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Contribution on the marmots in the High Tatra Mountains

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Abstract. In this article, historical data on the occurrence of Tatra mountain marmots (*Marmota marmota latirostris*) in the High Tatras are processed from the first written record to the present day. Reasons for a decline in marmot numbers in the past are given as well as the development of measures for protection and maintenance of this species at a favourable conservation status in the mountains of Slovakia.

Key words: Tatra mountain marmot, High Tatras, poaching

Data on this theme in the past were connected mainly with information on the hunting of marmots for the medicinal properties of their subcutaneous fat. Not until modern sources from the middle of the last century from staff of the High Tatras National Park are there descriptions of the exact occurrence of marmots on the basis of observations.

History of marmot occurrence up to the beginning of the 20th century

In historical sources, records on marmots are rarer than, for example, those on chamois because of the less conspicuous life of the marmot. The first records are preserved from the 17th century, when chamois hunters also hunted marmots for their fat (Blahout 1971). The inhabitants of sub-Tatran villages knew the marmot by the names whistler (Slovak: hvizdák), watcher (mercúň) or mumbler (mrmlavec) (Jamnický 2002). The original distribution of the marmot in Slovakia was much larger than at present, mainly during the cold period of the Pleistocene (Blahout 1971). Altered conditions during the warming of the last Würm glaciation, so about 10,000 years ago, forced it to seek refuge in high mountains, in the cooler conditions of the alpine zone (Kratochvíl 1964, Bohuš 1982). In the High Tatras, therefore, lives an autochthonous marmot population, which has persisted since the last glaciation. There are mountain massifs and valleys named after this animal in different parts of the Tatras. For example: Mount Marmot (Slovak: Svišťový štít), Marmot Valley (Svišťová dolina), Marmot Towers (Svišťove veže), Marmot Horn (Svišťový roh), Marmot Pile (Svišťová kôpka), Marmot Passage (Svišťový priechod), Marmot Ridge (Svišťový chrbát), Lower and Upper Marmot Caves (Nižná and vyšná svišťová jaskyňa), Greater Marmot Peak (Veľká Svišťovka), Lesser Marmot Peak (Malá Svišťovka), Saddle below Marmot Peak (Sedlo pod Svišťovkou), Liptov Marmot Peak (Liptovská Svišťovka), as well as Marmot Stream (Svišťovský potok). All these localities are typified by their exposure, grassy vegetation and geological parameters as well as very suitable habitat for marmots (Bohuš 1982, Chovancová and Kacerová 2008).

Blahout (1969) states that according to historical sources at the beginning of the 19th century there were supposedly almost no marmots in the High Tatras. In the 19th century there was no interest in determining the abundance of marmots or even the number of colonies, because at that time its rarity was not known. Only isolated reports have survived indicating its abundant occurrence in some localities, rare occurrence or absence elsewhere. The Hungarian hunting law of 1872, amended in 1883, which was valid in some legislation until the end of the Second World War, did not deal with hunting or protection of marmots at all. Its protection could have been at least partially secured by § 9 of this law, which forbade the hunting of animals and birds from 1st February to 15th August throughout Hungarian territory (Jamnický 2003). Chovancová (1999) mentions a law from 1868, signed by Franz Josef, forbidding trapping, digging and selling of Tatra animals: marmots and chamois. However, this law was not very effective, because private landowners were not interested in marmot protection, because it did not bring them any material advantages (Chovancová 1983). In hunting magazines, also, information about the hunting of two or three marmots only sporadically occurred (Jamnický 2003). The animal is meaningless from a hunting point of view in terms of trophies (Halák 1984). Hunting it was made harder by the fact that it was necessary to shoot it precisely, so that it would be dead on the spot. The imperfection of guns then and the alertness of marmots did not make it much easier (Jamnický 2003).

