

## SURVEY OF SCOPS OWL *Otus scops* ON THE HIGH KARST GRASSLANDS OF SNEŽNIK PLATEAU (SOUTHERN SLOVENIA)

### Popis velikega skovika *Otus scops* na visokokraških travnikih Snežniške planote (južna Slovenija)

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Eurasian Scops Owl *Otus scops* was surveyed on Snežnik plateau in southern Slovenia, using the playback method. Only areas above 800 m a.s.l. were surveyed in order to confirm the presence of this presumed lowland species on high karst grasslands and to estimate their density. 10 calling males were recorded. Their average ecological density was 0.4 ind./km<sup>2</sup>, and ranged from 0 to 0.8 ind./km<sup>2</sup> in four study areas. The highest locality with a recorded calling male was at 1070 m a.s.l. on Velika Milanja on Volovja reber ridge which is, according to available literature, the highest known locality of Scops Owl in Slovenia. In spite of the altitude, the high karst grasslands on Snežnik plateau evidently present a suitable habitat for this species, as the densities of calling males are comparable to those reported from lowland areas of Slovenia.

**Key words:** Scops Owl, *Otus scops*, Snežnik plateau, Slovenia, high karst grasslands, survey

**Ključne besede:** veliki skovik, *Otus scops*, Snežniška planota, Slovenija, visokokraški travniki, popis

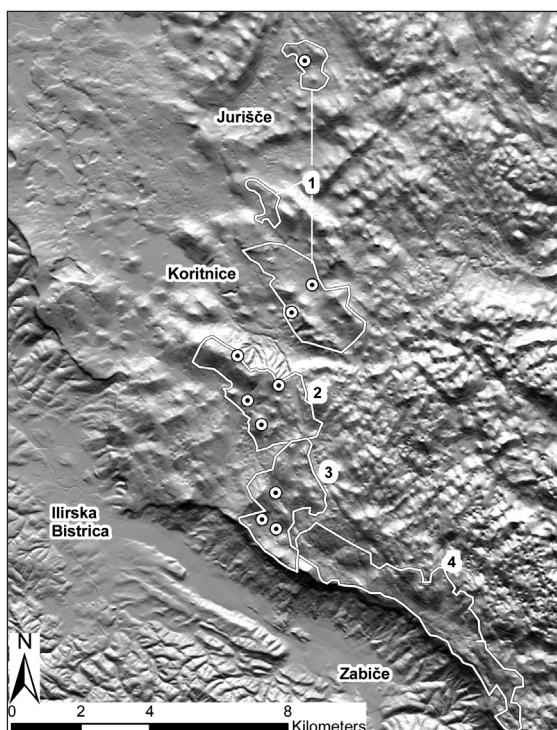
### 1. Introduction

Scops Owl *Otus scops* is distributed mainly in the Mediterranean region (MIKKOLA 1983). In Europe, it is most common in southern regions, including some parts of Central Europe. It inhabits mainly semi-open cultural areas and normally avoids dense forests and open panoramas (BAVOUX *et al.* 1997). The favoured breeding habitat of Scops Owl is believed to be areas of scattered broad-leaved trees (MIKKOLA 1983). It also frequents urban areas (VREZEC 2001), rocky hillsides, brushwood, vineyards (GALEOTTI & GARIBOLDI 1994) orchards, olive groves, parkland and open woodland (MIKKOLA 1983). The distribution of its territories appears to be affected also by inter-specific interactions with other owls (GALEOTTI & GARIBOLDI 1994).

In Slovenia, the population size in 1995 was estimated at 500–800 breeding pairs, with the greater part occurring in SW Slovenia (GEISTER 1995). Later estimate is even higher at 800–1300 for years

1999 and 2000 (BIRDLIFE INTERNATIONAL 2004). Relatively high breeding densities were later reported from Goričko district in the NE part of the country (ŠTUMBERGER 2000). Several surveys have been carried out in Slovenia, e.g. on Ljubljansko barje (SENEGAČNIK 1998, DENAC 2000, DENAC 2003), Jovsi (GOBEC 2000) and Kras (KMECL & ŠETINA 2008). However, they were all confined to lowland areas and the species was considered to be a characteristic inhabitant of low country. In a review of the altitudinal distribution of owls in Slovenia, TOME (1996) described Scops Owl as occurring mainly at altitudes between 200 and 500 m a.s.l., with the highest location being recorded at 710 m a.s.l. However, there are reports of some areas outside Slovenia where the species was also recorded at higher localities (CRAMP 1985).

