Managing the Estrela Aspiring Geopark
A framework for promoting geoheritage conservation

Emanuel Castro [1], Gonçalo Vieira [1,3], Fábio Loureiro [1], Filipe Patrocínio [1], Gisela Firmino [1], Hugo Gomes [1,2], Magda Fernandes [1]

1) Associação Geopark Estrela, Portugal, 2) Centro de Geociências (UId_73) , 3) CEG/IGOT – Universidade de Lisboa, Portugal

Geology and Geomorphology

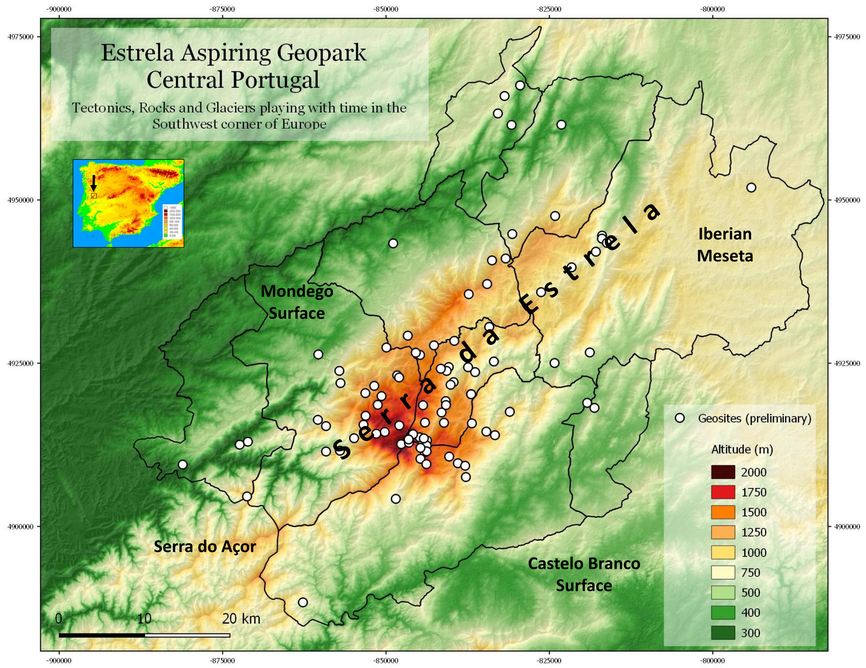
The serra da Estrela (1,993 m asl) is the highest mountain range in mainland Portugal and is part of the Iberian Central Cordillera. Bounded by fault scarps, a granite massif occupies the central area forming a summit plateau between ci. 1,400 and 2,000 m, while surrounding the core area, there is an interplay with schists and greywackes. During the Last Glacial a plateau ice-field and five radiating valley glaciers occupied the highest parts of the mountain with an estimated equilibrium line altitude at 1,650 m asl. The plateau style of the glaciation and the ELA just below the plateau edge made the Estrela very sensitive to climate fluctuations, having resulted in several terminal moraine complexes that reveal several glacial stages. The central plateau area shows widespread glacial erosion features and an almost complete stripping of the Cenozoic weathering mantle. The non-glaciated plateaus show a rich landscape dominated by granite weathering landforms. The remarkable glacial landscape of the serra da Estrela when considering its setting in SW Europe, together with other relevant geoheritage such as periglacial, weathering and mass wasting phenomena, tectonic, petrological and hydrogeological features, are at the core of Estrela's application to become a UNESCO Global Geopark.

