

# LIFE – NATURA 2000

## “Actions for the conservation of Mediterranean ponds in Crete”

LIFE04NAT/GR/000105

*LAYMAN'S REPORT*





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Full title of project: *“Actions for the conservation of Mediterranean Temporary Ponds in Crete”*

Code number: *‘LIFE04NAT/GR/000105’*

Dates of programme: *01/11/2004 – 01/11/2008*

Duration in months: *48 months*

Actual full budget (numbers): *1.275.000.00 Euros*

EC contribution (numbers): *956.250.00 Euros*

Project website (both addresses): *www.life-kriti.gr and www.life-medponds.gr*

**Table of Contents**

*General Information* ..... 5

*Flora Diversity* ..... 7

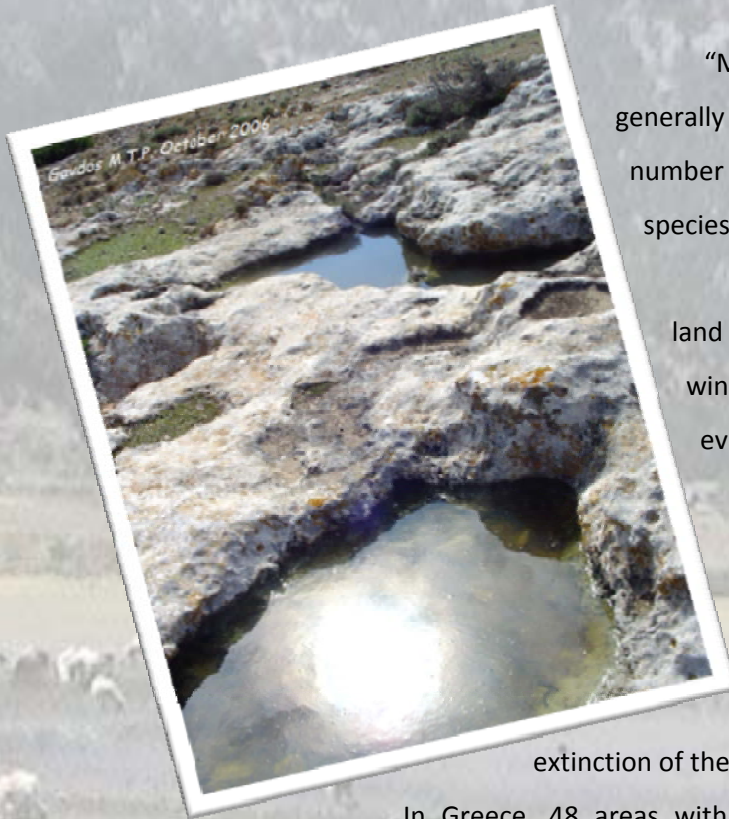
*Fauna Diversity* ..... 7

*M.T.P. Threats* . . . . . 8

*The Project* ..... 9



## General Information



“Mediterranean Temporary Ponds (M.T.P.)” are generally small water bodies, which contain an important number of flora and fauna, with many rare and endemic species.

They can be formed mainly in small holes on land or in rocks, in which rain water accumulates in winter and dries up in summer because of evaporation.

