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Research Articles

Effects of power lines on flight behaviour of the West-Pannonian Great Bustard *Otis tarda* population

RAINER RAAB^{a1} c¹, PÉTER SPAKOVSKY^{a2}, EIKE JULIUS^{a1}, CLAUDIA SCHÜTZ^{a1} and CHRISTIAN H. SCHULZE^{a3}

^{a1} Technisches Büro für Biologie, Quadenstraße 13, A-2232 Deutsch-Wagram, Austria.

^{a2} University of West Hungary, Institute of Wildlife Management and Vertebrate Zoology, H-9400 Sopron, Ady E. u. 5. and Technisches Büro für Biologie, Quadenstraße 13, A-2232 Deutsch-Wagram, Austria.

^{a3} Department of Animal Biodiversity, University of Vienna, Rennweg 14, A-1030 Vienna, Austria.

Summary

Flight directions of Great Bustards *Otis tarda* after take-off were used to analyse effects of power lines on spatial movements of this highly endangered bird species. Data on flight directions came from Great Bustard observations conducted in eastern Austria (northern and eastern parts of Lower Austria, northern part of Burgenland), western Slovakia and western Hungary. Flight directions were determined by a constructed line connecting take-off site and the bird's position after a flown distance of 100 m. Up to a distance of 800 m from the nearest power line, mean flight direction of Great Bustards after take-off deviated significantly from a random distribution. The mean flight direction angles clearly indicate that take-off flight routes point away from power lines at an angle of approximately 180°. Furthermore, flight directions of bustards still deviated from a random distribution in two 200-m distance bands much further away from power lines (> 1,200–1,400 m, > 1,400–1,600 m), possibly suggesting that even at larger distances from power lines flight directions might still be affected by such artificial linear landscape structures. With increasing distance to nearest power lines, mean vector length r values of flight paths decrease significantly, while circular standard deviations S values increase significantly. Very similar results were achieved independently if all data were pooled or analysed separately for individual study areas for which the number of flight observations was large enough to conduct reliable analyses. Our study reports a strong effect of power lines on the flight behaviour of Great Bustards, at least up to a distance of 800 m, perhaps even up to 1,600 m. Although this may significantly reduce the risk of collision with power lines it most likely has severe consequences for the spatial movements of birds within the entire landscape and between potentially suitable breeding and foraging habitats.

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Correspondence:

^{c1} Author for correspondence; e-mail: rainer.raab@gmx.at

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