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The Red-backed Shrike *Lanius collurio* in southeastern Sweden: Breeding biology

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Abstract

The breeding biology of Red-backed Shrikes was studied in Gryt, southeastern Sweden from 1956–94. The shrikes used many different kinds of nest sites and a variety of nest materials. Parallel to an increased colonization of planted clear-cuts, young spruce has become more often used as a nest site. Mean clutch size was 5.3 eggs when also late clutches and repeat layings were included. The mean size of clutches in May was 5.64, with a marked decrease during the course of the summer. Average breeding success was 3.4 fledged young, with failing nests included, while it was 4.3 for successful nests (i.e. nests from which at least one young fledged). Nests suffering total loss made up 19.8% of all nests; total loss was mostly the result of predation. There were great differences in breeding success between favourable and unfavourable springs. Juvenile Red-backed Shrikes stayed near the nest up to one month after fledging after which they left, often still together and attended by the adults. Breeding success was good in the study area over the whole study period, and, contrary to the situation in other parts of Sweden, the local population showed no signs of a decline. Such a decline has been very marked (75% or more) in the northern part of the breeding area. Periods of bad weather there seem to hit the population harder than further south. Probably the poor reproduction reported for the Swedish population of Red-backed Shrikes refers to these marginal areas of the breeding range. It is possible that the shrikes are negatively affected by factors acting during the major part of the year when they live outside the Swedish breeding area.

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Introduction

A marked decrease of Red-backed Shrike *Lanius collurio* populations has been documented in large parts of Western and Central Europe (Kowalski 1987). An increase in precipitation in the breeding season, large habitat changes and the use of herbicides and insecticides have been proposed as the main causes of the decline (Hölzinger 1987, Kowalski 1987). In Sweden, a decrease has also been recorded in both the breeding areas (Svensson 1994) and at bird observatories along the species' migration routes (Pettersson 1993). Pettersson found that the decrease started at the beginning of the 1980s and that it was first reflected in a lower proportion of juvenile birds, indicating a low reproductive rate in the recruitment areas to the north. However, details on the actual breeding success of the Swedish population of Red-backed Shrikes are lacking, but desirable. In a companion paper (Olsson 1995), details on habitat and territory have been treated. Here the breeding biology will be considered in more detail.

Material and methods

The study was made in Gryt in the province of Östergötland (50°10'N, 16°50'E) during several decades but more intensively during the late 1980s and, especially, from 1990 to 1994. For a description of the area and its climate, see Olsson (1995).

The Red-backed Shrike arrives very late in spring and leaves the breeding area early in autumn. This makes the territory a strict breeding territory. The male usually arrives a few days before the female and immediately announces his possession of a restricted area from high vantage points. In those 27 years during the period 1956–91 for which reliable data exist, the mean date of first arrival was 16 May (±4.2 days, S.D.; Fig.1).

After pairing the shrikes soon turn to a very elusive living. The nest-building period is short – only some 5–6 days – and does not give an investigator much time to locate a number of nests. The species is also very sensitive to disturbance and may desert the nest during the construction phase and

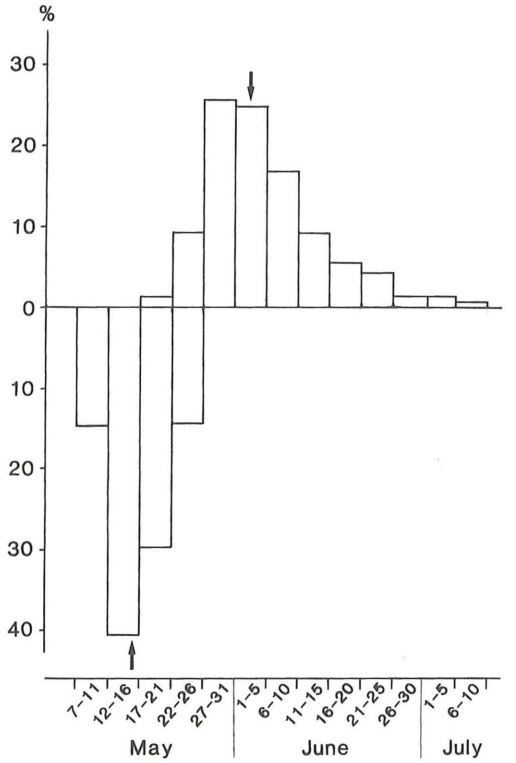

Fig.1. Distribution of dates of first arrival (%) of Red-backed Shrikes during 1956–1991 (N=27; lower histogram) and of laying dates (%) during 1959–1993 (N=195 clutches; upper histogram) in Gryt. Median dates indicated by arrows.

Törnskatans första ankomstdag på våren (%) till Gryt under perioden 1956–1991 (N=27; nedre histogrammet) och datum för läggningsstarten i 195 kullar under åren 1959–1993 (övre histogrammet). Mediandatum indikerat med pil.

even later with eggs in the nest cup (Durango 1963). For these reasons, most nest search must be done later on.

The data on nests gathered here will have somewhat different origins which explains why the total number of nests varies in different calculations. Ideally, for calculations of clutch size, only nests found during incubation should be used. Likewise, calculations of the number of fledglings should ideally be based on observations at the very latest nestling stage. However, also in this case difficulties arise with the Red-backed Shrike because the nestlings have a tendency to jump out of the nest at the slightest disturbance several days before they are able to fly even poorly. Already at the age of 13 days they may sit on the nest rim (Fig.3). For this reason, ringing of the young and the last nest control at close quarters should be done no later than 9–10 days after hatching. The data on numbers of fledglings presented here therefore refer to young of this age. Losses after this stage and up to the point of fledging seem to be very few, however.

