

## The first documented record of a GPS-tagged Pallid Harrier (*Circus macrourus*) in Slovakia

*Prvý dokumentovaný záznam kane stepnej (Circus macrourus) s GPS lokátorom na Slovensku*

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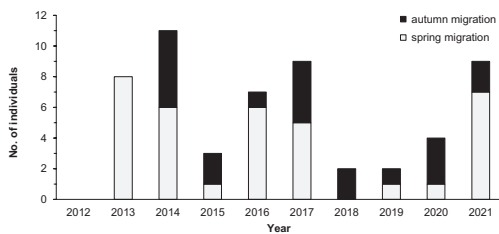
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**Abstract.** Here we present the first documented occurrence of a GPS-tagged Pallid Harrier (*Circus macrourus*) in Slovakia, along with the summary of observations in this country in the last ten years (2012–2021), and underline the importance of GPS-GSM tagging in birds. The individual, a second calendar-year male, tagged with a solar GPS-GSM transmitter as pullus in the nest near Dobřichov, Czech Republic in 2020, migrated across the Slovak territory on May 8, 2021 and between September 2, and September 6, 2021. In the first case, it migrated from Austria across the westernmost part of Slovakia, reaching the Czech Republic in less than two hours. The individual occurred in Slovakia again during autumn migration on September 2, when it crossed the Slovak-Ukrainian border in Sobrance District, flew over the Východoslovenská nížina Lowland and on September 3, it continued along the Slovak-Hungarian border, mostly in Hungary. The bird re-entered Slovakia on September 4 (Levice District), moving westwards across southwestern Slovakia. It roosted in Šala District (the night of September 4–5) and in M.R. Štefánik Airport (Vrakuňa, Bratislava II District, the night of September 5–6). The observation and documentation of the bird took place in the area of M.R. Štefánik Airport on the morning of September 6, and represents one of only two records of this scarce migrant during the autumn migration in 2021 in Slovakia. The individual crossed the Slovak-Austrian border shortly after the observation and progressed with the migration.

**Key words:** Pallid Harrier, *Circus macrourus*, GPS-GSM tagging, migration, satellite tracking

Pallid Harrier (*Circus macrourus* Gmelin, 1770) is a medium-sized transcontinental migratory bird of prey (family Accipitridae). Its breeding range extends from eastern Scandinavia eastwards with the core population in Central Asian steppes, reaching as far as China (BirdLife International 2022). The population in the steppes of Eastern Europe (Romania, Moldova, Ukraine, Belarus) has shrunk dramatically, albeit the population in Finland is well-established and even increasing (Galushin et al. 2003, Henry 2018, Terraube 2020). The European population is

estimated at 1,000–2,200 pairs and the Pallid Harrier is listed as Near Threatened by BirdLife International (2022). However, the species seems to change its breeding and migration strategies, as the occurrence of migrating birds in Western Europe has become much more regular since 2000 (Ollé et al. 2015, Henry 2018). Furthermore, occasional successful breedings of pure Pallid Harrier pairs in Western and Central Europe were recorded in the recent decade - the Netherlands in 2017 and 2019 (Koks & Vellinga 2017, Ławicki & van den Berg 2019), Spain in 2019 (Mougeot & Tazo 2019),



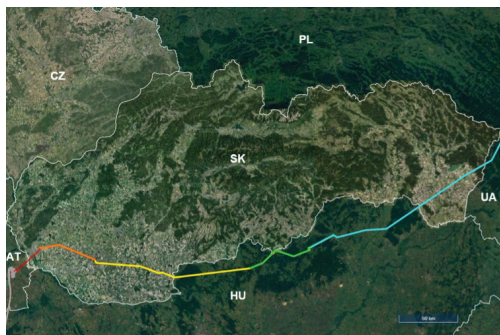
**Fig. 1.** The summary of Pallid Harrier individuals observed in Slovakia in the years 2012 to 2021 with separated spring and autumn migration, reviewed and accepted by the Rarities Committee of the Slovak Ornithological Society/BirdLife Slovakia ( $n = 56$ ).

