

## MIGRATIONS AND WINTERING OF THE KESTREL (*Falco tinnunculus*) IN POLAND

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### ABSTRACT

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In Poland, the Kestrel is an uncommon bird during the winter time. It rarely winters in the eastern part of the country; however, the reported numbers of regular wintering cases increase towards the south-west. The aims of this study were: to analyse the wintering area of Kestrels nesting in Poland, to compare distances covered by the birds migrating for the first time in their life to their movements in the following years, and to determine the origin of Kestrels wintering in Poland. The material for the analysis comprised 171 recoveries of the birds ringed in Poland or recorded in Poland but ringed abroad within the years 1931-2001. Out of 48 adult Kestrels ringed or recovered during both migration periods (autumn and spring), the great majority were recorded in Poland; only 2 birds were found as adult ones in France and 1 in Ukraine. We obtained 32 recoveries of Kestrels ringed in Poland as chicks or as individuals in their first year of life and recorded again during their first migration season (autumn-spring). Five of them were recorded outside the country. In Poland, there were reported 94 Kestrels that had been ringed abroad. Those birds came from Finland, Sweden, Norway, Germany, Denmark, Slovakia, the Czech Republic and Ukraine. These data show that mainly Kestrels nesting in the north of the continent migrate across Poland and some of them winter here as well. A great majority of recoveries referred to Kestrels ringed in Finland. These birds also came to Poland from Germany and from the areas located to the south-west of Poland.

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**Key words:** Kestrel, *Falco tinnunculus*, wintering, migration, post-breeding dispersal

### INTRODUCTION

The Kestrel is one of the most numerous birds of prey inhabiting the Western Palearctic (Cramp and Simmons 1980). The sub-species *F. t. tinnunculus*, nesting in Poland, is distributed almost all over Europe (except for the northernmost edges of the

continent) as well as in the north of Africa and in the Middle East (Ferguson-Lees and Christie 2001). In Europe, its population is estimated at 330 000-500 000 pairs (Hagemeijer and Blair 1997, BirdLife 2004). In Poland the Kestrel is not a very numerous breeding species (2500-3000 pairs), however, it nests slightly more frequently in the valleys of some rivers and in larger cities (Tomiałojć and Stawarczyk 2003, Śliwa and Rejt 2006). The European populations of Kestrel are partially resident and partially migratory. Birds from the north and the east migrate in autumn to the west and the south of the continent, whereas the western and central European populations are mostly resident (Cramp and Simmons 1980). Between the resident and migratory populations there is a fairly indefinite divide, which expands from southern Sweden in the north-west through Poland to southern Ukraine in the south-east (Cramp and Simmons 1980). In the resident populations, these are adult birds that most often winter on breeding grounds, whereas young individuals (in their first year of life) migrate more frequently (natal dispersal), sometimes hundreds of kilometres away from their place of birth (Cave 1968, Snow 1968, Village 1990, Bijlsma 1993, Adriaensen *et al.* 1997).

In Poland, the Kestrel is an uncommon bird during the winter time. It rarely winters in the eastern part of the country, however, the reported numbers of regular wintering cases increase towards the south-west (Tomiałojć and Stawarczyk 2003). For example, in Lower Silesia its winter population density in the fields reached 0.5 to 1.7 individuals per 10 km<sup>2</sup> during the 1988-1992 period (Lontkowski 1994). The phenomenon of common wintering mainly concerns the individuals breeding in large cities, *e.g.* Poznań, Wrocław or Warszawa (Śliwa and Rejt 2006). So far there has not been any comprehensive studies about the Kestrel movements on the territory of Poland, both in winter and summer.

The aims of this study, based on the recoveries of ringed birds, were: to analyse the wintering area of Kestrels nesting in Poland, to compare distances covered by the birds migrating for the first time in their life to their movements in the following years, and to determine the origin of Kestrels wintering in Poland.

