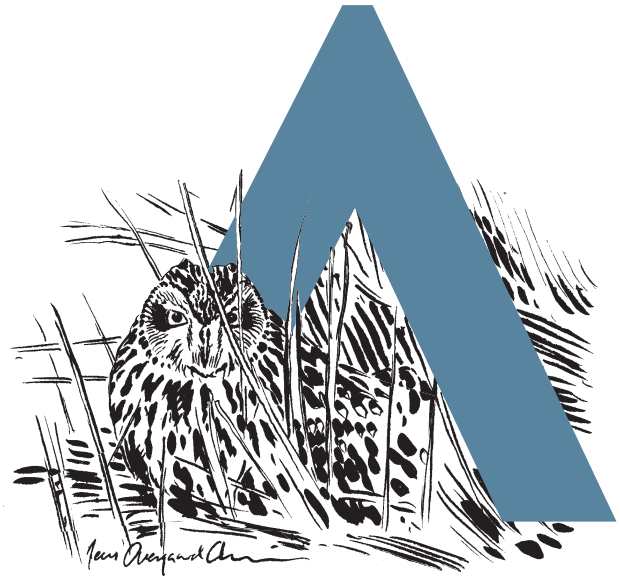
Distribution and current state of the Short-eared Owl (*Asio flammeus*) in Ukraine

Distribuição e situação atual da coruja-do-nabal (*Asio flammeus*) na Ucrânia



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ABSTRACT

This paper reviews the literature on the distribution, abundance, and habitat use of the Short-eared Owl (*Asio flammeus*) over time and by nature zones and regions in Ukraine and summarizes its conservation status and threats to its population. Until the early 20th century it was a common breeding species in the current territory of Ukraine whereas today it is generally rare, breeding in small numbers in some areas of the country. In some areas (the Black Sea coast, the Crimea) the Short-eared Owl was observed mainly during migration and winter periods. It was quite numerous during some warm and relatively snow-free winters in the northern part of the country. A significant decline of the Short-eared Owl population was noted since the 1960s in Ukraine caused by degradation of meadow habitats by livestock grazing and burning of vegetation and shooting. Drainage changed the hydrological regime and caused a negative effect on breeding habitat. The species did not recolonize some areas, despite the re-naturalization of wetlands. Today the total population of Short-eared Owls in the Ukraine is estimated at 700-1,400 breeding pairs.

Keywords: *Asio flammeus*, distribution, population decline, Short-eared Owl, Ukraine

RESUMO

Este artigo faz uma revisão da literatura sobre a distribuição, abundância e uso de habitat pela coruja-do-nabal (*Asio flammeus*) ao longo do tempo, nas zonas naturais e regiões da Ucrânia, e resume o seu estado de conservação e as ameaças à população. Até ao início do século XX, a espécie era nidificante comum no território da Ucrânia, sendo atualmente em geral rara, nidificando em pequenos números em algumas áreas do país. Em algumas áreas (costa do Mar Negro, Crimeia) a coruja-do-nabal foi observada principalmente durante a migração e o inverno. A espécie foi numerosa durante alguns invernos amenos e com pouca neve, na parte norte do país. A partir da década de 1960, a coruja-do-nabal registou um declínio significativo na Ucrânia, devido à degradação dos prados pelo pastoreio e pela queima de vegetação, e também devido ao abate. A drenagem alterou o regime hidrológico e causou um efeito negativo no habitat de reprodução. A espécie não recolonizou algumas áreas, apesar da re-naturalização das zonas húmidas. Atualmente, a população total de coruja-do-nabal na Ucrânia é estimada em 700-1.400 casais reprodutores.

