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Notes on the owls of the Polish Tatra Mountains, southern Poland

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Abstract. Qualitative observations of owls were carried out in the Polish Tatra Mts, S Poland in the years 1998-2003. The following six species were recorded: Eagle Owl, Tawny Owl, Ural Owl, Pygmy Owl, Tengmalm's Owl and Long-eared Owl. The distribution of particular owl species in the Tatra Mts is clearly associated with changes in the habitat according to the altitude. Records of the Tawny Owl predominate in the lower montane zone, those of Tengmalm's Owl in the upper montane zone, and of Long-eared Owl at higher altitudes (timberline and above).

Keywords: owls, Strigidae, Tatra Mountains, vertical distribution.

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I. INTRODUCTION, STUDY AREA AND METHODS

The Tatra Mts are the highest part of the Carpathian mountain range. The main Tatra chain running from west to east is about 56 km long and 19 km wide. Only one fifth (174 km^2) of the Tatra Mts is in Poland; the rest belongs to Slovakia (MIREK 1996; KLIMASZEWSKI 1996). The highest peak in the Tatra Mts is Gerlach (2663 m asl) and on the Polish side Rysy (2499 m asl). There are several dozens of other peaks rising to over 2000 m asl, denivelation rich up to 1500 m. The vegetation is greatly diversified and this is reflected in the zonal biotopes which include the lower montane zone (900 -1200 m asl; beech-fir and fir forest), upper montane zone (1200-1550 m asl; spruce forest), subalpine zone (1550-1800 m asl; dwarf pine bushes), alpine zone (1800-2300 m asl; alpine meadows) and subnival zone (above 2300 m asl; bare rocks) (PIĘKOŚ-MIRKOWA & MIREK 1996). The whole area of the Polish Tatra Mts constitutes the Tatra National Park, whose equivalent on the Slovakian side is the Tatranský Národný Park.

The main papers on the bird fauna of the Polish part of the Tatra Mts include historical as well as contemporary publications (WODZICKI 1851; SCHAUER 1862; KARLIŃSKI 1882; KOCYAN 1884; FERENS 1962; GŁOWACIŃSKI & PROFUS 1992; PROFUS 1993, WASILEWSKI 1996). However, none of them includes detailed observations on owls; the available data are scarce. The same is true for

the atlases of RUPRECHT & SZWAGRZAK (1988) and WALASZ & MIELCZAREK (1992) whose data on the Tatra Mts are very fragmentary.

Even though this paper is preliminary, it includes the most comprehensive observations on owls in the Polish part of the Tatra Mts that have ever been made. No attempt was made to collect any quantitative data but we attempted to collect qualitative observations from a large area by listening to the vocalizations of owls and using playbacks to stimulate their activity. Observations were collected when walking along bottoms of valleys and on mountain ridges during February-July of 1998-2003 (six seasons). Although observations were collected during good weather conditions, owls were heard on every third trip only. Particular dates of observations (the successful ones marked with an asterisk) are as follows:

1998: February 15; March 7, 30*; April 9*, 15, 23, 24*, 30*; May 17, 27*; June 5*, 13, 28; July 6.

1999: March 3, 15, 23; April 1*, 18, 29; May 2*, 20, 22*, 28*; June 15; July 22*, 23*.

2000: February 28; March 1, 18, 25; April 7, 8, 20*, 27; May 1*, 6*, 17, 23; June 1, 9*, 12, 23; July 8.

2001: February 27; March 8, 11, 17, 27, 30*; April 1, 7*, 8, 17; May 21, 25*; June 7; July 5.

2002: February 23; March 7, 11; April 20*; May 2*, 3*, 16, 17*, 18, 20; June 15*.

2003: February 28; March 17, 19, 26; April 2, 7, 11, 12*, 13, 15, 27; May 7, 11, 23*, 26; June 7*, 8, 12, 14*, 23; July 7.

We usually set out before dusk and came back at about one (two) o'clock in the morning. At the beginning of each year's observations snow cover was still present; its thickness and distribution varied depending on the year. We were able to carry out observations only in certain predetermined areas of the Polish Tatra Mts, and routes and areas of penetration were not necessarily the same every year – some of them were repeated while others were changed. Larger white areas in Fig. 1 (i.e. east and west parts of the mountains) indicate the terrain from which very few or no observations were available. Each year's routes were planned in such a way so that we could gather data from all altitudinal zones. Additional reliable observations acquired from foresters and the archives of the Tatra National Park were incorporated into this study.

