

MALE-BIASED BREEDING SITE FIDELITY IN A POPULATION OF NORTHERN SHRIKES¹

REUVEN YOSEF²

Mitrani Center for Desert Ecology, Department of Biology, Ben-Gurion University,
Jacob Blaustein Institute for Desert Research, Sede Boqer Campus, 84993 Israel

Key words: Northern Shrike; *Lanius excubitor*; Israel; breeding site fidelity; shrike.

Northern Shrikes (*Lanius excubitor*) are the most widely distributed of true shrikes (Laniinae) with a circum-polar breeding range. In Israel, it is a permanent resident (Paz 1987). I studied sex-biased, nest site-fidelity of a population of this species during three breeding seasons (mid-January to mid-June, 1987-1989). The study area was on Sede Zin, a loess-covered plateau, near Sede Boqer (30°52'N, 34°47'E; 475 m altitude) in the Negev Desert highlands. The region is arid with mild winters and warm summers. The Sede Zin plateau supports a sparse dwarf-shrub community dominated by *Hammada scoparia*, *Zygophyllum dumosum*, *Raemuria hirtella*, *Anabasis syriacus*, and *Artemisia herba-alba*. The major woody species are *Tamarix nilotica*, *Atriplex halimus*, *Retama raetam*, and *Thymelaea hirsuta* (Danin et al. 1975).

METHODS

I trapped Northern Shrikes using a modified Bai-Chatri noose trap (Clark 1967), and banded all individuals included in the study area with a unique combination of aluminum and colored plastic leg bands. I visited active nests every 2-5 days, and mapped territories

based on activity of males and their aggressive responses to playbacks of other males and a taxidermic mount. Seven breeding pairs were observed during 1987-1989.

In all three years, Northern Shrikes were the earliest nesting passerines in the area. Their nests are bulky structures made of sticks and twigs and are anchored to the surrounding branches of the nesting tree or bush. I observed 31 nest initiations. The period of nest initiation was 23 January-19 May in 1987, 1 March-21 May in 1988, and 23 March-17 May in 1989. Average time for completion of the nest was 9.0 ± 3.2 days ($\bar{x} \pm$ SD; $n = 27$ pairs). The shrikes nested in a variety of trees and bushes situated in open areas, building mainly in *Atriplex halimus* (74%), but also in *Tamarix nilotica* (11%), *Ochradenus baccatus* (6%), and *Colutea istria* (4%). Two nests (4%) were built in a roll of barbed wire. The average height of the rim of the nests above ground was 95.2 ± 27.9 cm ($\bar{x} \pm$ SD; $n = 33$).

In Loggerhead Shrikes (*Lanius ludovicianus*), nest sites used for two or more consecutive years have been taken as an indication of nest-site fidelity (e.g., Atkinson 1901, Miller 1931, Porter et al. 1975). Because some pairs of Northern Shrikes were multi-brooded within a breeding season, I used three measures of nest site fidelity within and among breeding seasons: (1) repeat use of same supporting structure; (2) second or additional nest within a radius of 25 m from the initial nest of the season, which can be described as the core territory; and (3) all nests beyond the core territory.

In 1987, of nine second or third nesting attempts,

¹ Received 19 March 1992. Accepted 18 May 1992.
² Present address: Department of Zoology, The Ohio State University, Columbus, OH 43210

SHORT COMMUNICATIONS 1027

- rates of migratory Loggerhead Shrikes: winter mortality or low site fidelity? *Wilson Bull.* 101: 458-460.
- KLIMKIEWICZ, M. K., R. B. CLAPP, AND A. G. FUTCHER. 1983. Longevity records of North American birds: Remizidae through Parulinae. *J. Field Ornithol.* 54:287-294.
- KRIDELBAUGH, A. 1983. Nesting ecology of the Loggerhead Shrike in central Missouri. *Wilson Bull.* 95:303-309.
- MILLER, A. H. 1931. Systematic revision and natural history of the American shrikes (Laniidae). *Univ. Calif. Publ. Zool.* 38:1-242.
- PAZ, U. 1987. The birds of Israel. Ministry of Defense Publ. House, Tel Aviv.
- PORTER, D. K., M. A. STRONG, J. B. GIEZENTANNER, AND R. A. RYDER. 1975. Nest ecology, productivity and growth of the Loggerhead Shrike on the shortgrass prairie. *Southwestern Nat.* 19:429-436.
- YOSEF, R., AND B. PINSHOW. 1989. Cache size influences female mate choice and reproductive success in the Northern Shrike. *Auk* 106:418-421.