People living below the Tatras knew long ago that plants and animals living in high mountains must be resistant to cold, frost and wind. So they tried to obtain life-giving strength from these organisms. The commonest beliefs about the healing powers of some animal parts, especially rare ones, sometimes evoked their unrestrained destruction (Blahout 1969). People made healing oils from the needles of dwarf and Arolla pines, they tried to bezoar from chamois as a medicine for strengthening the body and spirit and fat from marmots as a cure-

all against many ailments (Jamnický 2003), above all against TB (Blahout 1971). But these beliefs had rational reasons. In states where marmots are commonly hunted, their fat is used as a constituent of many medicines and cosmetic preparations (Chovancová 1987). The most widespread method of hunting marmots was digging. The extent of marmot digging, however, is unknown. Only a few data have been preserved such as, for example, that in 1858, 14 dug marmots were brought to the sub-Tatra village of Štôla or that a shepherd from Kôprová Valley brought a whole keg of marmot fat to a Polish market. Destruction of marmots reached a peak perhaps in the mid 19th century, when they were in danger of eradication from the whole Tatra region (Jamnický 2003). In the 1860s marmots were noted in only three places in the High Tatras (Kratochvíl 1964). In these years several articles were published calling for the protection of marmots (Jamnický 2003). Articles on the destruction of marmots appearing around 1870 can be regarded as the first attempts at marmot protection. Some natural scientists also warned about the decline of marmots at this time, such as Maksymilian Siła-Nowicki, foresters Anton Kocyan and Stanisław Pietruski and clergyman Eduard Janota (Chovancová 1999) and Daniel Gabriel Lichard, who in 1866 in his magazine Horizon (Slovak: Obzor) wrote an article with the title, "A Word on the Protection of Whistlers and Wild Goats" (Urban 2002). In 1879, when Prince Kristián Kraft bought Javorina, the capturing of marmots in such large numbers ceased in this area, on the one hand because there were fewer of them but also because criminal sanctions were brought against the perpetrators (Zelina 1965). In a book on the history of the Hungarian Carpathian Society, it is written that its members dug marmots on the northern slopes of the Tatras and brought them and released them on the south side, where they were almost eradicated (Jamnický 2003). Members of the Carpathian Society were nature lovers and experts on the Tatras, who marked themselves for the role of saving high mountain animal species: the chamois and marmot. In connection with this they also employed rangers, some of whom were well-known poachers before, but later they became zealous nature conservationists (Chovancová 1999).

Diggers killed marmots by a spade blow to the head or by holding them by the back legs and hitting their heads on a rock (Jamnický 2003). It took marmot diggers a day to excavate a burrow, or sometimes several days according to the terrain and length of the burrow. They dug marmots in autumn, when they had already entered their burrows (Zelina 1965). People from sub-Tatra villages caught marmots in traps, snares and sacks with the aid of smoke or sulphur and in autumn they dug them and drove them out with the help of dogs (Bohuš 1982). The biggest poachers were shepherds. They caught marmots not only because of meat, which they ate themselves, but above all for their fat (Bohuš 1982), for which they often earned more in pharmacies than their entire year's pay (Zelina 1965, Blahout 1972). When shepherds caught marmots in sacks with the aid of smoke, they first blocked with rocks and soil all burrow entrances except one, to which they attached the sack. They built a fire in the main entrance and added fresh dwarf pine to it so that it smoked better. In a quarter of an hour the marmot ran straight into the sack (Zelina 1965). On the basis of reports from members of the Carpathian Society, natural scientists and other aware conservationists of Tatra nature, the destruction of marmots declined at the end of the 19th and beginning of the 20th centuries (Jamnický 2003).

History of marmot occurrence in the 20th century

Somora (1954) writes that in 1910 around 500 marmots lived in the High Tatras in tens of known colonies. They were in these places: Malá Studená Valley, the Batizovské Tarn area, the Zelené Tarn terrace at the foot of Kriváň, the surroundings of Skok Waterfall and lower Kozie Tarn in Mlynická Valley, the Skalnaté Tarn area, the surroundings of Lievikové Tarn, the surroundings of Greater Marmot Peak, Marmot Valley and Marmot Peaks.

Apart from digging and trapping hunters could legally hunt marmots until 1929, when a new hunting law came out which protected marmots yearround. According to official hunting statistics the average annual bag in the year 1924 to 1928 was still 16 individuals and in 1928 alone 33 marmots were hunted (Jamnický 2003).

