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Breeding biology of the Great Grey Shrike *Lanius excubitor* in W Poland

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Abstract. A Great Grey Shrike population was studied in two large plots (220 km^2 and 176 km^2) in western Poland in 1999–2003. During the study period densities varied from 11.4 to 14.1 breeding pairs/100 km^2 but numbers were stable. In all, 180 Great Grey Shrike nests were found — 114 (63.3%) in conifers, 66 (36.7%) in deciduous trees. This population's reproductive parameters were relatively high in comparison to those of other European populations: mean clutch size — 6.6, hatching success — 92.5%, mean brood size — 5.72, mean number of fledglings per pair — 4.1, mean number of fledged young per successful pair — 5.25. Eggs (mean 27.1 × 19.9 mm) were found to be larger than reported in the literature. Nesting success was similar in both study plots, but there was slight seasonal variability: 41.0%–52.6% from 99 nesting attempts in the first plot, 42.1%–43.7% from 37 nests in the second. Predation was the main cause of nest losses. Plastic string used as nesting material appeared to be the most important cause of partial failures: 13 (8.2%) of a total of 147 nestlings surviving to fledging perished as a result of becoming tangled up in it. Nestlings rarely starved. Nests in linear habitats suffered significantly higher breeding losses (78.6%) than those in non-linear habitats (50%). The high fitness values obtained from this population were probably due to traditional farming practices, the sparing use of pesticides and the good potential food source.

Key words: Great Grey Shrike, *Lanius excubitor*, breeding biology, farmland, nest location

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INTRODUCTION

In Western Europe, the populations of the Great Grey Shrike decreased markedly during past decade (Tucker et al. 1994, Bassin 1995, Bechet 1995, Rothhaupt 1995, Schön 1995b). Changes in land use, deterioration of breeding habitats and subsequent decrease in potential food base were suggested to be responsible for such a dramatic decline (Tucker et al. 1994, Schön 1995b, Lefranc 1997, Lefranc & Worfolk 1997, Harris & Franklin 2000). Thus, several distribution gaps have been observed within breeding range in this species (Hagemeijer & Blair 1997). Stable and numerous populations of the Great Grey Shrike still occur in Fennoscandia, Russia, Belarus, and Poland (Tucker et al. 1994, Lorek 1995a, Lefranc & Worfolk 1997).

The breeding biology of the Great Grey Shrike seems to be well known but for long time only studies carried out in Germany (Bäsecke 1956, Ullrich 1971, Ristow & Braun 1977, Hölker 1993, Schön 1994, Schön 1995a) were a main referee for European populations. A majority of studies in Western Europe was performed on small, declining populations. So far, Polish populations of the Great Grey Shrike have not been studied sufficiently. The aims of this study were to provide a general information about breeding biology of the Great Grey Shrike in farmland landscape of

Western Poland and to compare it with other populations. The results presented may give a picture of condition of the Great Grey Shrike population just before joining Poland to the European Union and adoption of the Common Agriculture Policy.

STUDY AREA AND METHODS

The major part of material was collected on two large plots: 1) located near town Odolanów (51°34′N, 17°40′E, size 220 km^2, years 1999–2003) and 2) near town Koło (52°12′N, 18°39′E, size 176 km^2, years 2000–2001). The study areas were covered with agricultural landscape with arable fields, meadows and small woodlots in different age and tree row among them. Several extensive surveys were done also in radius about 50 km^2 from Poznań and those data were included into analyses. The study plots were surveyed from pre-breeding period (since end of February) and the movements of birds, boundaries of territories as well other signs of presence of birds (e.g. impaled prey items, pellets) were mapped, also intensive nest searches were performed (see also Tryjanowski et al. 2003).

The majority of found nests was checked from distance using binoculars and telescope at least once per week. Intrusive nest controls were conduced in the end of incubation and nestling period when eggs and nestlings were measured and ringed. Some nests were not available for direct control, therefore the observation from distance was the only method of data collection. To evaluate breeding success, nests and their surroundings were carefully surveyed for young and families during post-fledgling period as known from nest history. Nest was considered as successful in case when at least one fledgling left. Hatching success was defined as the ratio between number of nestlings hatched, to the number of eggs laid. The number of nestlings was estimated on the basis of first inspection after hatching.

