On the Biology of the Honey Buzzard (*Pernis apivorus*) - Some results revealed by Satellite Telemetry

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Introduction

European Honey Buzzards are long distance migrants. Little is known about the migration and wintering patterns of German breeding birds. Other open questions include habitat use, home range size in summer and winter, flight height and speed etc.

Methods

In the time frame 2001 to 2011 we fitted 12 adult German Honey Buzzards (seven males and five females), primarily in Schleswig-Holstein, with solar powered satellite transmitters (PTTs), of various types and producers, weighing 18-22 g. 13 transmitters were used. In the last three years four males and two females were fitted with GPS transmitters. In 2010 and 2011 we used 3-D transmitters which, as well as GPS fixes, transmit data on flight height, speed and direction. A female was caught again after three years and fitted with a new transmitter. A male and another female were re-trapped after two years. In the case of the male the transmitter was not replaced as it was still in good working order. In the case of the female the transmitter was removed without being replaced by a new one.

Results

Signals were transmitted for up to three years. With the exception of the last six transmitters fitted with GPS location and solar arrays in three layers, data was transmitted almost only during migration. Outside the migration periods the birds remained in vegetation that was too dense to allow the earlier transmitters to be adequately recharged.

Migration

To date we were able to record up to six complete autumn and spring migration routes of individual birds in this on-going project. In the relevant literature there is no previous account of pre-nuptial migration of European Honey Buzzards fitted with satellite transmitters. It was possible to study both partners of a pair for two of the project years. They migrated separately and wintered far away from each other. All birds migrated to West and Central Africa.

Male No. 52033 wintered furthest south (2°22‘S/ 12°42‘E) in Congo (Brazzaville) (see Figs. 4 & 5). In autumn 2010 it covered a distance of 8,560 kms in 61 days, 140 kms/day on average. In spring 2011, performing a loop migration, passing through Sicily, it flew 7,526 kms in 29 days (259.5 km/day on average). The bird did not avoid crossing mountains. In autumn it spent one night of 10/11 September in the Pyrenees at an altitude of 1,725 m ASL. In Spring it crossed the Austrian Alps at about 2,000 m ASL. The attempt to cross the Adriatic Sea was abandoned after four hours (see Fig. 6).

The second longest migration route was taken by a male with transmitter No. 57029, that flew 7,612 km as far as Gabon in autumn. It covered on average 167 km daily. With the exception of male No. 52033, it is the only Honey Buzzard to date that has crossed the Equator.

Data on flight height and speed became available for the first time on autumn migration 2010 (for male No. 52033). It reached its highest flight altitude over the Sahara at 1,703 m ASL at a flight speed of 60 kph. The fastest flight speeds (72 und 76 kph) were also recorded here. Speeds of between 60 and 70 kph were recorded on seven occasions.

Two birds perished on migration while crossing the Sahara and Mediterranean respectively. Three more birds vanished in the wintering area and another two in the breeding region.

