

## Cultural Sheep Grazing in the Area of Two Carpathian National Parks

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Raising and breeding sheep in the Carpathian Mountains has always been one of the main forms of the traditional pastoral economy, determining the character of this region (Wróbel, 1997). Pastoralism, as a specific type of animal maintenance and breeding, requires long-lasting contact with nature and partial isolation of shepherds, however, over the centuries, it was their wanderings that contributed to the penetration of various customs and traditions. Thanks to this, pastoral culture is a kind of conglomerate of elements, composed not only of nature and economic aspects of sheep breeding, but also, to a large extent, the original tradition of a given region (Molik et al., 2017, Radkowska and Musiał, 2017). Therefore, sheep grazing in mountain regions holds important and specific culture-creating functions, which distinguishes these areas from other regions in the country. Sheep play an important role in maintaining the regional traditions, also increasing the tourist attractiveness of the region, and the sheep grazing is a part of cultural activities, among others, in mountain national parks (Musiał, 2004). Sustaining the pastoral tradition and the way of maintaining valuable landscape and natural meadows and clearings within such protected areas is currently conditioned by the seasonal grazing of small sheep herds and, therefore, limited cultural grazing.

Extensive and restricted animal breeding is also carried in national parks, which are recognised as protected areas distinguished by special natural, scientific, social and cultural values, with an area not less than a thousand hectares. The basic purpose of the foundation of national parks is to observe and preserve the entire natural systems, which is also possible due to the existence of protection zones in the form of adjoining greenery (Denisiuk, 1995).

In Poland, cultural or commercial-cultural grazing is carried out in all the mountain national parks, including in the Pieniny and Tatra Mountains. The Pieniny National Park (PPN) with an area of 23.46 km<sup>2</sup> occupies the most valuable areas of the Main Pieniny Range in terms of landscape and nature: the Three Crowns Massif, Pieniny Czorszyńskie, Pieninki and the Dunajec Gorge. It was established in 1932 as the first national park in Poland and from the beginning of its existence sheep grazing was carried out there in order not to interrupt the current method of use. At the time, the rules of cultural grazing were adopted on the Majerz clearing leased to a selected shepherd, who, at the request of the Park, built a mountain hut in the Podhale style (Wróbel, 1997, Kawęcka et al., 2017). The situation within the area of the Tatra National Park (TPN) founded in 1955 with an area of 211.64 km<sup>2</sup> was slightly different. Earlier, especially during the World War II and in the post-war period, too intensive sheep grazing was carried in the Tatras, which caused various damage to existing plant groupings. As a result, after the foundation of the park and the purchase or expropriation of the clearings in the 1960s of the twentieth century grazing was completely abandoned. In time, however, it turned out that this was a cause of negative changes in the natural environment and now the cultural grazing is carried only on selected clearings (Ciużycki, 2004).

The purpose of the work is to synthesise the currently carried sheep grazing in two mountain national parks, located within the Western Carpathians - the Tatra National Park and the Pieniny National Park.

## Materials and methods

The study has a character of a dual analysis combining a review part based on the available literature, including authors' studies on sheep cultural grazing and institutional analysis covering the facts of the formal grazing conditions. The areas of the Pieniny National Park and the Tatra National Park, located in the southern part of the Lesser Poland Voivodeship, were assumed as the research area. The data on cultural grazing were collected in the directorate of both national parks, for which relevant lease contracts for mountain clearings and pastures were used. The interviews were also carried out with employees responsible for the organisation of grazing. The information and requirements included in the lease agreements were divided into three main groups: general information on grazing in the parks, socio-cultural requirements and requirements for natural environment protection.

The examples of organised activities to maintain the biodiversity of the clearings situated within the national parks and the cultural heritage of the region through sheep grazing were: in the Pieniny - Hala Majerz, while in the Tatras - the Chochołowska Niżnia and Jarzącza Niżnia clearings.

