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# Geobotanical heritage, environmental education, valorisation and new civic culture of the territory<sup>1</sup>

## Património geobotânico, educação ambiental, valorização e nova cultura cívica do território

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### Abstract:

The purpose of this paper is to present a summary of the state of the art/literature review on the relevance of geobotanical heritage and environmental education in strategies to exploit the territory and promote a new territorial culture. It also explains their practical application through an example (Mata do Sobral) in the Coimbra Region (Central Portugal). In the case of a preliminary approach, this note reflects the authors' participation in the planning and/or implementation of actions to control and eradicate invasive flora in the area, raising and environmental education, involving the school community and the community in general, with the support of Operational Programme Sustainability and Efficiency in the Use of Resources (POSEUR).

**Keywords:** geobotanical heritage, environmental education, territory, POSEUR, Mata do Sobral

### Resumo:

A presente reflexão tem como objetivo apresentar uma síntese do estado da arte/revisão de literatura especializada sobre a relevância do património geobotânico e da educação ambiental nas estratégias para valorizar o território e promover uma nova cultura territorial, bem como explicitar a sua aplicação prática através de um exemplo (Mata do Sobral) na Região de Coimbra (Centro de Portugal). Tratando-se de uma abordagem preliminar, esta nota reflete a participação dos autores no planeamento e/ou execução de ações de controlo e erradicação de flora invasora na área referida, de sensibilização e educação ambiental, envolvendo a comunidade escolar e a comunidade em geral, com o apoio do Programa Operacional Sustentabilidade e Eficiência no Uso de Recursos (POSEUR).

**Palavras-chave:** património geobotânico, educação ambiental, território, POSEUR, Mata do Sobral

## 1. Biodiversity, environmental education and geobotanical heritage - a summary state of the art

Concerns about nature conservation and biodiversity have been raised in the context of considering development and its various perspectives or paradigms, and these, too, have taken on an

international dimension, especially since the early 1970s. Since then, there has been an increase in the number and typology of elements to be classified/protected (Pickering & Weaver, 2003; Hall, Gossling, & Scott, 2015; Carvalho, 2018). This has gone hand-in-hand with the increase in and enlargement of the world of heritage (Graham, Ashworth & Tunbridge, 2000; Graham & Howard, 2008) and also with the

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implementation of policies and instruments targeting territorial cohesion and valorisation (Capelo & Nijkamp, 2009; Tomaney, Pike, & Rodríguez-Pose, 2011; Ferrão, 2015).

Following the international trend and with the growing concern of society for environmental issues, have been carried out various initiatives in the field of environmental education over time, in the context of formal and non-formal education, accompanied the development of laws, campaigns, activities, projects, organizations, publications, conferences, plans, among others (Carvalho & Alves, 2017).

In the case of Portugal, it is important to note the recent approval of the National Strategy for Environmental Education (NSEE 2020) for the 2017-2020 period, in order to “establish a collaborative commitment, cohesion and strategic in building environmental literacy (...) that, through an inclusive citizenship and visionary, leading to a civilizational paradigm shift, translated into models of sustainable behaviour in all dimensions of human activity”.

From the perspective of performance, were identified the following thematic axes: decarbonising society (climate; energy efficiency; sustainable mobility); make circular economy (dematerialization, collaborative and sustainable consumption economy; design of products and efficient use of resources; waste recovery); valuing the territory (land and sea coast; water; nature and biodiversity, landscape), which makes classified or protected areas, the pair of schools, environmental education, central/regional/local administration, companies and non-governmental organizations, one of the main agents of environmental education in this new time of awareness and education for an effective change of behaviors and practice (APA, 2017).

The management model and the design of protected areas in Western Europe, contrary to what happened in other regions of the globe, reveals the centrality of “landscapes that despite a long and intense presence of man kept natural features or relevant and semi-natural examples happier mirrors a harmonious relationship between human and physical elements (...) “in such a way that” (...) does not include only the natural resources of patrimonial relevance (the conservation aspect), it is considered also the safeguarding and valorisation of traditional ways of life, in addition to indict a greater openness

to leisure activities and tourism” (Alves, Cordeiro, & Carvalho, 2015, p. 99).

