

Environmental education program in Mongofra Nou

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Abstract

Mongofra Nou estate is located in the northern part of the Natural Parc s'Albufera des Grau in Menorca and hosts an incredible fauna, flora and geological structures. Due to the legislation of the Natural Park, traditional activities that were carried out have been reduced, here, the need to reinvent the estate. Currently, the intention is to promote the natural values and the promotion of their scientific research, in this context also grows up the need to create one Environmental Education Itinerary (EEI) in the coastal area of Mongofra Nou.

To carry out the project, it has been made a careful study of the area to determine the best possible routes while embracing the different environmental features of the zone; after that we analyzed the viability of our routes with one protocol created by EducAmb and then we selected the suitable one.

Then we proposed different stops explaining the potentialities of this stops, which will be accompanied with some educational information and QR codes in boards to allow the user to interact with the environment.

Finally, due to the fear that the massive influx of users from damaging this magnificent landscape, we carried out an influx study and create mitigation measures if the carrying capacity of the ecosystem is exceeded.

The other two proposals for environmental education (EE) will present other areas such as Bassa de ses Ànedes and the salterns, we pointed also the possibility of an alternative route to Punta de ses Llungües, landscape that has a significant importance for the coastal ecosystem.

Key words

Mongofra Nou, Albufera des Grau, environmental education Itinerary (EEI), environmental education (EE), Menorca, ecosystems.

Introduction

This article is placed within the socio-environmental framework of Mongofra Nou estate on the island of Menorca. It focuses on a creative project that seeks to characterize an environmental and educational route that exalts the qualities and peculiarities of the eastern area of Mongofra Nou estate; in order to transfer to the user, the sensitivity and majesty of the coastal and dune area.

The creation of this route requires an integrated, holistic and multidisciplinary vision to understand the environment as a whole in which each sphere (social, environmental and economic) plays a key role. We will however, integrate different fields in the same format; from scientific research to popular knowledge and hiking.

Objectives

It aims to promote environmental education through a route that projects from the house of Mongofra to the dune and coastal region of the eastern side of the property, and at the same time study the feasibility of two more tracks that would allow knowing other regions like salterns (es Escalfadors, ses Salines i sa Plaça de Toros) and the lakeside (Bassa de ses Ànedes).

Specific objectives

- Assess the feasibility of the route using a standardized protocol.
- Assess the feasibility of the suggested tracks of the lake area and salterns.
- Characterize the most important cultural and environmental aspects of the route.

- Develop virtual tools which facilitate an interactive experience.

- Develop tools to raise public awareness of the high vulnerability of the area.

- Assess the feasibility of the access route for people with physical disabilities.

Methodology

In order to prepare the three routes it has been compiled a series of data on environmental education, the legal framework in which it is possible to work, on the morphology and geomorphology of the island of Menorca, the Mongofra estate and the various subsystems included. Then, we made a field work for the study area; using templates we could study the natural and social resources of the route and collect a series of quantitative and qualitative data. In addition, interviews were conducted with experts and centers, as well as visits to other environmental pathways of the island to extend the working capacity. Finally, we conducted an evaluation and weighting of our routes through the protocol EducAmb (EducAmb 2013) and also we have performed a study of the affluence to minimize the direct risk to the system due to the preparation of the route.

Results

In this section we set out the results obtained in this study:

Analysis of the fieldwork

The analysis of the fieldwork was conducted by crossing data from the templates that show the potentialities of the areas, with the possible destinations of the routes; were also

evaluated accessibility features (so that the already open roads prevail over those that need to be cleared) and the landscape and nature in the process of selection of hypothetical routes, thus were created three routes. Each of these routes has been divided into sections corresponding to different ecosystems units, this division is targeting to facilitate the selection process regarding the qualitative characteristics of the different proposals.

The first route contains one section, since only goes through one ecosystem unit, the forest; on the contrary route number two passes three different ecosystemic units (dune, forest, shrub community); finally the third route includes the other two tracks and adds three more ecosystemic units, the semi-fixed dunes, the pine trees and coastal community.



Map 1

Title: Representació de les zones de treball
Scale: 1600

Source: Elaboració pròpia a partir d'un ortofotomapa d'escala 1:2000
Projection: Digitalització

Analysis of EducAmb protocol

This analysis aims to determine which of the three routes is the most viable. The protocol tested if a number of Unique criteria were satisfied, if so, you can continue evaluating secondary factors otherwise the route is not feasible; Unique criteria measured essential aspects such as security by users, if the route fits to the current legislation etc. However, the secondary factors weights the potentialities contained in the itinerary depending on whether they represent a greater or lesser interest to the user. The three routes fulfill the unique criteria, so you can weigh the secondary factors.