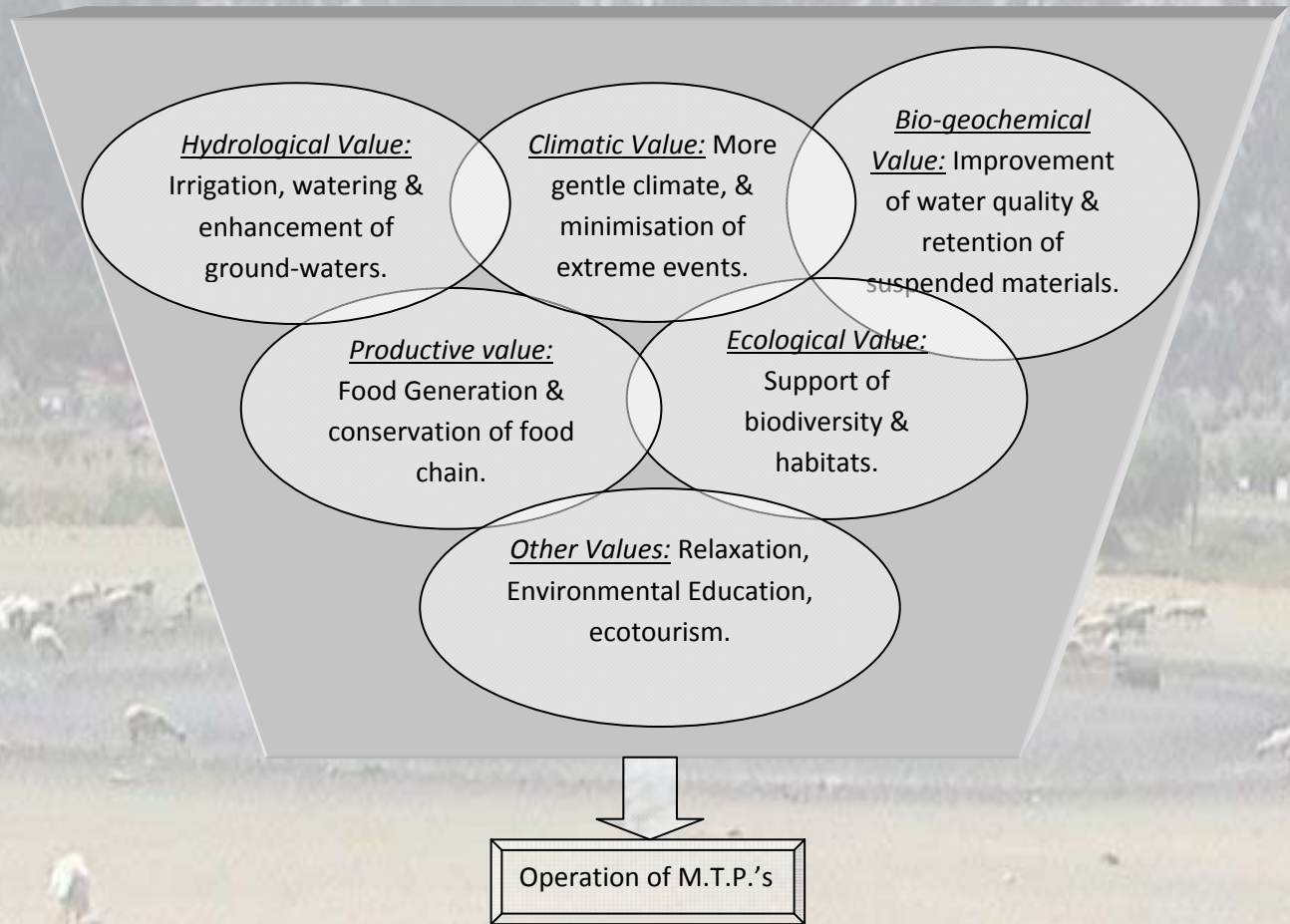
Because of the small surface area of the M.T.P.’s and their limited protection, they are facing serious threats due to anthropogenic activities, which in some cases, have led to degradation and consequently to the extinction of these valuable ecosystems.

In Greece, 48 areas with Mediterranean Temporary Ponds, have been identified until 1996. Five of them are located in West Crete (Falasarna, Elafonisos, Gavdos Island, Kourna Lake, Plateau of Omalos), in the Prefecture of Chania, which is the southernmost area of European continent where M.T.P. ’s appear.