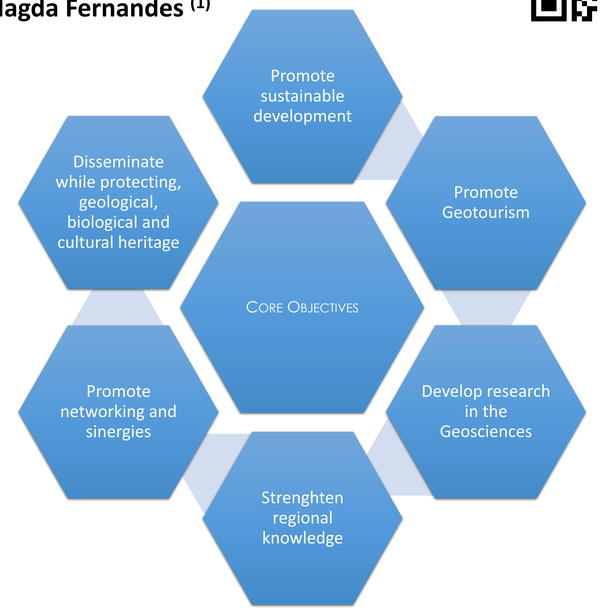
Geodiversity highlights

- Glacial landscape with geosites of international scientific relevance
- Petrological geosites with international scientific relevance
- Rich diversity of geosites of national scientific relevance (e.g. tectonic, periglacial, granite landforms, hydrogeological, petrological and mining)
- Numerous geosites with very high educational and touristical relevance
- Excellent access to most geosites
- Long history of geological and geomorphological research

Why applying for a UNESCO Global Geopark?

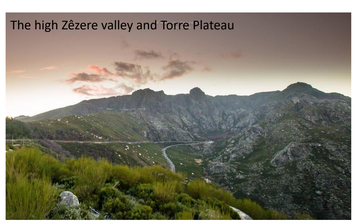
- Very rich and relevant geoheritage needing improved management measures
- Regional geodiversity has been a historical guiding factor for the socio-economic development.
- The serra da Estrela is part of the cultural identity of all of its peoples.
- But the presence of the mountain has frequently divided, rather than unified.
- The application for the UNESCO framework has already promoted regional cohesion with a common goal.





Promoting Science

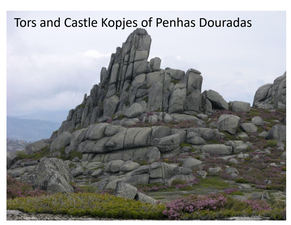
- Implementation of an International Scientific Advisory Committee
- Development of a 5-year Strategical Science Plan
- Development of an interdisciplinary mountain research centre
- Defining science hot topics and their links with societal needs and regional development
- Implement a grant system for research projects
- Support and create a new generation of mountain scientists
- Promoting science education and outreach


The high Zêzere valley and Torre Plateau


Penedo do Sino


The Charco da Candieira sedimentary sequences

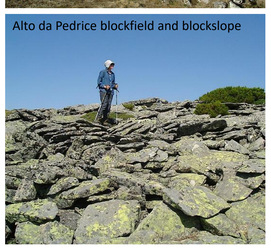

The glacial cirque of Covão Cimeiro


Tors and Castle Kopjes of Penhas Douradas

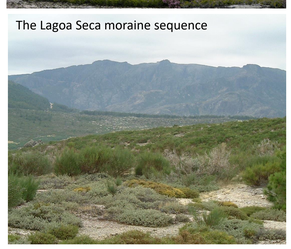

Salgadeiras


The Zêzere glacial valley

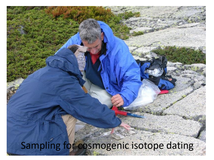

Barroca de Água stratified deposit


Alto da Pedrice blockfield and blockslope


São Sebastião stratified slope deposit

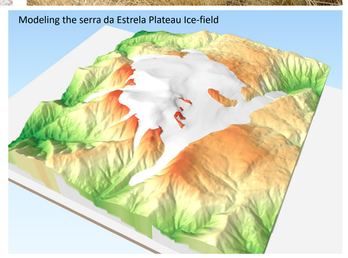

The Lagoa Seca moraine sequence


Moraine at the Conde valley


Sampling for cosmogenic isotope dating


Field trips with students


High resolution mapping of geosites


Modeling the serra da Estrela Plateau Ice-field


Lateral moraine at the Alforfa valley

http://www.geoparkestrela.pt