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Distribution, numbers and habitat of Pigmy Owl *Glaucidium passerinum* in Rhodopes Mts (S Bulgaria)

Razširjenost, številčnost in habitat malega skovika *Glaucidium passerinum* v Rodopih (J Bolgarija)

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Distribution of Pigmy Owl *Glaucidium passerinum* was studied in Rhodopes Mts, where the largest compact prime habitat of the species on the entire Balkan Peninsula exists. Ten linear transects with a total length of 78 km were conducted. A total of 18 Pigmy Owls were registered in 17 separate territories. The species was registered at least once in 7 of the transects. It inhabits old (unchanged by man) Norway Spruce *Picea abies* and mixed Norway Spruce–European Beech *Fagus sylvatica*, Norway Spruce–Scots Pine *Pinus sylvestris* and European Beech–Silver Fir *Abies alba* (European Beech–Silver Fir–Norway Spruce) forests at altitudes between 1,417 and 1,930 m a.s.l. Pigmy Owl was registered in many different massifs of the Central and Western Rhodopes – Persenk, Batashka Mt, Perelik, Dubrash and Prespa. The Pigmy Owl population density in the studied area of suitable habitat was calculated to be 2.18 occupied territories / 10 km^2. Total numbers of the Pigmy Owl in the Rhodopes was estimated at 150–170 occupied territories.

Key words: Pigmy Owl, *Glaucidium passerinum*, Rhodopes Mts, population density, numbers, habitat, threats
Ključne besede: mali skovik, *Glaucidium passerinum*, Rodopi, Bolgarija, populacijska gostota, številčnost, habitat, grožnje

1. Introduction

Pigmy Owl *Glaucidium passerinum* is considered a very rare breeding bird in Bulgaria, a glacial relict scarcely distributed in the coniferous and mixed forests of the highest mountains of the country (Shurulinkov & Stoyanov 2006). Most recent estimates of the national population reached 80–120 pairs (Nankinov *et al*. 2004), 20–100 pairs (Birdlife International 2004), 30–120 pairs (Kostadinova & Gramatikov 2007) and 100–140 pairs (Pacenovsky & Shurulinkov 2006), although just 20 years ago the species was considered extinct (Simeonov 1985). During the last 20 years, the species was found to live in Mt Rila, Mt Central Stara planina, Mt Pirin (southern part), Mt Slavyanka and Western Rhodopes (Spiridonov & Mileva 1988, Kouzmanov *et al*. 1995, Spiridonov 1999, Nikolov *et al*. 2001, Nankinov 2002, Shurulinkov & Stoyanov 2005, Shurulinkov & Stoyanov 2006, Pacenovsky & Shurulinkov 2006). The major difficulty regarding the estimation of national numbers of the species is the unclear situation in Rhodopes Mts (Shurulinkov & Stoyanov 2006), considering that they hold the largest spruce forest massif on the Balkan peninsula, including more than 40,000 ha Spruce forests older than 80 years (data from the "Rhodopi" UNDP project). For the Bulgarian part of Rhodopes Mts, the species was reported for the first time by Shurulinkov & Stoyanov (2006) – the species was heard in October 2005 at "Gazinchevtsi" site, close to "Beglika" nature

Figure 1: Pigmy Owl *Glaucidium passerinum* at Batashki Snejnik (W Rhodopes, S Bulgaria); photographed on 15 Oct 2006. Photo: Peter Shurulinkov

Slika 1: Mali skovik *Glaucidium passerinum* na gori Batashki Snejnik (Z Rodopi, J Bolgarija); fotografiran dne 15.10.2006. Foto: Peter Shurulinkov

reserve. Subsequently, the presence of the species was published also for Pamporovo Resort (Pacenovsky & Shurulinkov 2006, Petrov *et al.* 2006) on the basis of the observation of a single adult and two juvenile Pigmy Owls in August 2005 by T.I. Stopher and G. Gorman. Petrov *et al.* (2006) presumed that 2–3 Pigmy Owl pairs inhabited the Bulgarian part of Rhodopes Mts. Kostadinova & Gramatikov (2007) estimated a total of 3–12 Pigmy Owl pairs breeding at all Rhodope's Natura 2000 sites. In the Greek parts of the same mountains, the species was registered in the 1980s (Bauer & Bohr 1987) (Figure 1).