## MATERIAL AND METHODS

The material for the analyses comprised 171 recovery data of Kestrels ringed in Poland or recorded in Poland but ringed abroad. The recoveries were collected within the 1931-2001 period in the Recovery Data Bank of the Polish Bird Ringing Centre supplied by the Institute for Ornithology at the Polish Academy of Sciences. Additionally, we took into consideration 12 "pre-war" recoveries of birds ringed and/or recorded on the territories that at present do not belong to Poland (*i.e.* Western Ukraine).

In order to perform the assumed analyses, the classification of recovery data had to be made, considering, *inter alia*, the dates of ringing or reporting the birds, which were assigned to determined phenological periods (based on Glutz von Blotzheim *et al.* 1971):

- (1) breeding: 1 May – 31 Jul.
- (2) autumn migration: 1 Aug. – 31 Oct.
- (3) wintering: 1 Nov. – 28 Feb.
- (4) spring migration: 1 Mar. – 30 Apr.

The above phenological periods should be treated as approximate ones, because, especially in migratory populations, they are not very specific and depend on various factors, *e.g.* weather conditions. Moreover, we have to remember that there are phenological differences between the populations that reside on the territories distant from each other. Therefore, for example, some of the February records (classified to the wintering period) may in fact concern the birds during their spring migration, or many records from April (classified to the spring migration) may relate to pairs that already started breeding.

We compared the movement distances between the birds migrating for the first time in their life (called “the young” in this paper) and the birds ringed as adult ones and migrating in the following years of life (called “the adults”).

The age categories are connected with the term: “first migration season”, which in our study covered the period from hatching to first breeding.

We also analysed the recovery data about Kestrels recorded in Poland but ringed abroad with regard to the proportion of young to adult birds, making an attempt to establish the type of their movements.

## RESULTS AND DISCUSSION

### Movements of adult Kestrels ringed in Poland

Out of 48 adult Kestrels ringed or recovered during both migration periods (autumn and spring), the great majority were recorded in Poland; only 2 birds were found as adult ones in France and 1 in Ukraine (Fig. 1). A very low mobility of adult birds is also reported from the western European countries, therefore we may conclude that a part of Polish population is in principle resident as well. However, these data relate only to Kestrels nesting in the central and western part of the country as no birds were ringed in the east of Poland. Since in Poland, as it was mentioned in *Introduction*, there is a border separating the resident and migratory populations, we can assume that Kestrels nesting near the eastern boundaries of Poland may migrate towards the west. This could be confirmed by field studies showing that the analysed species wintered there in much smaller densities than in the centre and in the west of the country (Lontkowski 1994, Kunysz 1995, Kasprzykowski and Rzępała 2002). If we assume that the recovery data about 2 adult birds (ringed when young) from France relate to the birds that resided there after their first migration, it turns out that the main direction of movements of adult individuals cannot be determined.

### Movements of young Kestrels ringed in Poland

We obtained 32 recoveries of Kestrels ringed in Poland as chicks or as individuals in their first year of life and recorded again during their first migration season (autumn-spring). Five of them were recorded outside the country (Fig. 2): in Austria (473 km), Denmark (515 km), France (1187 km), Germany (549 km) and Italy (930 km).

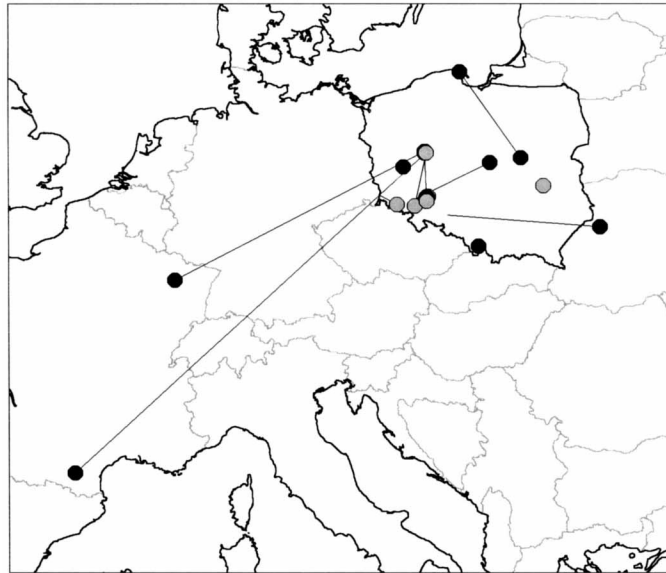


Fig. 1. Recoveries of adult Kestrels ( $N = 48$ ): grey circles – winter recoveries, black circles – recoveries in other seasons

