4 Brezové mire; the jewel in the crown of Slovak mires

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Introduction

Figure 1: Location of the Special area of Conservation Brezové. Digital ortophoto 2000 © EUROSENSE s.r.o., www.eurosense.sk. Compiled by © Administration of the Tatra National Park, 2010; Site photo by Petra Hájková.
The Brezové calcareous spring fen (the local name, Pastierske, is also sometimes used) is a small dome-shaped mire of approximately two hectares, located between the villages Štrba and Važec. This mire is a very well developed ground water fed fen system. Although very small, it is the most pristine calcareous mire in Slovakia. It was discovered relatively recently (Halada et al. 1997) and information on the site and its flora is published by Dítě & Vlčko (2000). A rich population of the snail Vertigo geyeri was found by Horsák & Hájek (2005), which belongs to the threatened animals listed in Annex II of the European Union Habitats and Species Directive. Grootjans et al. (2005) described the hydrological regime, peat development and vegetation on the site. Because of its extraordinary natural values, the locality, with the surrounding wetlands, was included in the Natura 2000 network in 2004, which places them among the Special Areas of Conservation (code SKUEV 0196 Brezové). The total area of the protected site is 13.49 ha. The location of the site is indicated in Fig. 1. The Brezové spring fen is positioned between two brooklets.

The mire is situated at an altitude of 890-900 m. The average annual temperature is ca. 6 °C (-6 °C in winter, 10 °C during the vegetation season from April to September). The average annual precipitation is about 700 mm (Miklós 2002).

Description of the study area

Geological setting
The Brezové fen is situated in the eastern part of the Liptovská Kotlina Basin, which is the wide depression between the High and Low Tatra Mountains. The base of the basin consists of Mesozoic calcareous sediments (mainly limestones), which surface locally in the basin. Approximately 200 meters northwest of the reserve, Triassic Guttenstein limestone deposits are surfacing. The main filling of the basin consists of Palaeogene sediments, represented by alternating claystones and sandstones (the so-called flysch stone), which overlap the Mesozoic rocks. At the site and fields above, this geological unit, consisting predominantly of claystones, is present. These Palaeogene sediments are probably not very deep here. The dominance of claystones has given the area its smooth hilly character.

The surface geological layers are formed by deluvial quaternary sediments (Gross et al. 1990). The Paleogene and deluvial sediments above the fen (a possible recharge area) are calcareous. Only the upper horizons are decalcified.

Due to the geological composition of the Liptovská Kotlina Basin, and its position between two calcareous mountain systems, mineralized ground waters are common in the region. In the Liptov region, more than 30 mineral springs were found (based on data from the internet database of mineral springs of the Slovak Environmental Agency), predominantly of the calcium bicarbonate type, which is connected with their origin in the geological environment of calcareous rocks. Favourable conditions for their occurrence are provided by the existence of two intersecting systems of geological faults in the Basin (older east-west and younger south-north faults). Along the faults, precipitation waters infiltrating in large infiltration areas in the mountains can spring to the surface, forced by an artesian hydraulic pressure.

During a previous geological survey, a geological fault transversing the Brezové fen in the NNE-SSW direction was assessed (Gross et al. 1978). This is why we do not know the exact size of the catchment which supplies the fen with water. The aquifer probably originates at the base of the Tatra Mountains, which are several kilometres away from the topographic borders of the fen watershed.

Methods of the research
An eco-hydrological approach was used to investigate the mire. This approach combines various methods of hydrology, soil and vegetation science, with the aim of describing the whole fen system and its relation to the surroundings. The field survey of the Brezové mire was performed in the summers of 2002 and 2003.