The present work is aimed at obtaining actual data on the breeding numbers, population density and preferred habitat of the Pigmy Owl in Bulgarian parts of the Rhodopes Mts and thus improving our knowledge concerning the species' distribution and numbers in Bulgaria.

2. Study area, material and methods

The observations were collected during the six field expeditions undertaken in April–May 2006, September–October 2006 and May 2007. During these periods, the vocal activity of the Pigmy Owl is high and it can be detected easily. The presence of a singing male in a territory during the autumn also means a high probability of the male nesting in the ensuing spring (S. Pacenovsky *pers. comm.*).

The study area included the following parts of the Western Rhodopes: Chernatitsa ridge, Perelik ridge and some parts of State Forest Enterprise Mugla, Mantaritsa Nature Reserve and its surroundings, Batashki Snejnik ridge, Mt Devinska, the forests around Toshkov chark and Shiroka Polyana reservoirs and central parts of Dubrash ridge.

We conducted 10 transects (between 4.0 km and 13.9 km long) in these regions with a total length of 78 km and total studied area of approximately 7,800 ha, as we accepted that we could detect every call by a Pigmy Owl at a distance of 500 m or less from the observer's point. The transects with their locations, date, time, lengths and weather conditions during their completion are presented in Table 1. At times, Pigmy Owl could be heard from a greater distance, but this depended very much on the current conditions – weather, relief, presence of the rivers, other singing birds, etc. The transects were combined with acoustic provocation of the Pigmy Owl, made by us at every 300–400 m of the route. Until now, this technique was used by us only during the evening and early mourning, in a comparatively short period of the day (Shurulinkov & Stoyanov 2006, Pacenovsky & Shurulinkov 2006). In such short time, it is of course impossible to cover great distances. But our experience with Pigmy Owl showed that at least in Bulgaria imitations of the territorial calls of this species are useful for detecting it even through the entire day. This is why we completed the transects also during the day, and in fact the greater part of positive results were obtained during the daytime. If the distance between the two birds heard was less than 1000 m we considered them different only if they could be heard together at the same time from diffrerent slopes, or if there was well presented individual difference in their voice.

Each locality was registered by GPS and thus we estimated the distances between the localities, as well as the altitude of each of them.

3. Results and discussion

The results of the transects are summarized in Table 1. A total of 18 Pigmy Owl individuals were registered in 17 separate territories (localities). Of these, 15 were territorial males, performing their mating song. The others were females or first-year birds performing a number of diverse calls. Out of 18 individuals, 9 were observed and photographed. The Pigmy Owls are quite curious and came very close to us after our imitations. In the Mantaritsa Reserve, two birds were observed sitting on a branch of an old Norway Spruce *Picea abies* tree and one of them was a calling male. The minimal distances between two calling males varied between 0.77 km (in the Mantaritsa Reserve) and 2.4 km. Longer distances were also registered in suitable habitat – 3.45

Table 1: Results from ten transects conducted during search for Pigmy Owls *Glaucidium passerinum* in Rhodopes Mts (S Bulgaria).

Tabela 1: Rezultati desetih transektov v raziskavi pojavljanja malega skovika *Glaucidium passerinum* v Rodopih (J Bolgarija).