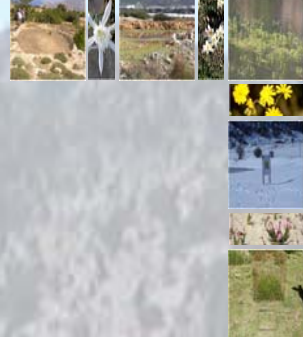
The various processes occurring in the M.T.P. ’s (hydrological, ecological, bio-geochemical, bio-productive-trophic, climatological-micro-climatological, e.t.c.), give them multi-dimensional roles in the environmental and human community. As wetlands, they offer many benefits, such as:



## The Mediterranean Temporary Ponds Values



- ✓ Retainment of water and water supply (e.g. livestock watering, irrigation, enhancement of ground-waters, e.t.c.).
- ✓ Food Generation (e.g. grazing, conservation of food meshes).
- ✓ Variety of habitats and support of biodiversity (ecological value).
- ✓ Improvement of water quality and transformation of organic waste into inactive components (bio-geochemical value).
- ✓ Influencing the the region's micro-climate and decreasing the impacts from frost and heat-waves (micro-climatic value).
- ✓ Various opportunities for education, ecotourism, relaxation, e.t.c.



## Flora Diversity



The soil of ponds is usually characterized as "a seedbank", because spores of plants overwinter there and sporocysts-seeds of the carinoid, are activated and germinated, in more favorable conditions, with respect to water content, soil humidity, temperature.

In M.T.P. regions, in West Crete species such as helophytes, amphiphyta, hydrophyta. There are species that exist in various areas of Greece, while others appear only in the region of Crete, and some exist only in the M.T.P.'s areas. Among the flora of those ponds, where

water is maintained for more than few weeks, hydrophytic and hydrophile communities dominate, while after their desiccation those communities recede, and hydrophytic plants appear again. If the dry period has a long duration, xerophytic scrubs may appear. The typical flora species of this regions, such as the endemic species *Crepis cretica*, and more common like *Callitriche pulchra*, *Elatine alisinatrum*, helophytes like *Juncus sp.*, *Carex sp.*, *Eleocharis sp.* e.t.c. are of particular interest.



## Fauna Diversity

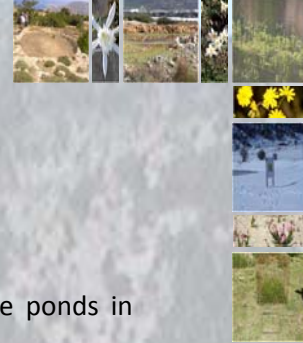
The fauna diversity of M.T.P.'s varies and depends on the hydroperiod, the climatic conditions, the size and geomorphology, but also the altitude at which there exist. These areas constitute places of rest and food for birds. After seasonal samplings, recording of species and their frequency of appearance, in each of the regions

(Falasarna, Elafonisos, Gavdos, Kournas, Omalos) gave the following results:

- ✓ In relative large surface ponds, which have the ability to retain water for some months, such as the ponds of Kournas, Omalos and Falasarna







## **The Project**

The basic aims of this programme were, on the one hand, the rehabilitation of the ponds in Western Crete to favourable conditions that preexisted the human intervention in the region, and on the other hand, the protection and conservation of the habitats by applying administrative solutions that can effectively overcome the habitat threats in the long-term.

In order to achieve these aims, four groups of actions were organised. The first group included actions regarding the description of the current situation in the regions of ponds which is described in the following paragraphs.

### **Hydrological Survey**

According to this survey the habitats' hydrological regime was estimated and the annual and monthly water budget of each site. The aim of this survey was to estimate the water reserves in order to propose the best applicable method to solve water related problems in the ponds.

### **Socio-economic Study**

The Socio-economic Study conducted by H.C.M.R. and N.C.S.R. had a final aim to maximize the socio-economic benefits from the program actions, for each one of the variable target groups such as the hotel-keepers, the cattle-breeders, and the farmers.

### **Water Quality Survey**

The action included the sampling and analysis of water and soil samples, comparison of results with data that concern the quality of waters in each region, the determination of pollutants as well as proposals for the improvement of water quality with environmental techniques.





