

## THE FIRST RESULTS OF GPS TRACKING OF THE SHORT-TOED EAGLE *Circaetus gallicus* IN CROATIA

*Prvi rezultati telemetrijskog praćenja zmijara *Circaetus gallicus* u Hrvatskoj*

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The short-toed Eagle *Circaetus gallicus* is a summer resident in Europe, wintering in northern tropics of Africa south of the Sahara desert (BWPi 2006). There are exceptional wintering reports from South Europe, among them one from Croatia when an adult female was shot in Danilo Biranj on 13<sup>th</sup> January 2014 (<http://tris.com.hr/>). The Croatian breeding population is estimated at 110-140 breeding pairs distributed along the coastal area of the country, from Istria to Konavle, including islands and mountains by the coast (TUTIŠ *et al.* 2013).

Telemetry research of the Short-toed Eagle migration has shown that the majority of migrating birds use two main flyways, over the pass of Gibraltar and Suez Canal, avoiding the flight over open waters in order to conserve energy and decrease the risk of mortality (AGOSTINI *et al.* 2004). Due to the lack of data on migration movements, the flyway of Croatian population has remained unknown.

In order to gain preliminary data on the migration route taken by the Short-toed Eagle population from Croatia, we tagged a nestling from the Telašćica Nature Park with a 19 g Ecotone solar/GPS/GSM tracking unit. Tagging was performed on 27<sup>th</sup> July 2017, when the bird, named Paško, was fully fledged, only a few days before leaving the nest. The tracking unit was programmed to record one GPS position every two hours. For the next month and a half, Paško moved within a radius of 1.9 km from the nest before he started his first journey to the wintering grounds on 18<sup>th</sup> September 2017. The tracking unit was then reprogrammed to take two GPS positions every hour, in order to get the most positions during migration. On the first day, Paško flew 225 km to Vrgorac, where he remained for the next two days. On 21<sup>st</sup> September, he was already in Albania, from where he flew with a steady pace of approximately 275 km per day through Greece, Turkey, Syria, Lebanon, Jordan, Egypt and Chad, until on 12<sup>th</sup> October, it reached its wintering position, the southern part of Sudan (Table 1, Fig. 1).

Its autumn migration from South Croatia to South Sudan, over a stretch of 6054 km, lasted 25 days. Although interesting, this preliminary data come from

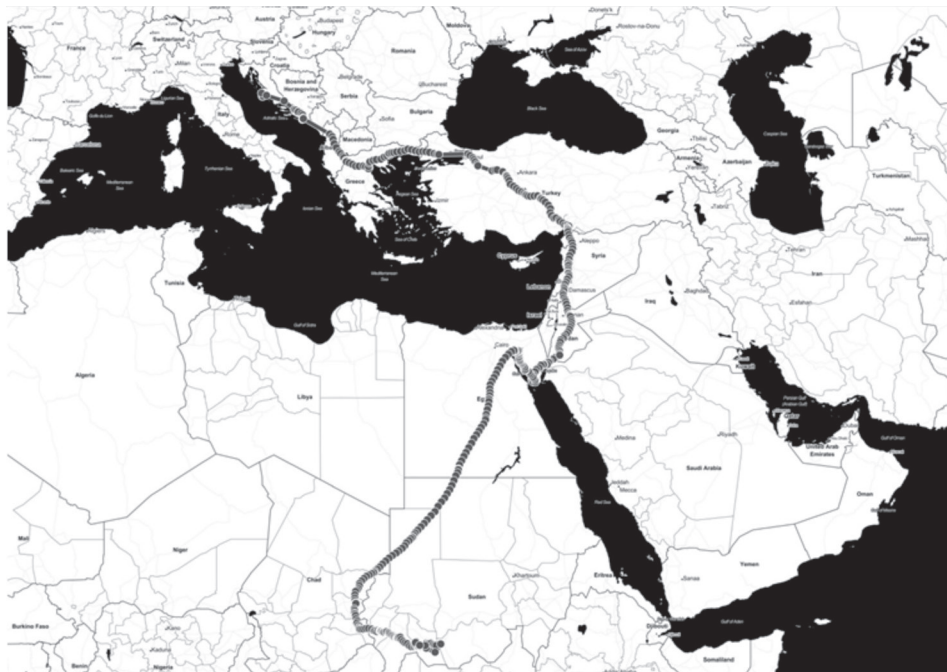
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only one individual, and may therefore not be representative for the behaviour of the regional population (YANEZ *et al.* 2014). Hence, further research is needed in order to determine its migration patterns and movement ecology.

