

# Historical and current overview of negative anthropogenic impacts on eastern part of Low Tatras

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## Abstract

The report describes present state of tourist possibilities and historical overview of human activities such as mining, pastoralism and forestry in regions of the Low Tatras (specially part surrounding the peak of Kráľová Hoľa) and Horehronie (upper part of the valley of river Hron). High potential of physical environment was massively changed after the windthrow disasters especially the last one in 2004 which was reflected also in possibilities of land use from hiking point of view. The restoration of tourist paths and supporting equipment is presently in progress. Today's system of nature protection and landscape conservation in Slovak Republic seems to be a problem for environmentally suitable tourism development.

*Key words:* tourism, windthrow disaster, the Low Tatras, Central Slovakia

## Introduction

There are a lot of traces of direct and indirect impacts of human activities causing soil destruction in areas of upper timberline and above it in high mountains of the West Carpathians (Midriak 1973). The most influential regarding the settlement foundations in the Low Tatras were mining and Walachian colonisation.

### *Mining*

The founders of settlements were searching for southern sunny slopes at the foothill of Low Tatras as well as terraces of the river Hron which were quite easily transformed into arable land and grasslands after the deforestation. There were deposits of iron ore, antimony, gold, silver, copper and other metals which extraction is associated with formation of first mountainous settlements in the Middle Ages (12<sup>th</sup>-14<sup>th</sup> century) – metallurgy, charcoal and lately timber communes – Boca (1271, gold, iron ore), Malužiná (1362, lately glass factory), Magurka, Špania Dolina (10<sup>th</sup> century, copper), Mišúty, Donovaly, Motyčky and others (12<sup>th</sup>-13<sup>th</sup> century). In these areas not only forests suffered but also soils by erosion on the completely deforested areas. Traces of previous golden mining can

be observed also nowadays over the upper timberline in altitude 1700 m asl. in sector between saddleback of Čertovica and Králička (Turis and Jasik 2007).

### *Pastoralism*

Next settlement of the Low Tatras region has been performed during the Walachian Colonisation. Walachian people were interfering westwards especially along the valley of river Hron in particular and as well as the valley of river Váh. The communes of Polomka, Heľpa, Závadka, Pohorelá, Šumiac and Telgárt were formed by the Walachian Colonisation in the dominion of Muráň in 14<sup>th</sup>-16<sup>th</sup> century (Häufner 1955). Chaloupecký (1947) mentions walachian colonies also in rural areas of communes Horná and Dolná Lehota, Jasenie and Jarabá. Communes Mýto pod Ďumbierom and Liptovské Revúce, Liptovská Lučná, Liptovská Osada have walachian origin too.

Forest inventories from a few communes in the southern part of the Low Tatras inform us about range of pastoral history. According to this source 3,313 pieces of sheep, 262 cows, 257 bullocks, 136 heifers and 131 horses were reared in Polomka in 1672. Šumiac had 2,015 pieces of sheep, 322 cows, 216 bullocks, 165 heifers and 96 horses (Binder 1962). Fear of lack of wood and charcoal for copper mining and metallurgy around Banská Bystrica avoided devastation of the Horehronie forests by Walachian pastoralism and overgrazing.

Pastoral way of life in Low Tatra was analysed by Holub-Pacewiczowa (1933) in particular. She counted in 13 pastoral districts 36,643 pieces of sheep and 11,342 pieces of cattle in summer of 1929. Häufner (1955) specifies livestock from 1952-1953, when 30,066 pieces of sheep and 7,335 pieces of cattle were grazed in the same locations. There were 66 pastoral settlements on the southern slopes of the main mountain ridge and 86 on the northern slopes.

In distribution of pastoral settlements in particular altitudinal levels significant changes occurred during the years 1929 - 1953. Pastoralism remained the most stable in zones over the upper timberline and close to the communes in lower altitudes. In mid-altitude level the most pastoral settlements became extinct mainly because of reforestation.

According to Häufner (1955) there was the highest number of pastoral settlements in area around the upper timberline, nowadays reaching 1,423m a.s.l. in average in Low Tatras, 4 to 7 decades ago. After the liquidation of pastoralism in the highest locations of Low Tatras the highest situated pastoral settlements in Slovak Republic remained in given locations (e.g. cattle shelter in Príslop, under the Orlová etc.) (Midriak 1983).

Relations between grazing and soil erosion on grassland soils with different permeability of the Ďumbier and Kráľova hoľa peaks as well as in the surrounding of the communes of Telgárt, Pohorelá and Mýto pod Ďumbierom were studied by Maršáková-Němejcová (1958). She presents that damaging consequences of grazing are already visible on the loamy slopes with 18° inclination where apparent gutter erosion is and on the slopes with greater inclination also channel erosion. On the permeable carbonate slopes harmful results of grazing appear with inclination of 32°. However, data were not collected from intensively used locations, but from locations without cattle accumulation and passages of cattle. According to the actual observation the most obvious soil destruction is influenced by anthropogenic impacts.

At present, artificially (by pastorals) decreased upper timberline generally in grassland areas of the mountains on the smooth slopes with lower inclination is fundamentally lower (even few hundreds meters) than the natural one was. On the southern slopes occurs decreased upper timberline in the areas of Orlová – Kónská mládka, Stredná hoľa – Rovienky – Pod Byčianskou kolibou, Kráľova hoľa – Vyšné a Nižné sedlo, Kráľova hoľa – Tri studne and Martalúžky. Average altitude of primal natural upper timberline on the southern side of Low Tatras was specified as 1 529 m a.s.l. by cartographic analysis of maps (Randuška 1973).