A c k n o w l e d g m e n t s. We are grateful to Filip ZIĘBA (Tatra National Park, Poland) for giving us access to the archives of the Tatra National Park, and providing us with unpublished observations from the years 1998-2003 collected by him and his colleagues (Wiesław SIARZEWSKI, Robert KORN and Łukasz PĘKSA), and to Jan CICHOCKI for supplying us with his unpublished observations. We are also thankful to Zygmunt BOCHEŃSKI (ISEZ, Poland), Jacek WASILEWSKI (Jagiellonian University, Poland) and an anonymous reviewer for providing helpful comments on the manuscript, and Christopher A. SHAW (George C. Page Museum, USA) for correcting the language of this paper.

II. DATA ON THE OWLS OF THE POLISH TATRA MTS

To date, severe mountain conditions (high altitudes, steep rocky slopes, snow cover), along with the specific time of observations (night), were responsible for the relatively little data on the owls from the Tatra Mts. Our observations fill a void in the data partly because we focused our study on the more accessible central part of the mountains; the east and west parts still need futher detailed studies (Fig. 1). Quantitative observations from a larger sample plot will be undertaken in future.

Taking into account possible size of territories (GLUTZ VON BLOTZHEIM & BAUER 1980; CRAMP 1985) and topography of the mountains, we plotted on a map all records in such a way that each sign represents a separate individual, at least within one year (Fig. 1). In most cases this was relatively easy because particular individuals of the same species were usually far apart from one another. Only in the case of the Eagle Owl was it at times more problematic due to the large territories of this species.

