

# WINTERING BIRDS OF PREY MONITORING PROGRAMME IN ROMANIA



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## Introduction

In 2006 the Milvus Group Association initiated a long term citizen science programme with the aim of monitoring wintering populations of birds of prey in Romania. Beside trend information, the programme also offers valuable insight on the geographic and temporal distribution and relative abundance of birds of prey wintering in Romania.

## Material and methods

### Study area

The study area includes the whole country, except the Carpathian Range, where the density of birds of prey in winter is very low. Observations are performed on routes of at least 5 km length (mean: 9.15±2.56SD km). The routes are non-randomly selected mostly in open habitats where significant number of birds of prey are expected to occur. Until 2018 a total of 157 routes were completed at least once, but only 38 regularly. The distribution of routes is uneven across the country, large areas in Southern and Eastern Romania being uncovered (Figure 1).

### Data collection

Observers are required to perform observations annually, twice per winter, in early December and middle of February. The routes are walked in slow pace between 9:00-16:00. All birds of prey are counted and their distance to the route is estimated.

### Data analysis

Data analysis was performed in R using the data collected between December 2006 and February 2018. For between region analysis all routes were included, that had at least one observation in both sessions and had at least one repetition. Between sessions analysis includes those instances, where observations were performed in both sessions of a winter. The uneven distribution of routes and incomplete time series in some regions permitted trend analysis only separately for each region. Trend analysis was performed separately also for the two sessions. All routes were included in the analysis, that had at least one repeated observation in the respective session.

## Distribution of the routes selected for monitoring

Number of data collection events/route

- 1 data collection
- 2-4 data collections
- 5+ data collections
- ▨ Study area and main regions mentioned in the text