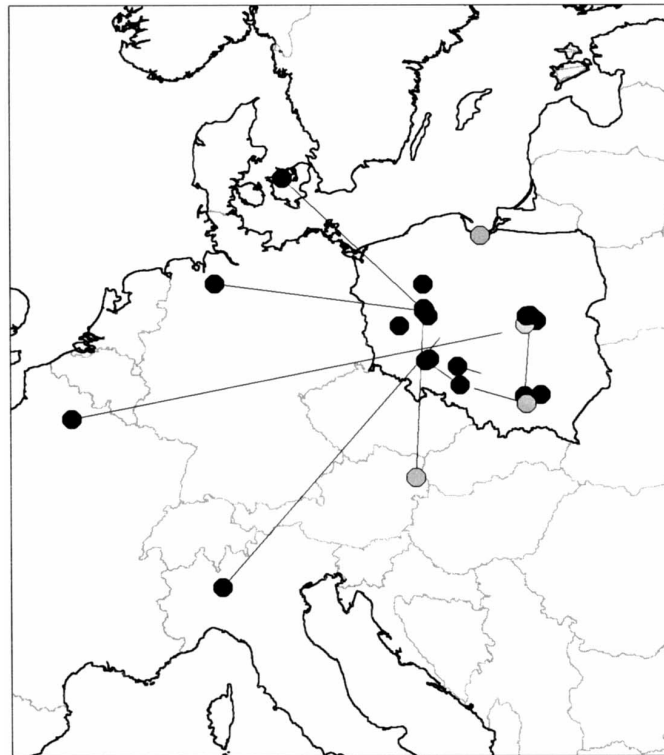


Fig. 2. Recoveries of young Kestrels ( $N = 32$ ). Explanations as in Figure 1.

The majority of repeated records of young birds by far concerned the period between June and August of their birth year. Small distances and various movement directions indicate a typical juvenile dispersal. Towards the end of August the long-distance recoveries can be noted (Fig. 3). These moments can be regarded as the beginning of the season when the young start their longer-distance migrations. According to the results of our study this period lasts approximately until the end of November. The recoveries of Kestrels recorded a few hundred kilometres from the place where they were ringed indicate the western and south-western direction of movements. It is difficult to assess whether it is still a natal dispersal or it is already a typical migration. Unfortunately, it is not very easy and not always possible to draw a distinction between both these types of movements (Cave 1968, Village 1990, Bijlsma 1993, Adriaensen *et al.* 1997). However, if we assume that the population is resident and the adult birds winter nearby their breeding sites, which follows from the analysis of adult birds recoveries, the movements of the young can be considered as the natal dispersal. Yet, a total lack of foreign recoveries from the winter time in the collected data was confusing. To some degree, it can have resulted from a small number of Kestrels ringed in Poland. On the other hand, and more probably, the lack of such recoveries is caused by the fact that young Kestrels, after their autumn short-distance migration and still before the winter time, return to their natal sites. This phenomenon was also observed in Dutch and Belgian Kestrels (Bijlsma 1993, Adriaensen *et al.* 1997) and in Buzzards (*Buteo buteo*) (Walls and Kenward 1995). Obviously, we cannot exclude the situation in which a part of winter recoveries of young Kestrels from Poland refers to the individuals moving within shorter distances from the natal site. The distances covered by Kestrels in their first migration season can vary significantly and, to some degree, they depend on food accessibility (Adriaensen *et al.* 1998). According to these authors, the majority of movements of the young do not exceed a few hundred kilometres. However, there have been some cases in which young Kestrels covered distances longer than 1000 km (Mead *et al.* 1993, Clark *et al.* 2001) or even 3000 km (Appleton *et al.* 1997).