During fieldwork on Snežnik plateau on 18 Apr 2007 I heard three calling males and one female Scops Owl at two locations, at 1070 m and 840 m a.s.l. Given these interesting records at unusual altitudes I decided



**Figure 1:** Locations of recorded calling males of Scops Owl *Otus scops* on the high karst grasslands above 800 m a.s.l. on Snežnik plateau, southern Slovenia. The study area was divided into four parts as following: 1 – northwestern part (grasslands above Jurišče and Koritnice), 2 – Volovja reber, 3 – Kozlek, 4 – southeastern part (pastures on Gure and Goljak).

**Slika 1:** Lokacije zabeleženih klicočih samcev velikega skovika *Otus scops* na visokokraških travnikih nad 800 m na Snežniški planoti. Območje raziskave je bilo razdeljeno na štiri dele in sicer: 1 – severozahodni del (travniki nad Juriščem in Koritnicami), 2 – Volovja reber, 3 – Kozlek, 4 – jugovzhodni del (pašniki na Gurah in Goljaku).

to perform a survey of this species on the high karst grasslands of the Snežnik plateau and determine the male densities in areas above 800 m a.s.l. During a study of breeding birds of Volovja reber in the western part of Snežnik plateau, the Scops Owl was not recorded in higher areas, but only in a valley below the main ridge (TOME *et al.* 2003).

## 2. Study area and methods

### 2.1. Study area

Snežnik plateau is a high karst massif located in the northern Dinaric Mountains in southern Slovenia. Together with neighbouring Javorniki and Gorski Kotar, it is one of the largest forest complexes in Central

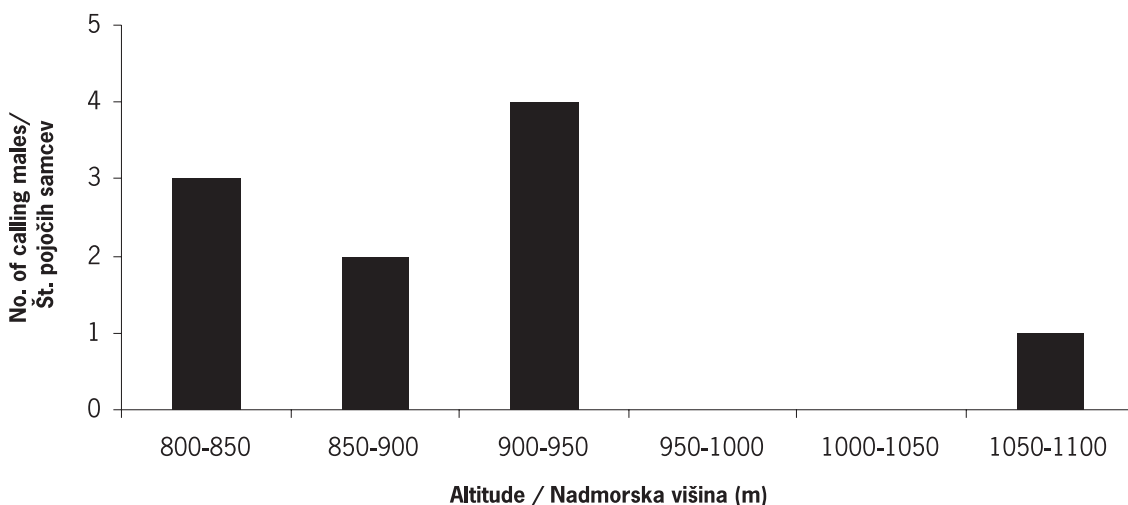
Europe. Altitude ranges from approximately 600 m to the peak of Mount Snežnik at 1796 m. Limestone and dolomite prevail in the area, and the relief shows typical karst phenomena, such as dolines, collapse dolines, uvalas, horizontal caves, vertical shafts, steep canyons, poljes, etc. (PERKO & OROŽEN ADAMIČ 1998). Surface water is rare as water runoff is largely underground. The climate is a mix of Mediterranean, continental and Atlantic influences, with annual temperature averaging 5–8°C. During the breeding season of Scops Owls the average temperatures at 1000 m range between 6 and 15°C. The average annual precipitation is between 2000 and 3500 mm and normally reaches a peak in autumn.

Most of the area is covered by fir-beech association (*Omphalodo-Fagetum*), with four dominant tree species: Common Beech *Fagus sylvatica*, Silver Fir *Abies alba*, Norway spruce *Picea abies*, and Sycamore Maple *Acer pseudoplatanus* (KORDIŠ 1993). The majority of the grasslands are located along the western and southern edges of the plateau. These are mostly dry, sub Mediterranean-Illyrian grasslands with prevailing *Carici humilis-Centaureetum rupestris* community. Some of them are grazed by sheep. The larger part of the study area, with the exception of Volovja reber, is included in SPA Snežnik–Pivka and pSCI Javorniki–Snežnik.