Table 1. Nest sites of Red-backed Shrike *Lanius collurio* in southeast Sweden during 1959–94.

Boplatsval hos törnskata i sydöstra Sverige under åren 1959–94.

Nest site *Boplats*	n	%
Dogrose *Rosa canina* *Nypon*	54	22.2
Juniper *Juniperus communis* *En*	54	22.2
Blackthorn *Prunus spinosa* *Slån*	51	21.0
Spruce *Picea abies* *Gran*	19	7.8
Blackberry *Rubus fruticosus* *Björnbär*	17	7.0
Heap of dry branches and twigs *Rishög*	13	5.4
Apple bush or tree *Malus sylvestris* *Vildapel*	10	4.1
Nettles *Urtica dioica* and other herbs *Nässlor och andra höga örter*	7	2.9
Alder *Alnus glutinosa* *Al*	4	1.6
Hawthorn *Crataegus oxyacantha* *Hagtorn*	2	0.8
Raspberry bush *Rubus idaeus* *Hallon*	2	0.8
Alpine currant *Ribes alpinum* *Måbär*	2	0.8
Plum bush *Prunus domestica* *Plommonbuske*	2	0.8
Pine *Pinus sylvestris* *Tall*	2	0.8
Hazel *Corylus avellana* *Hassel*	1	0.4
Goose-berry *Ribes grossularia* *Krusbär*	1	0.4
Bird cherry *Prunus avium* *Körsbär*	1	0.4
Black currant *Ribes nigrum* *Svarta vinbär*	1	0.4
	243	100

Choice of nest site

Bushes presenting good perches for insect hunting nearly always also provide good nesting sites. Returning from one year to another shrikes show high fidelity to their old territory and also often to nest sites (see Fig.2 in Olsson 1995). The new nest may sometimes even be built just above or very close to the still remaining nest of the previous year. Once a pair built their nest in the same twig fork from which I had removed the old nest of the preceding year. I have never seen shrikes re-use their nest, but once I found a nest built in the cup of an old Song Thrush *Turdus philomelos* nest.

The sites of 243 nests are shown in Table 1, which demonstrates the shrike's ability to vary their choice of nest site. Choice, of course, depends not only on the birds themselves but also on the availability of different kinds of shrub. However, in territories with many bushes of birch *Betula* spp., aspen *Populus tremula* or sallow *Salix* spp., these were never used. Many territories also contained plenty of young Scots pine *Pinus sylvestris*, but these were used extremely rarely compared with Norway spruce *Picea abies*.

Spikes and thorns seemed to be very important to make a bush a good nesting site. About half of all nests (50.2%) were built in dogrose *Rosa canina*, blackthorn *Prunus spinosus* and blackberry *Rubus fruticosus* (coll.). If junipers *Juniperus communis*, which are also difficult for predators to penetrate, are included, the proportion of spiny shrubs of all those used for nesting rises to 72.4%. Besides shrub, heaps of sticks and branches, and sometimes tall herbs, were used as nest sites, but only rarely.

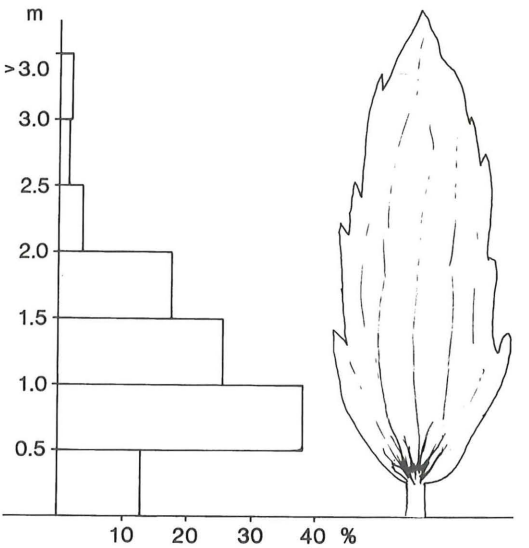

Fig.2. Height above the ground of Red-backed Shrike nests (N=208). Data from 1961–94.

Höjden över marken för 208 törnskatebon under åren 1961–94.

After nest loss, a pair of shrikes may choose quite a different kind of site and location for the repeat nest. In one case, when the first nest which was well hidden in a rose bush, was spoiled by a storm, the

Table 2. Weight (g dry weight; g.d.w.) in per cent of different nesting materials in five (1–10) nests of Red-backed Shrike from the years 1991–92.

Medelvikt (g torrvikt) i procentuell andel i fem olika bon (1–10) av törnskata, 1991–92.