When the nest contents disappeared and nest was undestroyed, a bird predator was assumed to be responsible for failure. In cases when nest structure was damaged, mammals were considered to destroy the brood (see also Yosef 2001). However, in large part of failed nests the predator was unknown. During fieldwork within shrike territories we noted several potential nest predators both birds mainly corvids, e.g. Hooded Crow *Corvus corone*, Jay *Garrulus glandarius*, Magpie *Pica pica* and mammals: Martens *Martes* spp., Weasel *Mustela nivalis* and Red Squirrel *Sciurus vulgaris*.

During each breeding season nests were described by variables as follows: tree species, nest height, nest tree height, distance from nest tree to forest edge.

All calculations were performed using Statistica for Windows software.

RESULTS

Population density, reoccupation of territories

Density of breeding pairs on plot Odolanów varied between 11.4–14.1 breeding pairs/100 km^2 (2000 — 11.4, 2001 — 13.6, 2002 — 13.2, 2003 — 14.1). Densities noted on plot Koło were similar and reached 11.4 pairs/100 km^2 in 2000 and 11.9 pairs in 2001.

Among 23 breeding sites recorded on plot Koło during two years study 19 (82.6%) of them were used in both seasons.

Similar situation was noted on plot Odolanów, year to year reoccupation rate was 2000/2001 — 57.6%, 2001/2002 — 71.4%, 2002/2003 — 75.0%. From 41 territories mapped in four years of the study, 16 (39.0%) were used during all years, 11 (26.9%) in three seasons, 6 (14.6%) in two, 8 (19.5%) in one season.

Nest location

During years 1999–2003 the data about 180 shrike nests located on 14 tree species were collected (Table 1). 114 (63.3%) of nests were build on conifers. In both studied areas as nest places pines were dominant whereas in surrounding of Poznań this proportion was reversed (Table 1).

Table 1. Location of Great Grey Shrike nests in Odolanów (Od) and Koło (Ko) plots and in vicinity of Poznań (Po).

Tree species	Od	Ko	Po	Total	
				N	%
Pinus sylvestris	79	27	6	112	62.2
Populus spp.	6	3	10	19	10.5
Alnus glutinosa	5	2	4	11	6.1
Pyrus communis	3	0	3	6	3.4
Salix spp.	2	3	3	8	4.4
Quercus spp	3	2	0	5	2.8
Robinia pseudoaccacia	0	1	3	4	2.3
Betula verrucosa	3	0	0	3	1.7
Populus tremula	3	0	0	3	1.7
Prunus spinosa	3	0	0	3	1.7
Acer spp.	0	0	2	2	1.1
Picea abies	0	0	2	2	1.1
Crategus spp.	0	0	1	1	0.5
Sambucus nigra	1	0	0	1	0.5
Total	108	38	34	180	100

Among trees used for nesting conifers were significantly higher (mean 15.5 ± 4.3 m) than deciduous (mean 12.5 ± 6.8, t = -2.95, p = 0.003). As the nest height was strongly correlated with nest tree height (r = 0.86, p < 0.05) nest on pines were located significantly higher (mean 12.9 ± 4.0) than on deciduous (mean 9.1 ± 4.8 m, t = -4.01, p < 0.001).

Reproductive parameters

Timing of breeding. The median date (days after 31 March) of laying first egg varied significantly between years (Median test $\chi^2 = 18.12$, df = 4, p = 0.001, Fig. 1). Breeding season started earlier in 1999 and 2002 (median 11 and 8, respectively) than in years 2000 and 2001 (median 21 and 22) as well as in 2003 which was extremely late (median 26).

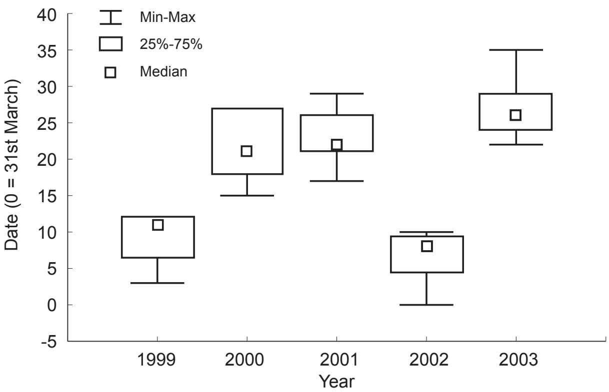

Fig. 1. Median date (number of days after March 31st) of laying the first egg in consecutive years of the study (N = 34).

Egg measurements. Mean length of eggs was 27.10 ± 1.20 mm and breadth 19.89 ± 0.86 (number of eggs n = 95, number of clutches n = 19).

