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Water quality monitoring of IDICE and ZENA rivers inside the Gessi Bolognesi and Calanchi dell'Abbadessa Regional Park: preliminary results

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ABSTRACT

The 2nd of april 1988, the Emilia Romagna Region promulgated the L.R. n.11 for the establishment of Regional Parks and Reserves and the realisation of qualified interventions for their better management. This regional law foresaw the national one of about four years, and was modified by it with the L.R. 12th of november 1992, n.40.

At the same time, among a great number of environment safeguard actions already realised at a Community level, it should be mentioned the "Habitat" Directive 92/43/CEE, whose main aim is "*ensuring bio-diversity [...] by taking measures "designed to maintain or restore, at favourable conservation status, natural habitats and species of wild fauna and flora of Community interest."*

According to the Directive, in order to achieve this objective, each Member State has to contribute to the creation of an European ecological network of special areas of conservation, called "Natura 2000", to answer to the need of natural environments protection, no matter what geographical boundaries they have, by joining, at the same time, the preservation of the natural resources with their social exploitation and the sustainable development for the local population.

Thanks to BIOITALY, a national program set out by the Environment Ministry, from 1995 to 1997, Italy established a draft list of areas that could be proposed to the European Commission as Sites of Community Importance (SCI): the italian Special Protection Areas and Sites of Community Importance, according to the "Birds" Directive 79/409/CEE and the "Habitat" Directive 92/43/CEE respectively, were defined by the Environment Ministry Decree the 3rd april 2000.

The Gessi Bolognesi and Calanchi dell'Abbadessa Regional Park, a protected area already established by the L.R. n.11/1988, is included among the proposed Emilia Romagna SCI with the IT4050001 code.

This protected area is situated on the first hill slopes in the south-eastern area of Bologna; it has a great naturalistic and cultural meaning due to its important and unique series of gypsum outcrops, that date back to the Messinian time (Miocene), from which a very interesting karst system have derived, and to the suggestive calanques of the Passo dell'Abbadessa.

The whole Gessi bolognesi territory represents one of the most important biodiversity basins in Emilia Romagna: the evidence of a pronounced karst phenomenon, at a superficial level as well as in depth, that occurred to the outcrops of the Miocene evaporites, has had high repercussions on the ground morphology and, as a consequence, to the habitat diversity and the biological diversity (both botanical and zoological) of the site.

Simultaneously, the clayey Calanchi determine a particular landscape characterized by a mosaic of habitats: harsh calanques and gentle clayey slopes alternating with areas in which the vegetation becomes rich in thick woods, shrubs and hedges, from a faunistic point of view, this territory is rich in birds linked to various habitat like wide open areas or thick undergrowth, while, in the major downhill, many streams give hospitality to various reptile and amphibian species. Moreover, the precence of more than 100 caves represents a key habitat to preserve the integrity of the 7 chiropters species found in the Park: together with the amphibians *Salamandrina interdigitata* and *Bombina pachypus*, the fishes *Cobitis taenia* and *Chondrostoma genei* and the shellfish *Austropotamobius pallipes italicus*, chiropters justified the involvement of the Gessi

bolognesi Regional Park to the Pellegrino Project, funded by the Life Natura 1998 european project to protect habitats, animal and vegetable species of community importance.

In Emilia Romagna, regional parks are managed by consortia which involve all the local communities that are directly included in the park territory: this Park Authority has to determine and activate all those actions that could lead to the realisation of protection and sustainable development programs, established by the Authority itself through the Territorial Park Plan. In the Gessi bolognesi and Calanchi dell'Abbadessa Park's document it's just underlined the need to protect the Idice and Zena rivers which run through the park: to this aim, the Park Authority decided to start a monitoring program whose results will recommend some new instructions to be inserted in the Park Regulations and/or extraordinary measures for a better protection of the fluvial habitats.

The monitoring project, set up by the Park Authority, which involved, among others, also the Bologna section of the ARPA Emilia Romagna (Regional Environmental Protection Agency), is aimed at the realisation of various monitoring activities for a better knowledge of the biotic and abiotic river systems inside the Gessi bolognesi Park: the final result would be the classification of the environmental quality of the Idice and Zena stretch and the construction of singles Minimum Vital water Flow models.

These models will be estimated by taking into account many environmental, social and economical factors: this is why the whole monitoring activity is in fact a multi-disciplinary activity that will last for over two years, starting from last summer.

The present work will address only the chemical and microbiological monitoring phase that, together with the study of the macrobentos fauna, will lead to the definition of the Superficial Waters Ecological Condition, according with the italian law (Decreto Legislativo 152/99, as modified by the Decreto Legislativo 258/2000).

By taking into account the results of the first three months laboratory analysis, starting from an introduction about the monitoring setting up and its meaning, this work would show how to proceed with all the calculations, once all the results are available, to define the Superficial Waters Quality Condition of Idice and Zena rivers.