**Obr. 1.** Súhrn počtu pozorovaných jedincov kane stepnej na Slovensku v rokoch 2012 až 2021 s rozlíšením jarnej a jesennej migrácie, posudzovaných a schválených Faunistickou komisiou Slovenskej ornitologickej spoločnosti/BirdLife Slovensko ( $n = 56$ ).

the Czech Republic (Studecký 2021) and France in 2020 (Ławicki & van den Berg 2020).

Pallid Harriers migrate across Europe and Asia to the wintering grounds on the Indian subcontinent and a wide belt in the Sahel region with an indication of an establishment of new wintering grounds on the Iberian Peninsula (Galushin et al. 2003, Ollé et al. 2015). The important Western Palearctic migration bottlenecks include the Strait of Messina and Israel (Spaar & Bruderer 1997, Corso & Cardelli 2004).

In Slovakia, as in other Central European countries, this species is considered rare, but annual migrant (Albegger & Brader 2018, Kvetko et al. 2020, Vavřík et al. 2021), being



**Fig. 2.** The westward migration route of the GPS-tagged Pallid Harrier across Slovakia on September 2–6, 2021, each day coloured differently (Adapted from app.anitra.cz).

**Obr. 2.** Migračná trasa kane stepnej s GPS lokátorom cez Slovensko smerom na západ počas 2. až 6. septembra 2021, každý deň je znázornený inou farbou (Zdroj: app.anitra.cz, upravené).

treated as scarce partially due to difficulties with identification in the field; regarding mainly females and immature birds (Danko 2002). Danko (2002) states that from 1980 to 1999, only four observations of the species (all males, one adult in spring and one juvenile and two adults in autumn) occurred in Slovakia, three in the east and one in the west of the country. On the contrary, according to the available data sources (aves.vtaky.sk, birding.sk, ebird.org, the Rarities Committee of the Slovak Ornithological Society/BirdLife Slovakia), 82 Pallid Harriers were observed in Slovakia in the last ten years (2012–2021, omitting the repeated observations of the same individuals), of which 56 were reviewed and approved by the Rarities Committee (Fig. 1). The majority of observations occurred during spring migration (March–May) with 49 (59.8%) observed individuals, most of them in April (40 birds, 48.8%). As for the autumn migration (August–October), 32 additional observations (39%) took place with a peak in September (19 individuals, 23.2%). One adult male was observed in the middle of winter (January 17, 2015).

Regarding age groups, 11 birds (13.4%) were identified as juveniles, 18 (22%) as subadults, 39 birds (47.6%) were identified as adults, ten individuals (12.2%) could be aged as subadults or adults and the age of four birds (4.9%) was unspecified. The majority of the Pallid Harriers observed between 2012 and 2021 were sexed as males (56 individuals, 68.3%), and only nine birds (11%) were sexed as females. In 17 cases (20.7%), the observers were unable to determine the sex of the birds (predominantly juveniles).

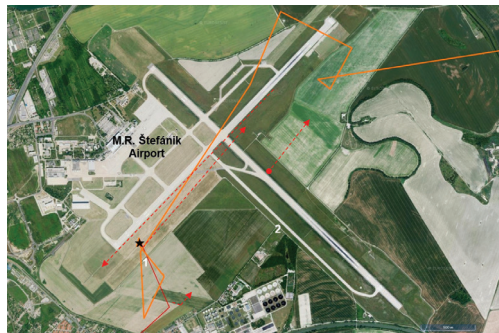
In Slovakia, Pallid Harriers were observed migrating mainly across lowlands and basins in the south of the country (Danko 2002). The observations from the last ten years show that most birds were recorded in the predominantly lowland regions of southeast (27 individuals, 33%) and southwest (23, 28%) of the country, and in the south of Central Slovakia (19, 23.2%). The rest of the country with mostly hilly landscape accounted jointly for just 13 records (15.9%). This might be attributable to the fact that the individuals, after migrating low above

the terrain, are easier to register in lowlands than when they are crossing the hills. The majority of the Pallid Harriers were observed only migrating across the Slovak territory, while some individuals scarcely stayed at one site for more than one day.

