

# Satellite tracking of Eastern Imperial Eagles *Aquila heliaca*

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## Introduction

The Eastern Imperial Eagle is a rare species. To our knowledge the migration of adult birds has never been studied by satellite telemetry.

## Method

Four adult males, two adult females and two immature Imperial Eagles were trapped near Taif in Saudi Arabia while wintering using the method described by Ostrowski et al. (2001). They were fitted with satellite transmitters (PTTs) from which we obtained only Doppler fixes in all but one case. We fitted a GPS tag to the last bird trapped. Three of these eagles were trapped up to three times. For more general information on satellite tracking of raptors see Meyburg & Fuller (2007).

## Results

Six eagles were tracked to their summer home ranges (see map) and in most cases back again to Arabia. Four birds migrated to Russia in spring, one to Kazakhstan and one to China. The distances between the summer home ranges and the wintering areas ranged between 3,900 and 5,000 km. At least two birds were shot on the Arabian Peninsula. A four-year-old female with PTT 23671, still in immature plumage, was much heavier than any previously known individual of this species. Its home range in the summer was in Xinjiang Province in north-western China close to the borders with Mongolia and Kazakhstan. It had the longest migration route of all the eagles tracked, over 5,000 km, and in the most east-westerly direction. After its second tracked wintering in Arabia it again took the same route towards China, but contact was lost shortly before it was presumed to have arrived there for the second time. One male, caught in March, was found breeding in Bashkiriya (Russia) at 55°57' N west of the Ural Mountains at the northernmost perimeter of the known breeding range in European Russia. The bird was caught a second time in the wintering area in November wearing the transmitter which was still functioning. In January two years later it was caught for the third time, but the PTT had been lost or removed.



Adult male Imperial Eagle 26047 from Kazakhstan  
Photo: B.-U. Meyburg



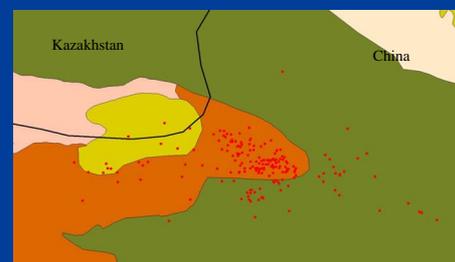
The spring migration routes of six Imperial Eagles wintering in Arabia



Young Imperial Eagle Photo: B.-U. Meyburg



The four-year-old female eagle with PTT 23671 took 3 1/2 weeks for its 5,000 km spring migration to China in 1995 and one month for the autumn migration to western Arabia. It spent six months at its summer site in Xinjiang (China) and 4 1/2 months in the wintering area.



Summer home range of 23671 in China, 6 April – 9 Sept. 1995.  
Home range size: 1,360 km<sup>2</sup> (80% MCP) Habitat used: Mainly Emin valley steppe, Junggar Basin semi-desert to a much lesser extent.

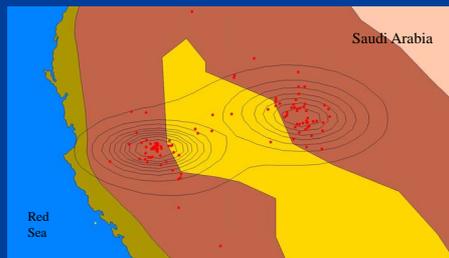
**Ad. female 23883:** Trapped three times: 6.2.98, 23.1.00 and 31.1.01. Tracking period: 3.2.01-8.9.02. Nest found (55°54' N/ 54°25' E) 163 km NW of Ufa (Russia). Distance between summer and winter ranges 4,120 km.

**Ad. male 21820:** Was already in full adult plumage when trapped for the first time on 20.12.92. Tracking period 8.3-28.12.1994. The bird did not breed in the summer of 1994, but ranged over approx. 2,000 km<sup>2</sup> in Russia some 250 km WNW of Ufa.

**Ad. male 39587:** This bird was tracked with a GPS enhanced transmitter from 23.11.2003 until 17.2.2004 which made it possible to study its wintering behaviour in great detail. Its home range was 5,900 km<sup>2</sup> in area with a diameter of up to 127 km. It was most often on the wing between 15.00 and 17.00 hrs (local time). It removed the GPS tag, which was found on the ground, while still in the wintering area.



Typical habitat in the wintering area in Saudi Arabia with eagle 39587



Winter home range of eagle 23671 in Arabia. The habitat used was mainly the Southwestern Arabian foothills savannah (brown). Montane woodlands (yellow) were used to a much lesser extent.

**Ad. male 26047:** Tracking period 19.10.95-6.10.96. Distance between summer and winter ranges 3,900 km. Apparently breeding in Kazakhstan (47°36' N/ 67°55' E). Shot in Kuwait one month after last fix.

## Information on some of the eagles tracked

**Ad. male 21819:** Trapped 3 times, tracking period 4.3.94 - 17.8.95, without PTT when trapped for the last time on 31.1.96. Its nest was found in Bashkiriya (Russia, 55°57' N/ 58°2' E) with two nestlings. Distance between summer and winter ranges 4,200 km.

**Four-year-old female 23671:** Weight 4,800 g (!), tracking period 9.3.95-17.3.96. Distance between summer and winter ranges over 5,000 km (see map, second return migration to area of summer range not shown).

## References

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Ostrowski, S., E. Fromont & B.-U. Meyburg 2001. A capture technique for wintering and migrating Steppe Eagles in south-western Saudi Arabia. Wildlife Society Bulletin 29:265-268.