

## Distribution of Little Owl *Athene noctua* and Barn Owl *Tyto alba* in the Zamość Region (SE Poland) in the light of atlas studies

I. Kitowski and E. Kisiel, Department of Nature Conservation, Institute of Biology, Maria Curie-Skłodowska University, Akademicka 19, 20-033 Lublin, Poland. E-mail: kitowign@biotop.umcs.lublin.pl

### 1. Introduction

Although Little Owl *Athene noctua* and Barn Owl *Tyto alba* are known as relatively uncommon, their actual distribution in Poland is poorly known, as emphasised by Ruprecht & Szwagrzak (1988) and Tomiałojć (1990). In particular, little is known about the factors influencing the distribution in Poland of these two owl species; such knowledge is vital for their protection. Furthermore, there is only fragmentary understanding of their population trends in Poland. The purpose of this paper was to analyse the data collected in field studies in the Zamość Region (SE Poland) up to the late 1990s concerning their occurrence.

### 2. Study area and methods

The Zamość region (6980 km<sup>2</sup>) of SE Poland is typically agricultural in character. About 80% of that area is arable land and 20% is forest. Meadows and pastures comprise some 11% of the region (Anonymous 1996). Two kinds of landscape resulting from agricultural use can be distinguished in the study area. First, the western and central part (except the wooded Roztocze Upland) is a mosaic of

small private farm plots separated sometimes by coppices, and the predominant pattern of habitation is of close or linked settlements along the watercourses. Second, the SE Zamość Region is covered largely by monoculture farming where scattered former government farms comprise islands of habitation.

By the late 1980s, the Zamość Region agriculture was in deep recession, manifested by an extremely low level of animal and plant production. In the 1990s the number of cattle and sheep reduced below the levels of the 1970s and 1980s. There was a concomitant reduction in hay production and in the use of grassland as pasture. The result was the appearance of unmanaged land and of large reedy areas in river valleys.

The field studies covered the 1995-1999 period. They consisted of control studies of places suitable for Little and Barn Owls to breed. In all, over 1000 potential nest sites were examined, such as churches, storehouses, schools, dovecots, windmills, barns, sheds, palaces, abandoned buildings, as well as about 200 places such as orchards, alleys of lime (*Tilia* sp) trees and established parks. Much of the study was undertaken in 1995, when some 146 churches were controlled. From 1997-1999, the studies concentrated on former government farm

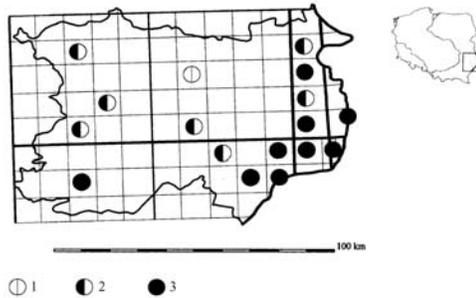


Fig. 1. Distribution of Little Owl *Athene noctua* in the Zamość Region.

1. Pellets, feathers or 1 adult present.
2. Two adults present, voices heard or territorial behaviour of adults observed.
3. Eggs, live or dead nestlings found or juveniles observed.

areas. A large number of sites, particularly in cities, were identified through the use of tape lures, using the methodology of Domaszewicz *et al.* (1984). Following the principles of other Polish atlas models (Ruprecht & Szwagrzak 1988), our map projection was the Universal Transverse Mercator (UTM) in 10×10 km format.

### 3. Results

*Little Owl.* Little Owl strongly avoids wooded areas, and so it was not present in the abundantly wooded areas of Central and Southern Roztocze (Fig. 1). In the western and central Zamość Region, its sites reflected the intensiveness of animal farming of the 1970s and 1980s. Here, the agricultural landscape dominated by small farms, a total of 49 sites of Little Owl was recorded. There, owls of this species populated the pastures and regularly mown waterside meadows of wide valleys of the rivers Bug, Wieprz, Por, Łabuńka and Wolica. Encroachment by headed willow *Salix* sp. is common. However, in this

region the Little Owl's preferred nesting sites were in-use or abandoned cowsheds, barns, lofts, drying buildings and houses. Only 2 breeding sites were found in headed willow and apple (*Malus* sp.) trees. Other sites were found in this area of small farms on the outskirts of small villages that lay in a mosaic of fields, meadows, pastures and large orchards that were often grazed. At these latter sites, the Little Owl nested in church towers and attics. Low buildings such as cowsheds, blocks of flats and schools were rarely used for nesting. During these studies, evidence such as live or dead juveniles, an adult pair or fresh pellets were found in only 8 churches (comprising only 5.5% (N=146) of all examined sites in the entire Zamość Region).