The use of satellite tracking of Pallid Harriers was so far limited to a handful of projects in Central Asia, India, and Finland (Terraube et al. 2012, LUOMUS 2022). On May 5, 2021 and later on September 2–6, 2021, a Pallid Harrier fitted with a GPS-GSM transmitter was registered migrating across Slovakia. This represents the first documented case of a GPS-tagged Pallid Harrier in this country. The observed individual—a second calendar-year male—is the youngest of three tagged chicks from the first successful breeding of Pallid Harrier in the Czech Republic near the village of Dobřichov in 2020 (for further details see Studecký 2021). The model of the GPS-GSM transmitter used was a solar-powered ANITRA BACKPACK S with a fix rate of one fix per hour.

The GPS-GSM transmitter allowed us to track the migration route of the bird (Fig. 2) and subsequently observe and photograph it (Figs. 3, 4). The first time this tagged bird flew across Slovakia was on May 8, 2021, when it crossed the Slovak-Austrian border near Devín (Bratislava IV District) some time after 13:31 and was fixed south of Láb (Malacky District) at 14:31. It left the country precisely at 15:31, after crossing the Morava River to the Czech Republic (N 48.673083, E 16.97407), flying more than 57 kilometres northwards across western Slovakia in less than two hours with no visual observation nor documentation of its occurrence.

However, during autumn migration, according to the data from the transmitter, the male migrating from Belarus across Poland and Ukraine crossed the Slovak-Ukrainian border on September 2, 2021 in the east of Slovakia in the Carpathians. It held a SW course and flew across southeastern Slovakia in approx. 3–4 hours and left to Hungary shortly after noon. The following day, it migrated mostly near the Slovak-Hungarian border (Fig. 2).



**Fig. 3.** The movement of the bird in the area of M.R. Štefánik Airport (Bratislava, Slovakia) on the morning of September 6, 2021 (Adapted from app.anitra.cz). The orange line shows the GPS-recorded track (1 fix per h); red arrows show the directly observed movements of the individual from observation points (white 1 & 2); the black star indicates the night roost of the bird.

**Obr. 3.** Pohyb vtáka v oblasti letiska M. R. Štefánika (Bratislava, Slovensko) počas rána 6. septembra 2021 (Zdroj: app.anitra.cz, upravené). Oranžová čiara predstavuje trasu zaznamenanú GPS (1 záznam pozície za hodinu); červené šípky ukazujú pohyb jedinca zaznamenaný z pozorovacích bodov (biela 1 a 2); čierna hviezda predstavuje nocovisko jedinca.

The tagged Pallid Harrier reached the Slovak territory again on September 4, 2021 in the Podunajská nížina Lowland in southwestern Slovakia, where it spent the night (September 4–5, N 48.059452, E 17.878949). On September 5 at 12:11, the bird reached the area of M.R. Štefánik Airport, located on the eastern edge of Bratislava, and spent the whole afternoon there. The site is known for being an attractive hunting spot for raptors because of the lack of pesticide



**Fig. 4.** The 2CY male Pallid Harrier fitted with a GPS-GSM transmitter; field south of the M.R. Štefánik Airport, September 6, 2021, 07:57 CEST (Photo by L. Sekelský).

**Obr. 4.** Samec kane stepnej v druhom kalendárnom roku s GPS-GSM lokátorom; pole južne od Letiska M. R. Štefánika, 6. september 2021, 07:57 SELČ (Foto: L. Sekelský).

usage, low grass cover, and stable population of European Sousek (*Spermophilus citellus*) and other rodents (Baláž & Ambros 2007, Baláž et al. 2008).