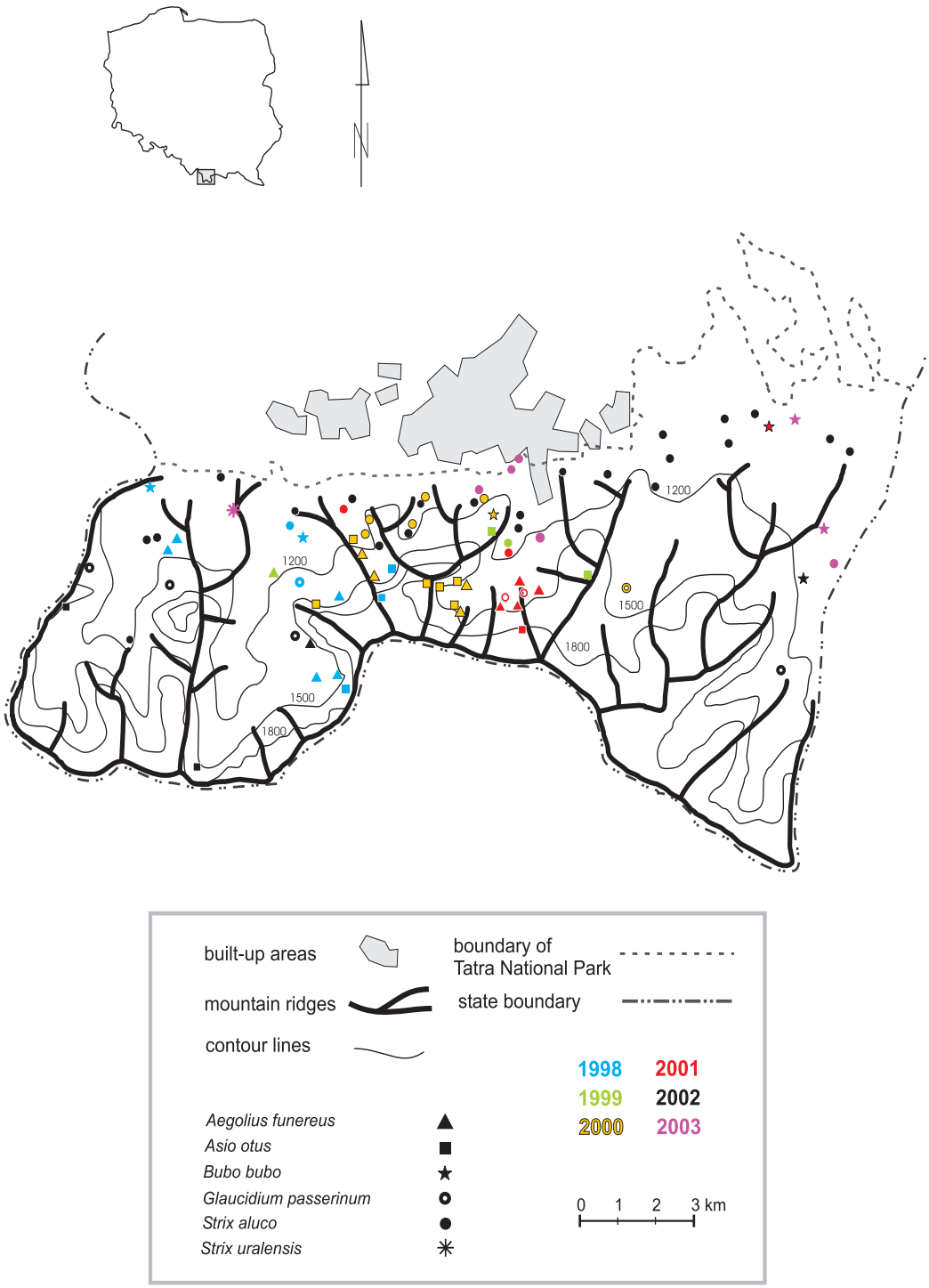

Fig. 1. Records of owls in the Polish Tatra Mts in the years 1998-2003. Each record represents a separate individual, at least within one year. East and west parts of the mountains were very little penetrated, hence they yielded low number of observations.

During the six years of this study, only one (2002) was relatively good in terms of the number of owls recorded (Table 1). The remaining years yielded considerably fewer observations, although counts were always carried out during good weather conditions. This may be due to the possible fluctuations in food supply (MIKKOLA 1983) but more studies are needed to resolve this problem. Altogether, six species of owls were recorded in the Polish Tatra Mts.

Table 1

Records of owls in the Polish Tatra Mts in the years 1998-2003, and their vertical distribution. Each record represents a separate individual, at least within one year. Subsequent years cannot be directly compared because the areas of penetration were not the same; the numbers give only a rough idea on the relative abundance of particular species

Speecies		1998	1999	2000	2001	2002	2003	Total 1998-2003	Vertical distribution in 1998-2003				
									Lower montane zone	Upper montane zone	Timberline	Subalpine zone	Alpine zone
Eagle Owl	*Bubo bubo*	2	–	1	1	1	2	7	6	1	–	–	–
Pygmy Owl	*Glaucidium passerinum*	1	–	1	2	4	–	8	–	8	–	–	–
Tawny Owl	*Strix aluco*	1	1	5	2	22	5	36	34	2	–	–	–
Ural Owl	*Strix uralensis*	–	–	–	–	–	1	1	1	–	–	–	–
Long-eared Owl	*Asio otus*	3	2	6	1	2	–	14	1	3	5	4	1
Tengmalm's Owl	*Aegolius funereus*	5	1	4	4	1	–	15	3	12	–	–	–
Total		12	4	17	10	30	8	81	45	26	5	4	1

Eagle Owl *Bubo bubo* (LINNAEUS, 1758) was observed mainly in the lower montane zone. We recorded it in two areas in 1998 (one of them was a certain breeding area) and 2003, and in one different area in each of the three years between 2000 and 2002. Most probably our data underestimate the real number of areas occupied by the species in the Polish Tatra Mts because we did not check all possible breeding sites every year. The Eagle Owl was recorded in the 19th century by several authors (WODZICKI 1851; KARLIŃSKI 1882; KOCYAN 1884). Its recent population in the Polish Tatra Mts is estimated at 4-7 pairs nesting up to 1200 m asl, depending on the author (FERENS 1953; TOMIAŁOJĆ 1990; WASILEWSKI 1996).

Tawny Owl *Strix aluco* LINNAEUS, 1758 was the most frequently recorded species (Table I, Fig. 1). We recorded it mainly in the lower montane zone. Our highest records come from the altitude of about 1200-1300 m asl (western slopes of Łysanki, Dolina Małej Łąki valley, 2000 and 2002). Our data are in accordance with those from the literature. The species has always been reported as common in the Tatra Mts and occurring mainly in the lower- and sometimes in the upper montane zone (WODZICKI 1851; KARLIŃSKI 1882; KOCYAN 1884; FERENS 1959; GŁOWACIŃSKI & PROFUS 1992; PROFUS 1993; WASILEWSKI 1996).

Ural Owl *Strix uralensis* PALLAS, 1771 was first reported in the Polish Tatra Mts in the mid 19th century (TOMIAŁOJĆ 1990 after WODZICKI), and the next observations were not made before a century later in the years 1960-1980 (WASILEWSKI 1996). WASILEWSKI (1996) lists two territories in eastern part of the Tatra Mts, and the species was also observed in the western part (Kopki between Dolina Kościeliska valley and Dolina Lejowa valley) in mid-1990-ies (F. ZIĘBA, personal comm.) and in June 2003 (Ł. PĘKSA, according to personnal comm. with F. ZIĘBA). All the observations come from the lower montane zone.