Nest materials *Bomaterial*	Nest no. *Bo nr* 1	3	4	7	10	Mean g.d.w.	Mean %
Grass *Gräs*	14.7	15.3	58.5	27.1	2.4	8.8	22.4
Dry herb stems *Torra örtstänglar*	53.7	1.6	12.5	0.6	8.2	5.9	14.9
Moss *Mossa*	11.4	8.9	3.8	25.5	–	4.2	10.7
Dry sticks *Torra pinnar*	0.8	3.1	5.5	11.7	32.5	4.2	10.5
Fine roots *Tunna rottrådar*	6.7	5.1	13.6	1.8	28.7	4.1	10.4
Roots of Agropyron repens *Kvickrotsrötter*	1.5	42.3	–	–	–	3.7	9.6
Bast from Juniper bush *Enbast*	0.5	4.4	–	24.2	1.1	2.7	6.9
Plant– and animal wool *Växt- och djurhår, ull*	–	9.8	–	0.6	15.6	2.1	5.2
Lichens *Lav*	–	–	0.7	1.9	3.4	0.5	1.2
Other *Övrigt*	10.7	9.5	5.1	6.7	8.1	3.2	8.1
Nest weight *Bovikt* (g.d.w.)	40.0	43.0	31.4	45.6	36.9	39.4	

new nest was built in a very open site in a small apple *Malus sylvestris* tree. Another nest, well concealed and placed very low in a small blackthorn bush, was depredated, and a new nest was immediately built 3.7 m high on a branch, also in an apple tree. This nest was exceptional, especially by having been built so high above the ground.

Nest sites higher than 2.5 m were rare, and those above 3 m extremely rare (Fig.2). Most nests were built 0.5–1.5 m above the ground, at a median height of 1.1 m. Even extremely low nests were mostly built without real contact with the ground, on some twigs or roots.

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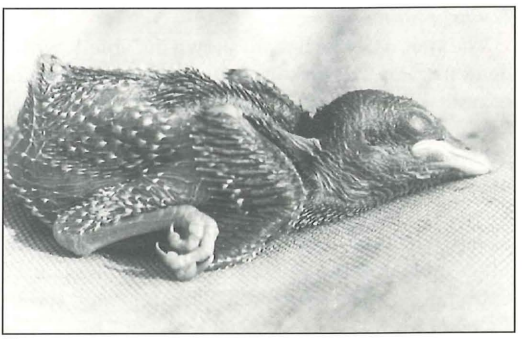

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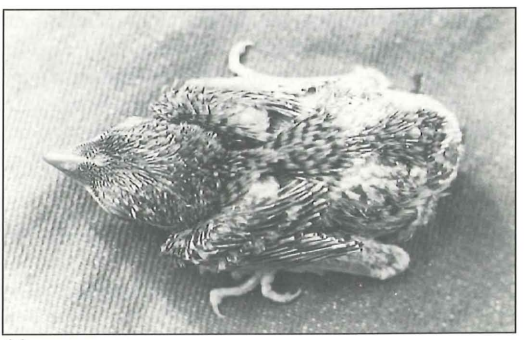

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Nest materials

Red-backed Shrikes vary their choice of nesting material considerably (Table 2). In fact, they seem to pick up just what is within reach. In the nest of one pair living in a small area of wasteland in open, cultivated fields (nest 3), more than 40% of the nest by dry weight consisted of roots of *Agropyron repens*, harrowed out from the soil by the farmer. Another pair nesting in a clear-cut had used dry sticks from cut bushes; these made up 30% of the weight of the nest (nest 10). One nest (4) contained more than 60% dry grass and yet another one (1) more than 50% dry herb stems. In nest 7, fibers from *Juniper* formed a large part (25%). According to Poltz (1975), nests with a large amount of moss would be at risk as they easily get soaked in hard rain. Only nest 7 contained much moss (25%), in one moss was completely missing, and in the others the amounts of this material were insignificant (Table 2).

Egg laying

In many cases, the date of laying of the first egg was calculated from the age of the nestlings. The time they stay in the nest is short and their age easy to define (Fig.3). To nestling age I added an incubation period of 14 days and the number of nestlings plus eggs (when present), assuming the laying of one egg per day.

Egg laying culminated in late May to early June, with 2 June as the median date. This is about two weeks after the mean date of first arrival (16 May) of the shrikes in spring (Fig.1). The earliest clutch in any year was started on 19 May, and the latest one was initiated on 9 July. The latter clutch and many others in late June and July may have been repeat layings after total nest losses but their proportion of the total number of clutches recorded is impossible to state. Fig.1 includes clutches from seasons with all kinds of weather, normal, bad or exceptionally good.

Late clutches may also represent first ones laid by birds arriving late in the spring. At Ottenby Bird Observatory about 200 km to the south of Gryt, Engqvist & Pettersson (1986) found 26 May as the median date of the spring passage of Red-backed