Clutch size, hatching success. Average clutch size in studied population was 6.6 ± 0.96 (n = 24, range 4–8). Modal clutch size was 7 (Fig. 2). No significant differences in clutch size between years were recorded (Kruskal-Wallis test, H = 3.40, p = 0.33). Studied population characterized high hatching success reach 92.5% (n = 16 broods). From 107 laid eggs 99 hatched successfully. Mean brood size calculated from all years was 5.72 ± 1.19 (n = 37 broods) and no significant variation between seasons were recorded (One Way ANOVA, F = 1.56, p = 0.2). The mean number of produced fledglings per pair (all years polled) was 4.1 ± 2.5 and significant differences between years were found (Kruskal-Wallis test, H = 12.00, p = 0.01). Consequently, mean number of fledged young per successful pair was 5.25 ± 1.25 and varied significantly between years (One Way ANOVA, F = 3.81, p = 0.02, Fig. 3).

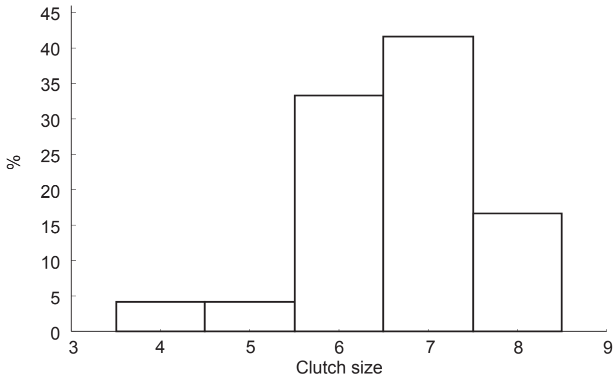

Fig. 2. Frequency distribution clutch size (N = 24).

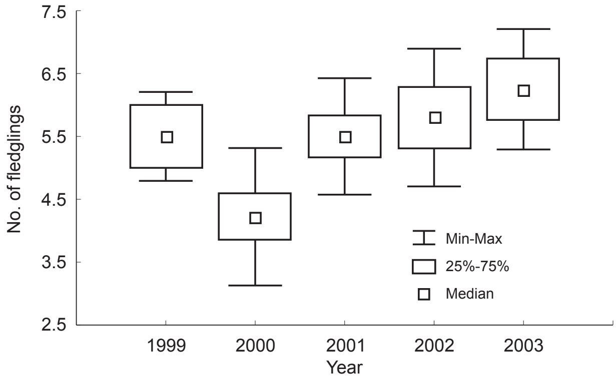

Fig. 3. Mean number of fledglings per successful pair of the Great Grey Shrikes in consecutive years of study (N = 28).

Breeding success, causes of nest failures

On both study plots the nesting success varied slightly between breeding seasons (Odolanów 41.0–52.6% , Koło 42.1–43.7%) but no significant seasonal differences were found. Also differences between surveyed areas were found when comparing average nesting success (all years polled, Odolanów 46.1%, n = 99 nesting attempts, Koło 43%, n = 37) were non-significant.

During four years study no second clutches were recorded. Among five replacement nesting attempts only one was successful.

Among completely nest fates with known cause of failure (n = 49), predation was the most important cause and 41 (83.9%) of nesting attempts were destroyed by predators. Mammals were responsible for 24 (49%) of destroyed nests, whereas birds 17 (34.6%). Additionally, another 87 nests were destroyed by unknown nest predators. Other reasons were weather (4, 8.2%) and human disturbance (4, 8.2%). Among nest losses caused by human three was abandoned after spring fires, in one case the nest tree was cut off. Assuming the same duration of breeding stages (Cramp & Perrins 1993) no differences in proportion of nest losses between incubation and nestling period were found. No significant differences were found between successful and failed nest respect to nest tree height (14.09 ± 4.86, n = 51 vs. 14.76 ± 5.52, n = 63), nest height (11.81 ± 4.49, n = 59, 11.59 ± 4.77, n = 73) and distance to forest edge (6.29 ± 8.22, n = 44, 4.1 ± 6.34, n = 56). However, there were strong relationship between habitat type and predation rates. Among 28 nests located in linear habitats like row of trees and road alleys only 6 (21.4%) produced at least one fledged young. In contrast, the nesting success in non-linear places such as woodlots reached 50% (n = 90 nests) and was significantly higher than in linear habitats (χ^2 test with Yates correction $\chi^2 = 5.99$, $p = 0.014$). The most important cause of partial failures was plastic strings which were used as nest material, totally among 147 nestlings 13 (8.2%) were died due to tangle in it. Plastic strings were commonly used by shrikes as nest material, from 108 nests that were found on plot Odolanów only two were built without plastic strings. Plastic strings might be dangerous also for adults, we recorded two females that were hanged on plastic strings during incubation. Starvation of nestlings was rare, only 3 (2.0%) among 147 nestlings from nests that survived to the end of nestling period starved.

