Status, habitat preferences and population estimates of non-breeding shrikes *Lanius* spp. in Maharashtra and Karnataka states, India

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Abstract: In November and December 2003, we conducted, for the first time in India, a survey on the status, habitat preferences, and numbers of shrikes. We recorded four species: Rufous-backed Shrike (*Lanius schach*), Bay-backed Shrike (*L. vittatus*), Southern Grey Shrike (*L. meridionalis*) and Red-backed Shrike (*L. collurio*). The last species, a winter vagrant to India, is the first record for the state of Maharashtra. The roadside census was conducted in Pune and Belgaum districts in Maharashtra and Karnataka states in India, by using the non-intersecting transect method. A total of 146 shrikes were recorded along 350 km of roads (i.e. 1 shrike per 2.43 km). The Rufous-backed Shrike was the predominant species (55.6% of records), followed by the Bay-backed Shrike (39%) and Southern Grey Shrike (4.7%). Major habitat types in the census were: urban areas (35.1%), agricultural cropland (21.7%), scrub with agricultural cropland (14.3%), and scrub areas (14%). Shrikes occupied 100% of sites of scrub with agricultural cropland, 72.3% of agricultural cropland and 57.1% of scrub. No shrike occurred in urban areas, although it was the dominant habitat type. Rufous-backed Shrikes occupied 6 of 11 habitat types and Bay-backed Shrikes occupied 4. Population density of Rufous-backed Shrikes was highest (0.58/shrike/km) in agricultural cropland, followed by scrub with agricultural cropland (0.34/shrike/km). Population density of Bay-backed Shrikes was highest in scrub with agricultural cropland (0.45/shrike/km) and followed by scrub (0.36/shrike/km). Population density of Southern Grey Shrikes was highest (0.86/shrike/km) in scrub with agricultural cropland among hillocks. The favorite perches of these shrikes were electric wires, followed by shrubs and small trees. In open arid fallow lands, perching sites and shrikes were absent.

Key words: densities, habitat use, India, large-scale surveys

INTRODUCTION

True shrikes *Lanius* spp. (Laniidae) are birds of open habitats, with little or no ground cover. They are important as indicator species of environment degradation and the status of grassland communities (HANDS et al. 1989, FUISZ & YOSEF 1998).

Twelve species of shrikes are found in India, of which six species are reported from the states of Maharashtra and Karnataka in mid-west India. These are: Red-

The status, habitat choice, and population trends of several shrike species have been studied in some parts of the world: Loggerhead Shrike (*L. ludovicianus*) in the continental United States and Canada (Morrison 1981, Burnside & Shephard 1985, Cadman 1985, Hands et al. 1989, Yosef et al. 1993); Brown Shrike (*L. cristatus*) in Hokkaido, Japan (Haas & Ogawa 1995); Great Grey Shrike (*L. excubitor*) and Red-backed Shrike in Sweden (Olsson 1995) and in northeastern Hungary (Fuisz & Yosef 1998). In India, some information is available on the occurrence and on nesting, breeding, and feeding and social behaviour of various species of shrikes but to date no work has been done on their habitat preferences and population size.

Here we present the results of our observations on status, habitat preferences, and population estimates of 4 shrike species recorded in the Pune district (Maharashtra) and Belgaum district (Karnataka). This is the first such a detailed study of shrikes in India.

**METHODS**

We conducted a roadside census of shrikes by using the non-intersecting transect method, in the following localities: in the Pune district (18°31′N, 73°55′E) on 16, 19 and 20 November 2003, from Saswad to Saswad via Indapur (250 km), from Pune to Saswad (21 km), and from Saswad to Saswad via Kapurhol (56 km); in the Belgaum district (15°52′N, 74°34′E), on 14 and 16 December 2003, from Belgaum to Jamboti (11 km) and from Belgaum to Hangarge (12 km), respectively. These surveys were conducted mostly between 06:30 and 08:30 h in the morning or in late afternoon until 17:30, depending on the distance covered. Two experienced observers rode on a motorcycle at a speed of 20–25 km/h, and used binoculars (8 × 50) to observe the shrikes on both sides of the road within a distance of 200 m.

At the end of each kilometre, we recorded the predominant habitat type, presence or absence of various shrike species, and their perch sites. We also recorded the number and presence of other insectivorous bird species. Data on exact location of each sighting are on file, too.

All the 350 habitat records taken along the 350-km census were classified into 11 major categories: urban (n = 123), agricultural cropland (n = 76), scrub with agricultural cropland (n = 50), scrub (n = 49), wasteland or thornbush on alkaline soil (n = 14), scrub with agricultural cropland among hillocks (n = 13), open arid fallow land (n = 10), arid-rocky Ghats (n = 7), river or stream banks (n = 3), urban fringes (n = 3), and groves (n = 2).

We combined all five surveys and calculated the total number and percentage of shrikes in each habitat, shrike species, habitat, population density, and perch site selection.

**RESULTS**

A total of 146 shrikes were recorded along the 350-km census route, 0.42 shrikes/km regardless of species. The shrikes observed were: Rufous-backed Shrike...
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(\textit{n} = 81; 55.6\% of records), Bay-backed Shrike (\textit{n} = 57; 39.0\%), Southern Grey Shrike (\textit{n} = 7; 4.7\%); and Red-backed Shrike (\textit{n} = 1; 0.7\%). The first three species are residents with local or seasonal movements and breed in March-June. The fourth species is a winter vagrant to India and this is the first record for the state of Maharashtra.