On the morning of September 6, 2021, the individual was tracked down using the data from the ANITRA transmitter and the bird's behaviour was observed and documented for the next two hours after leaving the roost in short grass at 06:10 (Figs. 3, 4). Most of the time, the bird was flying or resting near the runway or in the fields in the vicinity of the airport. It was mobbed four times by a Common Kestrel (*Falco tinnunculus*).

After the observation, according to the transmitter data, the bird flew directly over Bratislava-Petržalka and it was located in the east of Neudorf bei Parndorf (Neusiedler am See District) in eastern Austria before 09:00 AM, c. 25 km away from the last fix on the Slovak territory. Subsequently, the bird stayed in the lowland area of the Parndorfer Platte in Austria for a week and moved southwards on September 12. During its flight across Slovakia, it reached an average speed of 25 kilometres per hour and the average GPS height was 398 metres asl). Without the data from the transmitter available, the individual would have probably migrated across the Slovak territory unnoticed. Interestingly enough, the bird flew across all lowland regions of eastern, southern and southwestern Slovakia, which we identified as important migration routes of Pallid Harrier in this country.

#### Acknowledgements

The authors would like to thank D. Rak from Anitra for providing us with the access to the data from the GPS-GSM transmitter, L. Sekelský for providing the photograph of the individual and M. Mojžiš (Chairman) and R. Kvetko, the members of the Rarities Committee of the Slovak Ornithological Society/BirdLife Slovakia, for the information about the occurrence of the species in Slovakia. The authors are grateful to L. Rubáčová for her invaluable comments which led to a significant improvement of this paper, and to M. Lawson and M.K. Lawson for their corrections of the manuscript. Finally, the authors thank M. Čapek and R. Slobodník for their careful and insightful reviews of this paper.

## Súhrn

Kaňa stepná je u nás zriedkavým, avšak každoročne sa vyskytujúcim migrantom. So zmenami hniezdisk a migračných trás v 21. storočí dochádza aj na našom území k zvyšovaniu počtu záznamov tohto druhu. Údaj, publikovaný v tomto článku, predstavuje prvý zdokumentovaný záznam jedinca tohto druhu so satelitnou vysielacťou na území Slovenska, a súčasne ide o jeden z dvoch záznamov výskytu kane stepnej počas jesennej migrácie v roku 2021. Išlo o samca v druhom kalendárnom roku života, ktorý sa vyľahol pri obci Dobřichov v Středočeskom kraji v roku 2020. Tento jedinec migroval územím Slovenska najprv krátko (menej ako dve hodiny) dňa 8. mája 2021 cez Záhorie, a potom počas jesennej migrácie medzi 2. až 6. septembrom 2021 severovýchodo-juhozápadným smerom, pričom väčšinu času strávil na slovensko-maďarskom pohraničí. Samotné pozorovanie a dokumentácia prebehli 6. septembra 2021 pri bratislavskom Letisku M. R. Štefánika, kde jedinec v noci z 5. na 6. septembra prenočoval a ráno medzi 06:10 až 08:00 bol viackrát pozorovaný a fotograficky zdokumentovaný pri prelietaní nad nízkym porastom letiska a na poliach v jeho okolí. Počas svojho preletu nad Slovenskom letel priemernou rýchlosťou 25 km/h vo výške 398 m n. m. Tento článok opisuje časť migračnej trasy daného jedinca kane stepnej územím Slovenska, poukazuje na význam GPS-GSM lokátorov pre sledovanie pohybu a správania vtákov a na význam letísk ako potravného refúgia pre dravé vtáky. Súčasnne prezentuje aj súhrn pozorovaní kane stepnej na Slovensku medzi rokmi 2012 až 2021.

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Došlo: 2.11.2022

Prijaté: 14.12.2022

Online: 16.1.2023