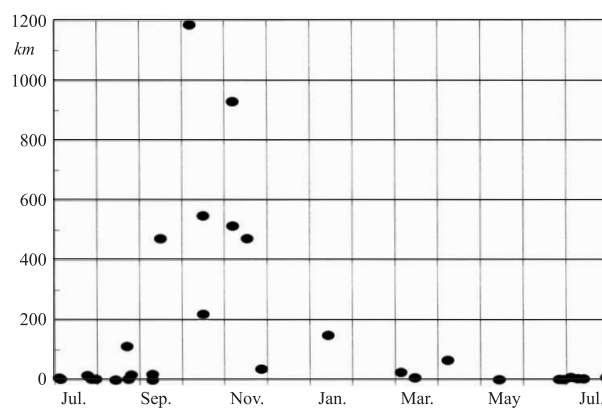


Fig. 3. Distances covered by young Kestrels in their first year of life.

There are two interesting recoveries of the birds found in autumn as the adults in France (860 km, 1524 km), mentioned while describing the adult birds' movements. It is very probable that these birds reached the place as the young in their first migration season and stayed there. Such cases were also observed in other populations, *e.g.* a female ringed as a chick in Schleswig Holstein (Germany) was recorded as a breeding one in Finland the following year, 1231 km from the place it had been ringed (Busche and Kaatz 2002). Obviously, we cannot exclude the case that these birds migrated for the following time in their life.

### **Natal philopatry and breeding site fidelity**

So far we have obtained the recoveries of 13 birds ringed as chicks or as individuals in their first calendar year of life that were next recorded as breeding birds in their second calendar year of life. The distance between their natal and breeding site was on average 1.8 km ( $SD = 2.9$ ). It means that at least a part of nestlings return to the area where they were born. Unfortunately, the distances between the nests built by the birds and the nests they hatched in refer only to Poznań, where many nestlings were ringed and at the same time the adult birds were caught in their nests. For this reason we cannot extrapolate the results we obtained to the whole domestic population. The natal philopatry of Kestrels was, however, reported in many European populations. In Switzerland, the great majority of Kestrels were recorded during the breeding season within 500 km from their natal sites (91% of ringed individuals; within 50 km – 43%). Not a very large part of birds breed about 600 km farther – in south-eastern Germany and Austria (Schifferli 1965). In the Netherlands and Great Britain all the young Kestrels find their breeding sites within a radius of 500 km from their natal sites, while 80-89% do not fly farther than 100 km away (Cave 1968, Snow 1968). It is assumed that an average distance between the natal and breeding site of the same individual reaches 192 km (Newton 1979).

We also obtained 15 recoveries of the adult birds ringed in the breeding season and recorded in the following breeding seasons. The distance between their subsequent nesting sites was on average 0.8 km ( $SD = 2.0$ ), hence we can presume that those birds did not change their breeding sites. A lot of birds have been raising their offspring in the same nests, *e.g.* in window boxes or on balconies (Poznań) for many years. Parents changed their breeding site only after damaging the previous nest.

### **Migrations across Poland**

In Poland, there were 94 Kestrels reported which had been ringed abroad. Those birds came from Finland, Sweden, Norway, Germany, Denmark, Slovakia, the Czech Republic and Ukraine. These data show that mainly Kestrels nesting in the north of the continent migrate across Poland (Fig. 4), a part of them winter here as well. A great majority of recoveries referred to Kestrels ringed in Finland. A smaller number of the reports from Norway and Sweden may imply that their local Kestrels migrate towards the west of Europe across the straits of Denmark and the North Sea (Cramp and Simmons 1980, Village 1990).

