Home range of raptors (Red Kite, Montagu's harrier and White-tailed eagle) in the vicinity of wind turbines in Germany revealed by telemetry studies

by
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Birds of prey fall victim to collisions with wind turbines relatively more often than other bird species. In Germany, some species of raptors are among the most frequently reported collision victims. In order to understand the underlying reasons for this phenomenon, the Michael-Otto-Institute within NABU, the consultancy BioConsult SH and the Leibniz Institute for Zoo and Wildlife Research recently finalized a research project on birds of prey and wind farms. The German Ministry of the Environment, Nature Conservation and Nuclear Safety financed the project.

The main aim of the project "Birds of prey and wind farms: Analysis of problems and possible solutions" is to understand when, where and why birds of prey - in particular White-tailed Eagles (*Haliaetus albicilla*), Red Kites (*Milvus milvus*) and Montagu's Harriers (*Circus pygargus*) are at risk of collision with wind turbines. Better knowledge of the underlying factors causing collisions will hopefully help to solve the conflict between the occurrence of birds of prey and wind farms in the future. A further aim of the project is to develop measures to minimize collision frequencies.

We present examplary results with regard to the home range and travel distances of breeding adults of the three species, leading to basis for collision risk assessments and the development of mitigation measures. The final results of this project will be published as a report in autumn 2011.

For all species, individuals were equipped with VHF- or GPS-transmitters in order to study their home ranges and potentially risky situations in relation to the wind farms.

Framework of this poster presentation:

Funding of the comprehensive research project „Birds of prey and wind farms: analysis of problems and possible solutions" by the German Ministry of Environment (0327684 A/B)

H. Hötker: Lead and coordination of the project. L. Rasran: „Effect of wind farms on population trends and breeding success of raptors" and "Analysis of collision victims in Germany"

U. Mammen, K. Mammen, N. Heinrichs & A. Resetaritz: „Telemetry study of Red kites"

O.Krone, M. Gippert, E. Treu & T. Grünkorn: „Telemetry study of White tailed eagles"

B. Grajetzky, M. Hoffmann & G. Nehls: „Telemetry study of Montagu´s harriers"

R. Joest: "Habitat analysis of Montagu´s harriers"

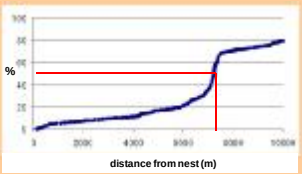
Further results of Red Kite telemetry study see poster presentation at this conference by U. Mammen et al.: Red Kite (Milvus milvus) fatalities at wind turbines – why do they occur and how they are to prevent?
Entire results of the project "Birds of Prey and Windfarms": www.bergenhusen.nabu.de/frschung/greifvoegel/berichtevortraege/

White-tailed Eagle

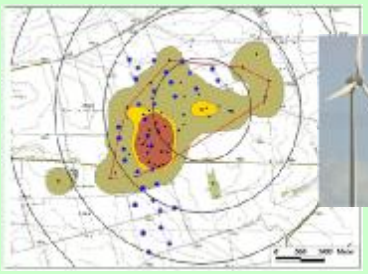
Locations and home-range (Kernel) of a female White-tailed Eagle. The core areas of activity (blue circles) are located around the nest and a lake in the centre of the area. Windmills– blue dots.

Home range: Here we show the locations and the calculated home range of a female White-tailed Eagle in the breeding season. The range area of 141 km² (95 % Fixed Kernel) included mainly agricultural landscape and a small lake in the centre, the most important foraging habitat and a core area of activity. Most of the flight movements occurred between the nest (second core area, see map) and the lake, but 42 of 4,630 locations were recorded in the vicinity of a wind farm in the southern part of the range. Adult birds obviously show no displacement reactions against wind farms. This female was located more often in the vicinity of wind turbines than expected from the utilisation distribution.