In the landscape dominated by monocultures (the large, former government farms comprising c20% of the studied region), some 30 sites were found, all associated with the isolated farms. The physical farm building layout and structures are characterised by plentiful accessible nesting places. In the past, such places were also suitable for perching and foraging to seek food, because intensive animal farming in this area was beneficial to the Little Owl's prey. At many of these locations (c50%), the Little Owl coexists with Barn Owl. In this region the Little Owl breeds in the cities. 25 territories were recorded in Biłgoraj, Hrubieszów, Szczebrzeszyn, Tomaszów Lubelski and Zamość. The species bred in blocks of flats that had plentiful ventilation ducts and were surrounded with regularly mown grass areas, but it was not found in city parks.

*Barn Owl.* This species is more numerous than Little Owl in the Zamość Region. 133 Barn Owl sites were found in the 1995-1999 period (Fig. 2). 109 of these

occurred in the mosaic agriculture landscape (small farms) of the western and central Zamość regions. It populated village and settlement ribbons that align with the watercourses of wide river valleys whose watersides are characterised by mown meadows and pastures amid a network of drainage ditches. Other breeding sites were found in localities beyond the river valleys. In the southeast Zamość Region of predominant monoculture farming, the Barn Owl uses the farm building structures for nesting and roosting (N=24 sites), particularly ventilation openings in blocks of flats, attics, cowshed ventilation ducts and barn revetment pillars.

In the agriculture landscape of the western and central Zamość Region, attics and church towers were the main nesting places and diurnal roosts, but others used such as ventilation ducts in village schools and barn revetment pillars. Of churches and orthodox churches accessible to owls (N=58) in the Zamość Region, the Barn Owl occupied 37 (63.8%), brick-built churches being preferred. Rather like Little Owl, Barn Owl is rarely found in the wooded areas of Roztocze. Barn Owl too, steadily populates cities (Biłgoraj, Hrubieszów, Szczebrzeszyn, Tomaszów Lubelski and Zwierzyniec) of the Zamość Region, using attics, church towers and ventilation ducts in blocks of flats or school garrets (Zamość).

#### 4. Discussion

The results obtained confirmed the tendencies of the studied species to avoid densely forested upland areas (Exo 1992, Manez 1994, Génot *et al.* 1997, Osieck & Shawyer 1997). Many papers have indi-

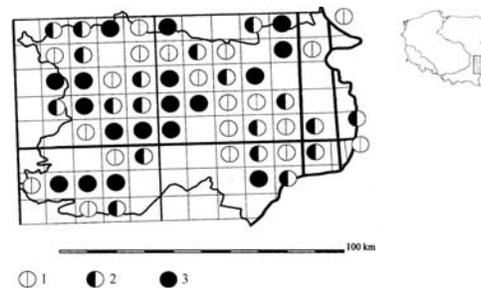


Fig. 2. Distribution of Barn Owl *Tyto alba* in the Zamość Region.

1. Pellets, feathers or 1 adult present.
2. Two adults present, voices heard, or territorial behaviour of adults observed.
3. Eggs, live or dead nestlings found or juveniles observed.

cated a close relationship between the occurrence of Little (Exo 1992, Vogrin 1997) or Barn Owl (Colvin 1995) and agricultural trends.

Little Owl occurrence is strongly linked with the abundance of mown or grazed grassland, where the vegetation remains below 15cm in height. Of special importance here are pastures whose boundaries are overgrown by headed willows (Dombrowski *et al.* 1991, Exo 1992). However, in the SE Zamość Region, those habitats populated by Little Owls differ markedly from those in Central Europe considered optimal for this species. It is also worth noting the numerous cases of sympatric occurrence of Little Owl and Barn Owl in the edifices of the former government farms, a circumstance that is favoured firstly by the concentration of accessible sites for nesting in a small area and secondly by the different food preferences of the two species (Mikkola 1983).