Table 1 EducAmb protocol scores of the three routes

	Score
Route 1	78/100
Route 2	77/100
Route 3	80/100

The results of the three routes (see Table 1) are within the range of “Well Suited” according to the protocol, but the third itinerary has more score and this proposal will then be considered as the final itinerary. This route, obtains a higher score due mainly to two factors, its circular shape and encompasses all the potentialities of the others routes and adds even more.

Analysis of the affluence study

The study has as main objective to achieve a threshold to mark a limit so that if it is exceeded we would have to establish a

series of mitigation measures included in the project.

Table 2 Carrying capacity and Annual influx of users in the two small bays we are targeting the study

	people/year
Carrying capacity of the small bays	167.900
Expected annual influx	45.790

It should be emphasized that the concept used as a "carrying capacity of the small bays" (see Table 2) does not include all the vulnerabilities of the dune ecosystem, consequently, the value collected cannot be regarded as true. To obtain a reliable value has been taken into consideration the value of expected annual influx, the carrying capacity of the bays, but also other studies conducted by the Observatori Socioambiental de Menorca (OBSAM) (Cardona & Carreras 2002). So, the proposed threshold is 100,000 Visitors / year. As mentioned, if this value is exceeded, mitigation measures will have to be carried out.

Itinerary

The route going through the coastal area and the dunes is the main pillar of project, comprises the most important wealth within the area of Mongofra Nou and also within the island of Menorca. Along the route different features such as the endemic botany of the island, the traditional agriculture or the geology are presented. Moreover, it presents the artistic, cultural,

ethnological and architectural in each of the stops.

Given this multidisciplinary approach, it presents a rich and full itinerary, which enhances an area with little influx of visitors and invites users to experience the history of the place from the features that the same environment provides.

In order to give a more comfortable discourse and scientific knowledge to the user, we use an animated character named

“Soqui” to offer the user the pedagogical information. This character emulates an endemic plant of the place called Socarrell (*Anthyllis hystrix*) and it will be projected onto each educational panel in all stops

The route will also have its standardized signage to guide the user through its paths. We also built a virtual platform that can be accessed through QR codes that appear in all panels, which collect detailed information of each stop; this tool will allow the user to see additional information of the place.



Map 1 **Title:** Representació de l'itinerari 3 amb les parades possibles
d'escala 1:2000 **Scale:** 1600

Source: Elaboració pròpia a partir d'un ortofotomapa
Projection: Digitalització

Other proposals

In response to the second objective, we suggest the possibility of carrying out future actions aimed to enhance the environmental education in other areas of Mongofra Nou. Three actions were selected; a route to Bassa de ses Ànedes, an observation point in the salterns, and finally one route to Punta de ses Llengües that could be done only with the intervention of a guide due to the fragility of the site.

In the first proposal we have compiled a series of field data, using the same criteria as in the principal study, then we used the protocol to evaluate the viability of the track and it has been completed with a series of stops that collect all the characteristics of the place.

The second proposal is the realization of a bird observatory, mainly migratory, located in the area of the salterns, this observatory is located in the old bullring, which is a five minute walk from the property; inside the observatory it will be explained the importance of salterns and the main migratory birds. Also, the old building next to the bullring can be renewed to do activities with the visitors.

Finally the third proposal consists in a guided route and only for small groups to introduce the area Punta de ses Llengües with a fragile and protected endemic flora.

Conclusions

After doing the literature search, field work, interviews and preparing the proposal we have made a route that responds fully to what was intended in first place; is a

multidisciplinary route which makes the eastern zone of Mongofra Nou even more attractive and accessible to the public.

"Other proposals" section wants to respond to the second general objective; and this is to establish a solid foundation for potential new projects in other potential Subzones.

It should be mentioned that the use of protocol EducAmb helped the team to extract an optimal proposal against all the alternatives that were discussed at an early stage, and allowing also to decide the "Other proposals".

From our own knowledge as professionals and the help of scientific studies already conducted in the area, we carried out an entire educational proposal that responds to the specific objective, which includes different materials to present in an easier way the information to the user and raise public awareness about the fragility of the environment

It should be mentioned that regarding the study of accessibility for people with reduced mobility (specific objective) which was studied during field work, there are certain sections where access would not be easy.

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