### Physical and geographic conditions of the Tatra and Pieniny areas

The geographic environment of the Małopolskie voivodship is highly diversified as only 9% of the area is situated below 200 m above sea level. In turn, over 50% of the land is situated over 500 m above sea level, which is a unique phenomenon in the generally lowland country. According to the regional division of the Carpathian Mountains, the areas of two national parks are located within the boundaries of the Western Carpathians region and the Central Western Carpathians subregion characterised by the fact that it consists of mountain ranges made of igneous and metamorphic rocks and arid lands cover of sedimentary rocks with the predominance of limestone and dolomite (Kondracki, 2009). Two macroregions belong here: Orava-Podhalańskie Lowering and the Tatra Range. The first one is the Pieniny, while the Tatra Range includes two mesoregions: the Western and Eastern Tatras (Tab. 1).

Table 1. Physiographic and administrative division of the areas of Pieniny National Park and Tatra National Park

Province	Subprovince	Macroregion	Subregion	County	Commune	Headquarters and acreage of the park
Karpaty Zachodnie	Centralne Karpaty Zachodnie	Obniżenie Orawsko-Podhalańskie	Pieniny	nowotarski	Szczawnica, Czorsztyn, Krościenko	Krościenko nad Dunajcem, 23,46 km <sup>2</sup>
		Łańcuch Tatrzański	Tatry Zachodnie	tatrzański	Zakopane, Kościelisko, Poronin, Bukowina Tatrzańska	Kuźnice, 211,64 km <sup>2</sup>
Tatry Wschodnie						

Source: own study, based on Kondracki (2009)

The Pieniny are a small mountain group, which is a part of a long, torn belt of limestone rocks on the boarder of Central and Western Outer Carpathians. In Poland, it covers the area among the Nowotarska Valley in the north-west, Spiskie Foothills in the south and Beskid Sądecki located in the north-east (Kondracki, 2009). There are resistant Jurassic and Cretaceous limestone rocks that form mountain ridges and individual rocks. The peculiarities of the terrain, as well as the flora, were the basic premises for the foundation of the National Park in the central part of the Pieniny region. The Tatra Range is a macro-region of the Central Western Carpathians, which is clearly separated from the

surrounding valleys and foothills, and its geological structure and typical glacial forms are similar to the higher parts of the Alps. From the north, this range is surrounded by the Orava-Podhalanskie Lowering, and from the south and east by the Liptovsky-Spiskie Lowering.

The Tatra Mountains are the highest mountain range in the Carpathians and, at the same time, in Poland. It is clearly separated from the surrounding valleys. The geological structure is very complex, the crystalline core is made of granitoids and metamorphic rocks, and sedimentary rocks to the north of the core (Balon et al., 1995). The Tatra Mountains are the only fragment of the alpine sculpture and landscape mountains in the Polish Carpathians. In addition, they have the best-developed storey vegetation system from among all the Carpathian ranges that covers all climate and vegetation zones.

### ***Cultural sheep grazing on the clearings of the Pieniny National Park and the Tatra National Park – case study***

In the Pieniny National Park, sheep grazing of one of the total number of 12 sheep herds in the Pieniny takes place. Such grazing in the protected area, referred to as cultural grazing, is currently taking place at the Majerz clearing in the Hałuszowa village, which covers the area of 52.06 ha. About 500 sheep of the Polish Mountain Sheep breed are grazed there (Tab. 2). One shepherd ("baca") selected by tender, with whom a contract has been signed for a period of 5 years (the current agreement ends in 2019) is responsible for grazing.