Much later, too, when the law on the protection of marmots was already in force, a sub reeve from Štôla was caught at Ostrvy in 1934 with a haul of nine marmots (Bohuš 1982).

The years of the First and Second World Wars always meant a marked decrease in the marmot population. Before the Second World War, their number in the High Tatras exceeded 1,200 individuals. During the war their number fell to 500 individuals, the largest colonies consisting of only a few families, at most 30 animals. According to a census in 1959, 1,000 individuals were documented in the High Tatras (Somora 1965, Kratochvíl 1964). In 1964 it was 1,440 individuals and 1,560 in 1967 (Mošanský 1974).

In the mid 20th century marmots were still pushed out of their original habitats, which were highly exploited by grazing. This was so in Tichá, Tomanová and Kôprová Valleys as well as in the whole of the Belianske Tatras. Herds of cattle disturbed marmots and trampled their colonies, which resulted in the relocation of marmots to the most inaccessible areas (Blahout 1960). Zelina (1963) mentions a 66% decline of marmots in 1957–1958 compared to 1936–1937 in localities near Brnčalova Cottage, near Kežmarska Cottage, at Greater Marmot Peak and Skalnaté Tarn. The direct destruction of animals, including the decline of marmots, was halted by the declaration of the High Tatras region as a national park, because Act no.11/1949 and its enforcing decree no.5 from 2nd December 1959 directly forbid the destruction of nature and decreed the protection of Tatra nature and wildlife (Blahout 1969). This law eliminated grazing on mountain meadows in the High Tatras region. The marmot was protected from 1965 by a SNR statute (Štollmann 1993). An increasing trend in marmot numbers was observed after 1950 by Blahout (1960) in the Podbanské region, especially in places which were intensively overgrazed before the establish-

ment of TANAP. He cites a rise in the number of colonies from 11 to 39. The situation was quite favourable for marmots at this time. As Zelina (1963) writes, marmots increased in strict reserves, even founding new colonies. Marmot numbers increased from 1950 to 1967. At this time even an expansion was detected, within which the marmot occupied its original habitat, from which it had been pushed out by grazing and persecution in the past (Mošanský 1974, Randík 1972). Somora (1954) cites the occurrence of marmots at these localities in the High Tatras: Vyšná Priehyba below Kriváň, Zahandel (Zadný handel), Suchá Valley below Krátka, Saddle below Sedielko (Sedielková kopa), the lower moraine of Wahlenbergové Tarns, the upper end of Mlynica (Mlynická Valley), the surroundings of Hincové Tarn and Kôprovské Saddle, near Dračie Tarn, in Zlomísk Valley, near Batizovské Tarn, near Velické Tarn and above it in Kvetnica on the southern slopes of Granátové steny, in Slavkovská Valley, on the southern slope of Slavkovský Peak, at the head of Veľká Studená Valley, around Päť spišské Tarns, below the large barrier of Téryho Cottage, at Skalnaté Tarn and in Mŕtvá záhradka, below Kežmarský Peak, below Jah-ňací Peak, in the surroundings of Kolové Tarn, at Čierný Javor Tarn, at Žabí Tarns below Široká, in Marmot Peaks Valley (Marmot Valley), in Široká Valley below Široká, in Litvorý Gully below Široká, at the head of Bielovodská Valley at Litvoré, Zamrzlé, Zelené and České Tarns and near Bialčianské Žabie Tarns (Bielovodské Žabie Tarns).