**Table 1.** Positions and distances for each date during the 25 day migration period of the Short-toed Eagle.

**Tablica 1.** Svakodnevni položaji i udaljenosti tijekom 25-dnevnog razdoblja selidbe zmijara.

Date	Starting position	Final position	Distance/ km
18.9.2017	Dugi otok	N from Vrgorac	225.36
19.9.2017	N from Vrgorac	N from Vrgorac	4.62
20.9.2017	N from Vrgorac	N from Mravinjac	88.31
21.9.2017	N from Mravinjac	E from Borsh, Albania	362.27
22.9.2017	E from Borsh, Albania	N from Rodovilos, Greece	339.34
23.9.2017	N from Rodovilos, Greece	E from Yukarı Kılıçlı Mahallesi, Turkey	301.33
24.9.2017	E from Yukarı Kılıçlı Mahallesi, Turkey	SE from Osmaneli, Turkey	261.95
25.9.2017	SE from Osmaneli, Turkey	SW from Sairoba, Turkey	182.81
26.9.2017	SW od Sairoba, Turkey	E from Kozluc, Turkey	269.15
27.9.2017	E from Kozluc, Turkey	SE from Kuyuluka, Turkey	286.17
28.9.2017	SE od Kuyuluka, Turkey	N from Braise, Lebanon	286.86
29.9.2017	N od Braise, Lebanon	E from Amman, Jordan	294.94
30.9.2017	E od Ammana, Jordan	E from Al Tavit, Jordan	289.26
1.10.2017	E od Al Tavit, Jordan	E from Al Tor, Egypt	268.83
2.10.2017	E od Al Tor, Egypt	SE from Abu Rudays, Egypt	163.62
3.10.2017	SE od Abu Rudays, Egypt	E from Uyun Musa, Egypt	161.90
4.10.2017	E od Uyun Musa, Egypt	SW from Asyut, Egypt	421.19
5.10.2017	SW from Asyut, Egypt	NW from Wadi Halfa, Egypt	545.53
6.10.2017	NW from Wadi Halfa, Egypt	Northen Sudan	598.31
7.10.2017	Northen Sudan	NW from Oure Cassoni, Chad	387.91
8.10.2017	NW from Oure Cassoni, Chad	I from Gaga, Chad	300.20
9.10.2017	I from Gaga, Chad	W from Goumbatou	208.43
10.10.2017	W from Goumbatou	E from For Baranga, Sudan	177.46
11.10.2017	E from For Baranga, Sudan	SW from Al Marwahah, Sudan	139.19
12.10.2017	SW from Al Marwahah, Sudan	Al Akhdar, Sudan	196.05



**Figure 1.** Track along the migration flyway of the Short-toed Eagle.

**Slika 1.** Migratorni put zmijara

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## SAŽETAK

Zmijar *Circaetus gallicus* je gnjezdarica selica Europe koja zimuje u sjevernim tropima Afrike, južno od Sahare. Većina jedinki na migraciji bira glavne selidbene puteve, preko Gibraltara i Sueskog kanala. Kako bi saznali kojim se selidbenim putem služe ptice hrvatske populacije, obilježili smo mladog zmijara GPS uređajem 27.7.2017. u Parku prirode Telaščica. Zmijar je na selidbu krenuo 18.9.2017. i u idućih 25 dana je preletio 6054 kilometara, birajući istočni selidbeni put preko Grčke, Turske, Sirije, Libanona, Jordana, Egipta i Čada, sve do Sudana gdje je zimovao.