The survey was made on the western and southern parts of the plateau, where all the larger grasslands are located. The study area was divided into 4 parts according to the habitat characteristics and distribution of open and semi-open areas, (Figure 1, Table 1). As I was most interested in the occurrence of Scops Owls at higher areas, I surveyed only parts above 800 m a.s.l., although the distribution of Scops Owls continues into lower regions towards Pivka Valley in the west and Reka valley in the south.

### 2.2 Methods

I used the playback method according to SAMWALD & SAMWALD (1992), as used in previous surveys of Scops Owl in Slovenia (ŠTUMBERGER 2000, DENAC 2003, KMECL & ŠETINA 2008). Count points were spaced 500 to 1000 m apart and distributed so that most of the open and semi-open areas above 800 m a.s.l. were covered. The total number of count points was 34. At each count point I first listened for spontaneously calling owls for at least two minutes, then used a playback of a male call for one to two minutes and waited at least three minutes for a response. The direction and estimated distance of each calling male was noted and marked on a 1:25.000 topographic map.



**Figure 2:** Altitudinal distribution of calling males of Scops Owls *Otus scops* on Snežnik plateau (n=10).

**Slika 2:** Višinska razširjenost klicočih samcev velikega skovika *Otus scops* na Snežniški planoti (n=10).

The coordinates of each count point were determined using handheld GPS.

The survey was conducted on three nights in the second half of May 2007: 21–22, 22–23, and 30–31. I always started after 22.00 and finished before 2.30 h. Dry and calm nights were selected for survey.

Data were analysed using ArcMap 9.2 (ESRI 2004). Densities of calling males were calculated with regard to the area of suitable habitats (ecological density) above the contour line of 800 m a.s.l. Suitable habitats were defined as open and semi-open areas, i.e. grasslands (including those with individual trees and small forest patches), shrubs and forest edge. These areas were determined with the help of aerial photographs of the study area (source: Geodetska uprava RS) and CORINE Land Cover 2000 maps of Europe (CLC 2000). Males recorded at localities below 800 m a.s.l. were not included in the calculation.

### 3. Results

10 calling males of Scops Owls were counted, three around Kozlek hill, four in the area of Volovja reber and three on the grasslands in the north-western part of the study area (above the villages Jurišče and Koritnice). None were recorded on the pastures in the south-eastern part of the study area (Gure and Goljak). Five males were recorded calling spontaneously and five responded to the playback.

The total area surveyed covered 25.58 km<sup>2</sup>. The average density of calling males for areas above 800 m a.s.l. was 0.4 ind./km<sup>2</sup>. If we exclude the pastures in

the south-eastern part, where no owls were recorded, the average density would be 0.6 ind./km<sup>2</sup>. The densities in the four surveyed parts ranged from 0 to 0.8 ind./km<sup>2</sup>, the highest density being recorded on Volovja reber (Table 1).

The altitudinal distribution of calling males in areas above 800 m a.s.l. is presented in Figure 2. The majority were recorded between 800 and 950 m a.s.l. The highest location of a calling male was at approximately 1070 m a.s.l. near the peak of Velika Milanja on Volovja reber.

Spontaneous callings of other owl species were recorded during the survey: two males and one female Tawny Owl *Strix aluco*, one male Ural Owl *S. uralensis*, and one male Tengmalm's Owl *Aegolius funereus*.

### 4. Discussion

Several male Scops Owls were present in areas above 800 m a.s.l. on the Snežnik plateau. Although calling males were recorded during the breeding period, it cannot at present be asserted that the species is actually breeding there. Recorded localities are higher than the highest reported by TOME (1996) and, according to available literature, the location at Velika Milanja on Volovja reber at 1070 m a.s.l. is the highest known locality of this species in Slovenia to be recorded during the breeding season. The only other available field record above 800 m in Slovenia was obtained at 820 m a.s.l. on Mt. Nanos (MIHELIC 2004).