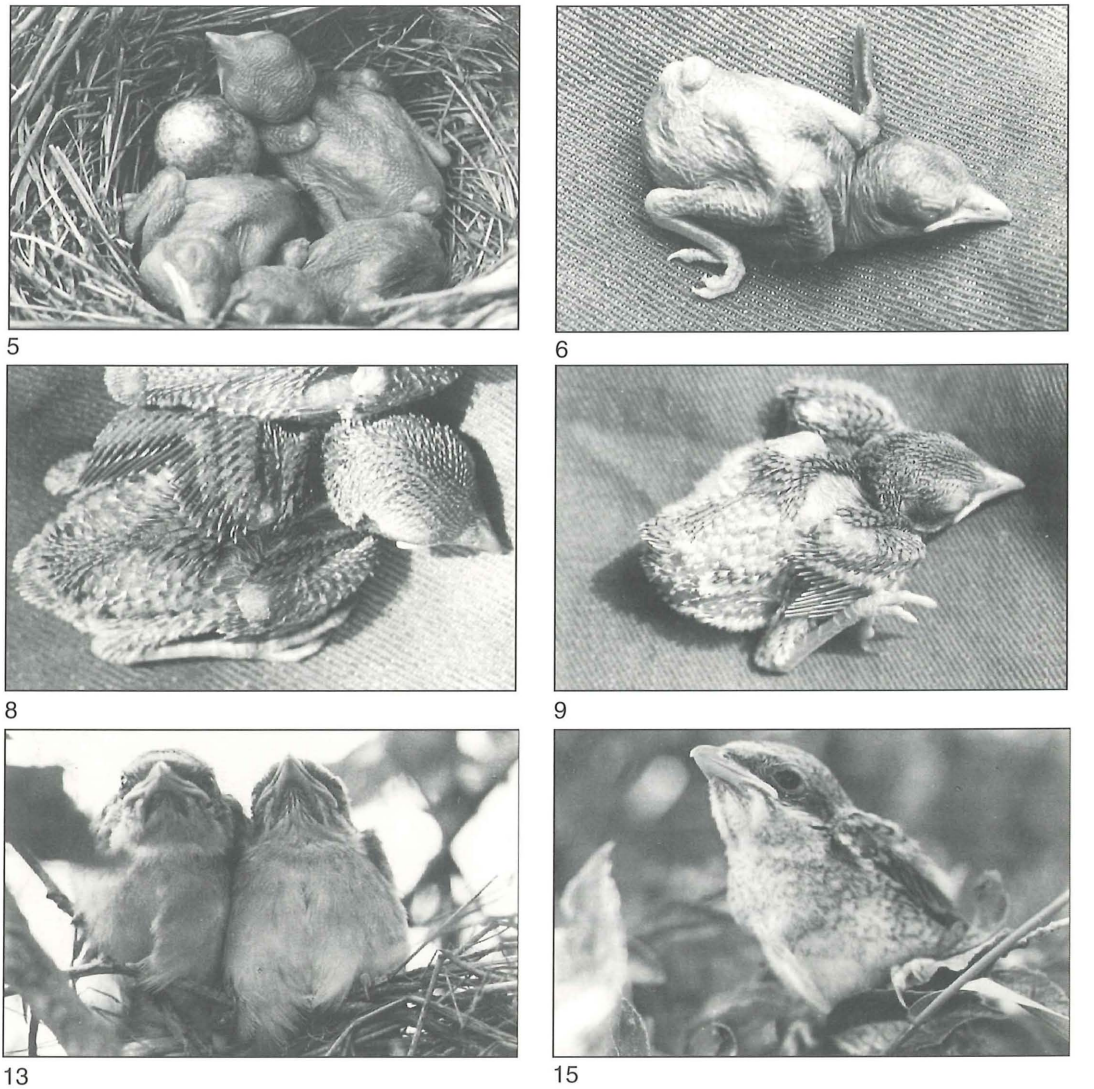

Fig.3. Development of nestling Red-backed Shrikes from hatching to fledging. Numbers indicate age in days.
Törnskateungens utveckling från kläckning till just efter bolämnandet. Siffror anger ålder i dygn.

Shrikes during the period 1950–84, but with considerable migration going on also in the first and second weeks of June.

In 1991, with an extremely bad weather, 22 June was the mean starting date for the 12 clutches found, i.e. about three weeks after the normal culmination. The cause of such late laying may be either a late arrival or a delayed egg-laying because of poor nutritional state of the female.

Clutch size

Data from 91 clutches with eggs have here been supplemented with data on 28 broods containing both eggs and very small nestlings. The clutch size distribution of these is shown in Table 3. During the course of the breeding season, the size of the clutch declines. Clutches laid in May (N=35) had a mean of 5.64 eggs, those in the period 1–15 June (N=53) 5.26

Table 3. The number of eggs in 119 complete clutches of the Red-backed Shrike from the years 1980–1994 in southeast Sweden.

Fördelningen av antalet ägg i 119 kullar hos törnskata under åren 1980–1994 i sydöstra Sverige.

Clutch size Kullstorlek	3	4	5	6	7	
Number of clutches *Antal*	3	10	56	47	3	n=119
%	2.5	8.4	47.1	39.5	2.5	Mean=5.3

eggs, and those from 16 June onwards 4.37 eggs (Fig.4). Similar series from May to July have been calculated in other parts of the species' breeding area, e.g. England (5.3–4.6–3.5; Ash 1970), France (5.37–4.73–4.0; Lefranc 1979) and Switzerland (5.51–5.03–4.57; Luder 1986).

Breeding success

For 91 clutches the number and fate of the eggs are known. The mean number of fledged young was 3.5, calculated for all nests including those suffering total loss. In successful nests, i.e. those producing at