TABLE 1. Nest-site reoccupancy by seven color-banded Northern Shrikes, *Lanius excubitor*, during the 1987-1989 breeding seasons on Sede Zin, Israel.

		Subsequent nest location			Total
		Same bush	Within core territory	Outside core territory	
Within season	male	25	1	1	27
	female	25	1	1	27
	pair	25	1	1	27
Among seasons	male	32	6	0	38
	female	0	0	0	0
	pair	0	0	0	0

five nests were built in the same site as the initial nest, three within the core area, and one outside the core area. Of 12 second or third nests constructed in 1988, nine were in the same bush and five within the core area. In the 1989 breeding season, of 11 second or third nesting attempts, seven re-nested in the same bush and four within the core area. None of the seven territories lacked shrubs or trees of at least 1 m in height within the core territory. This eliminated the possibility of lack of nest-site as a limiting factor that forced pairs to nest in the same structures every year. No changes in territory size or configuration were observed throughout the study period.

RESULTS AND DISCUSSION

During the 1988 breeding season, all seven males had different females, and initiated nest building in bushes or trees that had been used in 1987, as were all the subsequent renestings. Similar results were obtained for 1989, with one exception. A saltbush that had been used by the shrikes of that territory was cut down during the winter and the male chose another bush within the core area. In the 1989 season, one female that had bred in 1988 returned to breed with a different male. A within-breeding seasons comparison shows that males and females, when considered separately or as a pair, do not differ in their nest location (Table 1). However, an among-season comparison shows that no females returned to breed at a location from the previous seasons; and this also affects the nest-site reoccupancy for the pairs. However, males exhibit great reoccupancy rates by breeding 38 times in the same bush or tree. These data indicate the need for continuous, long term monitoring of the species in order to understand their breeding system.

Extreme sexual bias is also evident in this territorial population of Northern Shrikes. Males did not migrate and held territories all year, while females remained on territories only for the breeding season (Yosef and Pinshov 1989). All seven males were observed during the 1987-1989 breeding seasons; however, only 1 out of the 20 (5%) females bred on the study site in two separate years (1988 and 1989). This low return rate is similar to that observed by Kridelbaugh (1983, 0%), and Haas and Sloane (1989, 5%) for Loggerhead Shrikes.

Males initiated nest building by bringing twigs ($n = 31$) to the proposed nest site, although the female built most of the nest by herself. The males then perched on the bush and sang a 'trilling' song with an occasional

bobbing of the head. After 6 to 10 such sequences, the female would continue the building of the nest. Twigs brought by the males were incorporated into the external structure of the nest. When females started to build alone, males resumed hunting and fed the female.

Additional evidence of nest site fidelity was the occurrence of nests from previous breeding seasons in bushes and trees with current nests. One saltbush in 1987 contained 13 nests from previous years. During 1987-1989 breeding seasons, six more nests were added to this bush. This suggests that shrikes had returned to nest at the same site at least for the six years prior to 1987. That is, the bush had been occupied for about nine consecutive breeding seasons. If all these nests are attributed to a single male, it is indicative of his longevity. Although nine years may seem to be a long lifespan for a passerine, records for Loggerhead Shrikes indicate that they live up to 12 years (Klimkiewicz et al. 1983).

In summary, males are resident, females remain only for the duration of the breeding season, males initiated nest building in all three breeding seasons, and although not lacking suitable nest-sites in their core territories, nests were built in the same supportive structures. This suggests that nest sites were chosen by males who then lead the females to them.

I thank James N. Layne, Fred E. Lohrer, Carola A. Haas, Mark D. Howrey, Roy S. Slack and two anonymous reviewers for their comments on earlier drafts of this MS. This study was supported by grants from the Interuniversity Ecology Fund, Israel; and the Frank M. Chapman Fund of the American Museum of Natural History. This report is contribution No. 147 of the Mitrani Center for Desert Ecology.

LITERATURE CITED

- ATKINSON, W. L. 1901. Nesting habits of the California shrike. *Condor* 3:9-11.
- CLARK, W. S. 1967. Modification of the Bal-Chatrit trap for shrikes. *EBBA News* 30:147-149.
- DANIN, A., G. ORSHAN, AND M. ZOHARY. 1975. The vegetation of the northern Negev and the Judean Desert of Israel. *Israel J. Bot.* 24:118-172.
- DARLEY, J. A., D. M. SCOTT, AND N. K. TAYLOR. 1977. Effects of age, sex and breeding success on site fidelity of Gray Catbirds. *Bird-Banding* 48:145-151.
- HAAS, C. A., AND S. A. SLOANE. 1989. Low return