Palavras-chave: : *Asio flammeus*, coruja-do-nabal, declínio populacional, distribuição, Ucrânia

Introduction

The Short-eared Owl's (*Asio flammeus*) range includes all continents, except Antarctica and Australia (Olsen et al. 2013). It occurs throughout Ukraine's nature zones (Fig.1), breeding in all areas except the Carpathian and Crimean Mountains. It is migratory, however it may over-winter in some regions. Currently only the nominate subspecies *A. f. flammeus* is believed to occur in Ukraine (Voinstvensky 1960), although in the past Charlemagne (1938) identified *A. f. flammeus* as the widespread common breeding subspecies, and *A. f. leucopsis* being restricted to the area east of the Dnipro river. This paper reviews the literature on the distribution, abundance, and habitat use of the Short-eared Owl over time and by nature zones and regions in Ukraine and summarizes its conservation status and threats to its population.

Methods

A review of studies on the status and distribution of Short-eared Owls in Ukraine was conducted. These covered a variety of landscapes and physiographic zones, including the forest (Polissia), forest-steppe, and steppe zones and the Carpathian region (Fig.1), and many habitats such as deciduous forests (including beech or *Fagus* spp. stands) of Central Europe, forests (including oak or *Quercus* spp. woods) of the forest-steppe areas of eastern Europe, mixed coniferous-deciduous forests of northern Europe and meadow-steppe vegetation of southern areas as well as agricultural areas.

The distribution of breeding territories of Short-eared Owls was depicted on maps (Bibby et al. 1993) with territory boundaries determined by mapping aggressive interactions of neighbouring pairs of owls, as well as of owls with other raptorial birds or corvids, and by locating owl roosting and nest sites. Routine searches throughout known and potential breeding biotopes were also reported. On the Verkhniodnistrovska lowland (Lviv region, western Ukraine) as well as in part of the steppe zone, breeding studies included 1x1 km census plots (Bashta 1997).

Figure 1 - Nature Zones of Ukraine.

Figura 1 - Zonas naturais da Ucrânia.

Results and Discussion

Distribution, population status and trend by zones and regions

While the number of Short-eared Owls fluctuates dramatically from year to year in relation to changes in the availability of small mammal prey, many 19th and early 20th century researchers (Dzieduszycki 1880, Zarudny 1892, Somov 1897, Valh 1900, Averin 1910) described it as being common and widespread in Ukraine. Published estimates of its populations are heterogeneous in Ukraine and based on

limited counts of pairs or individuals on breeding territories within protected nature reserves and anecdotal observations in various zones and regions. Together, these estimates suggest that a significant population decrease has occurred from the middle of the 20th century. I suggest that currently there are 700-1,400 pairs in Ukraine.

Forest zone (Polissia)

Tatarynov (1973) described the Short-eared Owl as common in western Ukraine, in particular in Western Polissia. Since then, its status has changed significantly. In north-western Ukraine's Shatskyi National Nature Park (National Nature Parks are denoted as NNP hereafter) breeding pair density decreased from 5-6 pairs (1.02-1.23 pairs/100 km²) in 1982-87 to 2-4 pairs (0.41-0.82 pairs/100 km²) in 1997-2001 (Gorban 2002). In some parts of Shatskyi NNP, it was not detected despite the re-naturalization of habitats within the park (i.e., stabilization of the water level) (Gorban & Mateychyk 2003).

In the central and eastern part of Polissia, the Short-eared Owl is a rare breeding bird (Lebed et al. 1996, Afanasyev 1998, Polushkevych 2006, Domashevsky 2009). Generally, it is distributed sporadically throughout this region in some years (Khlebeshko & Tsytsiura 1996). It may breed and over-winter in the Chernobyl exclusion zone, in particular in its central part (Domashevsky et al. 2012). Its spring population density in abandoned fields in Eastern Polissia was 0.03 breeding pairs/km² and 0.01 individual owls/km² from spring through autumn (Kuzmenko et al. 2013).

Forest-steppe zone

Plater (1852) reported the Short-eared Owl as common in peat bogs in this part of western Ukraine that then belonged to Poland. Its population decreased significantly during the 20th century (Guziy 1987, Gorban et al. 1998) and today is a rare breeder in the zone's plains and foothills (Bashta 2009).

In the plains of the upper part of the Dnister River basin, it occurs only in wet meadows in the Verkhniodnistrovska Lowland where its breeding density has been estimated at 3 pairs/100 km2 (Bashta 2013) and 1 pairs/km2 (Bokotey et al. 2010). Its population has likely continued to decrease due to shrub and tree encroachment.