Kostroň (1965) completes the above localities with the following: in the saddle between Závory and Hladký Peak and on the southern slope below Hladký Saddle, below the face of Hrubé, below Bránou Chalubińského (Chalubinského vráta), near Temnosmrečianske Tarns, on the southern slopes of Smrečiny and Kôprovský Peak, below Kôprovský Saddle, in the mo-raine of Terianské Tarn, above Pavlová, towards Kriváňský Gully, above upper Furkotský Tarn, below Solisko, on the southwest slope of Patria, below Široký Saddle and Predná Bašta, in the moraine above Skok Waterfall, on the southern slope of Oľgin Peak, to the north from Žabie Tarns, on the southern slope of Ostrvy, below Gerlach corrie, in Kvetnica, in the right part of the Dlhé Tarn moraines, near Vareškové Tarn, on the right bank of Studený Stream, at the head of Veľká Studená Valley, near Sivé Tarns, opposite Priečné Saddle, below Lomnické Saddle, on the ridge from Greater Marmot Peak to Lesser Marmot Peak, in the basin of Zelené Tarn, near Čierné Tarn, in Veľká Zmrzlá Valley, below Kolová veža, on the bank of Červené Tarn, the moraine near Kolové Tarn and above it, on the north slope of Svinka, below Ľadový and Snehový Peak, the gulley between Sedielko and Ľadový Peak, in the basin of Žabi Tarn and in the Valley of Zelené Tarn below Široká, below Košiar and in Marmot Peaks Valley and in the moraine of Zamrznuté and Litvorové Tarns.

Blahout (1971) speaks about 170 colonies of marmots in the High Tatras (including the Podbanské region) in 1971, within which he recorded the highest density in Litvorová and Marmot Valleys. Following these are Skalnatá, Mengusovská, Malá and Veľká Studená Valleys. At this time the northernmost colony was evidenced in Dominová Valley below Havran, the southernmost in Kvetnica, the easternmost in Košiara Valley and the westernmost in Hlinná Valley.

However, despite legal measures, marmot numbers fell at the beginning of the 1980s (Chovancová 1983). Rapidly increasing tourism had a large influence on this state. There was a continually observed decline in the number of marmot colonies from the 1980s. According to the results of a range-wide inventory conducted in the 1990s, there were around 150 colonies in the High and Belianske Tatras and at the same time the number of marmots in individ-ual colonies fell sharply. In places where 8–12 individuals were evidenced in the 1980s, 4–6 or even fewer were detected in the 1990s (Chovancová 1999).

Ondruš (2003) states that in 1990 the following marmot localities were confirmed: Kamenná Tichá Valley, Závory Saddle (Valentková), Temnosmrečianske Tarns, Krížna, Kôprovica (Nižný závrat), Špania, Zadný Licierový Gully, Garajová Valley, Furkotská Valley, Mlynická Valley, Hincova Basin, Žabie Tarns Valley, Dračia Valley, Rumanova Valley, Zlomiská, Ostrva, Žľab below Klinom, Štôlska Valley, Batizovská Valley, Velická Valley, Slavkovská Valley, Veľká Studená Valley, Malá Studená Valley, Skalnatá Valley, Zelené Tarn Valley, Veľká Zmrzlá Valley, Medená Valley, Malá Zmrzlá Valley, Červená Valley, Bielé Tarns, Valley Predné Meďodoly, Kolova Valley, Čierna Javorová Valley, Zelená Valley Javorová, Zadná Valley Javorová, Žabia Bielovodská Valley, Spádová Valley, Česká Valley, Kačia Valley, Litvorová Valley, Svišťová Valley, Rovienková Valley and Široká Valley. A total of 98 colonies lived in these localities.

He also cites the following localities as unconfirmed, unchecked or vanished: Kôprova Valley - below Prostredný chrbát, Kôprova Valley - below Daxnerové Saddle, Žabie Tarns Valley - below Vyšná Štrbina in Kôpkach, Slavkovská Valley - below Vareškový Ridge, Malá Studená Valley - below Veľký Hang, Skalnatá Valley – in Lievikov Corrie, Žabia Valley – Javorová, Litvorová Valley - below Hrubá veža, Zámky, Litvorový Gully and Marmot Peaks Valley.

Occurrence since 2000

From 2001 to 2006, monitoring of marmot colonies was conducted in cooperation with the Polish University of Agriculture in Krakow within the task of Mapping TANAP Biotopes. In 2002 the abundance of marmots in the High Tatras was estimated at 600–800 individuals. In 2003, 79 colonies were ascertained in the High Tatras. The average number of individuals in a colony was rated as 6 individuals. In comparison with the 1990s the marmot population fell by 20% (Chovancová 2004, 2008).

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