DISCUSSION

Results presented in this paper support former findings (Tryjanowski et al. 1999) that in the study area locally occur dense and so far stable populations belonged to this rapidly declining species. Moreover, breeding densities noted on both study plots are one of the highest among recorded in Poland and Europe (Lorek 1995a, Lefranc & Worfolk 1997, Tryjanowski et al. 1999). Surveyed areas were located in medium size river valleys with high proportion of extensive used meadows and wide diversity of microhabitats and seems be optimal for this species offering suitable nest places and foraging areas (Lorek 1995a, Tryjanowski et al. 1999). However, in scale of whole region breeding densities are much lower than it was in the study areas, especially in intensive used farmland and reach values about 4.3 p/100 km^2 (Kuźniak et al. 1995, Tryjanowski et al. 1999). In Silesia, c. 100 km south from the study area, in similar habitats located in small and medium size river valleys breeding densities reached up to 33 breeding p/100 km^2 (Lorek 1995a).

Differences between conifers and deciduous trees in height and connected with this in nest height location are probably caused by differences in natural conditions of above-mentioned species.

Overall breeding success reported from studied population was slightly better than recorded in others part of Europe (Cramp & Perrins 1993, Schön 1994). In the study area as a main cause of nest fates was predation, more than 80% breeding attempts with known reason of failure were destroyed by predators. In intensive studied population in south-western Germany main cause of breeding failures were bad weather conditions (Schön 1994). Great Grey Shrike belongs to one of the earliest breeding passerine in local breeding assemblage, although time of breeding varied strongly between breeding seasons. Probably the weather conditions in early spring strongly influenced the start of breeding between years. Reproductive parameters of the Great Grey Shrikes from study area show a rather high value in comparison to other studied populations in Europe. Average clutch size (6.6) was similar to recorded in Silesia (Lorek 1995b) and larger from results obtained in other European populations (5.45–6.2, Bäsecke 1956, Huhtala et al. 1977, Ristow & Braun 1977, Schön 1994; only first clutches included). Also hatching success noted in studied population (92.5%) was higher than obtained in other studies: 80.9–89% (Huhtala et al. 1977, Schön 1994). Mean number of fledged young per pair (4.1) as well as mean number of fledglings per successful pair (5.3) obtained in the presented study, fall in to high values reported in other studies: 2.6–5.2 (Ullrich 1971, Huhtala et al. 1977, Bassin 1982, Holker 1993, Schön 1994). Presented results provoke a question why such high reproductive values are displayed by studied population?

Some studies performed on shrikes reported a clear negative impact of intensification of land use on shrike's populations (Schön 1995b, Lefranc 1997, Leugger-Eggimmann 1997). Indeed one of the most often proposed reasons of global decline several shrike species is intensification of agriculture (Yosef 1994). In our study areas dominate small family farms with traditional agriculture including low pesticide use, mixed structure of crops with high proportion of meadows — the main foraging areas of the Great Grey Shrike (Tryjanowski et al. 1999).

One of the most interesting findings of this study is that pairs of Great Grey Shrike, which located nests in linear habitats, suffered significantly higher predation losses than pairs from non-linear habitats. This fact indicates that shape of nesting place might be one of the important habitat variable which strongly influences breeding success. Similar results were obtained in Loggerhead Shrike *Lanius ludovicianus* from Florida (Yosef 1993) and support findings that birds including shrikes in linear habitats have worst production reduced mainly by predation. So far, three not exclusive explanations were proposed: 1) birds may reach much higher densities in linear habitats and therefore attract predators (Basore et al. 1986) or 2) linear habitats are much simpler in structure and thus that nests might be easier to find. Finally predators may use linear structures as corridors and probability of discovering the nests by chance is higher than in non-linear habitats (Yosef 1993). During fieldwork we have observed Jays and Hooded Crows single or in small flocks which moved throughout linear habitats. Also mammal predators during foraging use linear habitats and in some cases such habitats might be preferred (Crabtree et al. 1989).