*Table 2. Terms of lease agreements for cultural sheep grazing in the area of Hala Majerz (PNP) and Chochołowska Niżnia, Jarząbcza Niżnia (TNP) – general data on the organization of grazing*

<i>Specification</i>	<i>Pieniny NP</i>	<i>Tatra NP</i>
<i>Total number of flocks of sheep covered by cultural grazing in the park</i>	1	7
<i>Total number of sheep covered by cultural grazing in the park</i>	about 500	about 1300
<i>Duration of the agreement</i>	5 years (current agreement 2014–2019)	extended after meeting the grazing conditions
<i>Selection criterion of shepherd</i>	tender	tender
<i>Annual lease fee (1 ha)</i>	485,9 zł	fee in the amount of 0.5q rye, according to market price in a year
<i>Place of cultural grazing</i>	Hala Majerz	Chochołowska Niżnia, Jarząbcza Niżnia
<i>Acreage of clearing</i>	52,06 ha	in total 20.3 ha
<i>Number of sheep in the clearing</i>	up to 500	up to 150
<i>Breed</i>	Polish Mountain Sheep	Polish Mountain Sheep
<i>Auxiliary staff</i>	not specified how many people	one person per 100 sheep
<i>Number of sheep during grazing</i>	about 10 sheep/ha	7–8 sheep/ha
<i>Type of sheep fold</i>	loose (1 sheep /2–2.5 m <sup>2</sup> /night)	not specified
<i>Access to electricity and water</i>	yes, water from a deep-drilled well	not specified
<i>Shepherd dogs</i>	Polish Tatra Sheepdog	Polish Tatra Sheepdog

Source: own study, based on lease agreements shared by the Directorate of PNP and TNP

The leased area includes non-forested and unfenced parts of 12 registered plots. The pasture was leased together with maintenance facilities: a mountain hut, a stable, water drinkers in the pastures and meadow fences. The density of sheep is about 10 individuals per 1 ha, and the grazing type is referred to as loose. The annual fee for each hectare is PLN 485.9, however, the number of so-called auxiliary staff ("juhas") is not specified. Shepherds, i.e. "baca" and "juhases", must have medical research necessary for milk processing. Shepherd dogs that accompany them in grazing must also be vaccinated and "baca" is responsible for the safety in this aspect. Shepherds are also obliged to take care of the order within the leased area, especially in the vicinity of the mountain hut.

Within the area of the Tatra National Park there is a total of 7 herds of grazing sheep, with the total of about 1,300 animals. The lease agreement, concluded between the national park and the shepherd selected by tender, may be extended after meeting the conditions for grazing and refers to the Chochołowska Niżnia and Jarząbcza Niżnia clearings with the total area of 20.3 ha. The annual contract fee for the lease of 1 hectare is as much as the price of 0.5 q of rye according to the prices for a given year. One can only graze animals of local breeds. About 150 sheep of the Polish Mountain Sheep breed are grazed there. Used shepherd dogs must belong to the local Polish Tatra Sheepdog breed in the Tatra Mountains. The Tatra National Park imposes on the shepherd the obligation to hire helpers, i.e. "juhases" in the number of at least one person per every 100 animals.

Cultural grazing, constituting a certain form of protection of the regional cultural heritage, is also a chance for its economic recovery.

Therefore, the shepherds must meet various conditions specified in the lease agreement, from the group of so-called socio-cultural conditions. They include organising pastoral events, expanding the offer of sheep milk products sold, and cultivating traditions in the mountain huts. The sight of sheep grazing near tourist trails (Molik et al. 2017, Knapik and Musiał, 2017) is also a special attraction of increasing importance. In the area of the Tatra National Park, for cultural grazing, the so-called ethnographic conditions have an important role (Tab. 3). This is expressed in the observance of traditional pastoral rites: in the village before grazing, in the parades, in the clearing and in the shepherd's mountain hut. This also applies to the equipment requirements for the mountain huts as well as the possession and use of traditional equipment, such as, for example, ladles, scoops, a small cauldron, pails and pushers. In the mountain hut there is a traditional hearth, a cauldron, milk processing equipment, etc. The mountain hut is located on the "oscypek" cheese route and there are made certified dairy products, such as "bundz", "oscypek", "redykolka", and "golka". The contract also requires the communication in the highland dialect, including the use of traditional naming for the equipment found in the mountain hut. A great emphasis is also put on the wearing of highland clothing by shepherds and juhases, such as: trousers with "parzenice", "kyrpce", a white shirt, a "serdak" chest and others. In addition, during the grazing period, the shepherd should look after all the historic huts that are located on the clearing.