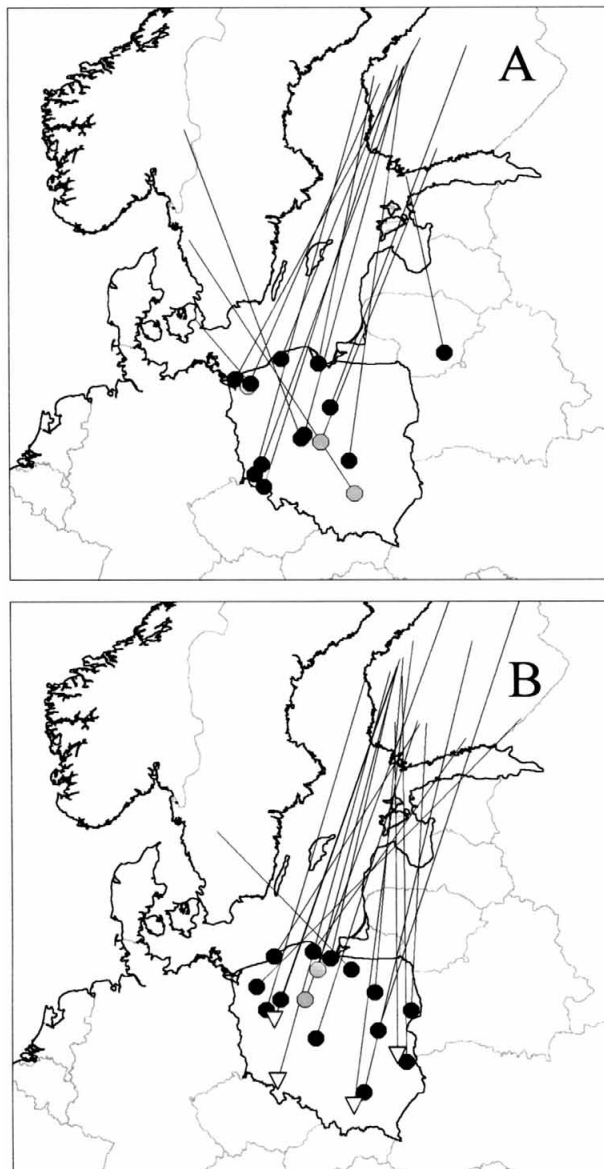


Fig. 4. Recoveries of Kestrels ringed to the north of Poland. A. birds recorded in their first migration season ( $N = 15$ ), B. birds recorded in subsequent migration seasons ( $N = 20$ ). Circles – birds ringed as pulli: grey circles – winter recoveries, black circles – recoveries in other seasons; triangles – birds ringed as adults.

The recovery analyses of birds from Finland recorded in Poland show that their movements exclude only the first migration season when they can correspond to a far natal dispersal. These birds, most probably, regularly migrate across the territory of Poland in the following years. Nearly half of Kestrels ringed as chicks in Finland were re-



corded in Poland later than in their first migration season. The birds flying to Poland from the north are not recorded here during their breeding season but mostly in autumn.

Kestrels also fly to Poland from Germany (Fig. 5). A great majority of these birds were recorded in Poland during their first migration season. It is most probable that