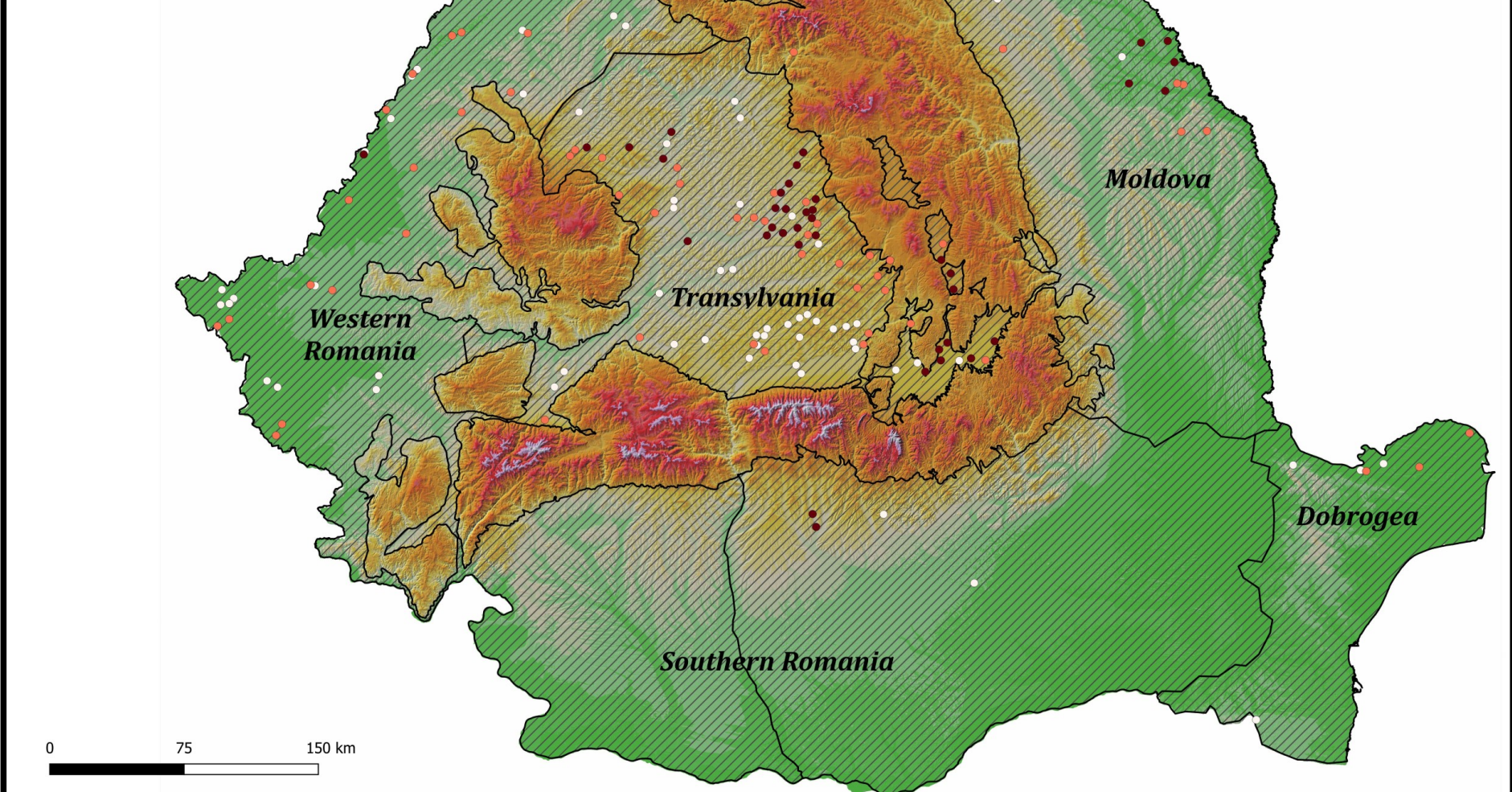


Figure 1. The study area with the distribution of and number of data collection events on the selected routes.

## Birds of prey abundance in the different regions of Romania

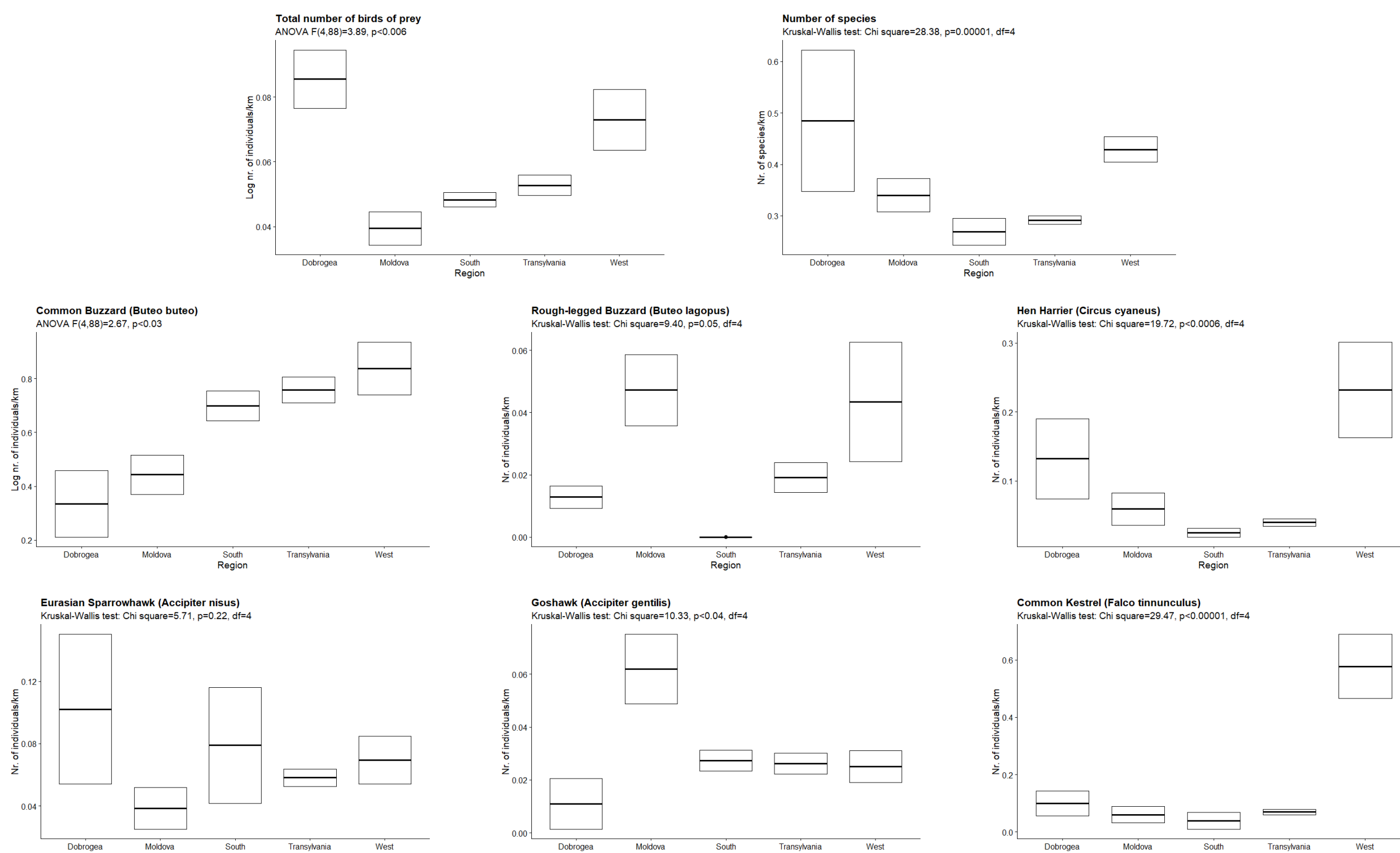


Figure 2. Average number of species, number of individuals for all raptor species together and number of individuals of the 6 most abundant species of birds of prey per km route in 5 regions of Romania. Note, that only Transylvania and Western Romania can be considered representative. From Southern Romania there were only 2 routes included from the Subcarpathian hill region, from Dobrogea 3 routes from the Danube Delta and from Moldova all but one routes are located in Iași County.