Travelling distances: The female regularly travelled between the nest and the lake 6 km away. Maximum distances exceeded 10 km. 50 % of the locations of this bird were tracked in a radius of 7.2 km around the nest.



Red Kite

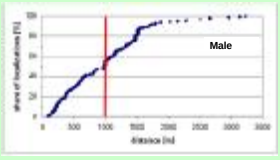


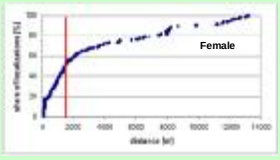
Home range of a male Red Kite during the breeding season. Distance of breeding site (red dot) to the next turbine: 440 m; size of 95 % MCP (red line): 4.1 km²; coloured areas: 95%/60%/50%-Kernels. Blue stars: wind turbines.

Home range: Home ranges differed remarkebly among the 11 tracked birds, ranging from 1.7 up to 74.4 km² during the breeding season and between 2.1 and 213.4 km² after the breeding season. The map above shows a home range and its overlap with wind farms of a male during the breeding season using Kernel estimators and the 95 % MCP. Red Kites show no measurable displacement reactions against windfarms and regularly hunt in the vicinity of wind turbines.

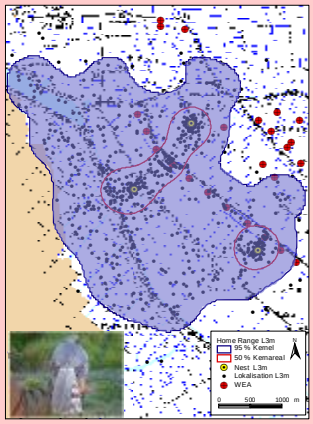
Travelling distances: Different home ranges resulted in different flight distances from the nests. The maximum distance from the nest of the male presented here was 3,228 m. 50 % of the locations of this bird were within a distance of 1,000 m from the nest.

The shown breeding female travelled distances up to 13 km, but 50 % of all locations were tracked in a radius of 1,500 m around the nest.





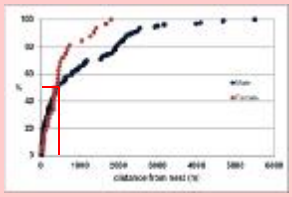
Montagu´s Harrier



Locations, home-range and core area (Kernel) of a polygynous male and its three females. The core areas of activity are located around the nests and in the vicinity of wind turbines (WEA).

Home range: Dependent on the breeding status we found Kernel-home ranges from 40 ha (female, almost exclusively provisioned by male) up to 1,200 ha (polygynous male with three females, see map). Important foraging areas are the coastal salt marshes and grassland. The centres of activity (core areas) were located around the nests (food delivery and feeding nestlings).
Wind farms were regularly included in the home ranges and are used as transfer areas and foraging habitat as well. Montagu's Harrier show no measurable displacement reactions against wind farms and are regularly hunt in the vicinity of wind turbines. The overlap of wind farm areas with home range of 11 adults ranged from 1 to 12 %. Males breeding in the vicinity of high quality foraging areas (salt marshes and wetlands) obviously showed no need to visit wind farm areas.

Travelling distances: The maximum distance from the nest was 5.5 km for the male and 2.0 km for the female. The main activity was concentrated around the nest site. 50 % of the locations of both birds were tracked within a radius of 300 m around the nest.



Conclusion

Home ranges of the three studied species are highly variable and dependent on sex, breeding status and individual preferences. Wind farms can be part of the home ranges and are used as transfer area and foraging habitat as well. The utilisation of windfarms is obviously dependent on the habitat structure of the home ranges. In less structured agricultural areas wind farms might be attractive and thus preferred, whereas the neighbourhood of high quality foraging habitats may prevent birds from flying into windfarm areas. Consequently, habitat management (e.g. harvesting and mowing management) can have a strong influence on the attractiveness of windfarms and the resulting collision risk. The entire report of these studies will be published in autumn 2011.

References

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