

Geodiversity, geoheritage and geoconservation strategies in Portugal

Paulo Pereira

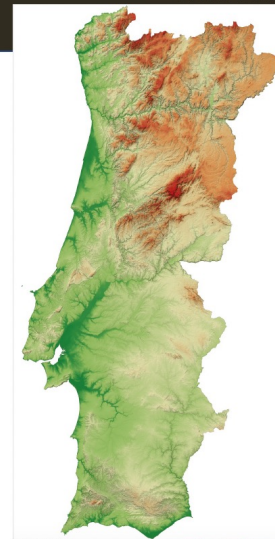
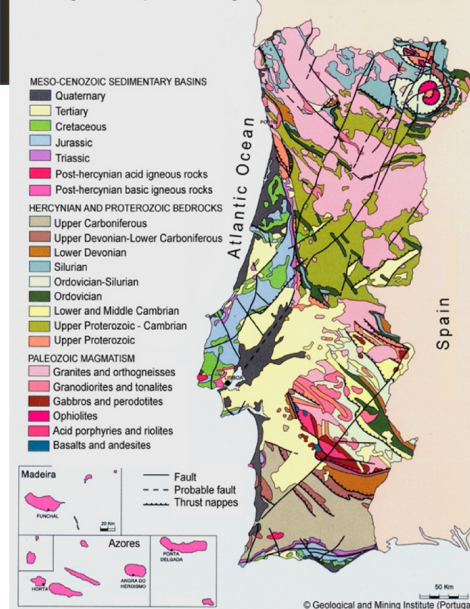
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Geological Map of Portugal



1970 - Dec. Lei 9/70: **Basic Law for the creation of National Parks and other types of reserves** (Integral, Natural, Landscape, Touristic, Botanical, Zoological, Geological)

1971 - Creation of the National Environment Commission and the **Peneda-Gerês National Park** (an initiative to commemorate the 1970 European Year of Nature Conservation); a Reserve was also created in the entire area of the Selvagens Islands and the Botanical Reserve of the Medos National Forest

1987 - Basic Law of the Environment (creation of Protected Areas of regional, local and particular scope);

1990 - Creation of the Ministry of Environment and Natural Resources;

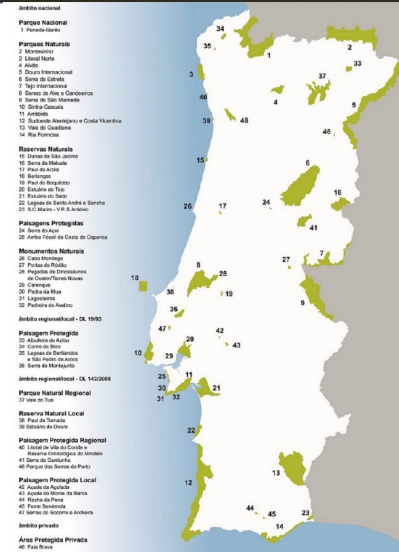
1993 - Dec. Lei 19/93 : Protected Areas of national, regional, local and private scope;

1993 - Creation of the Institute for Nature Conservation (ICN) and the Institute for Environmental Promotion (IPAMB); - Today **ICNF (Institute for Nature Conservation and Forests)** and APA (Portuguese Environment Agency)

2008 – DL 142/08 (current nature conservation regime in Portugal)

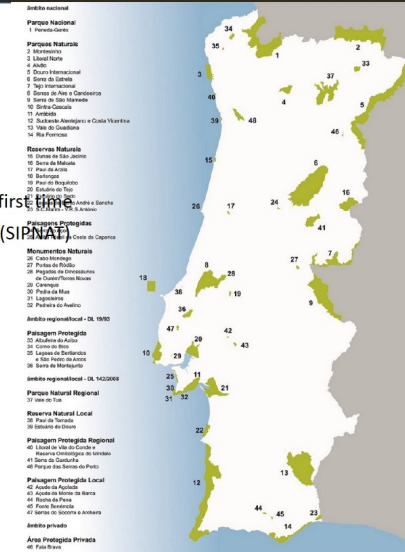
RNAP - National Network of Protected Areas