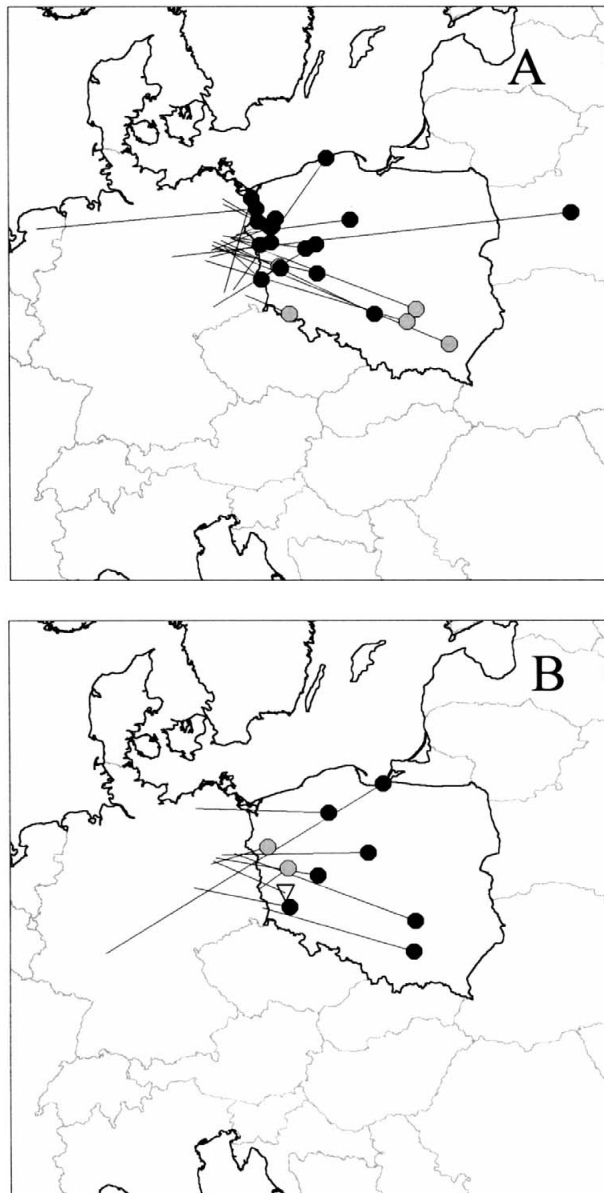


Fig. 5. Recoveries of Kestrels ringed to the west of Poland. A. birds recorded in their first migration season ( $N = 22$ ), B. birds recorded in subsequent migration seasons ( $N = 10$ ). Explanations as in Figure 4.



these movements are the examples of a typical natal dispersal because they are made towards the east – which is opposite to the probable migration direction of the German population. Moreover, only the birds from eastern Germany fly to Poland, thus the migration distance is relatively small.