Pygmy Owl *Glaucidium passerinum* (LINNAEUS, 1758) was encountered eight times only, always in the upper montane zone. One observation was made during the daytime (15.45, 3 May 2002, Dolina Tomanowa valley) which is not unusual (BOROWSKI 1961; GLUTZ VON BLOTZHEIM & BAUER 1980; CRAMP 1985). It was recorded in the Tatra Mts both in the 19th century (KARLIŃSKI 1882) and in recent times (TOMIAŁOJĆ 1990; WALASZ & MIELCZAREK 1992; Komisja Faunistyczna 2000, 2001, 2002; TOMIAŁOJĆ & STAWARCZYK 2003).

Tengmalm's Owl *Aegolius funereus* (LINNAEUS, 1758) was heard regularly but not very often, mostly in the upper montane zone and more rarely in the lower montane zone. Its occurrence in the Tatra Mts up to about 1400 m asl has been known since the 19th century onwards (TOMIAŁOJĆ 1990; TOMIAŁOJĆ & STAWARCZYK 2003).

Long-eared Owl *Asio otus* (LINNAEUS, 1758) was recorded regularly although not very often. It has been observed in all zonal biotopes, however most records come from the upper- and subalpine montae zones; the transition between the two zones (i.e. timberline) seems to be its preferred habitat. The highest altitude that this species occurred was below the summit of Giewont at about 1880 m asl (hooting heard on 6 May 2000). Fledglings were seen in dwarf pine bushes on Kopa Magury at about 1680 m asl on 30 June and 5 July 1999. The data on its vertical distribution in Poland are very scanty (TOMIAŁOJĆ 1990; TOMIAŁOJĆ & STAWARCZYK 2003). It was observed rarely up to 1250 m asl in the Bieszczady Mts, SW Poland (ĆWIKOWSKI 1996), and it bred at the altitude of 1120-1220 m asl in the Gorce Mts, S Poland (LOCH 1997). Its last observation from above the timberline in the Polish Tatra Mts comes from the 19th century (KOCYAN 1884); TOMIAŁOJĆ & STAWARCZYK (2003) refer to our unpublished results provided by CICHOCKI.

The distribution of particular owl species in the Tatra Mts is clearly associated with changes in the habitat relating to the altitude (Table I). The same numbers of species were recorded in the upper montane zone (5) and in the lower montane zone (5) but the number of observations for each species varied between the two zones. Tawny Owls clearly outnumbered other species in the lower montane zone whereas Tengmalm's Owls were the most numerous in the upper montane zone. The occurrence of the latter species is correlated with the number of available nesting sites – i.e. holes made by Black Woodpeckers in spruce trees (GOTZMAN & JABŁOŃSKI 1972; HARRISON 1975; FERIANC 1979). At higher altitudes (i.e. timberline and above) only Long-eared Owls were recorded. That species seems to occur at lower altitudes in the Tatra Mts very rarely (only one record from the lower montane zone). This may be due to the competition with Eagle Owls and Tawny Owls (MIKKOLA 1983), because Long-eared Owls are very often observed at lower altitudes in Kotlina Nowotarska dale, i.e. outside but close to the Tatra Mts (CICHOCKI, unpublished observations).

III. COMPARISONS AND GENERAL COMMENTS

None of the six species of owls studied is restricted to the mountains – all of them also occur in lowlands. Three species (Ural Owl, Pygmy Owl and Tengmalm's Owl) belong to the taiga bird species (sensu STEGMAN 1931) and are of general disjunctive boreal-montane distribution. All the species occur in various parts of the Western Carpathians. The estimated population of each species varies from author to author which may be due to fluctuations in the abundance of food (MIKKOLA 1983). In some cases also the upper altitudinal limits of their distribution varies according to the source.

The vertical distribution of the Eagle Owl in the Slovak part of the High Tatra Mts reaches to 1000 m asl (DANKO & KARASKA in DANKO et al. 2002), and in the Belanske Tatra Mts to 1100 m asl (PIKULA 1958), thus lower than on the Polish part of the Tatra Mts. According to MOŠANSKÝ (1974), the species preferred altitude in the Slovak part of the Tatra Mts is about 900 m asl. The number of pairs on the Slovak part was estimated at 6 pairs in the 1930's (BALÁT et al. 1955), and later at 15-20 pairs (MOŠANSKÝ 1974).