Within the area of the Pieniny National Park, the shepherds are obliged to keep grazing in neat outfits and to use traditional equipment for mountain huts and farm equipment, such as a hearth, a cauldron and milk processing equipment.

The contract also includes a record that at the discretion of the lessee, i.e. the Pieniny National Park, on the date determined by the institution, the lessee undertakes to conduct grazing in full regional outfits, which also applies to all his employees. In addition, the lessee undertakes to produce certified regional "oscypek" cheese and undergo the control of the production. He also has the obligation to display certificates in a prominent place in the mountain hut. As a part of the activity, the sales of dairy products obtained exclusively from the production originating from the Majerz clearing can be carried out. The lessee is also obliged to carry out the necessary renovations and current repairs of the mountain hut and milk processing equipment at their own expense (i.e. maintenance of facilities and equipment). He also undertakes to inform tourists about grazing, traditions of the region and the rules of visiting the Pieniny National Park.

Table 3. Social and cultural requirements for cultural sheep grazing in the area of Hala Majerz (PNP) and Chochołowska Niżnia, Jarząbcza Niżnia (TNP)

<i>Specification</i>	<i>Pieniny NP</i>	<i>Tatra NP</i>
<i>Equipment for the shepherd's hut</i>	<i>traditional hearth, a cauldron, equipment for milk processing</i>	<i>traditional equipment (warzecha, czerpaki, kotlik, gielety, puciery)</i>
<i>Regional clothes</i>	<i>not always required</i>	<i>highland lothing (portki, kyrpce, biała koszula, serdak, kapelusz, pas, spinka, ciupaga, torba)</i>
<i>Using the regional dialect</i>	<i>not required</i>	<i>yes</i>
<i>Abiding by traditional customs</i>	<i>not ecessary</i>	<i>yes</i>
<i>Shepherd's hut on the oscypek cheese trail</i>	<i>yes</i>	<i>yes, a full production of dairy products (bundz, oscypki, redykołki, gołki)</i>
<i>Certified milk products</i>	<i>yes</i>	<i>yes</i>
<i>Taking care of shepherd's huts</i>	<i>yes</i>	<i>yes</i>
<i>Informing tourists about cultural grazing</i>	<i>yes</i>	<i>not specified</i>

Source: own study, based on lease agreements shared by the Directorate of PNP and TNP.

For many centuries, the Polish part of the Carpathian Mountains has been under strong and varied human pressure, as a result of which even the Tatra landscape is no longer completely primitive, and some of its elements are even deeply transformed. In the regal layers, where natural, permanently conditioned by climate,

are forests, the vegetation of the meadows is of non-climatic nature and after the withdrawal of the factor maintaining its current state it is subject to secondary succession. The current nature of the meadows was shaped as a result of sheep grazing as well as mowing meadows, and such groupings are referred to as semi-natural.

The dynamics of succession in the meadows is twofold. First of all, changes occur in the whole area associated with pastoral economy in other communities, adapted to changed conditions. Secondly, the forest returns to the areas where it used to be (Ciurzycki, 2004, Michalik, 1990). Sheep grazing is treated in such grassland ecosystems as an element of active protection of plant groupings, affecting the preservation of biodiversity at a favourable level (Sosin-Bzducha et al., 2012, Musiał and Kasperczyk, 2013, Musiał et al., 2015).

On the other hand, the pastoral economy is one of the oldest and most important factors of anthropopressure, and therefore, the human impact on the natural environment. Therefore, the lease contract within the area of the Tatra

Table 4. Requirements for nature conservation for cultural sheep grazing in the area of Hala Majerz (PNP) and Chochołowska Niżnia, Jarząbcza Niżnia (TNP)

Specification	Pieniny NP	Tatra NP
Start of grazing season	1 May each year	spring regrowth of grasses up to 8 cm
End of grazing season	15.10 of each year	15.10 of each year
Mechanical or manual removal of unwanted plants	yes	not specified
Mowing during the growing season	2 times (May or June and August)	not specified
Distance from the sheep fold to the spring and banks of the streams	min. 50 m	not allowed near the spring and banks of the streams
Right to lead the sheep to adjacent forests	no	no
Mineral land fertilisers	no	no

TPN. Source: own study, based on lease agreements shared by the Directorate of PNP and TNP).