In the Bukovyna territory (south-eastern part of the Carpathian region) its status is unknown, and it is rarely detected in the plains, in particular in the central and western districts between the Prut and Dnister rivers (Skilsky & Godovanets 1996).

Khranevych (1925-1926) stated that some Short-eared Owls were resident and that it was a common migrant in Podillia. More recently, it has observed only in the breeding season (Novak 2003, Kapelukh 2008).

At the end of the 19th to the mid-20th centuries it was a frequent breeder and common migrant, and occasionally over-wintered, leading some to suggest it was possibly a year-round resident in the forest-steppe zone of central and north-eastern Ukraine (Somov 1897, Averin 1910, Orlov 1948, Volchanetsky 1954). Significant annual variation in its numbers were noted (Somov 1897). Until the 1960's it bred in meadows, logged areas and in some forest habitats. By the mid-20th century it was not noted every year and then only in small numbers (Matviyenko 2009). Two nests (0.87 pairs/10 km2) were found in 23 km² of flood plain meadows (Sova 1994). Vetrov (2013) estimated up to 100 pairs (0.32 pairs/km²) in the Kharkiv region. This population decline likely occurred concurrently with the degradation of meadow habitat (Sova 1994).

In the forest-steppe part of north-eastern Ukraine, it is rare breeding and migrant species (Lebed et al. 1996, Knysh 2001, Banik et al. 2013).

Steppe zone

At the end of the 19th century the Short-eared Owl was a common nomadic and sedentary species of the steppe part of the Kharkiv province, which included the present Kharkiv region and part of the Lugansk region (Somov 1897). It was a common breeding species of the steppe (in shrub ravines) and island forests adjacent to the Orchyk River (Zarudny 1892).

At the turn of the 19th and 20th centuries in the Katerynoslav province (today - mostly Donetsk and the Dnipro regions) it was a common migrant and bred in some years. Short-eared Owls were as common, and in some places it more numerous, than Long-eared Owls (*Asio otus*), especially in winter (Valh 1900). It was a common breeding throughout the steppe zone (Voinstvensky 1960).

More recently, in northern parts of the Luhansk region, the Short-eared Owl is a common year-round resident and wintering species (Artyushenko 2005). In the southern steppe region it is less common. In this area (southern and eastern Ukraine), its density was estimated at 0.1 (valley of Samara river, Bulakhov et al. 1999) to 0.58-1.93 pairs/km^2 ("Striltsivskyi step" Nature Reserve, Moroz 2011). In the central part of the steppe (biosphere reserve "Askania-Nova") it is common and widespread, including in abandoned fields (Gavrilenko 2011). I observed similar average densities (0.8 individuals/km^2, unpubl. data) in the steppe north of Azov Sea in July 2018. However, the abandoned fields were small, and owls were noted mainly on the ground along narrow forest plantations or on dead tree branches along roads by fields.

Most observations from the Black Sea part of the steppe are from winter; fewer are seen during migration. Here it is considered a rare winter, and probably a breeding species. Recently, an increase in breeding pairs has been noted (Arkhipov 1996). This has only been quantified for parts of the nature reserve: 0.1 pairs/km^2 ("Tarutinsky steppe"; Rusev 2011), 0.15-0.25 pairs/km^2 ("Yelanetsky steppe"; Redinov 2006), and 0.14 pairs/km^2 ("Tuzlovski Limany" NNP; Rusev et al. 2011). It is described as a common breeding species in the reed beds in the Dniester delta (Rusev 2009).

In Crimea in 1959-62, it was common almost throughout the steppe in the breeding season, during migration and in winter (Kostin 1983) but subsequently its numbers fell sharply. Currently the Short-eared Owl is a rare migrant and winter resident in the steppe part of the Crimea, with breeding documented in the plains in the southern part of this peninsula (Beskaravayny 2015) and in the northern part of the Kerch Peninsula (Andryuschenko 1999). Non-breeding individuals were found in other parts of the Crimea, especially in the southeast (Beskaravayny 1999) and southwest (Klestov & Tsvelyh 1999).

