

WINTERING BEHAVIOUR OF THE GREAT GREY SHRIKE (*Lanius excubitor*) IN THE WESTERN UKRAINE

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ABSTRACT

Gorban I. 2000. *Wintering behaviour of the Great Grey Shrike (Lanius excubitor) in the Western Ukraine*. Ring 22, 1: 45-50.

During the last century, status of the Great Grey Shrike in the Western Ukraine has not changed. However, the species was and is now considered, in some regions, as rare. Its area has not changed but at higher altitudes in the Carpathians, the species is more rare than on the plains.

Since 1994, the Great Grey Shrike was included in the second edition of the National Red Data book. The species breeds mostly in the zone of mixed forests. The wintering area of the species is dynamic and covers the whole country with the heaviest density occurring in the forest-steppe. The territories in the winter are determined by landscape structure and the hunting habits of the species.

In the forest-steppe, the Great Grey Shrike uses winds for gliding for successful hunting. This is a widely used technique of hunting when snow is absent or when it is no more than 2-3 cm deep.

Rodents predominate in the winter diet of the Great Grey Shrike (86-89%) in the Western Ukraine.

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Key words: Great Grey Shrike, Ukraine, hunting methods

STUDY AREA

All field research was conducted in the Western Ukraine near the border with Poland. For observation and analysis of the wintering areas of the Great Grey Shrike, two sites of 100 km² (situated across the 24 meridian) were pre-selected. The distance between them is 230 km. The first site is situated in the Shatsk National Park, which is included in the zone of mixed forests. This is known as the Volyn Polissya and is situated in the basin of the Pripjat River within the borders of the Volyn administrative region. It is a plain with altitudes of 165-189 m a.s.l. There are many lakes surrounded by mixed forests dominated by Pine (*Pinus silvestris*) and agricultural sections. The largest area is in the form of fens (6%) and flood-plain

bogs (13%), which forests or shores surround. The total area of the forest is 45% (L'vovich and Gorun 1994). The second study site is a plain with altitudes of 220-231 m a.s.l. and about 230 km from the previously described site. This area is a forest-steppe zone and is located in the Zhovka district of the Lviv region.

Pine and mixed forests here cover 20% of the area but agricultural landscapes, with a large network of canals, which were built between 1965-1983, predominate. The landscape is dominated by large fields and pastures (total 20-48 ha) of ex-collective farms, which occupy more than 45% of the study area.

In the last 50 years, the largest changes have occurred in the biotopes of the second site in the Lviv region. Intensive construction work within the forest glades and agricultural landscapes were conducted. In recent years, the majority of forest glades were overgrown with bushes, mostly willows (*Salix* sp.) and some of the pastures were degraded because of drainage owing to negligence of the ex-collective farms. The large areas of meadows and pastures are often used for private construction, which has resulted in extensive building of private homes in country landscapes.

Weather conditions in both sites are almost identical. The average precipitation per year is 600-720 mm, most of it in January and February. Snow cover occurs for 90-100 days (Marynych 1982) and can be 13-35 cm deep. In winters, thaw is typical, but during some years (1986/87, 1996/97), winters were long-drawn and frosty with temperatures below -35°C and snow depth ranging from 60 to 70 cm, (sometimes even 115-130 cm).

In both sites, west winds predominate (22-25%), but in the Lviv region southwestern winds are also characteristic (> 25%) and depend on open landscapes. Winds are strongest in January and February (6.1-6.3 m/s).

MATERIALS AND METHODS

Field research was conducted during winters of 1986-1991 in the Shatsk District of the Volyn region and during 1995-1999 in the Zhovka District of the Lviv region. In addition, short-term studies were conducted at the first site during the winters of 1992-1995 and at the second site during the winters of 1986-1990. The average for winter study in the field was 189 hours in the Volyn region and 126 hours in the Lviv region. The total time of observations was 1040 hours. Study territories were analysed in detail on 1 : 25 000 topographic maps. All records of the Great Grey Shrike were registered on special schemes of each wintering site.

Further, we studied hunting behaviour of the Great Grey Shrike, reaction to other species and relationships with different elements in the structure of the winter biotopes. Each wintering site was observed separately and the speed of the observer's movement was arbitrary. They were able to stay in one place for a long time waiting for Great Grey Shrikes. As a rule, sites with the most favourable weather were chosen. The less important sites and sites with the worst weather conditions were observed for a shorter time (2 hours maximum).

A special effort was made following long-term snowfalls or other changes of weather patterns. We observed most of the wintering territories 9-14 times a season. We analysed behaviour of the Great Grey Shrike in the Lviv region (267 records) and in the Volyn region (156 records).

Remains of the Great Grey Shrikes prey or pellets were collected and analysed in laboratory.

RESULTS

Great Grey Shrikes were observed at the wintering sites between September and late March (in warm winters) or early April if heavy snowfalls occurred in February or March (e.g. 1996/97, 1998/99).

In the Volyn region, four large (90-140 ha) and four small (29-42 ha) wintering sites were found. In different years, 4-5 different individuals used them. In the Lviv region, five large (53-69 ha) and three small (27-36 ha) sites were discovered and used by 3-6 individuals.

In the Volyn region, three hunting sites were discovered, but the species was not observed at the site every winter. In the Lviv region, seven such sites were observed. We assume that these territories were used by passing individuals that did not stay for a long time.

We found a clear correlation between wintering of the Great Grey Shrike, climate factors and landscape structure. The most important limiting factors appear to be precipitation and snow cover. The influence of these factors has previously been reported (Olsson 1986, Bassin 1995).