National Park includes various restrictions, designed to protect the natural environment. It specifies that grazing can be started when the sward reaches 8 cm and ends not later than on October 15 (Tab. 4). Furthermore, the shepherd has to prove that he has, beyond the Tatra meadows or clearings, temporary pastures where he can graze sheep in the spring, before grass in the Tatras grows at least 8 cm. This is due to a shorter vegetation season than in areas adjacent to high altitudes above sea level. The contract prohibits the use of artificial fertilisers and grazing near the water sources and streams. They cannot graze sheep in adjacent woods, either. In addition, after heavy rainfall, grazing should not take place in steep areas, nor should animals be grazed before the dew dries. The shepherd is also obliged to protect the research areas designated on the clearings and to leave about 20% of the area to bloom.

The lease contract in the Pieniny National Park assumes that each year the start of grazing time falls on May 1, and ends on October 15. In addition, the shepherd is obliged, at his own expense, to mechanically or manually mow unwanted plant species, such as, for example, *Cirsium arvense*, which appear in the pasture. Such mowing should be carried out twice during each grazing season - in May or June and in August. The contract also records the distance of the grazing from water sources and streams, i.e. at least 50 meters. However, the lessee does not have the right to bring sheep to adjacent forests and woodlands or apply mineral fertilisation. Currently, however, the data obtained from the Directorate of the Pieniny National Park indicate that the park is not interested in expanding grazing, as mowing seems to be a better way to sustain biodiversity in this type of area. Therefore, where it is possible, grazing is supplemented by mechanical mowing with mountain mowers or by hand using a scythe. Every year, about 90-100 ha of meadows and mountain pastures in the Pieniny are mowed.

### Summary

Cultural grazing is subject to numerous restrictions and rules, according to which only shepherds who receive a grazing license and sign a lease contract with the authorities of national parks can participate in it. Such a contract contains not only general information about grazing in the park, but, above all, different requirements - socio-cultural and the nature related. It is therefore

determined within which area and how many sheep can be grazed so that the animals do not cause damage to the environment, which serves to preserve the natural diversity.

Cultural grazing also regulates the observance of traditional pastoral rituals, such as the use of traditional equipment, clothing and highlander's dialect, which allows cultivating the heritage of a given region. In addition, it can be used in the promotion of tourism, contributing to the development of the services sector. The socio-cultural aspect of breeding and grazing of animals, especially native breeds, which is an important element of sustainable development of rural areas, is also important. Old breeds of farm animals, such as the Polish Mountain Sheep, not suitable for large-scale farming, also represent a significant way to maintain the specific cultural heritage of the region.

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TATRA AND PIENINY**

**Summary**

Cultural grazing of sheep is characterized by numerous restrictions and rules for shepherds, which are imposed by the authorities of particular national parks. Firstly, to participate in such grazing, one needs to sign a lease contract, and then abide by its rules. Such an agreement contains not only general information about grazing in the park, but above all, requirements for nature conservation, as well as various socio-cultural requirements. Thus, it is determined how many sheep can be grazed in particular area, so that animals do not cause damage to the environment, and the issue of compliance with traditional pastoral rites is also regulated. The socio-cultural aspect of animal husbandry and breeding, especially native breeds, is also important for sustainable development of rural areas. In particular, old, native breeds of farm animals, such as the Polish Mountain Sheep, unsuitable for large-scale farming, make a significant contribution to maintaining the specific cultural heritage of the region of Western Carpathians.

**Key words:** Polish Mountain Sheep, national parks, cultural sheep grazing, Western Carpathians