Portugal has kept abreast of these events and developed various initiatives designed to implement the efficient organization and management of protected areas. At the moment there are over one hundred and fifty natural sites classified under national and/or international statutes.

The forest fires of 2017 reached unprecedented proportions in this Iberian country. The burned area amounted to more than 500,000 hectares, not to mention the high cost in human lives lost and other negative externalities. The Central Region of Portugal was particularly badly affected, with the district of Coimbra notable for accounting for about 25% of the burned area. There are several protected or classified areas in this Region, such as the one used as an example in the present reflection.

It is in this context that we must mention the geobotanical or phytogeographical heritage, which is taken to mean the natural biotic elements, separately or together, that constitute the vegetation cover of our planet. Trees and shrubs are perhaps the most visible typologies, with the greatest media expression. They occupy a prominent place in conservation and heritage valorisation strategies and actions (Font & Tribe, 2002; Pröbstl et al., 2010), as well as in the context of environmental education (Liefvändern et al., 2013; Almers, Askerlund, & Kjellström, 2018). At the same time, it is important to mention the expansion (number and broadcast territories) considered invasive plant species with negative externalities for the environment (Almeida & Freitas, 2012; Cordeiro, 2017).

Taking Portugal as an example, it is important to mention the national recognition, through specific legislation<sup>2</sup> (Law no. 57/2012 and Ordinance no. 124/2014), of the exceptional value of a given tree or grove. The criteria used to determine the granting of protected status (a grove of public interest) include rarity, age, size, structure, surrounding landscape, historical or cultural motifs. This is similar to what

<sup>2</sup> In the case of Portugal, considering the scale and the scope of action of the central State, the classification “of public interest” attaches to Grove protection status similar to that of the built heritage. “For example, it should be noted that the trees classified or classification of public interest benefit automatically from a “general area” of 50 meters around the base, your being conditioned to look higher than any intervention in this area involving amendment of the situation existing at the time of the assessment/rating – without forgetting that the law prohibits any intervention that could destroy or damage the trees with this status” (Carvalho, 2018, p. 34).

is in force for immovable cultural assets and paved the way for a national register – despite the small number of classifications (less than six hundred) to date. Furthermore, the country has accepted the task of building environmental literacy through an action plan based on three thematic axes, namely: the de-carbonisation of society, the creation of a circular economy and the valorisation of the territory (including nature and biodiversity), according to the National Environmental Education Strategy for 2017-2020. However, an effective change of values, behaviours and practices is only viable through direct contact with the natural heritage. This is how we link up to the case study.

## 2. An example of application: Mata do Sobral

The Mata do Sobral is in the municipality of Lousã (Figure 1), about 40 kilometres south-east of Coimbra. It is considered a relic of the natural vegetation of the Central Portugal before human intervention. The last century of its historical course has been marked by government intervention (request for the Mata to be placed under the Forest Regime in 1909), which led to the valorisation of the vegeta-

tion cover and improved circulation/access, and other benefits. Organic changes in responsibility for oversight and successive sectoral policy changes in the last thirty years led to the management of the Mata do Sobral becoming steadily less active and efficient (event though it was shared), which coincided with the occurrence of two large fires (1990 and 2017). However, in 2000, part of the Mata was included on the site “Serra da Lousã – code PTCON0060” of the Natura 2000 Network.

The natural regeneration capacity of the Mata derives from its vegetation, in particular cork oaks (*Quercus suber*) – Figure 2 – and arbutus trees (*Arbutus unedo*), along with other native species, while invaders gained ground after the fires, notably acacias, (especially *Acacia dealbata* – Figure 3, and to a lesser extent *Acacia melanoxylon*) and the silky hakea (*Hakea sericea*).