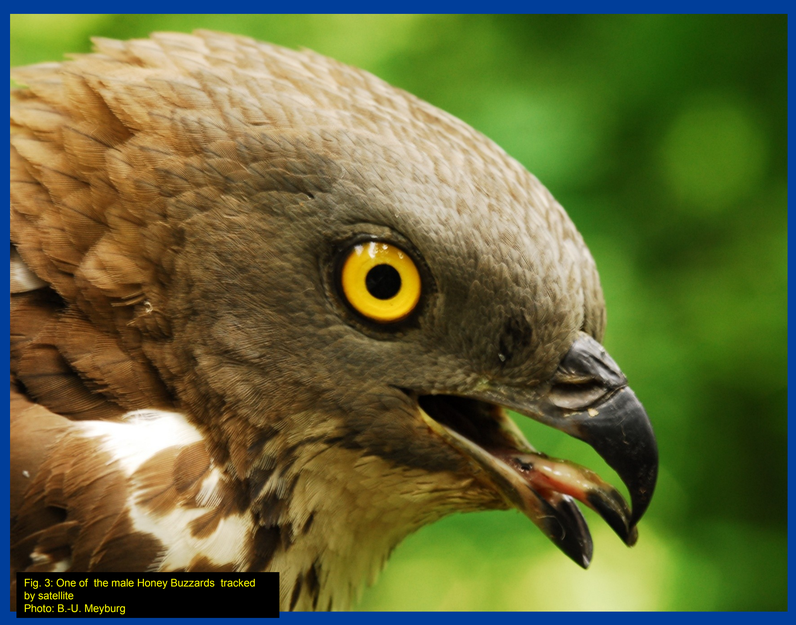

Fig. 3: One of the male Honey Buzzards tracked by satellite
Photo: B.-U. Meyburg

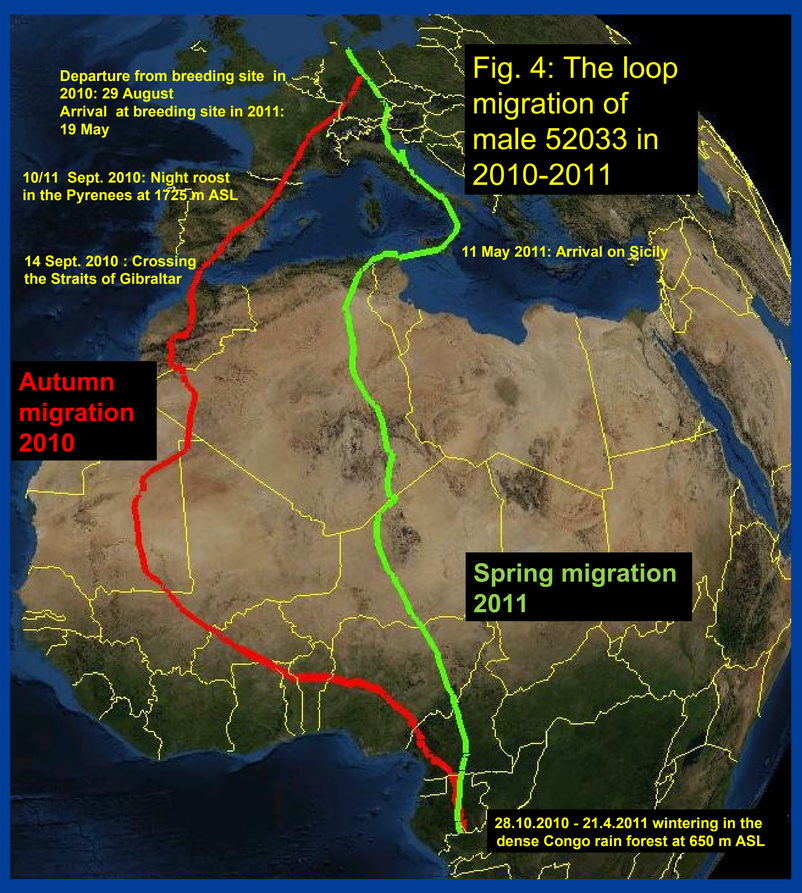

Fig. 4: The loop migration of male 52033 in 2010-2011

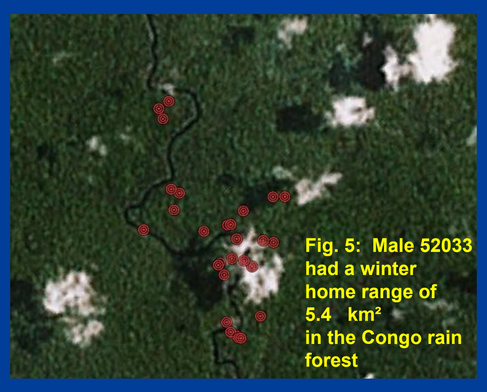

Fig. 5: Male 52033 had a winter home range of 5.4 km² in the Congo rain forest

Fig. 6: Male 52033 abandoned a crossing of the Adratic Sea on 15 May 2011

Wintering

In so far as the birds could be tracked as far as their wintering area, four Honey Buzzards spent the winter in Nigeria and one each in Gabon, Guinea, Cameroon, the Republic of the Congo and Liberia. Of the birds that were tracked more than once as far as their winter quarters, it was established that they returned to the same areas. The home range size in the wintering area was determined for the first time with the assistance of GPS telemetry (see Fig. 2 & 5).

Behaviour in the breeding area

The birds' main diet are the larvae of ground-dwelling wasps. They build their nests above all in woodland, but also in countryside peripheral structures (hedges, woodland fringes, waysides etc.), and to a lesser extent in open areas. The GPS fixes were accurate enough to enable the dug-out wasps' nest to be found in some cases. The home range size in the breeding area in northern Germany was established for five Males:

Male 95771: 17.4 km² (MCP 95%) (see Fig. 9) in 2009

Male 95770: 12.3 km² (MCP 95%) (see Fig. 10) in 2009

Male 52033: 14 km² (MCP 95%) in 2010

Male 52033: 6.32 km² (MCP 95%), 7.5 km² (Kernel 90%) in 2011

Male 68561: 6.4 km² (MCP 95%) in 2011

The core foraging area can change in the course of the breeding season. Male No. 95770 for instance daily sought out a piece of woodland 17 ha in size from 12 to 25 August 2009 but in the preceding period from 19 July to 11 August not at all. We found three exploited wasps' nests in this location.

The birds sometimes spent the night in their foraging areas in close proximity to the wasps‘ nests found (Fig. 10), which had probably not yet been completely exploited. The home ranges of neighbouring pairs overlap to a great extent and aerial territorial conflicts are common. They help patient observers to determine the distribution of home ranges.