- covers about 8% of Portugal mainland
- only 8 PAs of national level classified because of their geological value
- however, almost all PAs have important geological and geomorphological features



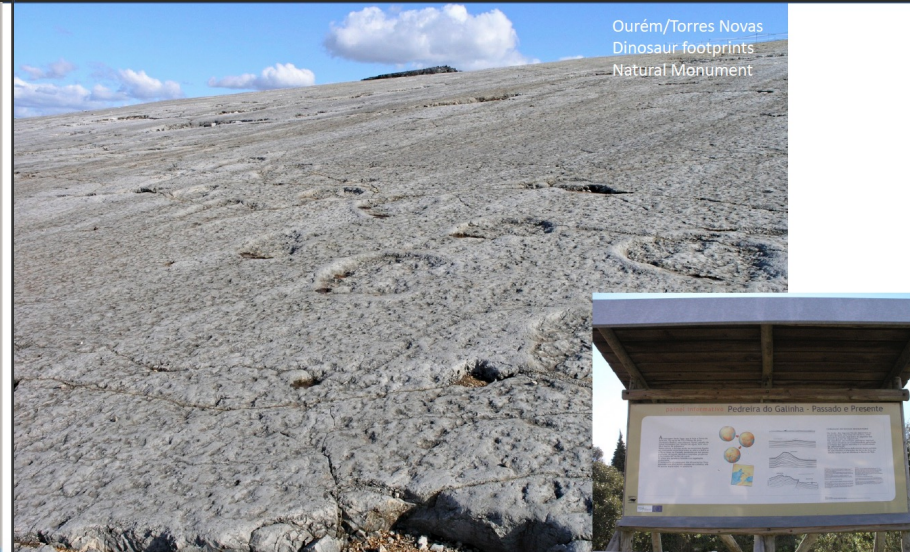
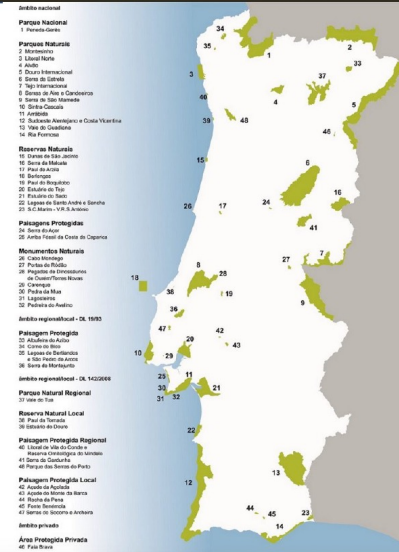
2008 – DL 142/08 (current nature conservation regime in Portugal)

- Recognises geological heritage and geosites for the first time
- Establishes the Natural Heritage Information System (SIPNAT)
- Protected areas of national, regional or local levels
- 5 typologies
 - a) National park
 - b) Natural park
 - c) Nature reserve
 - d) Protected landscape
 - e) Natural monument



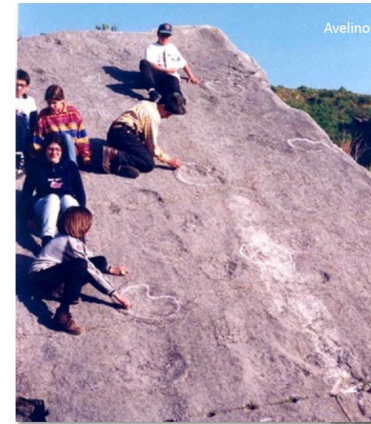
Natural Monuments

CARENQUE: Belas, Sintra
LAGOSTEIROs: Cabo Espichel, Sesimbra
PEDREIRA DE AVELINO: Zambujal, Sesimbra
PEDRA DA MUA: Cabo Espichel, Sesimbra
PEGADAS DE DINOSSAURIO DE OURÉM / TORRES NOVAS
CABO MONDEGO Figueira da Foz
PORTAS do RÔDÃO Nisa/Vila Velha de Ródão





Pedra da Mua, Pedreira do Avelino,
Lagosteiros and Carenque
Natural Monuments



Pedra da Mua, Pedreira do Avelino,
Lagosteiros and Carenque
Natural Monuments





Protected Landscape
of Costa da Caparica
Fossil Cliff



Inventory of geosites of national and international relevance

<http://geossitios.progeo.pt>

322 geosites with international or national relevance have been inventoried in 27 geological frameworks