### Habitat Mapping

In this study M.A.I.Ch. conducted seasonal samplings, delineation and mapping, of the habitat's boundaries, as well as of the human activities in the study regions (streets, greenhouses) that are likely to disturb the ponds' ecological succession.

### Investigation of grazing and watering capacity

The aim of this study was the measurement of grazing and watering capacity at all project habitat sites, in order to promote sustainable grazing and livestock watering by providing alternative regions for livestock watering in the project regions. According to the survey results, the only one of the five M.T.P.'s showed signs of overgrazing: this was the Omalos pond, where the percentage of overgrazing tend to be 73%.

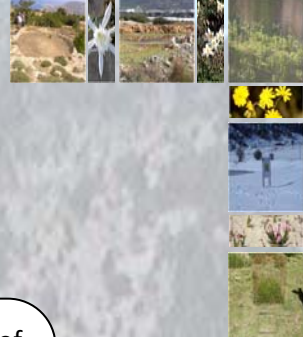


The second group of actions for the protection of Mediterranean Temporary Ponds, included practices related to the restoration of the habitats' processes to their natural state.

### Restoration of the habitat's natural hydroperiod

- ✓ Construction of low-scale ditches or soil transects to facilitate water movement towards the ponds' area.
- ✓ Slight deepening of specific ponds.





### Elimination of water pollution levels

- ✓ Application of specific or precautionary actions for the restoration of eutrophication levels in M.T.P.s
- ✓ Measures for the decrease of the incoming pollution, such as construction of a waste water treatment plant, sewerage network or specially designed deposition lagoons.

### Sign Posting

- ✓ Informative signs were installed to highlight the habitat's importance, its vulnerability and major threats of ponds as well as precautionary activities that visitors should adopt.
- ✓ To avoid altering the natural landscape significantly, the number of signs was maintained to a minimum at each site, with relatively small size and made of environmentally-friendly materials.



### Solid Waste Removal

- ✓ Many regions were cleared resulting in a significant reduction of solid waste. Light mechanical equipment was used during the cleaning stage, to avoid causing potential damages to the habitat. Manual solid waste collection was carried out with the contribution of public participation (volunteers and school children).

### Livestock Watering

- ✓ A livestock watering network, was constructed near the ponds, comprising of low-scale, distinct constructions, which was regularly filled with water from a water supply system receiving rainwater or surface water from a nearby stream/ canal or if necessary, from a borehole.



*Simple water level measurement instrument in Elafonisi*

The next group of actions involved the protection and conservation of sensitive ecological areas. First, a monitoring network with sensors was established at all habitat sites, recording meteorological data, water quality data. This network was then used for planning restoration actions and improving water quality. Hydrological surveys also took place in order to restore the natural hydroperiod.

The next action involved *hydrological monitoring*. In this phase, a hydrological monitoring network was established, which contained all the necessary data for the hydrological actions and the restoration of the ponds' hydroperiod. This action also provided the possibility to observe and assess the results of the measures taken under the re-establishment of the habitats' original hydroperiod.

In order to restore the ponds' water quality, water quality sampling surveys were carried out, as part of a *water quality monitoring program*,

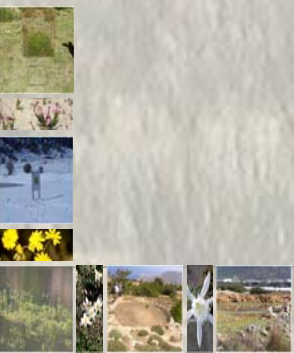
which constituted the third action of this particular group. This included monthly sampling of water at all ponds, chemical analyses of these samples, and importing the results in respective data bases.

