Mountains, geoheritage, and protected areas: a natural trilogy

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Abstract: Mountain areas are excellent windows to the Earth geodiversity. Rocks, their structures and landforms are well exposed due to active tectonic and geomorphological processes. The high geodiversity of mountains underpins biodiversity and, together with the historical use of these territories by humans, originate landscapes that always have impressed people. For these reasons, it is understandable that mountain areas concentrate a high number of protected areas (PA). Sangay (Ecuador), Dolomiti Bellunesi (Italy), Kluchevskoy (Russia) or Yellowstone (USA) are examples of mountain PA recognised by UNESCO as World Heritage due to geoheritage. In mainland Portugal, 52% of the total area of PA corresponds to mountain areas and 36% of PA have this geomorphological character. In spite of the fact that most of these PA were designated for biological reasons, the high number of geosites inside PA should not be neglected. The occurrence of geoheritage and biotic values, combined in dramatic landscapes with high aesthetic value justify the tourism attraction of mountain areas, which is a major asset for UNESCO Global Geoparks. Tumbler Ridge (Canada), Yandangshan (China), Carnic Alps (Austria) or Chablais (France) are examples of geoparks in mountain areas with internationally significant geoheritage.

Keywords:
- Geoheritage
- Protected Areas
- UNESCO
- Tourism

Geoconservation in action: restoring the Alto Vez geosite

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Abstract: The Alto Vez valley is located in the Peneda Mountain in northern Portugal. It includes one of the most remarkable fields of glacial erratic boulders in Portugal, in addition to other relevant glacial features such as an U-shaped valley and side moraines. These relevant features justify why this site is one of the most important glacial geosites in the Portuguese geoheritage inventory. Despite its scientific relevance, the major part of the area of the valley is located outside the contiguous Peneda-Gerês National Park, the most important protected area in Portugal. In 2012, the local administration built a horse racing track affecting the integrity of this geosite. A citizen’s complaint was the starting point of a campaign to save the geosite from further destruction. The legal and administrative actions made by the Portuguese Institute of Nature Conservation and Forests and by the municipality of Melgaco, under the scientific supervision of the Earth Sciences Centre of the University of Minho, have resulted in the closure of the racing track and the establishment of a restoring plan for that geosite. Aerial photos captured by unmanned aerial vehicles, together with dGPS and GIS procedures, were used to restore the initial topography and the moving of the erratic boulders back to their original position.

Keywords:
- Geoheritage
- Restoration
- Alto Vez
- Peneda