

# MIGRATION STRATEGIES OF 16 STEPPE EAGLES

## *Aquila nipalensis* TRACKED BY SATELLITE

Bernd-U. Meyburg & Christiane Meyburg

BUmeyburg@aol.com www.Raptor-Research.de

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### Introduction

In an earlier paper we published the migration routes of Steppe Eagles wintering in Arabia and Africa (Meyburg et al. 2003). Here we examine the differences in the migration schedules of adult and young Steppe Eagles.

### Method

Sixteen Steppe Eagles were trapped on migration and in their winter quarters and fitted with satellite transmitters, 15 of them in Saudi Arabia and one in South Africa. They were tracked for up more than a year and for a distance of up to 17,100 km. A total of 3,734 location fixes received were used in this study. One adult female was observed in its breeding area in Kazakhstan eight months after being tagged. Its nest contained two feathered young, thus providing reassuring evidence that the satellite transmitter was no hindrance to reproduction. In addition to observations of Steppe Eagles in Saudi Arabia, observations of the birds on passage and wintering were made in Tanzania, Namibia, South Africa, India and Israel.

### Results

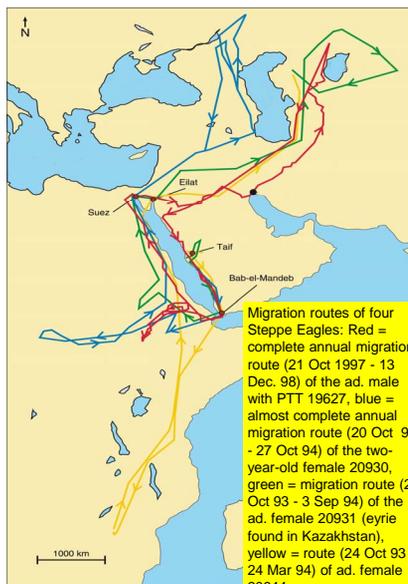
#### Duration of stay in wintering area

In spite of their greater speed, the eagles wintering furthest away from their breeding areas required more time for return migration than those wintering a comparatively short distance away. The adult wintering furthest away could only remain a little over two months in its winter quarters in Botswana, whilst those wintering in Arabia spent about twice as much time there. Adult birds wintering in Arabia, closer to their breeding areas, are clearly able to remain there for over four months, twice as long as those wintering further away in Africa. Immature Steppe Eagles spend even more time, some six months, in their winter quarters. For the following three birds the length of stay in the wintering area could be reasonably accurately assessed:

Adult female with PTT 20644: just over two months (18.11.93 - 29.1.94) in Botswana, South Africa and Zimbabwe.

Adult female 20931: 2 ½ months (29.11.93 - 18.2.94) in Ethiopia and the Sudan

Immature female 20930: six months (9.11.93 - 18.2.94) in Ethiopia, Chad and the Sudan.



#### Spring migration

All eagles that could be tracked back to their breeding areas spent the summer in Russia and Kazakhstan, just east of Lake Aral (63°16'E). Two adults possibly originated however from East Kazakhstan or even West Mongolia, as indicated by the direction of the first part of their homeward stretch until contact was lost.

#### Period and duration of migration

The immature eagles departed for the breeding areas considerably later than the adults. They left their wintering grounds shortly before, or after the adults had already reached their nesting territories, arriving there from three to six weeks later. The adults arrived at their nests between 26 March and 2 April, whereas the immature eagles arrived around mid-May.



Ad. female Steppe Eagle 20644 which wintered in Southern Africa

Photo: B.-U. Meyburg

For seven of the birds the duration of homeward migration varied between 28 and 54 days (mean 40 days). The longest time, almost 8 weeks (29.1 -24.3) was taken by adult female 20644 from Botswana, closely followed by adult male 22693 from South Africa taking 7 weeks (2.1 -24.1 and 4.3 -31.3). The latter interrupted its spring migration for around 5 ½ weeks in the Sudan, but this period is excluded from the above figure.

