

One country, two different approaches in the application of geoconservation and geotourism procedures in Natural Monuments (Portugal)

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In Portugal the Decree-Law n. 19/93 of January, 23rd regulates the National Network of Protected Areas under the management of the Institute for Conservation of Nature and Biodiversity. One of the purposes of this law is the protection of outstanding geomorphological, geological and speleological features. In this scope the most used category of protection is Natural Monument corresponding to any natural occurrence with singularity, rarity or representativity in terms of ecological, aesthetic, scientific and/or cultural means that requires its conservation and integrity maintenance. There are presently 6 Natural Monuments in the continental part of Portugal mainly related with the protection of dinosaur tracksites and a GSSP. Recently, in the autonomic Azores islands were protected 7 regional Natural Monuments under the regional law related with the volcanic diversity and one fossil site. The aim of this work is to do a survey on the state of the Portuguese Natural Monuments considering geoconservation and geotourism applications. This work shows that the Azorean long experience in geotourism led Regional Secretary of Environment and Tourism to protect and develop sustainable projects that promote the geological heritage internationally. On the contrary, national government main concerns in nature were always related with biodiversity and natural monuments are almost all abandoned to uncertainty.

Carenque dinosaur tracksite was found in 1986 in an abandoned quarry and is protected by the Decree 19/97. For some time was considered the longest dinosaur track with more than 120 m and dated from Cenomanian (Upper Cretaceous). This site was responsible for a famous mixed popular/scientific movement to save the tracksite to be destroyed by the building of a highway. The so called "Battle of Carenque" had the support of the President of Portugal and finished with the opening of a tunnel to save the fossil site. Afterwards the footprints were covered with geotextile and a project of a major class interpretive center was presented. In the protection diploma was referred the degradation of the site by garbage and wastes resulting the urgent need to protect it. The Natural Monument of Carenque is nowadays still covered, without any accessibility or interpretation. The old quarry is again abandoned and a place for garbage.

Lagosteiros Natural Monument located near Cabo Espichel was protected by the Decree 20/97. This site is a dinosaur track bed from the Hauterivian (Lower Cretaceous). The aim of this protection was to preserve the trace fossils, their scientific study and divulgation for environmental education. More recently, this Natural Monument was included in the area of the Arrábida Natural Park. The interpretive panel was destroyed and there are no signs or restrictions to public.

Pedra da Mua Natural Monument is very famous because is the physical evidence for a Marian legend coming at least from the 13th century and for one of the first evidences of sauropod gregarious behavior including seven parallel tracks of juveniles. This fossil site from the Tithonian (Late Jurassic) is again abandoned, without any interpretation or indication. Abandoned is also Avelino Natural Monument, near the former two sites. This tracksite from the Kimmeridgian was protected by the same Decree as the previous ones. It was a quarry and nowadays only reading geological maps it is possible to find the place.

Ourém-Torres Novas Dinosaur Footprints Natural Monument was the first Natural Monument to be protected in Portugal by the Decree 12/96. Corresponds to a rare Sauropod tracksite from the Middle Jurassic with almost 150 m long and its world scientific importance led the national authorities to buy this once active quarry in the heart of the Serra d'Aire e Candeeiros Natural Park and to develop the most successful project of geotourism in Portugal. In this paleopark protection and valorization of geological and paleontological heritages are privileged. The accesses are excellent and the interpretive center provides good scientific information and activities for children. A trail enables to find the best geological places and views. The quarry was transformed for the geotourist including a Jurassic garden. This Natural Monument is an example of strategy for geoconservation and sustainability.

Cabo Mondego Natural Monument is the newest one in Portugal, protected by the Decree 82/2007. The main finality is to protect Bajocian GSSP and the coastal outcrop from the Jurassic, including Oxfordian dinosaur footprints. For many years this area was endangered by the cement industry that opened successive quarries in Serra da Boa Viagem. Despite of so many scientific studies and pedagogical projects there is no information for the public about the importance of the site or interpretation. The protected area is not defined and the quarry industry is just in its limits.

In Azores the protection of geological heritage under the regional law is emphasized since 2004. In fact, all Regional Natural Monuments were protected between 2004 and 2005 to develop responsible tourist projects involving geological but also biological, aesthetic, scientific and cultural criteria that allow sustainable education and enjoyment.

Lava tubes are protected in S. Miguel island (Carvão Cave) and Pico island (Torres Cave), the last one considered the longest Azorean lava tube with more than 5 km and the best speleological-style guided tour. Algar do Carvão Cave Natural Monument, in Terceira island, corresponds to an impressive volcanic conduit with silica speleothems that can be discovered

by a guided visit. In Graciosa island Caldeira Natural Monument is a magmatic chamber emptied that shelters a subterranean lake. This unique geosite is part of the UNESCO biosphere reserves since 2007. Pico das Camarinhas and Ponta da Ferraria Natural Monument is an important interpreted geosite from S. Miguel island where is possible to decipher several volcanic phenomena. In the same island, Caldeira Velha Natural Monument is a fumarole field with some hyperthermal springs which delights tourists. Furnas do Enxofre Natural Monument in the Terceira Island was recently prepared to conserve special

endangered ecosystems. Campo Quarry Natural Monument, in Santa Maria island, interprets submarine lavas and carbonate beddings with marine fossils from the Miocene.

Geopark Naturtejo Meseta Meridional is the first Portuguese geopark under the auspices of UNESCO. The protocol celebrated with the Institute for Conservation of Nature and Biodiversity gives the opportunity for municipalities to run the tourism destinies of the almost protected Portas do Ródão Natural Monument following the same good practices on Nature Tourism and geoconservation of Azores islands.



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