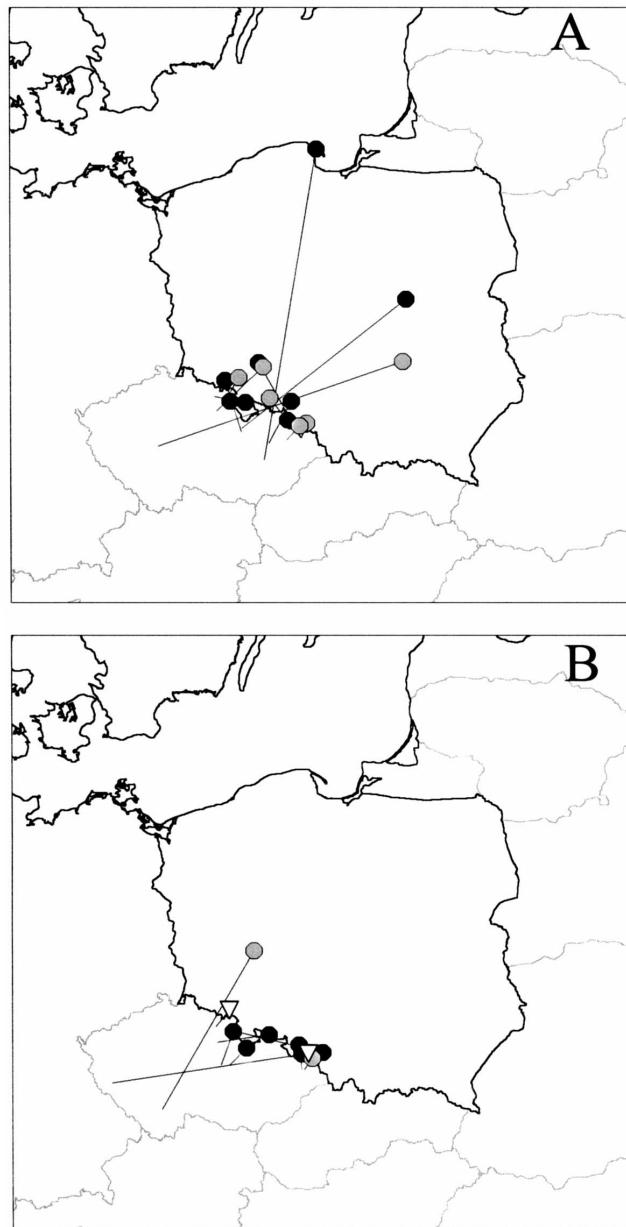


Fig. 6. Recoveries of Kestrels ringed to the south-west of Poland. A. birds recorded in their first migration season ( $N = 14$ ), B. birds recorded in subsequent migration seasons ( $N = 10$ ). Explanations as in Figure 4.

Young birds appear in our country as early as in July, that is just after leaving their nests. Next, in subsequent seasons, *i.e.* in autumn and winter, the number of records decreases. The adult Kestrels are also reported on the territory of Poland, both in autumn and winter. Unfortunately, we cannot affirm whether these birds came to Poland as adult ones or started residing here as young ones, which seems to be more probable. We can consider both alternatives for particular individuals.

The least numerous are the recoveries from the territories to the south-west of Poland (Fig. 6). Also in this case we can talk about the natal dispersal of young birds, especially that the majority of records come from the first migration season. The records of adult birds in Poland can also result from the dispersal of young individuals in previous years or from not very distant local movements. Like in the case of birds from Germany, the first young birds appear in the breeding period, although winter reports predominate. The distances of movements in this group are even smaller than in the case of German Kestrels. The birds were almost exclusively reported on the border-line. The Kestrels nesting to the south of Poland are much more resident, and the reports in Poland suggest that the natal dispersal of young birds as well as possible migrations of adult birds occur mainly towards the west and south, like in other European countries. When analysing our data, no information was found about the movements of birds coming from the areas to the east of Poland, which can be caused by a small number of birds ringed there or can result from the south direction of migration of the birds nesting there. Some confirmation of this can be the recoveries of

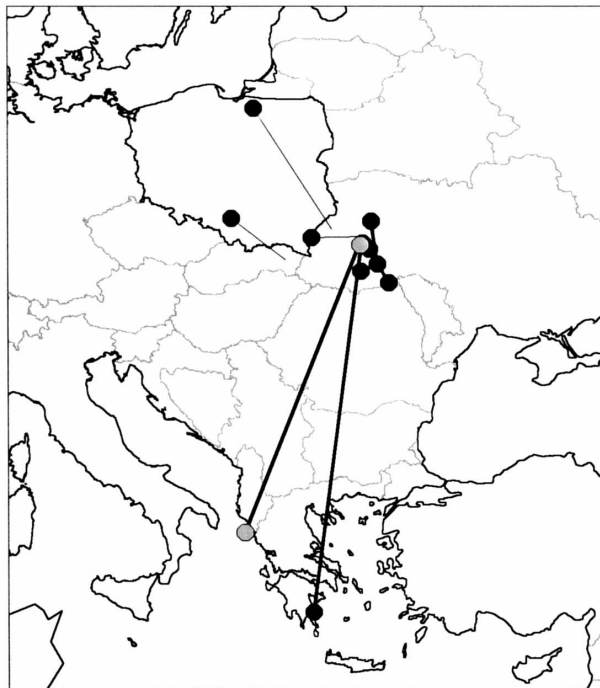


Fig. 7. Recoveries of Kestrels ringed to the south-east of Poland. The bold lines mark the recoveries in seasons later than the first migration season ( $N = 12$ ).

birds ringed in Western Ukraine. Two adult birds ringed there were recovered in the Balkans (Fig. 7) and show a clearly southern direction of migration.

Despite a lack of confirmation in the recoveries, we cannot exclude that the range of breeding grounds of Kestrels following this migration direction is wider and it also covers eastern Poland. The recoveries of Kestrels ringed in Ukraine refer to the young birds which probably moved during their natal dispersal.

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