For hunting territories of the Great Grey Shrike, the presence of trees and bushes of 3-8 m in height is very important (Schön 1995). The Great Grey Shrike perches and waits for prey on these trees and all prey remains were collected under them. Tops of trees are used if wind forces are strong to moderate. The bird dives down from the treetops at a distance of 30-40 m and glides for 9-14 seconds. When perched at a height of 1.3-8 m, the Great Grey Shrike turns its head in different directions searching for insects and rodents.

In some cases, Common Buzzard (*Buteo buteo*) or Rough-legged Buzzard (*Buteo lagopus*) was perched on these trees and from some we collected faeces of both Great Grey Shrike and Buzzard.

The Great Grey Shrike in the Volyn region used territories with varying dimensions between years. As a rule, territory size increased in years with low numbers of rodents. In the Lviv region, with its open landscapes, the territories of the Great Grey Shrike were smaller. This may be result of much larger numbers of rodents in the forest-steppe zone. In different years, we recorded 3-6 individuals for 450 ha, and in the Volyn region – 4-5 indiv. for 640-730 ha.

It is important to note that wintering sites, which have been used by Great Grey Shrikes from year to year, were not larger than 69-82 ha and such situation is similar to that reported from other European countries (Schön 1995).

Winter feeding sites in the Lviv region were mostly situated on the borders of pastures, meadows and forests. In 87% of all cases in the Lviv region, the Great Grey Shrike chose sites adjacent to big stacks, which belonged to collective farms. In the Volyn region, the majority of wintering sites were near small stacks (7-8 m²) in wetlands and in private meadows.

Over the years of research, wintering territories of Great Grey Shrikes in the Western Ukraine and their use of feeding sites was irregular. In the Lviv region, they use a single wintering site for a period of 12-48 days. The site comprises 43-65% of the total wintering area.

In the Volyn region, such behaviour is rare. Perhaps it is the result of differences in biotope structure and prey abundance. In the Shatsk National Park in areas that make up 59-74% of the total wintering area, a shrike may stay up to 17 days. Later it moves to another part of the territory or increases its hunting route within it. Frequency of changes of the feeding sites depended on precipitation and snow cover. This factor has the biggest influence on isolated meadows, forest glades and wetland.

In the Lviv region, wind direction had strong influence on the selection of feeding and hunting sites. When wind direction changed for 5-7 days, Great Grey Shrikes changed their feeding sites in accordance.

The winter diet of Great Grey Shrikes was analysed during our observations of their hunting behaviour. Also almost 250 pellets were analysed. A pellet's size of the Great Grey Shrike is on average 36 mm by 14 mm. Weight varied from 2.5 to 4.3 g. In pellets, small rodents predominated and they comprised 89% of the diet in the Lviv region and 86% in the Volyn region. The most frequent prey was Field-vole (*Microtus arvalis*).

DISCUSSION

Based on our data, we conclude that in the Ukraine the Great Grey Shrike chooses forest-steppe zones for wintering more often than mixed forests. This is confirmed by the number of records for these birds and by the density of the wintering individuals in the forest-steppe zone, even in areas where they do not breed. We think that fewer Great Grey Shrikes winter in the breeding range and this is confirmed by the fact that the wintering range covers almost all of the Ukraine and yet the breeding range is only in the western and northwestern regions (Snow and Perrins 1998). This appears to be connected to their diet – small rodents, which do not occur in large densities in the forest-steppe habitat. Because of easier access to food in winter, the wintering conditions are better in the forest-steppe habitat. This is caused by strong winds, which pulverize the snow cover. This explains the differences in hunting methods of the Great Grey Shrike in these two habitats.

In the Volyn region, the Great Grey Shrikes hunt mostly on small birds and search for prey by perching on trees or bushes (70% of all observations). In other cases, Great Grey Shrikes hunt in open areas. Alternatively, in the Lviv region

Great Grey Shrikes use the winds and hunt by gliding towards the prey (63% of all observations). They usually perch on top of stacks or bushes for searching of prey.

We got to the conclusion that birds use hunting sites irregularly. An area of 69-82 ha is divided into 4-6 small feeding and hunting sites, which are used by birds based on the hunting regime. The number of such sites increases with increasing precipitation because Great Grey Shrikes change their hunting strategy and search for places with concentrations of rodents. In one case, after heavy snowfall a Great Grey Shrike stayed at one site, less than 20 ha, for 31 days. It spent 50% of its time sitting on top of 2-3 bushes (0.37 ha) of Pussy Willow (*Salix caprea*) and 80% in an area of 8 ha.

During very heavy snowfalls, birds left their wintering sites and moved to other regions. During winters of 1986/87, 1995/96 and 1996/97 Great Grey Shrikes were not observed at the wintering sites. At the same time, when the numbers of rodents increased, Great Grey Shrikes appeared in large numbers in the wintering sites in the Ukrainian part of the Carpathians and even on the Zakarpatya plain where they do not breed (Strautman 1963).

Although the winter diet of the Great Grey Shrike and hawks (*Accipiter* spp.) is not similar, interactions among these species are mostly antagonistic. Great Grey Shrikes are often prey of hawks. The winter biotopes of these species in the Western Ukraine often coincide. Hence, it is possible that landscape structures, which are used as feeding sites by hawks, influence the choice by Great Grey Shrikes and determine their wintering distribution. However, this is still to be resolved in the Ukraine. Great Grey Shrikes were attacked by Hooded Crow (*Corvus corax*), Common Buzzard, Rough-legged Buzzard, Kestrel (*Falco tinnunculus*) and Hen Harrier (*Circus cyaneus*). These birds drove away the shrikes from their hunting sites. Mammalian competitors for food in the Western Ukraine are: Red Fox (*Vulpes vulpes*) and Ermine (*Mustela erminea*).

ACKNOWLEDGEMENTS

I thank Vasyl Matejchuk for field assistance in the Shatsk National Park and Yuriy, Evgen and Roman Gorban in the Lviv region.

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