Urban areas were predominant (35.1\%), followed by agricultural cropland (21.7\%), scrub with agricultural cropland (14.3\%) and scrub (14.0\%; Fig. 1). The other habitats (Table 1) were: wasteland (4.0\%), scrub with agricultural cropland among hillocks (3.7\%), open arid fallow land (2.8\%), arid-rocky Ghats (2\%), urban fringes (0.8\%), river or stream (0.8\%) and groves (0.5\%).

Shrikes occurred in 100\% of areas of scrub with agricultural cropland, in 72.3\% of agricultural cropland, in 57.1\% of scrub areas, and in 46.0\% of scrub with agricultural cropland among hillocks (Fig. 1). The birds were observed in agricultural

![Fig. 1. Habitat availability ■ and occupation □ by shrike species in the study area
Ur = urban, Agr = agricultural cropland, SA = scrub with agricultural cropland, Sc = scrub, SAH = scrub with agricultural cropland among hillocks](image)

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![Table 1. Habitat preferences of 4 shrike species in the study area](image)

<table>
<thead>
<tr>
<th>Shrike species</th>
<th>Agr</th>
<th>Sc</th>
<th>SA</th>
<th>SAH</th>
<th>Ur</th>
<th>UF</th>
<th>Op</th>
<th>Riv</th>
<th>Gh</th>
<th>Wd</th>
<th>Grove</th>
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<td>21(36)</td>
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<td>0</td>
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<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>RBS</td>
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</tbody>
</table>

Number of observations is given (with % for species in brackets).

Agr = agricultural cropland, Sc = scrub, SA = scrub with agricultural cropland, SAH = scrub with agricultural cropland among hillocks, Ur = urban, UF = urban fringe, Op = open arid fallow land, Riv = river or stream banks, Gh = arid-rocky Ghats, Wd = wasteland;
RS = Rufous-backed Shrike, BBS = Bay-backed Shrike, SGS = Southern Grey Shrike, RBS = Red-backed Shrike
cropland with sorghum (*Sorghum vulgare*), sunflowers (*Helianthus spp.*), leafy vegetables, and on ploughed fields, but were not seen in sugarcane fields.

Rufous-backed Shrikes occurred in 7 of the 11 habitat types, Bay-backed Shrikes in 4, Southern Grey Shrikes in 2, and Red-backed Shrikes in 1 (Table 1). Population density of Rufous-backed Shrikes was highest in agricultural cropland (0.58/km) followed by scrub with agricultural cropland (0.34/km), whereas in Bay-backed Shrikes it was highest in scrub with agricultural cropland (0.45/km), followed by scrub areas (0.36/km; Table 1). Maximum population density of Southern Grey Shrikes was seen in scrub with agricultural cropland among hillocks. Shrikes were rarely observed in habitats like urban fringes, river or stream banks, open arid fallow land, and groves. Scrub with agricultural cropland was occupied by all 4 species of shrikes.

Results of analysis of perch selection are presented in Fig. 2. Rufous-backed, Bay-backed, and Southern Grey shrikes preferred electric wires, followed by shrubs and small trees except the Southern Grey Shrike, which perched also on the ground. The solitary Red-backed Shrike perched on a shrub. Rufous-backed Shrikes rarely perched on poles and fallen twigs in fields. Further, in habitats like open arid fallow land, no suitable perches or shrikes were found. We also noticed that in all habitats where shrikes were present there were also thorny trees or shrubs.

DISCUSSION

The 4 shrike species occupied various habitats in open country during the non-breeding season. Collectively, their density was 0.42/km, which is less than half of that of Red-backed Shrikes (1/km) in Hungary in the post-breeding season (FIJSZ & YOSEF 1998). The Red-backed Shrike was the only species observed during the Hungarian roadside census and was found in a greater density (1.8 shrikes/km) in areas of open pastures or arable fields of wheat (*Triticum aestivum*), corn (*Zea mays*), or sunflower (*Helianthus annuus*), and in a lower density in urban areas and forests.
(0.1 and 0.2 shrike/km, respectively). In comparison to Hungary, our results indicate a greater diversity of shrikes, which were found in greater densities in scrub with agricultural cropland and in agricultural cropland. The inter- and intra-specific competition seems to be lower in these habitats, probably because food is abundant there. We inferred that the shrikes also find appropriate perch sites for hunting in these habitats. Shrikes did not occupy sugarcane fields because of the high density of the crop, low visibility, difficult access to the ground, and absence of suitable perches—all reducing prey accessibility. Southern Grey Shrikes appear to be habitat-specific. The species occupied only scrub with agricultural cropland among hillocks.

Rufous-backed Shrike was the dominant species, followed by Bay-backed Shrike. None of the *Lanius* spp. occurred in urban areas although this was the prevailing habitat type in our survey. In the 123 urban areas, we recorded 28 bird sightings of other insectivorous and carnivorous birds, such as the Black-shouldered Kite (*Elanus caeruleus*), Greater Coucal (*Centropus sinensis*), Indian Roller (*Coracias benghalensis*), Large Grey Babbler (*Turdoides malcolmi*), Black Drongo (*Dicrurus macrocercus*) and White-throated Kingfisher (*Halycon smyrnensis*). Also, shrikes did not occupy wasteland, open arid fallow land, and arid-rocky Ghats.

In conclusion, this study was the first detailed roadside census of shrikes conducted in India. It is essential to conduct such studies regularly in various parts of the country, to evaluate the effect of changing farming practices, particularly in fields for sugarcane cultivation, development of urban areas in scrub habitats and pollution around urban areas. This simple method of roadside census can help to detect negative changes prior to drastic declines.

REFERENCES