The Tawny Owl is the most frequently observed species, especially in the lower montane zone (present study). According to BALÁT et al. (1955), it was very rare in the High Tatra Mts and the Belanske Tatra Mts in the mid 20th century, and contrary to our observations it was then noted also in the subalpine zone. According to FERIANC (1979) the Tawny Owl was a common species in the High Tatra Mts reaching up to 1100 m asl, whereas according to PACENOVSKY and OBUCH (DANKO et al. 2002) it was known from 1300 m asl, which is in accordance with our data. According to MOŠANSKÝ (1974), Tawny Owl occurs sporadically up to 1500 m asl in the Slovak part of the Tatra Mts but its preferred altitude is up to 1100 m asl.

The first records of the Ural Owl in the Polish Tatra Mts date back to the mid 19th century (TOMIAŁOJĆ 1990 after WODZICKI), and similar suggestions regarding the Slovak part of the mountains are found in HUDEC et al. (1983). In the mid 20th century, the breeding areas of the species were restricted to eastern Slovakia (MOŠANSKÝ & SLÁDEK 1958). The same distribution is also given by FERIANC (1979) who defined the western borderline of the species as lying between 20° 45' and 20° 55' E, which corresponds with the data from the Polish Carpathians at that time (TOMIAŁOJĆ 1972). The species was later observed in Poland in the Gorce Mts (KOZŁOWSKI 1974) and on Mt Babia Góra (KIEŚ 1991; BOCHEŃSKI 2003). On the Slovak part of the western Tatra Mts, it was a breeding species in the years 1974-1996 (KOCIAN 1998), and its present general distribution in Slovakia reaches as far west as 18° 50' E (DANKO, KARASKA & KRISTIN in: DANKO et al. 2002). According to MOŠANSKÝ (1974), the species occurs in the Slovak part of the Tatra Mts at the altitudes between 800 and 1400 m asl. Its fossil records from the late glacial of the Vistulian include two sites in Moravia and one site in Slovakia, all of them situated west of the Tatra Mts (TYRBERG 1998). In southern Poland, it is known from the late Pleistocene (BOCHEŃSKI 1988) and late Holocene (NADACHOWSKI et al. 1989). The historical data from the 19th century and the beginnings of the 20th century (RUPRECHT & SZWAGRZAK 1988) as well as the fossil records indicate that the modern westward expansion of the species (HELMSTAEDT 1961) may be a "comeback" to previously occupied areas.

The Pygmy Owl on the Slovak part of the High Tatra Mts reaches up to the timberline and the lower part of the subalpine zone (FERIANC 1979). According to PACENOVSKY (in DANKO et al. 2002) it used to be a rare species in Slovakia but since 1980 the number of observations increased, which is probably due to better and more thorough methods used in looking for the nesting sites of this secretive species.

Tengmalm's Owl in the Slovak part of the High Tatra Mts forms a healthy population reaching up to the timberline, i.e. somewhat higher than that on the Polish side. According to MOŠANSKÝ (1974), the species occurs in the Slovak part of the Tatra Mts at the altitudes between 900 and 1430 m asl, with the zone between 1000 and 1300 m asl being the preferred altitude.

Our data provide the first records of the Long-eared Owl above the timberline in the Polish Tatra Mts. This can be due to the lack of proper observations in the higher altitudes of this area. This species was not observed above the timberline on the Slovak part of the mountains either (KLÍMA 1959), and according to KROPIL (in: DANKO et al. 2002) it reaches only 800 m asl in the Slovak Tatra Mts. However, it was observed foraging above timberline on a nearby mountain massif in Poland – Mt Babia Góra (BOCHEŃSKI 1970). The species is known to breed up to 2100 m asl in the Alps where its upper vertical distribution can reach to 2250 m asl. It has been observed above timberline more often than the Tawny Owl (GLUTZ VON BLOTZHEIM & BAUER 1980; CRAMP 1985).

Two species of owls observed in the 19th century by KOCYAN (1884) are not found in the Tatra Mts any more – Scops Owl *Otus scops* (LINNAEUS, 1758) and Hawk Owl *Surnia ulula* (LINNAEUS, 1758). Neither of the species was observed by us; they are accidental visitors to Poland (TOMIAŁOJĆ 1990; TOMIAŁOJĆ & STAWARCZYK 2003). Although KOCYAN (1884) lists the Scops Owl among the breeding species of the High Tatra Mts, MATOUŠEK (1962) questions it. Its breeding area is limited to southern Slovakia only (DANKO & SAROSSY in: DANKO et al. 2002). During the 20th century, the species was recorded only once in the foothills of the Tatra Mts in 1954 or 1955 (TOMIAŁOJĆ 1990; TOMIAŁOJĆ & STAWARCZYK 2003). According to TOMIAŁOJĆ (1990) the Hawk Owl observed in July 1881 by KOCYAN (1884) was an accidental visitor from northern taiga.

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