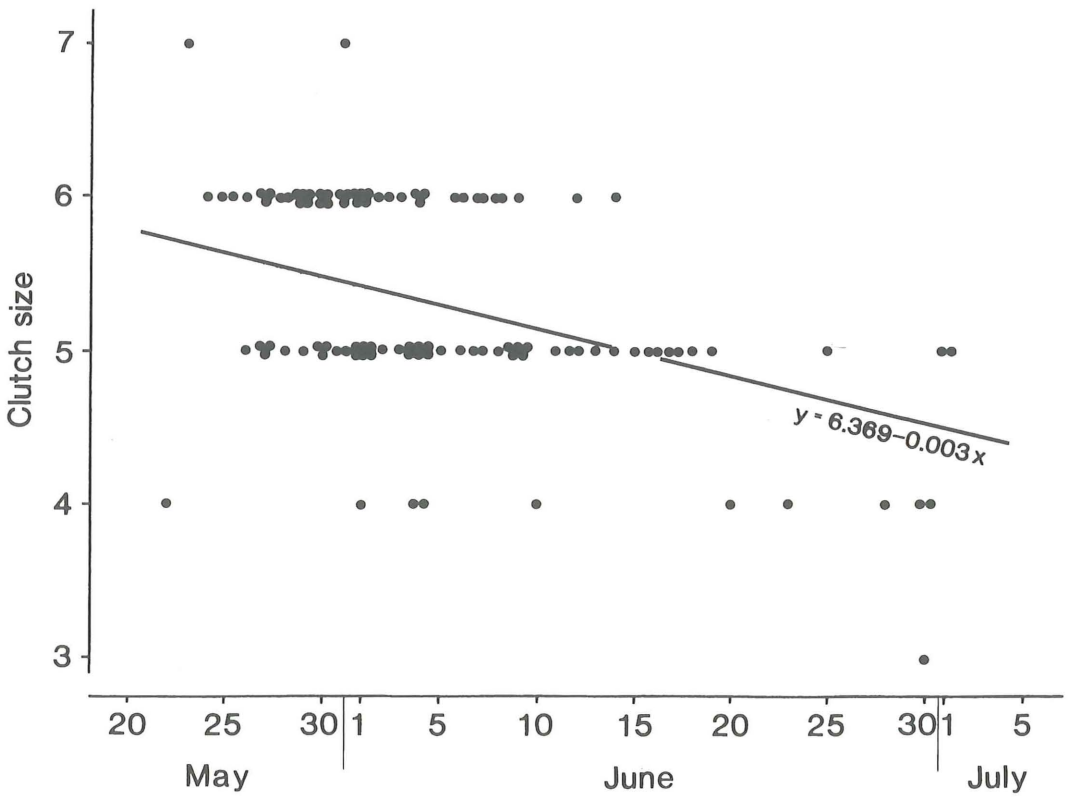

Fig.4. The seasonal decline in clutch size of the Red-backed Shrike in Gryt. Data from 1956–1992. Equation of the line: Y=6.37 – 0.03X.

Kullstorlekens minskning med säsongens framskridande hos törnskator i Gryt. Data från perioden 1956–1992. Linjens ekvation: Y=6.37 – 0.03X.

least one fledged young, the mean was 4.3. In only 34 of the 91 broods (37.4%) the number of fledged young was the same as the original number of eggs in the nest. In the remaining 57 nests either partial or complete losses occurred. Eighteen broods (19.8%) were totally spoiled, 15 of them by predation, one by rain and storm, and the remaining two were deserted for unknown reasons.

Out of a total number of 465 eggs, 29 (6.2%) remained unhatched in the nest together with the nestlings. However, calculations show that another 30 eggs were unsuccessful; these were either lost as eggs or as nestlings that had been removed dead or alive from the nest.

As a consequence of the Red-backed Shrike's choice of prey and hunting modes (Olsson 1995), its breeding success may be affected by even small variations in weather. In a very wet week of July 1982, the shrikes at one nest were seen feeding their young with earthworms. Eventually only one of the originally six nestlings survived to fledging. In the very cold and wet spring of 1991, the mean number of eggs in the nests was a quite normal 5.2, but only a mean of 2.1 young fledged. Considering only the few nests from which at least one young fledged (N=7), the corresponding number was 3.6. In contrast, in the three favourable (dry and hot) springs of 1989, 1990 and 1992, the mean number of fledglings in successful nests was 4.9. Thus, in the long run, production in good years may compensate for that in bad years. But the above observations also show how sensitive the Red-backed Shrike is to variations in the weather and how disastrous even short, wet cold spells may be.

Post-fledging period

The nestlings stay in the nest 14–16 days. During their last 4–5 days in the nest they show a pronounced behaviour that will help all or many of them to survive a predation attempt. Still not able to fly they simultaneously jump out of the nest and dive deep into tall grass or herbs. There they remain motionless until the adult birds signal that the danger is over.

Prolonged parental feeding keeps the brood together long after the young are fully fledged. In this study, ringed young birds were several times found quite near the nest up to a month after they left it. After this period they begin to leave the territory. On three occasions young birds were found 1–2 km from the nest 5–6 weeks after fledging. In two of these cases the brood was still together, with at least one of the adult birds also present. In all three cases they were found south of the original territory. Possibly this was the prelude to real migration. Most Red-backed Shrikes have already left the study area at the end of August.

Discussion

Nesting

In their choice of nest site and in building the nest, Red-backed Shrikes demonstrate adaptability. Even rather great changes in their environment may not cause them any difficulty with respect to these activities. Environmental changes seem to have been great enough already to have caused changes in their behaviour. As an example one can mention the decline of open meadows and shrub-rich pastures in Sweden and the contemporary increase of areas planted with spruce. In the years 1959–79 only 5.6% of the nests found were in young spruce, but from 1980–93 the corresponding figure was 9%. In Germany, the trend has been the opposite, from 15.6% of nests in spruce during 1968–73 to only 5% in 1980–85 (Jacober & Stauber 1987a). These authors' explanation is that the spruce plantations now have grown so tall that they no longer attract shrikes. Thus, new planting of spruce must have ceased or declined considerably in their study area in southern Germany. In Sweden, this has certainly not been the case, and will not be the case in the future.