- The Danube Delta, beside the species shown above, hosts the only regular wintering population of Greater Spotted Eagles (*Aquila clanga*), is the only important wintering site for Marsh Harriers (*Circus aeruginosus*) and is the most important wintering site for White-tailed Eagles (*Haliaeetus albicilla*) in Romania.
- The Western Plains hosts regular wintering (resident) populations of two endangered species: the Eastern Imperial Eagle (*Aquila heliaca*) and the Saker Falcon (*Falco cherrug*).
- Western Romania and the Danube Delta are the two most important regions for wintering birds of prey in general, but other regions also play important role in the case of some species. Western Romania is a relatively sheltered region from unfavorable climate events and winters are generally mild. Winters in the Danube Delta, although quite exposed to arctic climate events, are also relatively mild due to the vicinity of the Black Sea. Mild winters combined with the favorable habitat conditions, that both largely influence prey availability and accessibility, confer both regions very high importance for a large number of species of wintering birds of prey.

## December vs. February numbers

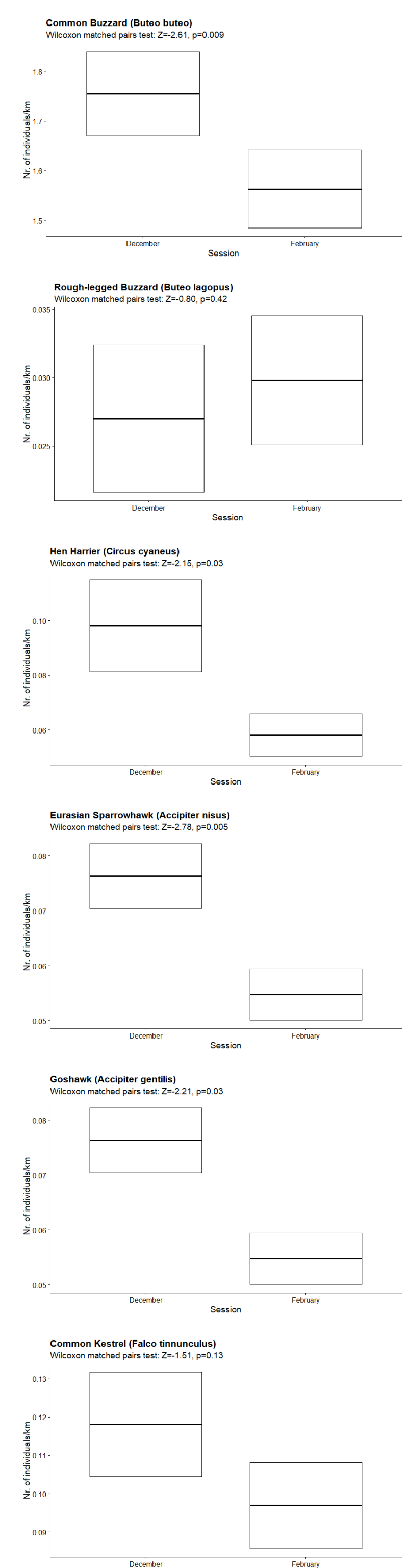


Figure 3. Average numbers per km route of 6 species during the December and February sessions.

Smaller numbers in February could be explained by (may vary across species):

- winter mortality;
- migration further south/west in late December or January, when snow/very cold weather arrives;
- migration north towards the breeding grounds of migratory, or return to breeding habitats of local populations in February.

## Trends

- Common Buzzard (*Buteo buteo*) showed moderate decline in Transylvania in both sessions, while in Moldova the population steeply declined in February, but was stable in December.
- Hen Harrier (*Circus cyaneus*) numbers declined steeply in Transylvania in February, but not in December.
- This pattern may be due to the earlier arrival of spring in recent years, that triggers an earlier start of spring migration towards breeding grounds further north. In the case of Common Buzzard, an earlier return to forests or mountain areas, the breeding habitats, is also possible, habitat types that are under represented in the sampling.
- Trends of the other species were uncertain in all regions in both sessions.



Figure 4. Common Buzzard (*Buteo buteo*) trends in four regions of Romania during the December and February sessions. Note, that start years vary across regions according to data availability.

## Acknowledgments

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