Presented findings show an importance of plastic strings as a factor that might seriously reduce number of fledged young and thus that influence on productivity of shrike populations. In western Poland plastic strings are widely used by farmers.

Our study shows that so far, local populations of the Great Grey Shrike in western Poland are dense, stable and in good condition. Presented results provide importance of Polish population of this rapidly declining species for other European populations especially in western part of continent (see suggestions in Rothhaupt 1995).

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REFERENCES

Bäsecke K. 1956. Unterschiede im Verhalten des Raubwürgers in zwei niedersächsischen Landschaftsformen. Vogelwelt 77: 50–54.

Basore N. S., Best L. B., Wooley J. B. 1986. Bird nesting in Iowa no-tillage and tilled crop-land. J. Wildl. Manage. 50: 19–28.

Bassin P. 1995. Status and trends of shrikes in Switzerland with special reference to the Great Grey Shrike. Proc. West. Found. Vert. Zool. 6: 45–48.

Bechet G. H. 1995. Status and habitat structure of the Great Grey Shrikes in Luxembourg. Proc. West. Found. Vert. Zool. 6: 45–48.

Crabtree R. L., Broome L. S., Wolfe M. L. 1989. Effects of habitat characteristics on Godwall nest predation and nest site selection. J. Wildl. Manage. 53: 129–137.

Cramp S., Perrins C. M. (eds). 1993. The birds of the Western Paleartic. Vol. VII, Oxford Univ. Press.

Hagemeijer J. M., Blair M. J. (eds). 1997. The EBCC Atlas of European Breeding Birds: their distribution and abundance. Poyser, London.

Harris T., Franklin K. 2000. Shrikes and Bush-Shrikes. Christopher Helm. London.

Hölker M. 1993. Breeding biology of the Great Grey Shrike *Lanius excubitor* in Southeast Westphalia. Vogelwelt 114: 86–98.

Huhtala K., Itämies J., Mikkola H. 1977. Beitrag zur Brutbiologie und Ernährung des Raubwürgers (*Lanius excubitor*) in Österbotten, Finnland. Beitr. Vogelkde. 23: 129–146.

Kuźniak S., Lorek G., Lorek J., Sibiński P., Stankowski A. 1995. [Density of breeding Great Grey Shrike in agriculture land in Southern Wielkopolska]. Przegl. przyr. 6: 61–70.

Lefranc N. 1997. Shrikes and farmed landscape in France. In: Pain D. J., Pienkowski M. W. (eds). Farming and birds in Europe. Academic Press, London.

Lefranc N., Worfolk T. 1997. Shrikes. The guide to the Shrikes of the World. Pica Press, Sussex.

Leugger-Eggimann U. 1997. Parental expenditure of Red-backed Shrikes *Lanius collurio* in habitats of varying farming intensity. Swiss Ornithological Institute, Allschwil.

Lorek G. 1995a. Breeding status of the Great Grey Shrike (*Lanius excubitor)* in Poland. Proc. West. Found. Vert. Zool. 6: 98–105.

Lorek G. 1995b. Copulation behaviour, mixed reproductive strategy and mate guarding in the Great Grey Shrike. Proc. West. Found. Vert. Zool. 6: 218–268.

Ristow D., Braun M. 1977. Der Raubwürger (*Lanius excubitor)* in der Eifel. Charadrius 13: 33–59.

Rothhaupt G. 1995. Current status and habitat of the Great Grey Shrike in Germany. Proc. West. Found. Vert. Zool. 6: 122–127.

Schön M. 1994. Breeding biology of the Great Grey Shrike *Lanius e. excubitor*: clutch size, brood size, and breeding success in the region of the southwestern Schwäbische Alb in comparison with other populations. Ecol. Birds 16: 173–217.

Schön M. 1995a. Breeding behaviour of the Great Grey Shrike in Southwestern Germany. Proc. West. Found. Vert. Zool. 6: 235–241.

Schön M. 1995b. Habitat structure, habitat changes, and causes of decline in the Great Grey Shrike (*L. excubitor*) in southwestern Germany. Proc. West. Found. Vert. Zool. 6: 142–149.

Tryjanowaki P., Hromada M., Antczak M. 1999. Breeding habitat slection in the Great Gray Shrike (*Lanius excubitor* — the importance of meadows and spring crops. Acta Ornithol. 34: 59–63.