Increased breeding in young spruce may have negative effects, for instance on breeding success. However, in their study of more than 800 nest sites, Jacober & Stauber (1987a) found greater breeding success (63%) in spruce than in other sites (45%) They supposed that nests in spruce dry out faster than others after heavy rain, and that the characteristic horizontal layering of the twigs provides better nest support than other bushes. The number of nests in spruce in my study was rather small (N=19) but predation resulting in total loss was very high (23.5%). As shrikes, because of their hunting mode, use plantations on which young spruce are dispersed thinly, a nest bush tends to stand in a rather open place, such as a glade or at the edge of the plantation. This may increase the risk that the nest will be discovered by predators.

Among shrikes renesting after nest loss, Ash (1970) found a preference for placing the nest in the same kind of site and saw a danger in the species' inability to turn to other nesting alternatives. This study, however, demonstrated flexibility in the shrikes' nest site selection. Yet, the re-planting of clearcuts

with pine seems to have negative effects because Red-backed Shrikes seem unable or unwilling to build in young plants of this species.

Clutch size

In the present study area, the mean clutch size was 5.3 when all clutches laid throughout the summer were included, i.e. also repeat layings. For much older Swedish clutches, probably mostly from the beginning of the 20th century, a mean size of 5.25 has been reported (Rosenius 1929) but the origin of the clutches upon which this calculation was based is not quite clear. In Finland, clutch size was 5.3–5.4 eggs (Haartman 1969).

For first clutches laid in May, the mean clutch size was 5.64 in my study area. Corresponding values were 5.3 in England (Ash 1970), 5.37 in France (Lefranc 1979) and 5.51 in Switzerland (Luder 1986). As in several other bird species, the size of the clutch of the Red-backed Shrike increases from west to east (Lack 1947). In my study area no signs at all of a decrease in clutch size have been found either compared with Rosenius' study or during the four decades of the present study.

Breeding success

The number of young fledging from successful nests in this study was on average 4.3. The corresponding value in England was 4.1 (Ash 1970) and in France 4.2 (Lefranc 1979). In studies of the productivity of populations, it is important to know the production of fledglings in all nests, including spoiled ones. In Gryt, this has been on average 3.5, to be compared with 2.7 in Germany (Jacober & Stauber 1987b) and 2.9 in Switzerland (Rudin 1990). According to Jacober & Stauber (1987b) a pair of Red-backed Shrikes must produce 2.9 fledglings per year to balance mortality losses. Even if there may be differences in mortality between Swedish and German populations, the productivity in Gryt seems quite satisfactory.

In Switzerland, Luder (1986) found a gradual delay in the arrival of the Red-backed Shrike in spring. As a consequence, the proportion of clutches started in May, with their larger number of eggs, gradually decreased which influenced productivity negatively. In the period 1960–85, he found a delay of 0.28 days per year in the arrival of the birds. From this he argues that the decrease of the Red-backed Shrike in Switzerland is explained by factors affecting the birds outside the breeding season.

In my study area, the average first day of arrival (1956–91) was 16 May. For the years 1930–54, Durango (1956) found this date to be 18 May at Täby north of Stockholm. The difference between these two dates probably only reflects the latitudinal difference, Täby being about 170 km to the north of Gryt. Thus, spring arrival of the shrikes in eastern Sweden has not been delayed in later years. Neither can any delay be found in the observations at Ottenby Bird Observatory during the period 1959–85 (Enqvist & Pettersson 1986).

The decline of the Swedish population

Doubtless the Swedish population of the Red-backed Shrike is declining (Svensson 1994). According to Pettersson (1993) this decline first became evident among juvenile birds leaving Sweden in autumn at Ottenby, but later on also among adults. The present study has not revealed any lowered reproduction in this part of the species' Swedish range, nor any decline in population density (Olsson 1995). Studies on strongly declining populations in both England (Ash 1970) and Germany (Poltz 1975) have demonstrated good breeding success in some populations close to others with poor reproduction. In England, the species has now gone extinct. In a long-term study near Gothenburg, western Sweden, the breeding population has long remained stable, and no decline in breeding success has been observed (J. Bergqvist in litt.).

On the other hand, reports from more northern parts of the species' Swedish range indicate poor breeding success and a sharp population decline. Here the species is living at the northern margin of its European range. In the 1950s and 1060s, Durango (1956, 1963) found that, in rainy springs, few pairs remained in his area and those that did reproduced poorly. In one really bad year, 1961, all birds disappeared. This was never observed in Gryt in any of the c.40 years of my study. Based on his experience of Red-backed Shrikes in both a southern (58°N) and a northern (59°30'N) area, Durango stressed the much stronger effects of bad weather in the latter.

From the provinces of Gästrikland and southern Dalarna (60–61°N), L. Risberg (in litt.) has reported that the Red-backed Shrike has decreased by 75%, or probably more. In Värmland, at the same latitudes but further west, there has also been a strong decline (U.T. Carlsson in litt.). Low autumn populations for Sweden as a whole have been reported after years with bad weather in spring and summer (1982, 1985–87 and 1991; Svensson et al. 1992). It seems

unlikely that the shrikes in the north have experienced more negative, man-made changes of their environment than those in the south of Sweden. But a species thriving in hot and dry climates must be harder hit by cold and wet weather at the northern border of the range than further south and it is in the former areas that a clear decrease has been documented. In a general description of the climate in Sweden, Bosaeus & Melin (1988) state that "the wettest June months have usually occurred in the 1980s".