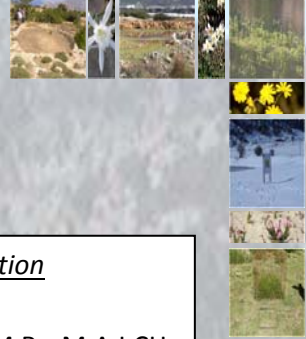
The *ecological monitoring* was the next action that took place and its realisation was based on four samplings per year for the total duration of the project. The aim of the sampling was to record flora and fauna species, as well as their fluctuations in fixed transect. The result of this action made possible the continuous observation, identification and characterization of the ponds' biodiversity.

The habitat management plan and the ecological monitoring were applied to the *management plan* for each site. The main aim of was to carry out activities such as the removal or the re-introduction of certain species or measures to control their population, in order to restore habitats to their original state.



*Water sampling in Omalos MTP*





### Habitat Communities Management scheme application

As a result of collaboration between H.C.M.R., M.A.I.CH. and the University of Ioannina, a habitat communities management scheme was applied, with final aim being to record the habitat's threats, to re-establish the original flora and fauna at each pond, to manage populations as well as to transfer scientific knowledge to local stakeholders and institutions.



The final group of actions concerned public awareness with regard to these important habitats.

The first approach was via environmental education

of the public, adults, children, and other stakeholders.

The environmental education at

schools focused on the values of Mediterranean

Temporary Ponds, the ways and the reasons for

which they should be protected. The project

team contacted school managers, scheduled and

provided environmental education sessions and distributed printed

material. Guided tours at the M.T.P. areas were organised for the public and local

stakeholders, where the project team promoted the significance of the habitat, and demonstrated

the best practices that local people should follow to achieve their long term preservation and the provide

benefits to people in the area such as eco-tourism and agro-pastoral infrastructure.



To increase public awareness, the project website was developed ([www.life-kriti.gr](http://www.life-kriti.gr)) and was continuously updated thus providing a dynamic

and continuous platform of information and communication. A series of

paper advertisement (brochures, stickers, posters) were produced by

“EVDILOS” and distributed to schools, public offices, workshops and

meetings organized under the project, as well as to other interest groups

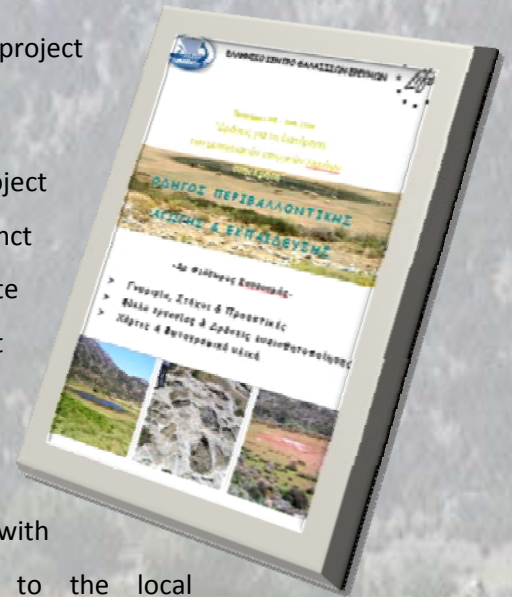
and local authorities.



Finally, workshops and seminars played a decisive role for raising awareness to the local society concerned about the project's

actions, objectives and results, but also for the *promotion* of the project through international and national conferences and journals.

In conclusion, the M.T.P.s of the LIFE NATURE project LIFE04NAT/GR/000105, enhanced the particularities and distinct biodiversity that exists exclusively in the natural environment of Crete including the habitats of the island of Gavdos, one of the important ecological sites in Crete.



These M.T.P. characteristics, combined with values the M.T.P.s offer to the local community, impose an imperative need for their protection and maintenance, that would create, at the same time, prospects for their success through “soft development strategies” and alternative ways of management (such as community and municipal parks, museums, or footpaths).

We need to comprehend that the natural environment was always unbreakably connected to traditional human activities and offered goods and values to human communities and maintained, the quality of life.

