



**GPS-Satelliten-Telemetrie bei einem adulten Schwarzmilan
(*Milvus migrans*): Aufenthaltsraum während der Brutzeit, Zug und
Überwinterung**

*GPS satellite tracking of an adult Black Kite (Milvus migrans): home
range during the breeding season, migration and wintering*

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Summary

An adult male Black Kite was studied over a period of two years (June 2007 - June 2009) using GPS satellite telemetry. Over 4,000 reliable GPS fixes from this time-frame were evaluated.

Breeding successfully in 2008, the bird spent 4 ½ months (36.4 % of the year) in the breeding territory, 5 ½ months in winter quarters (46.2 % of the year) and about one month each on autumn and spring migration (8.5 % and 8.9 % of the year) respectively.

Its home range during the complete 2008 reproduction period with breeding success, calculated on the basis of 821 reliable GPS fixes, covered an area of 365 km² (MCP 100 %) or 60.9 km² (MCP 95 %). Using the Kernel method home ranges of 121.24 km² (95 % Kernel) or 11.79 km² (75 % Kernel) were calculated. In 2008 the bird was located at distances up to 20.7 km from its nest. The size of the home range differed greatly in the individual months. Foraging was conducted most frequently on a stretch of river some 10 km long (upper reaches of the River Havel in Brandenburg).

The time spent by the male foraging for food increased continually from 05.00 hrs daily, reaching its climax at about 13.00 hrs. Overall the bird was on the move for some 60 % of the time between 08.00 and 16.00 hrs to search for food.

In 2007, when breeding was unsuccessful, the bird extended its home range considerably in the nine day period before it left the breeding area on migration (up to 38 km from the nest site). The bird left the nest site 2 ½ weeks earlier than in 2008 when the brood was successful. Immediately after the loss of its offspring due to human disturbance, the male moved to the area of the nest which was occupied in the following year and which was 900 m away from the old eyrie. A month after the brood was lost the bird

left the breeding territory. The home range size in this unsuccessful year covered an area of 417 km² (MCP 95 %).

Departure on migration was hesitant in both years. On both occasions migration picked up speed only at the end of August when the bird was in the state of Thuringia to the south. In the period before this it diverged from its actual direct migration route, 'fuelling up' in areas with a rich food supply. In 2008 the bird spent exactly 5 months in Germany.

If the time spent resting in Central Germany after leaving the breeding territory is disregarded, the Black Kite covered the distance on autumn migration more rapidly (2007 234 km/day, 2008 256 km/day) than on return in spring (215 km/day in spring 2008 and 191 km/day in spring 2009). In this respect the bird flew at least as fast in both directions as somewhat larger species (Short-toed and Lesser Spotted Eagles). On 30 March the male covered the longest recorded daily flight distance of 663 km. It began its migration flight before sunrise. Its average speed between 08.00 and 14.00 hrs was 86 km/h. The highest recorded average flight speed in the course of a single hour was 89 km/h over Morocco.

The bird reached its wintering area, which both 2007 and 2008 encompassed a rather large part of West Africa, on 15 September in both years. It divided up its wintering into three zones (A, B and C) which it visited consecutively and which were appr. 1,075 and 780 km apart respectively. The size of these zones was 54,430 - 88,403 km² (MCP 95%, zone A), 39,752 - 48,188 km² (B) and 7,955 - 16,339 km² (C). The male seldom used the same night roost on two consecutive nights. On average the distance between consecutive night roosts was 31 - 42 km. In 2007/2008 the Black Kite covered a distance of at least 14,000 km within its wintering area. The large size and temporal consistency of the three wintering areas is particularly striking. It is assumed that prevailing climatic conditions were responsible for movement between the three areas.