Geological framework	Main geological theme(s)	Geosites
#01 Neoproterozoic-Cambrian Metasediments in Central Iberian Zone	Petrology; Stratigraphy	6
#02 Palaeozoic Murias of the Ossa Morena Zone	Petrology	7
#03 Ordovician of Central Iberian Zone	Paleoecology; Stratigraphy	12
#04 Palaeozoic succession of the Barrancos region	Paleoecology; Stratigraphy	6
#05 Exotic Terranes of NE Portugal	Petrology; Tectonics	7
#06 Geotransverse of the Portuguese Variscan Fold Belt	Tectonics; Stratigraphy	10
#07 Geology and metallogenesis of Iberian Pyrite Belt	Mineralogy; Petrology	8
#08 Marine Carboniferous of the South Portuguese Zone	Petrology; Stratigraphy	3
#09 Continental Carboniferous	Stratigraphy; Petrology	3
#10 Pre-Mesozoic granitoids	Petrology	10
#11 The Iberian W-Sn Metallogenic Province	Mineralogy	4
#12 Gold mineralisation in Northern Portugal	Mineralogy	7
#13 Meso-Cenozoic tectonic evolution of the Western Iberian Margin	Tectonics; Stratigraphy	18
#14 Late Triassic SW Iberian rupture of the Pangea	Stratigraphy; Petrology	4
#15 Jurassic record in the Lusitanian Basin	Stratigraphy; Paleontology	6
#16 Cretaceous rocks of the Lusitanian Basin	Stratigraphy	3
#17 Dinosaur footprints of western Iberia	Paleoecology	6
#18 Meso-Cenozoic tectonostratigraphy of the Algarve	Stratigraphy; Tectonics	13
#19 Cenozoic basins of the Western Iberian Margin	Stratigraphy; Paleontology	4
#20 Landforms and river network of the Portuguese Iberian Massif	Geomorphology	39
#21 Karst systems of Portugal	Geomorphology; Hydrogeology	38
#22 Active and fossil coastal cliffs	Geomorphology	6
#23 Low coasts	Geomorphology	6
#24 Neotectonics in mainland Portugal	Tectonics; Geomorphology	30
#25 Vestiges of pleistocene glaciations	Geomorphology	16
#26 Volcanism of The Azores Archipelago	Volcanism; Geomorphology	30
#27 Volcanism of The Madeira Archipelago	Volcanism; Geomorphology	20



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Património Geológico de Portugal Inventário de geossítios de relevância nacional



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Geossítios
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Geossítios

Filtrar por Categoria temática

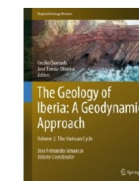
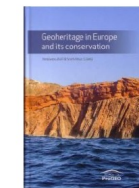
Filtrar por Município
Vieira do Minho

Filtrar por Região

Toco - Soutinho
Vestígios de glaciações pleistocênicas
Vieira do Minho

Inventory of geosites of national and international relevance

<http://geossitios.progeo.pt>



Inventory of geosites of national and international relevance

Example: **Framework 25: Vestiges of Pleistocene glaciations**

- 01 (Gorbelas - Junqueira)
- 02 (Vale do Alto Vez)
- 03 (Compadre)
- 04 (Couce)
- 05 (Vale do Homem)
- 06 (Toco-Soutinho)
- 07 (Covão Cimeiro - Cântaro Magro)
- 08 (Covões de Loriga)
- 09 (Lagoa Comprida)
- 10 (Lagoa Seca)
- 11 (Lagoacho - Covão do Urso)
- 12 (Nave de Santo António)
- 13 (Nave Travessa)
- 14 (Pedrice)
- 15 (Salgadeiras)
- 16 (Vale do Zêzere)



Inventory of geosites of national and international relevance

Example **Framework 25: Vestiges of Pleistocene glaciations**



Inventory of geosites of national and international relevance

Example: **Framework 25: Vestiges of Pleistocene glaciations**



Inventory of geosites of national and international relevance

Example **Framework 25: Vestiges of Pleistocene glaciations**

Geosites scientific value (results)