Carpathian region

The Short-eared Owl is a rare migrant in this region, appearing during autumn-winter and in spring (Strautman 1954) including in mountains and highlands (Carpathian NNP) where it occurs in open boggy habitats in forest ecosystems (Kyseliuk et al. 2009).

Grabar (1931) noted that it may have bred in the Transcarpathian plain where it remains a common migrant in October-December (Potish 2009) and during the last century its migration peak may have shifted to later in the season. During the breeding season it has been occasionally observed in the flood plain of the Latorytsia River (Potish 2009).

Breeding habitat by zones and regions

Steppe zone

In eastern Ukraine, in particular in the

steppe zone, the typical habitats used by Short-eared Owls include the steppe slopes, the banks of estuaries and seas, flood plains, banks of lakes, and, less often, dry areas of the steppe, but always near reservoirs (Voinstvensky 1960). Other habitats used include steppe bogs, and shrubs and weeds in ravines. In the post-breeding period they rarely enter, buy may remain adjacent to, forests. By day they use thick meadow or marsh grass, sedge, and rarely perch on branches of low bushes near marshes.

Today, breeding occurs in ungrazed protected areas with high grassland and in areas with very low or moderate grazing pressure. Breeding was also noted in watershed and ravine forests and in forest plantations (Volchanetsky 1954); in marshy meadows and swampy sedimentary areas (Zagorodniuk et al. 2012); and in gullies and on steppe slopes (Sirenko & Martynov 1998). Nest sites consists of a small depression in the grass, located on hummocks or directly on the ground under a bush or large grass plants (Somov 1897).

In southern Ukraine (the Dnister Delta area), it commonly breeds in reed complexes or solid thickets of cane with shallow water, sedge thickets, reed beds with interspersed willow bushes (Rusev 2009). Therefore, its breeding status can be impacted the destruction of reed thickets in the upper estuary for fishing channels (Arkhipov 1996).

In Crimea, in years when is abundant, it has colonized most open habitats in the steppe and foothills, including in virgin steppe areas and in crop land. However, when populations are low its distribution becomes sporadic (Kostin 1983).

Forest-steppe zone

In this zone the Short-eared Owl typically breeds in a variety of open meadows and those with tall shrub thickets, as well as in wetlands in Western Ukraine (Bashta 2009). Here nests are either on the ground (Klitin 1959, Tatarynov 1973) or under weeds (Orlov 1948).

In eastern Ukraine its nests in meadows, on logs, and in different types of forests (Sova 1994). More recently nests were recorded in floodplains and meadow habitats around lakes (Banik et al. 2013), damp grassy meadows, banks of lakes and marshes with sparse shrubs and reeds (Afanasyev 1998), and on the slopes of dry ravines (Knysh 2001).

Forest zone

The Short-eared Owl nests in flood plains, dry meadows, lowland swamps, among small forests near abandoned fields, and in logged areas within the forests. Nests are on the ground, often on a tussock, under a willow bush or a low tree (Kuzmenko 2009). In the Chernobyl zone, it has been recorded breeding in abandoned fields, open forests, and in meliorated and marshy meadows in river floodplains (Domashevsky et al. 2012).

Birds are usually active throughout the day, but also perched on dead tree branches, bushes and poles in hayfields. Males often actively protect nest sites, attacking other raptors and corvids that fly over their breeding territories.

Migration by zones and regions

The phenology of Short-eared Owl migration is poorly known but likely depends on variable seasonal climatic conditions across its range. It appears to undergo long-distance seasonal movements and is more visible in northern Ukraine.