Before the fire in 2017, the municipality of Lousã, in collaboration with other institutions, conceived and obtained an application under POSEUR (Operational Programme for Sustainability and Efficiency in the Use of Resources), with financial support from the European Union and Portuguese Government, to carry out a number of actions in Mata do Sobral. These actions aimed at the prevention, control and eradication of invasive species, the

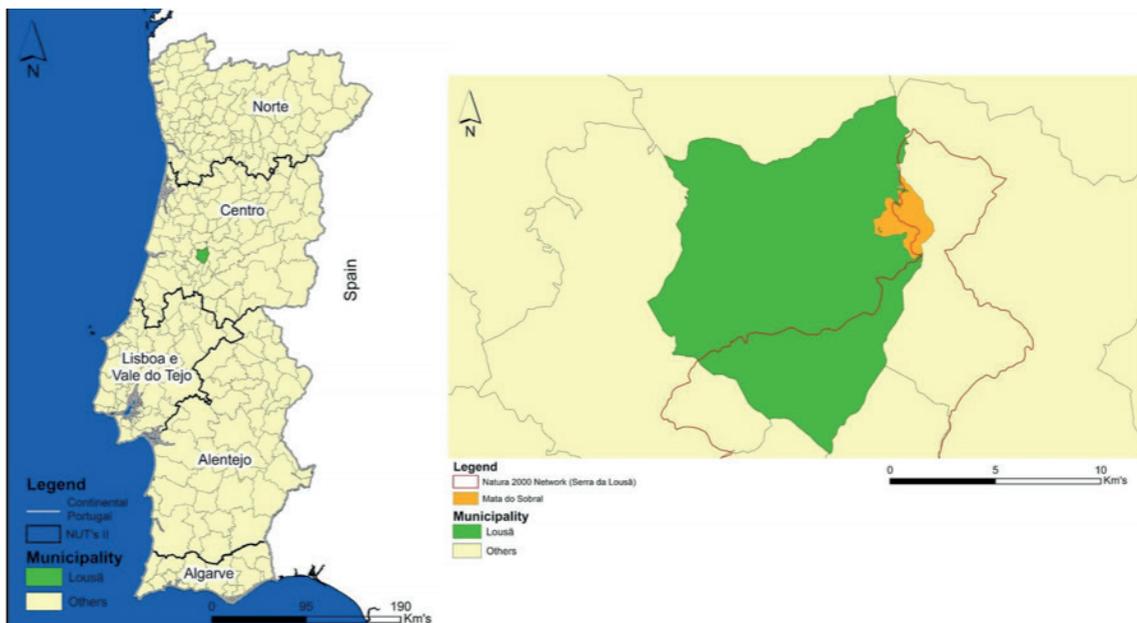


Figure 1  
Location map of the study area.  
Source: Own elaboration.



**Figure 2**  
The natural regeneration of cork oaks (*Quercus suber*) in Mata do Sobral (june 2018).  
Source: Photo, P. Carvalho.



**Figure 3**  
Invaders after the fire in Mata do Sobral: *acacia dealbata* and *eucalyptus globulus* (june 2018).  
Source: Photo, P. Carvalho.



**Figure 4**  
Environmental education initiative with children's in Mata do Sobral (august 2018).  
Source: Photo, L. Alves.

enhancement of natural habitats, the promotion of environmental education, and the introduction of recreational and tourist facilities, in particular marking out a pedestrian and cycling route.

After the fire, the project had to be reformulated and submitted again for consideration. As early as 2018, this resulted in the approval of a renewed framework of action, of which two areas should be highlighted: 1. environmental education initiatives focusing on native woodland (interpretation, planting) and on woody invasive plants (detection, control and eradication) – Figure 4; 2. installation of a planned geocaching network associated with the flora, taking



**Figure 5**  
Example of geocaching logbook in Mata do Sobral (june 2018).  
Source: Photo, L. Alves.

a route that can be used in other environmental education actions to be implemented in the territory, which will make it possible to follow the progress of the rebirth of the Mata (Figure 5), with different target publics (residents and visitors); The implementation of the calendar (development of actions) of environmental education and scientific dissemination will be carried out by researchers and lecturers of the University of Coimbra, so as to provide direct contact with specialists, techniques and work methodologies that shape different insights on the dynamics and themes mentioned above.

To sum up, two key areas in the awareness-raising and training of society to adopt new values and environmental behaviours are valorising the territory and promoting a new territorial civic culture. Woodlands in general and geobotanical heritage in particular provide an opportunity to involve society in their conservation, recovery and valorisation, which is especially relevant in the post-disaster context (fire), like the example used to illustrate this paper.

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