Both of the studied owl species require grassy areas lacking dense and high plant cover. This circumstance is guaranteed by regular mowing or grazing, and it allows

Barn Owl to track prey through hearing it move or call (Konishi 1973) and Little Owl to prospect for prey on the ground, because the vegetation is short enough to permit it to run and hop. Therefore, the distinct deepening of the recession of agriculture in Poland since the 1990s may reduce inadvertently the population of both species. The decline in grassland farming and the reduction in the numbers of cattle and sheep will more and more increase the areas of unmanaged land dominated by tall vegetation or reeds.

The accumulation of arable land and the increase in mechanical cultivation may lead to the mosaic agricultural landscape disappearing from the western and central Zamość Region and its replacement by monocultures as has happened in the southeast of the region. In turn, this would cause a decrease in the biodiversity of small mammals, leading to a population inadequate in size to buffer the cyclic fluctuations of the common vole *Microtus arvalis*, posing a distinct risk of starvation for the Barn Owl (Shawyer 1994).

## References

- Anonymous. 1996. [Statistical Yearbook of Zamość Voivodship]. Voivodship. – Statistical Dept, Zamość, Poland. (In Polish).
- Colvin, B. 1995. Common Barn Owl population decline in Ohio and the relationship to agricultural trends. – *J. Field Ornithol.* 56: 224-235.
- Domaszewicz, A., Jabłoński, P. & Z. Lewartowski. (Eds). 1984. [Methods of owl counting]. – [Bulletin of the Scientific Circle of Biologists]. Warsaw University, Warsaw, Poland. (In Polish).
- Dombrowski, A., Fronczak, J., Kowalski, M. & T. Lippoman. 1991. [Population density and habitat preferences of owls (*Strigiformes*) on agricultural areas of the Mazowsze Lowland (central Poland)]. – *Acta orn.* 26: 39-54. (In Polish with English abstract).
- Exo, K. M. 1992. Population ecology of Little Owls *Athene noctua* in Europe: a review. pp. 64-75. In: Galbraith, C. A., Taylor, I. R. & S. Percival. (Eds). *The ecology and conservation of European owls.* – Joint Nature Conservation Committee, Peterborough, U.K. (U.K. Nature Conservation No 5).
- Génot, J-C., Juillard, M. & D. van Nieuwenhuysse. 1997. Little Owl *Athene noctua*. pp. 408-409. In: Hagemeyer, E. J. M. & M. J. Blair. (Eds). *The EBCC Atlas of European Breeding Birds: Their Distribution and Abundance.* – T & AD Poyser, London, U.K.
- Konishi, M. 1973. How the owl tracks its prey. – *Am. Sci.* 61: 414-424.
- Manez, M. 1994. Little owl *Athene noctua*. pp. 330-331. In: Tucker, G. M., Heath, M. F., Tomiałojć, L. & R. F. A. Grimmett. (Eds). *Birds in Europe: their conservation status.* – BirdLife International, Cambridge, U.K. BirdLife Conservation Series No 3.
- Mikkola, H. 1983. *Owls of Europe.* – T & AD Poyser, Calton, U.K.
- Osieck, E. & C. Shawyer. 1997. Barn Owl, *Tyto alba*. pp. 398-399. In: Hagemeyer, E. J. M. & M. J. Blair. (Eds). *The EBCC Atlas of European Breeding Birds: Their Distribution and Abundance.* – T & AD Poyser, London, U.K.
- Ruprecht, A. L. & A. Szwagrzak. 1988. [Atlas of Polish Owls *Strigiformes*]. – *Studia Nat. Seria A* 32: 1-153. (In Polish with English abstract).
- Shawyer, C. 1994. Barn Owl *Tyto alba*. pp. 322-323. In: Tucker, G. M., Heath, M. F., Tomiałojć, L. & R. F. A. Grimmett. (Eds). *Birds in Europe: their conservation status.* – BirdLife International, Cambridge, U.K. BirdLife Conservation Series No 3.
- Tomiałojć, L. 1990. [The birds of Poland: distribution and abundance]. – PWN, Warsaw, Poland. (In Polish with English abstract).
- Vogrin M. 1997. Little Owl (*Athene noctua*): a highly endangered species in NE Slovenia. – *Buteo* 9: 99-102.