi-transparent green and yellow color scheme. The text is rendered in a bold, blue, sans-serif font.

QUESTIONS

**thank you for your
attention**