Short-eared Owls appear in northeastern Ukraine in mid- to late March (Chernay 1853) whereas in central Ukraine this ranged between mid-March to mid-April (Orlov 1948). In Eastern Polissia, observations ranged from the end of March to early April

(1960s to 1990s; Afanasyev 1998, Knysh 2006). Accounting for the meridional distance from Eastern Polissia to southern Ukraine (about 800 km), these data are consistent with reported departure dates of wintering individuals from Crimea (mid-March, Kostin 1983), as well as with the monitoring of migrants on Zmiiny Island in the Black Sea (mid-March, Korzyukov et al. 2011). In the western part of the Mykolaiv region, recent spring observations occurred at the end of March (Redinov & Korzyukov 2002).

Autumn departure from the Polissia area begins in August. In forest-steppe areas, departures varied by year and spanned from the end of September to the first half of October.

In the Podillia (forest-steppe zone) spring migration was early to mid-March whereas autumn migration occurred in October (Khranevych 1925-1926). In central Ukraine, the period of autumn migration varied from the end of September to early December in the middle of the last century (Orlov 1948). In the outskirts of Lviv (Western Ukraine), autumn migration occurred from September to the first half of November (Miczynski 1962).

In steppe areas, owls were observed mainly in September (Pisarev et al. 2007) and September-October (Arkhipov 2011). In some years, migration was delayed until December (e.g., 1970-1971) but owls did not over-winter (Panchenko 2007). On Zmiiny Island (Black Sea) the number of Short-eared Owl migrants has declined over time (Korzyukov et al. 2011).

Wintering by zones and regions

Short-eared Owl abundance and distribution in winter depends on prey availability and climate conditions. In some warm and less snowy winters in eastern Polissia some were sedentary while others were nomadic (Afanasyev 1998, Knysh 2001). It is known to over-winter in Central Podillia (Novak & Novak 2014), in the central part of Ukraine (Cherkasy region; Gavryliuk & Grishchenko 2001), and in Transcarpathia (Kucherenko 1953). In steppe areas, its winter density fluctuated between 0.97 and 7.50 individuals/km2 (Sirenko & Martynov 1998). In some years, large winter roosts reached 1-1.7 individuals/km² (Upper Dniester lowland, western Ukraine).

In winter in eastern and southern Ukraine (Steppe Zone) it occupied ravine forests and slopes covered with thick bushes. During winters with deep snow and heavy frost, it is found closer to villages and often in threshing locations with abundant prey (Averin 1910).

In winter in the northern banks of the Azov Sea, and generally in the southern part of the Steppe Zone, the Short-eared Owl is rare (Rusev et al. 2003, Redinov 2006, Syzhko 2007) or uncommon (Redinov & Korzyukov 2002, Arkhipov 2012). However, significant numbers have over-wintered in some years due to an abundance of prey (Valh 1990). This was the case in Crimea in prey-rich years with owls remaining in specific locations for long periods and sometimes all winter. Owls were usually observed near large colonies of the Social Vole (*Microtus socialis*) (Kostin 1983).

Negative factors and conservation

There are many natural and anthropogenic factors influencing Short-eared Owl populations. These include threats to it or its habitats caused by human activity. In north-eastern Ukraine, the main limiting factor for this species is livestock grazing in its breeding habitat

(Atemasova 2009). Meliorative drainage in the Verkhniodnistrovska Lowland (western Ukraine) led to changes in the hydrological regime. The resulting negative impacts on breeding habitats have contributed to its decline.

Short-eared Owl numbers, like other microtine or small mammal specialist predators, are influenced by prey availability. It has increased only in the years when its main prey species (mice and other small rodents) increased. Severe climatic conditions during winter often make it disperse in search of prey, regularly resulting in aggregations to form in cities.

The main anthropogenic activities that impact Short-eared Owls includes haying, harvesting, mechanized tillage, excessive grazing, and burning of fields which destroy nests and degrades habitat, and illegal killing (Khlebeshko & Tsytsiura 1996). Vetrov (2013) also reported that humans killing Sort-eared Owls and collisions with vehicles on roads as threats (Patsera 2013).

The Short-eared Owl is noted as a species of conservation concern in the Red Data Book of Ukraine (Kuzmenko 2009). The main conservation measures recommended for this species include the protection of wetland biotopes, ecological education for hunters, stopping overgrazing, and restoring breeding habitat.

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