Tryjanowski P., Hromada M., Antczak M., Grzybek J., Kuźniak S., Lorek G. 2003. Which method is most suitable for census of breeding populations of shrikes, *Lanius collurio* and *Lanius excubitor*? Ornis Hung. 12–13: 11–16.

Tucker G. M., Heath M. F., Tomiałojć L., Grimmet R. F. A. 1994. Birds in Europe. Their conservation status. Cambridge University Press, Cambridge.

Ullrich B. 1971. Untersuchungen zur Ethologie und Ökologie des Rotkopfwürgers (*Lanius senator*)in Südwestdeutchland in Vergleich zu Raubwürger (*L. excubitor*), Schwarzstirnwürger (*L. minor*) und Neunöter (*L. collurio*). Vogelwarte 26: 1–77.

Yosef R. 1993. The effect of fencelines on the reproductive success of the Loggerhead Shrikes. Conserv. Biol. 8: 281–285.

Yosef R. 1994. Evaluation of the global decline in the True Shrike (Family *Laniidae*). Auk 111: 228–233.

Yosef R. 2001. Nesting ecology of resident the Loggerhead Shrikes in south central Florida. Wilson Bull. 113: 279–284.

STRESZCZENIE

[Biologia rozrodu srokosza w zachodniej Polsce]

Badania prowadzono w Wielkopolsce na dwóch powierzchniach próbnych Odolanów (220 km^2) i Koło (176 km^2) w latach 1999–2003. Dodatkowo, część materiału zebrano także w promieniu 50 km od Poznania. Powierzchnie badań zlokalizowane były w dolinach rzecznych o zróżnicowanym krajobrazie rolniczym z wysokim udziałem łąk i pastwisk.

Zagęszczenie par lęgowych było podobne na obu powierzchniach badawczych i nieznacznie wahało się miedzy latami badań (11.4–14.1 par/100 km^2). Stwierdzono wysoką (ponad 70%) między sezonową powtarzalność zajmowanych terytoriów.

Ogółem zebrano dane o 180 gniazdach srokosza umieszczonych na 14 gatunkach drzew (Tab. 1). Na powierzchniach Odolanów i Koło większość gniazd umieszczona była na sosnach, natomiast w okolicach Poznania na topolach (Tab. 1).

Mediana daty złożenia pierwszego jaja różniła się istotnie między latami badań (Fig. 1).

Średnia wielkość zniesienia wynosiła 6.6 (zakres 4–8). Najczęściej notowano lęgi o 7 jajach (Fig. 2). Nie stwierdzono istotnych różnic w wielkości zniesienia miedzy latami badań. Średnia liczba podlotów wynosiła 4.1 w przeliczeniu na każde kontrolowane gniazdo, oraz 5.25 na gniazdo z sukcesem. W obu przypadkach stwierdzono istotne różnice między latami (Fig. 3). Sukces lęgowy był podobny na obu powierzchniach badań i nieznacznie wahał się miedzy latami (Odolanów 41.0—52.6%, Koło 42.1—43.7%). Główną przyczyną całkowitych strat gniazdowych było drapieżnictwo; innymi przyczynami strat były niesprzyjające warunki pogodowe oraz porzucanie lęgów spowodowane wiosennym pożarami. Najważniejszą przyczyną częściowych strat w lęgach było zaplątanie młodych w sznurki używane do budowy gniazd. Spośród 147 piskląt z gniazd, które dotrwały do końca okresu pisklęcego 13 (8.2%) zginęło właśnie w ten sposób. Zagłodzenie piskląt w badanej populacji występowało rzadko (2%). Nie stwierdzono istotnego wpływu wysokości gniazda, wysokości drzewa gniazdowego oraz jego odległości od skraju kępy gniazdowej na sukces lęgowy. Gniazda ulokowane w alejach śródpolnych, przydrożnych pasach drzew były istotnie częściej niszczone przez drapieżniki i osiągały niższy sukces lęgowy (21.4%) niż gniazda zbudowane w kępach i laskach śródpolnych o nieregularnym kształcie (50%).

Stwierdzone zagęszczenia par lęgowych należą do najwyższych w Polsce i w Europie. Parametry reprodukcyjne takie jak wielkość zniesienia, wielkość jaj, wykluwalność, liczba podlotów na parę z sukcesem stwierdzone w badanej populacji są wyższe niż odnotowane w Europie zachodniej.