The average density of calling male Scops Owls in the study area is comparable to those reported from

**Table 1:** Data on surface area and habitat characteristics of individual parts of the study area, together with numbers and densities of calling males of Scops Owl *Otus scops* on Snežnik plateau

**Tabela 1:** Podatki o površini in habitatnih značilnostih posameznih delov območja raziskave ter številu in gostoti klicočih samcev velikega skovika *Otus scops* na Snežniški planoti

	Area / Površina (km <sup>2</sup> )	No. of recorded males / Št. klicočih samcev	Ecological density/ Ekološka gostota (ind./km <sup>2</sup> )	Habitat characteristics / Značilnosti habitata
NW part/ SZ del	5.20	2	0.38	smaller, mostly unmown grasslands on western slopes with numerous scattered trees/ manjši, večinoma nekošeni travniki na zahodnih pobočjih s številnimi posameznimi drevesi
Volovja reber	5.28	4	0.76	larger, mostly unmown grasslands on south-western slopes with numerous scattered trees/ večji, večinoma nekošeni travniki na jugozahodnih pobočjih s številnimi posameznimi drevesi
Kozlek	4.76	3	0.63	smaller, mown grasslands in a valley interrupted with forest/ manjši, košeni travniki v dolini, prekinjeni z gozdom
SE part / JV del	8.64	0	0	larger, grazed pastures on south-western slopes/ večji pašniki na jugozahodnih pobočjih
Total / Skupaj	25.59	10	0.39	

lowland areas in Slovenia, such as Kras (KMECL & ŠETINA 2008), Ljubljansko barje (DENAC 2003) and Goričko (ŠTUMBERGER 2000). This suggests that, in spite of the high altitude and the fact that Slovenia is located close to the northern border of the species' distribution range, the high karst grasslands on Snežnik plateau present a suitable habitat for this species. This is probably due to the thermophilic conditions of the grasslands and absence of intensive agriculture. Although the area receives a relatively large amount of precipitation, most of it occurs in the autumn and winter, outside the breeding season of Scops Owl. Further, due to the karstic relief, water quickly sinks underground, leaving the surface relatively dry.

Although the average density is similar to those in lowland areas, no high local densities were observed, as were reported from Ljubljansko barje (DENAC 2003) and, even more profoundly, from Goričko, with up to 6 ind./km<sup>2</sup> (ŠTUMBERGER 2000). The reason for this might be the difference in spatial distribution of food resources and nesting sites. For example, since there are no villages or orchards on Snežnik plateau, the nesting sites are likely to be more homogeneously dispersed.

The absence of recorded males in the SE part might be due to the smaller numbers of scattered trees on the grassland and small forest patches. In other parts the habitat is much more mosaic-like, with numerous shrub and forest patches. According to the available data, it appears that the grassland on Volovja reber offers the most suitable habitat for Scops Owls in this area.

**Acknowledgements:** I am grateful to Tomaž Skrbinšek and dr. Hubert Potočnik for their help with GIS, dr. Primož Kmecl for providing some of the unpublished data from Scops Owl survey in Kras, to dr. Al Vrezec and Tomaž Mihelič for the literature and discussions and to two anonymous reviewers for their useful suggestions and corrections.

## 5. Povzetek

Med terenskim delom na območju Snežniške planote leta 2007 je avtor na nadmorski višini okoli 1000 m naletel na klicoče velike skovike *Otus scops*, ki so sicer večinoma vezani na nižinske predele. Zaradi nenavadne lokacije se je odločil, da v času gnezdenja opravi popis klicočih samcev na visokokraških

travnikih. Ker ga je zanimala predvsem razširjenost in gostote na višjih nadmorskih višinah, se je pri popisu omejil na območja nad 800 metri. Uporabil je metodo predvajanja posnetka samčevega klicanja. Skupaj je zabeležil 10 klicočih samcev. Najvišja lokacija z zabeleženim klicočim samcem velikega skovika je bila na 1070 m na Veliki milanji na vrhu grebena Volovje rebri in je glede na dostopne objavljene podatke najvišja znana lokacija pojavljanja v gnezditvenem času za to vrsto v Sloveniji. Povprečna gostota na celotnem popisnem območju je znašala 0.4 klicočih samcev / km<sup>2</sup> in se je na štirih vzorčnih ploskvah gibala od 0 do 0.8 klicočih samcev / km<sup>2</sup>. Največje število klicočih skovikov in tudi največja gostota je bila zabeležena na območju Volovje rebri. Visokokraški travniki na zahodnem delu Snežniške planote očitno predstavljajo ugoden gnezditveni življenjski prostor za to vrsto, saj je ugotovljena gostota podobna gostotam iz nižinskih predelov Slovenije. Pri tem ima verjetno pomembno vlogo termofilen značaj območja in odsotnost intenzivnega kmetijstva.

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Arrived / Prispelo: 4.2.2008

Accepted / Sprejeto: 5.12.2008