Immature 20930 and adult 20931 took five (12.4 -16.5) and six weeks (18.2. -1.4) respectively for homeward migration from their winter quarters in the Sudan. Those birds which wintered in Arabia completed the homeward journey much quicker. Among the adult birds, the shortest homeward time (5 ½ weeks, 20.2-1.4.) was taken by eagle 04170. Among all the birds tracked the fastest time of all, only four weeks, was taken by immature female 27993 (27.3 -23.4).

#### Distances covered

We calculated the minimum distances covered by the birds we tracked from their wintering grounds to their breeding areas. For the seven individuals whose spring migration was fully plotted, these ranged between 3,489 and 9,738 km.

#### Speed on migration

The average daily flight distances varied considerably for each individual bird and also between one bird and another. For those birds wintering in Southern Africa average distance was close to 200 km, and only slightly more than half of this figure for those wintering in Arabia. The longest average daily flight distance for all tracked individuals was around 355 km.



Ad. Steppe Eagle

Photo: B.-U. Meyburg

Eagle 20644 covered 5,882 km in 30 days on autumn migration from Saudi Arabia to Botswana, a daily average of 196 km. The average daily flight distance varied between 124 and 266 km. The eagle covered the complete 9,543 km spring migration route from Botswana to Kazakhstan in 54 days, thus averaging 177 km per day. The average daily flight distance varied considerably. Over two stretches, from the Nairobi area to the Red Sea, daily averages of 293 and 281 km respectively were covered. Along the coast up to the vicinity of Suez it covered a daily average distance of some 294 km. From this point on its speed decreased, picking up again from northern Saudi Arabia to Kazakhstan (238 km/day).



Fully feathered Steppe Eagle nestlings in their eyrie, Ural mountains, 19 July 1997.

Photo: B.-U. Meyburg

Eagle 22693 completed the 9,738 km stretch from South Africa to Kazakhstan in 50 days (average 195 km/day). This bird reached the highest recorded speed on migration (274 km/day) over a 1,438 km stretch in Tanzania and Kenya, as well as a further stretch along the Caspian Sea (247.4 km/day).

#### Times of arrival in summer quarters

There was a difference of over 1 ½ months between the arrival of adults and of immature birds in the breeding areas. The adults arrived between 26 March and 2 April, whereas the immature eagles arrived only in mid-May (04169 on 17 and 20930 on 18 May). Only 27995 arrived earlier on 23 April.

### Discussion

Comparison of the migratory behaviour of Steppe Eagles wintering in Southern Africa with that of Lesser Spotted Eagles (*Aquila pomarina*) tracked by us, shows a close correlation in the duration of migration over roughly similar distances. One adult Lesser Spotted Eagle from Germany, tracked throughout its entire spring and autumn migration to Zambia, where it wintered some 9,000 km from its breeding area, covered this distance in 7 ½ weeks on both occasions (Meyburg et al. 1995). This bird, however, spent nearly twice as long (28.10 -26.2) in its winter quarters as adult Steppe Eagle 20644, which wintered in Botswana. This is understandable, given the larger species' longer breeding season, and the consequent longer period of time necessarily spent in the nest territory.

Similarities to the Lesser Spotted Eagle's strategies on migration (Meyburg et al. 2008) can also be noted in immature birds. Both species remain considerably longer in winter quarters than breeding adults, migrate more slowly during return migration and arrive much later in the breeding area in spring. It is not clear whether one-year-old Steppe Eagle birds return in summer to the breeding area or remain in Africa. Further telemetry studies are needed to answer this and other questions.



Young Steppe Eagle

Photo: B.-U. Meyburg

#### References

- Meyburg, B.-U., Scheller, W. & Meyburg, C. 1995. Migration and wintering of the Lesser Spotted Eagle (*Aquila pomarina*): a study by means of satellite telemetry. J. Ornithol. 136: 401-422.
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