Transect / Transekt	Date and time/ Datum in čas	Length/ Dolžina (km)	Habitat	Number / Število	Weather condition/ Vremenske razmere
Shiroka Polyana reservoir–State Game Station Djenevra–Pchelaritsa peak	29 Apr 2006 12.00–21.30 h	9.3	Spruce and Scots Pine forest, 60–110 years old, few cuttings, 1520–1630 m a.s.l.	0	good
Rancha–Sveti Petar peak–Chukurska river (Dubrash)	1 May 2006 13.00–21.30 h	5.4	Spruce forests, 80–150 years old, without cuttings, 1620–1710 m a.s.l.	1 male (territorial call)	good
Upper stream of the Cherna river–Musayata peak–Golyama reka upper stream (Perelik)	22 Sep 2006 11.00–16.00 h	4.0	Spruce forest, 80–120 years old, old cuttings locally, 1820–2020 m a.s.l.	1 male (territorial call)	partly cloudy, light rain in the afternoon
Kosharite–Srednya peak–Muglenska river upper stream	23 Sep 2006 9.30–17.30 h	6.9	Spruce forest, 80–120 years old, many cuttings, locally not used, 1720–1900 m a.s.l.	0	good
Pashino burdo–"Mantaritsa" reserve–Batak reservoir	25–26 Sep 2006 during all the day and dusk (evening and morning)	7.8	Spruce, Spruce-Scots Pine, Spruce-Beech and Beech-Fir forests, 100–150 years old without forestry activities, 1400–1850 m a.s.l.	5 birds (3 territorial males and 2 females or juveniles – a total of 4 territories)	good
Hut Teheran–Batashki Snejnik peak–eastern border of Batashki Snejnik protected area	14–16 Oct 2006 during the entire day and dusk (evening and morning)	8.6	Spruce, Spruce-Beech and Beech-Fir forests, no cuttings, 1380–1840 m a.s.l.	3 (3 territories: 2 territorial males + 1 female or juvenile bird)	good
Sveti Spas–Izgrev hut–Chernogor peak–Sveti Ilya	20 Oct 2006 8.00–21.00 h	6.3	Spruce and Spruce-Scots Pine forest, 50–80 years old, many cuttings, 1690–1890 m a.s.l.	0	good
Izgrev hut–Persenk hut	21 Oct 2006 8.00–22.30 h	13.9	Spruce forest, 80–130 years old, few cutting activities, 1660–2100 m a.s.l.	5 males (territorial calls)	partly cloudy, but rain in the afternoon
Persenk hut–Modur peak–Hadjiitsa	22 Oct 2006 8.00–14.00 h	7.4	Spruce and Scots Pine forests, 60–130 years old, few cuttings, 1525–1740 m a.s.l.	2 males (territorial calls)	good
Toshkov chark reservoir–"Dupkata" reserve	9–10 May 2007 19.00–22.00 h 7.00–13.30 h	8.4	Spruce and locally Scots Pine forests, 80–140 years old, no cuttings, 1190–1430 m a.s.l.	1 male (territorial call)	good
Total / Skupaj		78.0		17 occupied territories (18 ind. registered)	

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km and 6.62 km, but in the last case some pairs were probably overlooked owing to the rainy weather. In some cases, the singing male followed us for 500–800 m. Vocalization was detected during the entire day from 30 minutes before sunrise until 22.00 hrs.

In the Rhodopes Mts, Pigmy Owl prefers old (unchanged by man) Norway Spruce and mixed Norway Spruce–European Beech *Fagus sylvatica*, Norway Spruce–Scots Pine *Pinus sylvestris* and European Beech–Silver Fir *Abies alba* (European Beech–Silver Fir–Norway Spruce) forests at altitudes between 1,417 and 1,930 m a.s.l., most typically between 1,700 and 1,870 m a.s.l. Many of the localities are situated in the uppermost stream of the river, in the water catchments where old spruce forests prevail. Often in the same areas, there are marshy meadows amidst the forests. The age of the stands was most often between 80 and 160 years, in some cases even less (60–70 years).

In suitable habitats, the Pigmy Owl population density in the studied area was 2.18 occupied territories / 10 km^2 (17 occupied territories in an area of 78 km^2). In the Bulgarian part of the Rhodopes, the total area of most suitable habitats (stands >80 years old of the above stated forest types) covers approximately 51,000 ha (Data of the "Rhodopi" UNDP project). On the basis of the Pigmy Owl population density obtained by the present study in sample areas for these forests, we can calculate an expected total population number of about 111 pairs. Undoubtedly, some Pigmy Owl pairs inhabit also spruce forests younger than 80 years with a total area of about 90,000 ha and natural Scots Pine forests (>120,000 ha) that are often mixed with some Spruce. Our estimation is that in these two forest classes we could expect population density of about 10 times lower than in optimal habitat, or within the framework of 0.24–0.28 territories / 10 km^2 and thus the presence of additional 50–60 Pigmy Owl pairs. In general, the Pigmy Owl's population in the Bulgarian part of Rhodopes Mts could be estimated at 150–170 pairs (occupied territories). This number could be smaller if there are some big parts of the Rhodopes covered with Norway Spruce but unpopulated by Pigmy Owl. Our opinion is that this is not true. This is supported by a number of recent observations by our colleagues in the massifs not covered by the present study:

