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## An Integrated and Adaptive Management Plan of the “Balta Mica a Brailei” Natural Park based on the Analytical Power of GIS Tools

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### Abstract

More than ever in history, we must manage, preserve and restore our natural resources. In accordance to the European Union Environment policies, the main concerns are addressed by a continuous deterioration of natural habitats and the threats posted to certain species. Romania has also to ensure the establishment of Natura2000 network in accordance to the Birds and Habitats Directives and to prepare protection measures for the community interest sites. An appropriate management and monitoring system has to be developed and implemented by decision makers of the “Balta Mica a Brailei” Natural Park Administration. There is no simple answer to ensure these tasks, but during the project there is increasing optimism that the application of GIS and geoportals tools will allow them to make decisions to better conserve its resources and protect its biodiversity. This article is focused on the ability to use GIS technology as a tool to monitor habitat changes, track community interest species and predict future land and resource use that is essential to protect natural heritage and to maintain a favorable conservation status.

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### 1. Introduction

During the last years, Romania is in the process to implement a series of the Sectorial Operational Programme Environment projects that are focused on inventorying and mapping natural habitats and wild species of Community interest for the major natural protected areas. “Balta Mica a Brailei” Natural Park (BmB-NP) represents one of the

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most important protected areas where complex aquatic and terrestrial ecosystems are preserved in a state close to the original one. Across an area of 24.555ha, BmB-NP is declared in accordance to national and international legislation as: a) “*Natura2000 site*”: ROSCI006 [1] and ROSPA005 [2], at the European level; b) “*Natural Park*” [3] – natural protected area at the national level; and c) Wetland site of international relevance as a “*Ramsar site*” [4] at the global level.

Our research activities are conducted under the Sectorial Operational Programme Environment (SOP) – Priority Axis 4: “*Natural capital management of Balta Mica a Brailei through an integrated approach, assessment and awareness*” that takes place inside a complex program which aimed to create the “*Interpretation and management manual of the species and habitats*” at the end of 2013. This manual will include a national and biogeographical synthesis for each species and habitats of community interest, for the period 2007-2012, with a dual approach:

- Scientific (identification, conservation status, ecological synthesis) and
- Technical (including proposed management and conservation measures, evaluation of the impact of these measures).

### 1.1. Biodiversity of the studied area

*Habitats* – in terms of the European Directive “Habitats, Flora and Fauna” [5], there are identified 19 types of habitats in “Balta Mica a Brailei” Natural Park and 9 habitat types are found in Annex I of the aforementioned EU Directive. Habitats which are directly affected by this project implementation: 92A0 type of habitat - galleries of *Salix alba* and *Populus alba*, occupies 15% of the park and 91E0\* (priority habitat) – water meadows of black poplar and ash with *Rubus caesius*, occupies 11% of the park area.

*Birds fauna* – are represented by 207 species (51% of the Romanian birds fauna) in accordance to “Balta Mica a Brailei” Natural Park database. A number of 68 species are included in Annex I of the European Birds Directive [6]. In 2008, “Balta Mica a Brailei” Natural Park is declared as ROSPA005 (Special Protection Area) for 26 species included in Annex I, Birds Directive and for 72 of migration species from the Bonn Convention Annexes. This protected area is very important for nesting populations of the following species: *Ardeide*, *Ciconia nigra*, *Aythya nyroca*, *Haliaeetus albicilla*. The localization of site along the Danube Delta – one of the largest rivers in Europe, makes it particularly important for migratory aquatic species such as ducks and geese which stop during the winter season.

*Terrestrial fauna* – in this area were identified other species of community interest which led to declare the BmB-National Park as SCI (Site of Community Interest) site. Among them, the following are mentioned: *Lutra lutra*, *Bombina bombina*, *Emys orbicularis*, and *Triturus dobrogicus*.

### 1.2. Main scientific activities of the project

The scientific activities conducted according to the project’s specifications are consisting of the following:

- Elaboration of the scientific studies, GIS mapping of the species distribution and proposed management measures for the following *species of community interest*: avifauna, ihtiofauna, reptiles and amphibians.
- Elaboration of the scientific studies, GIS mapping of the species distribution and proposed management measures for *terrestrial invertebrate species*: insects (including coleoptera, odonata, orthoptera), lepidopteres, terrestrial molluscs.
- Elaboration of the scientific studies, GIS mapping of the species distribution and proposed management measures for *aquatic invertebrates species*: crustaceans, molluscs and insects.
- Elaboration of the scientific studies, GIS mapping of the forest sites and meadows, and proposed management measures for *forest and shrubs habitats and meadows habitats*.
- Elaboration of the scientific studies for *aquatic habitats of community interest*, GIS mapping of the habitats and proposed management measures and
- The study of ecological relationships within aquatic, terrestrial and of ecoton ecosystems, integrated management measures proposed.

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