Paradoxically, in parallel to this decline, Red-backed Shrikes have been found increasingly often north of the Scandinavian breeding area. This increased number of observations mostly refers to single individuals, both in Sweden (SOF 1990) and in Norway (Gustad 1993).

As the Red-backed Shrike spends very few months of the year in Sweden, and most of its life in the wintering area and along the migration routes, great losses may occur outside Sweden. Two ringed birds from Gryt have been found, one in September in Czechoslovakia and one in April in Angola. Other winter recoveries of Swedish birds have been reported from Central Africa, but to the east of Angola (Österlöf 1976). In this area wintering shrikes have been studied in detail (Bruderer 1993) and seem to thrive and be exposed to very few dangers. Little is known about losses along the long migration routes between this wintering area and breeding areas in Sweden. If these losses are considerable, they will probably hit the populations farthest to the north hardest. From a diminishing number of birds arriving from the south in spring, few will reach the more northerly areas.

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References

Ash, J. 1970. Observations on a decreasing population of Red-backed Shrikes. *Brit. Birds* 63: 185–205, 225–239.

Bosaeus, L. & Melin, C. 1988. *Årets väder*. ICA-förlaget, Västerås. (In Swedish.)

Bruderer, B. 1993. Neuntöter – ein Leben unterwegs: Stammgast in der Savanne. *Ornis* 5/93: 33–35.

Durango, S. 1956. Territory in the Red-backed Shrike. *Ibis* 98: 476–484.

Durango, S. 1963. Törnskatan. In: Curry-Lindahl, K. 1963. *Våra Fåglar i Norden*. Bd 4. Natur & Kultur, Stockholm, pp. 2009–2016. (In Swedish.)

Engqvist, M. & Pettersson, J. 1986. Flyttningens tidsmässiga förlopp hos 104 fågelarter vid Ottenby. *Spec. Rep. Ottenby Bird Observ. No.8.*

Gustad, J.R. 1993. Fugler i Norge 1992. Rapport fra Norsk faunakomité for fugle (NFKF). *Vår Fuglefauna* 16: 227–248. (In Norwegian.)

Haartman, L. von 1969. The nesting habits of Finnish birds. I. Passeriformes. *Comm. Biol.Soc. Scient. Fenn.* 32: 1–187.

Hölzinger, J. 1987. Einfuhrung zum Artenschutzsympoisum Neuntöter. *Beih. Veröff. Naturschutz Landschaftspfl. Bad.-Wurtt.* 48: 7–15.

Jacober, H. & Stauber, W. 1987a. Habitatanspruche des Neuntöters (*Lanius collurio*) und Massnahmen fur seinen Schutz. *Beih. Veröff. Naturschutz Landschaftspfl. Bad.-Wurtt.* 48: 25–53.

Jacober, H. & Stauber, W. 1987b. Zur Populationsdynamik des Neuntöters (*Lanius collurio*). *Beih. Veröff. Naturschutz Landschaftspfl. Bad-Wurtt.* 48: 71–78.

Kowalski, H. 1987. Zur Bestandssituation des Neuntöters (*Lanius collurio*) in der Bundesrepublik Deutschland und in Westberlin. *Beih. Veröff. Naturschutz Landschaftspfl. Bad.-Wurtt.* 48: 17–23.

Lack, D. 1947–48. The significance of clutch size. Ibis 89: 302–352, 90: 25–45.

Lefranc, N. 1979. Contribution à l'écologie de la Pie-grieche écorcheur *Lanius collurio* L. dans les Vosges moyennes. *Oiseaux R.F.O.* 49: 245–298.

Luder, R. 1986. Abnahme der durchschnittlichen Gelegegrösse (1901–1977) beim Neuntöter *Lanius collurio* in der Schweiz. *Orn. Beob.* 83: 1–6.

Olsson, V. 1995. The Red-backed Shrike *Lanius collurio* in southeastern Sweden: Habitat and territory. *Ornis Svecica* 5: 31–41.

Pettersson, J. 1993. Populationsövervakning genom standardiserad fångst. *Vår Fuglefauna*, Suppl.1: 13–16.(In Swedish.)

Poltz, W. 1975. Über den Rückgang des Neuntöters (*Lanius collurio*). *Vogelwelt* 96: 1–19.

Rosenius, P. 1929. *Sveriges Fåglar och Fågelbon*. Bd 2. Lund. (In Swedish.)

Rudin, M. 1990. Bruterfolg under Futterungsverhalten des Neuntöters *Lanius collurio* in der Nordwestschweiz. *Orn Beob.* 87: 243–252.

SOF 1990. *Sveriges Fåglar*. 2 ed. Stockholm. (In Swedish.)

Svensson, S. 1994. *Övervakning av fåglarnas populationsutveckling. Årsrapport för 1992 och 1993. Ekologiska Institutionen, Lunds Universitet.* (In Swedish.)

Svensson, S., Olsson, O. & Svensson, M. 1992. Förändringar i fågelfaunan. *Naturvårdsverket, Rapport 4095.* (In Swedish.)

Österlöf, S. 1976. *Report for 1967 of the Bird Ringing Office*. Swedish Mus. Nat. Hist., Stockholm.