- above Medeni Polyani village, Northern Dubrash
- one male performing mating song was heard in March–April 2006 (K. Valchev *pers. comm.*);
- in Mt Prespa – a Pigmy Owl was heard around Prespa hut in the autumn of 2005 and spring of 2006 (E. Komitov *pers. comm.*);
- at Pamporovo (Mt Bukova) (T.I. Stopher & G. Gorman *pers. comm.*, cited also in Pacenovsky & Shurulinkov 2006).

The total estimated number of Pigmy Owls in Bulgarian part of the Rhodopes – 150–170 breeding pairs – is in sharp contrast with the data published by Petrov *et al.* (2006) and Kostadinova & Gramatikov (2007) for the breeding population of just 2–3 pairs or 3–12 pairs, and it is even much higher than the national estimations of the species' population. Despite this, the results were not unexpected, as the largest compact area of suitable habitat for the Pigmy Owl is situated in Rhodopes Mts, not only in Bulgaria but on the entire Balkan peninsula, and it has been totally unexplored for the presence of the species until now.

On the basis of all published data on the numbers of the species (Nankinov *et al.* 2004, Birdlife International 2004, Shurulinkov & Stoyanov 2006, Pacenovsky & Shurulinkov 2006, Kostadinova & Gramatikov 2007) and the present study results, the national population estimation of the Pigmy Owl in Bulgaria should be put at 240–290 breeding pairs. We can conclude that although very rare, the Pigmy Owl is not facing extinction in Bulgaria as believed till now.

The major threat to the Pigmy Owl in Rhodopes Mts is the habitat loss and fragmentation. Large scale logging (legal and illegal) during the last years has destroyed some very good habitats of the species. Although the species could be found in areas where sustainable forestry is practiced, it is crucial to protect the so-called "closed" forest massifs where no logging is practiced and where the highest densities of the species were registered. Many of these massifs have no legal protection, which is certainly a threat to the species. It is also crucial to stop the so-called "clearing of the river streams against flooding" in Rhodopes Mts, when forestry firms destroy all the trees in the uppermost river catchments and thus destroy the best habitat for the Pigmy Owl as well as cause erosion and higher risk of flooding in the downstream of the rivers. Construction of new ski-runs and newly planned ski-complexes, such as the "Perelik", is also a major danger for the Pigmy Owl's future in Bulgaria.

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4. Povzetek

Avtorji so preučevali razširjenost malega skovika *Glaucidium passerinum* v Rodopih (J Bolgarija), kjer se je do danes ohranil največji zgoščeni primarni habitat za to vrsto na celotnem Balkanskem polotoku. Pregledali so deset linearnih transektov v celotni dolžini 78 km. V 17 ločenih območjih so zabeležili skupaj 18 malih skovikov. Vrsta je bila ugotovljena vsaj enkrat v 7 od 10 transektov. Mali skoviki naseljujejo stare gozdove (v katere človek ni posegel) smreke *Picea abies* ter mešane gozdove smreke in bukve *Fagus sylvatica*, smreke in rdečega bora *Pinus sylvestris* in jelke *Abies alba* (jelke–smreke) na nadmorskih višinah med 1417 in 1930 m. Zabeleženi so bili v različnih masivih Osrednjih in Zahodnih Rodopov (Persenk, Batashka, Perelik, Dubrash in Prespa). Populacijska gostota malega skovika v preučevanih območjih s primernim habitatom je bila ocenjena na 2.18 zasedenih teritorijev / 10 km^2, celotno število v Rodopih pa na 150–170 zasedenih teritorijev.

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