NOME DO GEOSSÍTIO	Critério A	Critério B	Critério C	Critério D	Critério E	Critério F	Índice
Compadre	2	0	1	4	0	1	36,25
Covão Cimeiro - Cântaro Magro	2	0	2	4	0	1	38,75
Covões de Loriga	2	0	2	2	0	1	31,25
Gorbelas - Junqueira	2	0	2	2	0	1	31,25
Nave de Stº. António	2	1	2	2	1	1	38,75
Lagoa Comprida	2	0	2	2	0	1	31,25
Lagoa Seca	2	0	2	4	0	1	38,75
Lagoacho - Covão do Urso	2	0	2	2	0	1	31,25
Planalto de Couce	2	0	2	4	0	1	38,75
Nave Travessa	1	0	2	4	0	0	27,5
Pedrice	2	1	2	4	0	2	47,5
Salgadeiras	1	0	2	4	0	1	31,25
Toco - Soutinho	2	0	2	2	0	1	31,25
Vale do Alto Vez	2	0	2	2	0	2	35
Vale do Homem	2	0	2	4	0	1	38,75
Vale do Zêzere	4	1	2	2	1	2	57,5

Inventory of geosites of national and international relevance

Example: Framework 25: Vestiges of Pleistocene glaciations

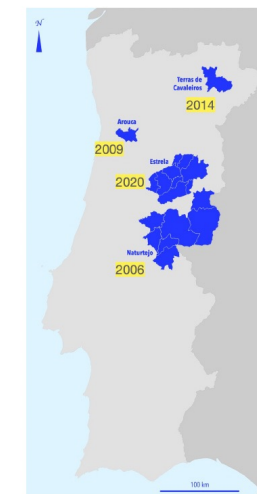
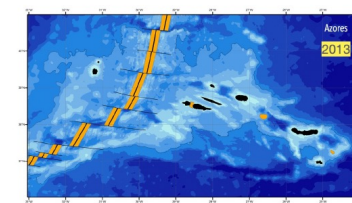
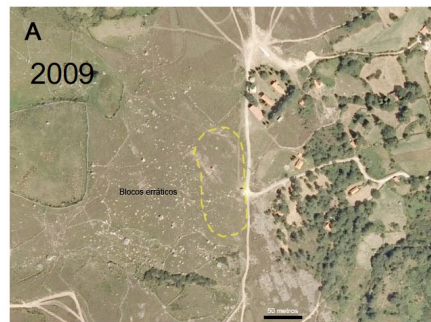
Geosites vulnerability (results)

NOME DO GEOSSÍTIO	VULNERABILIDADE						
	Critério A	Critério B	Critério C	Critério D	Critério E	Índice	Vulnerabilidade
Compadre	1	1	2	1	1	120	Baixa
Covão Cimeiro - Cântaro Magro	1	1	2	3	1	150	Baixa
Covões de Loriga	2	2	2	2	1	190	Baixa
Gorbelas - Junqueira	3	1	2	2	1	205	Moderada
Nave de Stº. António	1	1	2	4	1	165	Baixa
Lagoa Comprida	1	1	2	2	1	135	Baixa
Lagoa Seca	1	1	2	2	1	135	Baixa
Lagoacho - Covão do Urso	1	1	2	2	1	135	Baixa
Planalto de Couce	1	1	2	2	1	135	Baixa
Nave Travessa	1	1	2	2	1	135	Baixa
Pedrice	1	1	2	2	1	135	Baixa
Salgadeiras	1	1	2	3	1	150	Baixa
Toco - Soutinho	3	4	4	2	1	305	Alta
Vale do Alto Vez	3	4	4	4	1	335	Alta
Vale do Homem	1	1	2	3	1	150	Baixa
Vale do Zézere	1	1	2	3	1	150	Baixa

Inventory of geosites of national and international relevance

Example: Framework 25: Vestiges of Pleistocene glaciations

Vale do Alto Vez geosite



Challenges

Next steps for the protection of the inventoried geosites

Awareness and interpretation of geoheritage

Recognition of geoheritage in PA's management

Geodiversity, geoheritage and geoconservation strategies in Portugal

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Thank you for the attention