Spatial distribution of breeding Pied Flycatchers *Ficedula hypoleuca* in respect to their natal sites

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Sokolov, L., Chernetsov, N., Kosarev, V., Leoke, D., Markovets, M., Tsvey, A. & Shapoval, A., 2004. Spatial distribution of breeding Pied Flycatchers *Ficedula hypoleuca* in respect to their natal sites. *Animal Biodiversity and Conservation*, 27.1: 355–356.

Extended Abstract

Spatial distribution of breeding Pied Flycatchers Ficedula hypoleuca *in respect to their natal sites.*— Study of philopatry and dispersal of pied flycatchers *Ficedula hypoleuca* was launched on the Courish Spit (SE Baltic) in 1981. Since then, *ca*. 9,000 nestlings were ringed at different sites in the Russian part of the Courish Spit. A total of 557 individuals ringed as pulli were recaptured in subsequent seasons in the study area.

Both males and females are more often recaptured in the plots where they were ringed than in other plots. These results were interpreted in the framework of the hypothesis forwarded by Löhrl (1959) and supported by Berndt & Winkel (1979). These authors suggested that cavity nesters (pied flycatchers and collared flycatchers *F. albicollis*) imprint their future local breeding area during the period of postfledging exploration. Birds that survive until the next spring, return to these imprinted areas to breed. A similar study done by Sokolov et al. (1984) on the Courish Spit in an open nesting species, the chaffinch *Fringilla coelebs*, confirmed this finding.

We assumed that juvenile pied flycatchers disperse for varying distances during their postfledging movements and imprint a local area, some 1–5 kilometres in diameter. This area is the goal of their migration next spring. It is suggested that in spring, yearlings are non–randomly distributed in respect to the area they have imprinted as juveniles.

Recently, Vysotsky (2000, 2001) re–analysed the same data on philopatry of pied flycatchers on the Courish Spit and forwarded an alternative hypothesis. He suggests that juveniles, both males and females, do not imprint any local area during the postfledging period, but are distributed randomly across the area of several dozens of kilometres in spring. Vysotsky was able to show that distribution of distances of natal dispersal did not differ from the random pattern the study plot which was an 8.5 km long line of nest boxes along the Courish Spit.

The aim of this study was to test these two alternative hypotheses. To do so, we set up nine new study plots in 2000. Over 800 nest–boxes were made available for the birds (in addition to the old 400) in the 44 km long area. We recaptured pied flycatchers returning for breeding during four years, 2000–2003. The distribution of natal dispersal distances was compared with the null model which assumes that pied flycatchers settle randomly in the study area. We took all nest boxes from which pied flycatchers successfully fledged in a particular year and all next boxes where we were able to capture either a male or a female in the subsequent year, and calculated the distances between each pair of such nest boxes. Simulations were run separately for each sex.

Theoretical distributions already include control efficiency. If some nest boxes were not checked in some year, or if we failed to capture one or both members of a breeding pair, we did not include this nest box in

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ISSN: 1578–665X

the model. Some birds could settle outside the study plot. Therefore, the theoretical distribution may underestimate the actual range of natal dispersal, but is unlikely to overestimate it.

The number of females ringed as nestlings and recaptured as one–year–old birds was 43. The distribution of their natal distances (mean 6,8 km, SE = 0,81; median 5,4 km) was not significantly different from the pattern predicted by the null model (Wilcoxon matched pairs test: z = 1,25; p = 0,21). Conversely, males settled significantly closer to their natal nest box (n = 83; mean 4,3 km, SE = 0,57; median 2,5 km) than predicted by the model (Wilcoxon matched pairs test: z = 2,45; p = 0,014). For example, 24% of males settle within one km from their natal site, as compared with 7% predicted by the model. Males are found with a greater than chance probability within the 7 km zone around their natal site.

The hypothesis by Vysotsky (2000) can thus be rejected for pied flycatcher males. Pied flycatcher females are known to settle at larger distances from their natal nest box. The very fact that were controlled 83 males and only 43 females suggests, assumed that sex ratio at fledging is close to being equal and that true survival rates during the first year of life do not differ greatly between the sexes, that many females emigrated from of our study plot. This does not mean that juvenile females do not imprint a home area during the postfledging period, as suggested by Vysotsky (2000). We think that the reason for this is not the inadequate navigational ability of the females but the fact that they were attracted by a prospecting male at some distance from their migratory destination and settle there. Such intercepting was suggested by Fedorov (1996) for *Acrocephalus* warblers, and it may exist in other migratory passerines. This is supported by the data on natal site fidelity from Spain which show that in Spanish pied flycatcher populations, recruitment rate did not differ between female and male juveniles (Potti & Montalvo, 1991). Females from these southern populations have a limited chance to be attracted by prospecting males in even more southern areas.

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