#### *Wood extraction and forestry*

Large area of the Horehronie region was even at the end of the 14<sup>th</sup> century unsettled. The colonisation of this region has started at the beginning of the 16<sup>th</sup> century until then the location had represented unaffected huge primeval forest. The region was part of the dominion of Muráň and belonged to Széchy family line, settled was mainly by walachians of Ruthenian and Polish origin. Establishing of settlements brought also negative impacts of human activities in the forests. The forest soils were transformed into human settlements and agricultural land necessary for subsistence.

Devastation of the region by permanent deforestation, damaging of vegetation by overgrazing and change of natural vegetation by anthropogenic impacts caused increased sensibility of forests to harm of abiotic origin.

According to the written sources communes of given area came into existence mostly in the 14<sup>th</sup> and 17<sup>th</sup> century. First colonies were mentioned in 1326, this fact declares that settlement of that region started sooner.

Development of mining and metallurgy brought next wave of forest devastation. Coburgs' metalworks in Horehronie region had the headquarters and main factory in Pohorelá and workshops in Šabotka, Nová Maša, Zlatno and Červená Skala. Nearby forests were mostly cut because of saving transport costs. Deciduous forests, beech in particular, declined because of charcoal production and wood-processing industry. However, the greatest damages of vegetation in the past and in the presence as well are caused by windthrow and snow disasters. The largest one was in 1941. Insufficient stability and low resistance of spruce monocultures were exposed, root systems and trunks were devaluated and weakened by decay, arising as a results of grazing.

Next cause of huge windthrow disasters, also in the past, was failure in breeding of inappropriate spruce monocultures and missing of counterwind strengthened belts regulated in olden Plans of forest management.

## **Discussion**

Environmentally suitable tourism or more precisely sustainable tourism should be practised without reference to location (if it is in protected areas or not). There are 9 National Parks and 14 Protected Landscape Areas in Slovakia but according to the category of II. IUCN – National Park only high mountainous relief of TANAP satisfies it (Vološčuk 2005). It seems that sustainable tourism is not possible because conservation of natural ecosystems is not sufficient in the present system of protected areas.

Larger windthrow disasters were recorded in given region also in the past, e.g. in 1941, in November of 1964 and in November of 2004. In 1964 continuous unstocked areas were formed on area of 40-60 ha and in 1965 there was 305,100 m<sup>3</sup> of wooden biomass processed in Červená Skala forest enterprise (in 1966 170,000 m<sup>3</sup> of wood). Causes consisted in neglected timber-stand improvement and in preferring of spruce in restoration aim at the expense of fir and deciduous species, also in last decennium. This fact did not prosper to vegetation cover stability. The negative impacts of human activity after the year 2004 are given in Table 1.

Because of a wide range of windthrows and snow disasters that had been out of processing ability in the past, there was calamity gradation of bark beetle. In 1964 gradation of bark beetle did not reach present calamity situation because of removal of bark from salvage felling timber in locations of extraction. Few specialists say that there is no sense to use chemical spraying because we can not avoid to natural swarming of bark beetle depending on local ecological conditions (Jakuš 2007). Forest administrations point out selectivity of the chemical insecticides. But main idea of national parks, non-interference into the natural environment and processes inside, is denied by extraction of wood or using chemicals.

Few countries applied possibility to increase tourism by presentation of natural processes in ecosystems of protected areas (e.g. NP Berchtesgaden, NP Šumava) and support local economy that way. Profit of sustainable tourism is higher compared with the profit from salvage felling timber sales. Important factor is also intentional environmental education of local inhabitants in point of the natural environment conservation.

NAPANT Management in terms of sustainable tourism in the Low Tatras improved technical facilities of tourist paths and in 2006-2007 repaired damaged facilities caused by windthrow disaster. From project "Completion of infrastructure for pursuance of commitments in relation with system of NATURA 2000 in area of the National Park of Low Tatras" resources were used for reconstruction of two tourist shelters (Andrejcová and Ramža) and also for completion of informative tagging of proposed protected areas of European significance (Halgaš 2006, Turis and Jasík 2007).

Impact	Location	Comment
Damage of tourist paths and technical equipments	main ridge (red tourist path Andrejcová - Čertovica)	- crossable in the presence - hindered orientation
Damage of tourist paths by extraction and processing of salvage felling timber	paths to main ridge: Šumiac - Predné sedlo, Pohorelá - Andrejcová, Heľpa - Priehyba, Polomka - Havranie Polany, Source of Božena Nemcová - Bacúšske saddleback, Beňuš - Beňuška, Čertovica - Za lenivou - Bacúšske sedlo	
Damage of winter bar tagging	Andrejcová - Heľpa mountain, Priehyba - Kolesárová - Zadná hoľa	- partially restored by Mountain Rescue
Clash between tourists and forest mechanisms	Predné saddleback, Heľpa mountain, Kolesárová	- forest tractors, helicopters
New stores of wood in places of official camps	Saddleback of Priehyba, tourist shelter Ramža	
Dust and noise	gale-disaster areas, stores of wood	
Plastic waste	Saddleback of Priehybka, Zadná valley, Zbojnická valley	- fuel canisters, plastic oil containers, PET bottles
Chemicals against bark beetle	narrow endings of valleys, inaccessible rocky locations	- spots where salvage felling timber was not processed
New forest roads	Priehyba - Priehybka, Priehyba - Kolesárová, Bacúšske sedlo - Fišiarica	- to advance salvage felling timber

**Table 1.** Negative effects after the windthrow disaster in 2004.

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