Sammanfattning

Törnskatan i sydöstra Sverige: Häckningsbiologi

Beträffande undersökningsområdet, dess naturförhållanden, törnskatebiotoper och artens utnyttjande av dessas födoresurser, se Olsson 1995.

På grund av törnskatans undangömda levnadssätt just vi häckningens inledningsskede och risken för att fåglarna vid störning skall överge påbörjat bo och även nylagda ägg, har de flesta bon sökts vid senare skeden i häckningen. Genom att veta ungarnas ålder (se Fig. 3), utgå från en ruvningstid om 14 dygn och inräkna antalet ägg med utgångspunkt från att de lagts ett per dygn, kan ett sannolikt äggläggningsdatum beräknas (Fig. 1). Kulmen i äggläggningen ligger i månadsskiftet maj–juni med 2 juni som mediandatum. Detta datum ligger cirka 2 veckor efter medeldatum för artens första ankomstdag (16 maj) beräknat på 27 vårar under åren 1956–91.

Törnskatan uppvisar stor variationsrikedom i valet av plats för boet (Tabell 1) och i valet av bomaterial (Tabell 2). Buskar med taggar och tornar föredrages klart (50,2%) framför andra, och medräknas enen, som på litet annat sätt också hindrar eventuella predatorer, uppgår de "stickiga" buskslagens andel till 72,4%. Trots riklig förekomst av björk, asp och sälg i de flesta revir har av 243 bon inte något anträffats i dessa trädslag, och bon i tall är mycket sällsynta jämfört med dem i gran.

Vid omläggning, t.ex. efter boplundring, visar törnskatan ej någon speciell tendens att söka upp samma eller liknande läge som för det första boet. I England konstaterades en bundenhet till den först valda boplatstypen, vilket ansågs försvåra törnskatans anpassningsmöjligheter till nutida landskapsomvandlingar. I denna svenska studie har en förhållandevis stor del (15,3%) av häckningarna skett på hyggen, och andelen bon i smågranar har redan ökat i takt med nedläggning av beten i hagmarker och en parallell ökning av granplanteringarna. Törnskatans ovilja att bygga bo i ungtallar gör rena tallplanteringar mindre lämpliga för arten.

Äggkullens medelstorlek (N = 119) har varit 5,3 (Tabell 3). Vid denna beräkning har alla funna kullar inkluderats, alltså även omlagda kullar, vilkas andel av totalmaterialet inte gått att fastställa. Under häckningstidens gång finner man en gradvis nedgång i kullstorleken enligt följande; alla kullar i maj 5,64 ägg, kullar från 1–15 juni 5,26, och alla kullar senare än 15 juni 4,37 (Figur 4).

Produktionen av ungar har uppgått till i medeltal 3,5, vari då också inräknats bon med olika grader av förluster, även totalförluster. Av de 91 bon, som varit användbara för denna beräkning, har det endast varit 34 där antalet flygga ungar varit detsamma som det ursprungliga äggantalet. I 18 (19,8%) av de 91 bona inträffade totalförlust. Femton av dessa spolierades av predatorer, ett bo blåste ner och de övriga två övergavs av okänd anledning. Trots dessa förluster får en produktion om 3,4 ungar per bo ses som hög, då motsvarande siffra t.ex. i Tyskland varit 2,7 (Jacober & Stuber 1987b) och i Schweiz 2,9 (Rudin 1990). Enligt Jacober & Stauber måste i Tyskland ett törnskatepar producera 2,9 ungar/år för att uppväga mortaliteten.

Medelantalet producerade ungar per lyckad häckning (minst en flygg unge) har i denna undersökning uppgått till 4,3, jämfört t.ex. med 4,1 i England (Ash 1970) och 4,2 i Frankrike (Lefranc 1979). Det finns i undersökningsområdet inga tecken på att häckningsresultaten skulle ha försämrats under senare år. Från Schweiz rapporteras en gradvis försenad ankomst under en längre serie vårar (Luder 1986), vilket givit färre andel av de större, tidiga kullarna, och därigenom en minskad produktivitet i området. Jämförelser mellan äldre kända ankomsttider (Durango 1956, Engquist & Pettersson 1986) och nutida i sydöstra Sverige visar inte heller på någon sådan försening.

I samband med artens snabba nedgång i Storbritannien påvisades normala häckningsresultat i vissa områden, samtidigt med mycket dåliga i närliggande undersökningsytor (Ash 1970). Det har inte gått att finna några uppgifter om försämrade häckningsutfall i andra delar av södra Sverige. Däremot har vid förfrågan Lennart Risberg angivit en minst 75%-ig nedgång i beståndet i Gästrikland–södra Dalarna, och Ulf T. Carlsson en "stark minskning" i Värmland (båda i brev).

Det är svårt att se att av människan orsakade miljöförändringar i dessa nordligare delar av törnskatans utbredningsområde skulle vara allvarligare än i sydöstra Sverige. Det förefaller däremot sannolikt att den konstaterade nedgången i den svenska populationen som helhet framför allt kan ha sin orsak i allvarligare följder av kall och våt väderlek i dessa artens nordliga utkantsområden än längre söderut.

Slutligen bör man komma ihåg att arten endast vistas under cirka 3 månader av året i Sverige, och under 9 månader utanför våra gränser. Vintertillhållen ligger i södra Afrika, och ökade risker av flera olika slag under senare år kan drabba törnskatorna framför allt utmed de långa flyttningsvägarna. Till dem hör ökenspridningen, miljögifter och aktiv förföljelse från människans sida.