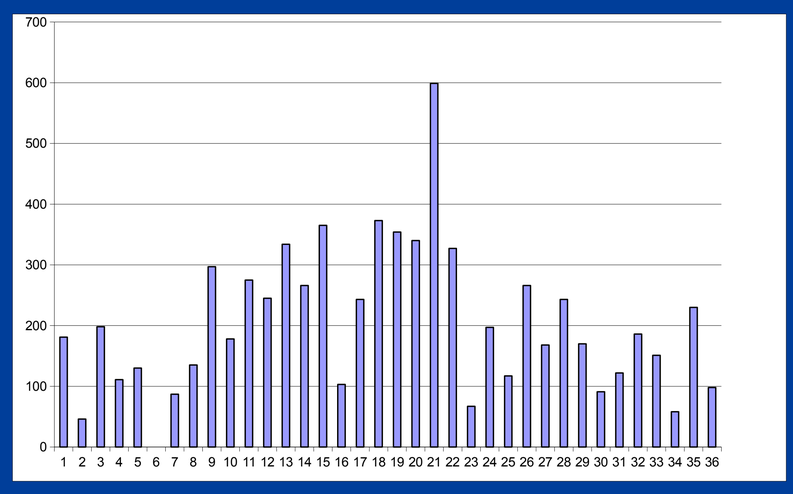

Fig. 7: The daily flight distances, up to a maximum of almost 600 km, covered by male 95771 on autumn migration 2009 to Cameroon.

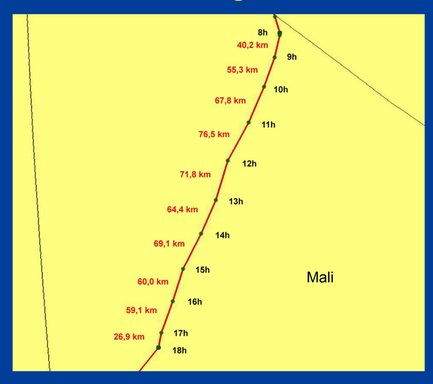

Fig. 8: On 18 September 2009 male 95771 covered a distance of 591 km while crossing the Sahara in Mali. The average flight speed for a full hour reached 76.5 kph.

Fig. 9: 643 GPS fixes of male 95771 in the breeding area in Schleswig-Holstein (northern Germany) in summer 2009. Home range size: 17.4 km² (MCP 95%), 8 km² (MCP 80%), maximum recorded distance from nest 5 km.

Fig. 10: Male 95770 on the outskirts of Plön (Schleswig-Holstein, northern Germany) provided 461 GPS fixes in the summer of 2009. Home range size 12.3 km² (MCP 95%), maximum recorded distance from nest 6.2 km. The map shows night roosts (red) and wasp nests found (yellow) as well as the boundary of the MCP at 100 %, 95 % and 80 %. Half of the night roosts were within a radius of of 250 m from the nest, the remainder further afield - as far as 3.4 km distant.

Fig.1: Most Honey Buzzards returned from Africa via the Straits of Gibraltar. In a few cases the Mediterranean was traversed at wider places.

The map shows the spring migration routes of male No. 41504 in the years

2004

2005

and

2006

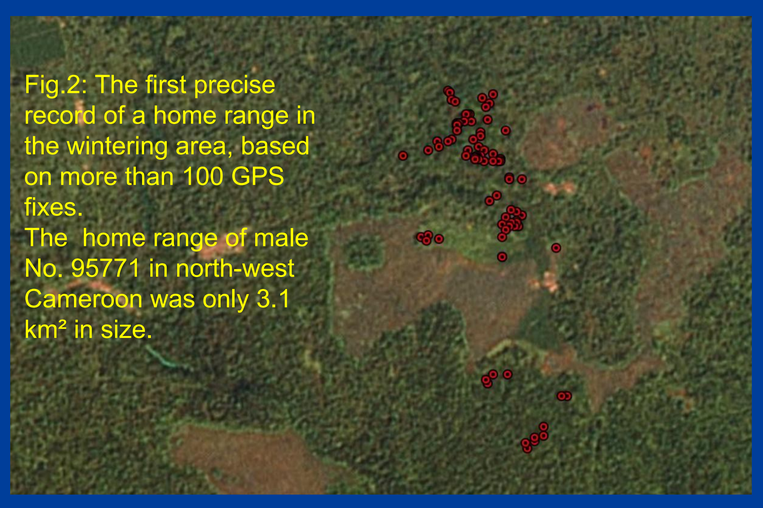

Fig.2: The first precise record of a home range in the wintering area, based on more than 100 GPS fixes.
The home range of male No. 95771 in north-west Cameroon was only 3.1 km² in size.

References

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