



LIFE05/NAT/E/000060

RESTORATION OF PRIORITY HABITATS FOR AMPHIBIANS



**RESTAURACIÓN
HABITATS
ANFIBIOS**



**GENERALITAT
VALENCIANA**

CONSELLERIA DE MEDI AMBIENT
AIGUA, URBANISME I HABITATGE





Introduction

Species included in the project:

- **Iberian Ribbed Newt**
(*Pleurodeles waltl*)
- **Spanish Painted Frog**
(*Discoglossus jeanneae*)
- **Western Spadefoot Toad**
(*Pelobates cultripes*)

In addition to the rest of amphibians of the Valencian Region:

- **Common Midwife Toad**
(*Alytes obstetricans*)
- **Parsley Frog**
(*Pelodytes punctatus*)
- **Natterjack Toad**
(*Bufo calamita*)
- **Common Toad**
(*Bufo bufo*)
- **Iberian Marsh Frog**
(*Rana perezi*)

The abandonment of traditional activities that helped maintain ponds is one of the **main threats currently affecting amphibians**. Other threats are the loss of water inputs, habitat loss, water pollutions or the introduction of exotic species. The main goal of this project is thus to restore temporary Mediterranean ponds, an habitat type whose conservation is considered a priority in Europe. Additionally, the risk of extinction currently faced by amphibians owing mainly to the destruction of their habitats is also dealt with in this project.

Among the actions that have been carried out the restoration of some of the habitats by selective dredging, the restitution of water inputs and revegetation of ponds, the eradication of exotic species and the passing of recovery plans for the threatened species as well as an important dissemination and awareness raising campaign can be mentioned.

One of the **main objectives** of the project is the restoration of the different types of aquatic habitats in SICs, since they are either considered priority habitats or are vital sites for the survival of amphibian populations in the Valencian region (including species of Annex II and IV of the Directive). These habitats are:

- 3170. Temporary Mediterranean **ponds**
- 3140 oligo mesotrophic calcareous **waters** with charophytes
- 7220 Petrifying **springs** with tuf formation
- 6420 wet **grasslands** (*Molinion-Holoschoenion*)
- 3280 Permanent Mediterranean **rivers** of the *Paspalo-Agrostidion*



Summary

The main goals of the project were the restoration of **55 ponds**, the establishment of 23 fauna reserves for amphibians, the development of **action plans** for amphibians and their habitats, the biological and physico-chemical **monitorization** of sites were actions were developed and the implementation of an **awareness-raising campaign**.

The development of the project can be summed up as follows:

- The **effective cost** of each management actions has been lower than estimated, owing to an optimisation of the works performed between neighbouring sites within a given SIC. The final result has been a higher-than-expected degree of execution.
- Actions have been carried out in most of the **scheduled ponds** in addition to neighbouring areas. Coordination with forest wardens and other social organisations has resulted in an optimisation of works and in increase of restored areas. Altogether works have been carried out in 96 sites within 25 SICs.
- The **subsidy scheme for pond owners** to carry restoration works within these habitats has yield excellent results with 15 projects being subsidised.
- 16 **fauna reserves** for amphibians have been officially established and an additional 10 are undergoing procedures for declaration.
- **Limnological and vegetation studies** of ponds made by University of Valencia and the Polytechnic have significantly increased knowledge about biodiversity and ecology of ponds. These results have been presented in international congresses.
- **Restoration actions** have been very effective and have resulted in almost immediate colonisation by amphibians, especially *Pleurodeles waltl*, *Pelodytes punctatus*, *Alytes obstetricans* and *Bufo calamita*.
- Over 200 **diffusion activities** including workshops, oral presentations, conferences, TV and radio shows, guided field trips, exhibitions and photography competition) have been made as part of the environmental awareness raising campaign.
- The project has been disseminated in a diversity of international **forums** and **congresses**.
- From may 14 to may 16th 2008 the **3rd European Pond Conservation Network Workshop** was organised with 130 attendants from 25 countries and 120 communications (33 oral and 87 posters).

Action plan for the conservation of aquatic habitats

The **actions** that have been carried out include

- **update of the inventory of ponds** of conservation interest for amphibians, invertebrates or plants. Up to date information on 153 ponds together with an analysis of amphibian communities is included
- **26 reserves** are included in the **fauna reserve network** for amphibians or aquatic habitats
- **management plans for natural areas**. 4600 sites have been included in the preliminary inventory drafted in cooperation with the natural protected areas network of the Valencian region. Management measures have been put forward for their recovery and conservation.

Guide to pond restoration

This **guide** puts forward restoration and management techniques for every type of pond. Different types of actions are described in fact-sheets and include information on:

- name of the management action
- types of ponds where it is applicable
- threats or problems that the management action aims to mitigate
- explanatory notes and drawings
- photographs of case studies
- requirements in terms of work force and materials
- estimation of cost





Conservation of Spanish Painted Frog, Western Spadefoot Toad and Iberian Ribbed Newt



- The project **coordinator** and technical staff of the environmental office have surveyed several populations of these species and the 55 ponds included in the project

- The **information** required for the drafting of the documents anticipated in the present action has been gathered

- **New populations** of threatened amphibians Spanish Painted Frog and Iberian Ribbed Newt have been discovered and evaluated in the Castellon and Valencia provinces

- An **inventory of ponds** of interest for Spanish Painted Frog in the Plana de Utiel-Requena region has been compiled. This is a key region for the conservation of the species. 55 potential sites for sheltering the species have been identified with a view to reintroductions.

- A **Reintroduction plan for the Iberian Ribbed Newt** in the natural park of Sierra Mariola has been drafted. Some of the actions foreseen in the plan such as the improvement of some ponds are being implemented.

- **Ex situ breeding** of Spanish Painted Frog is being carried out in the fish nursery of El Palmar, with the first individuals undergoing acclimatisation.



Subsidies for pond owners

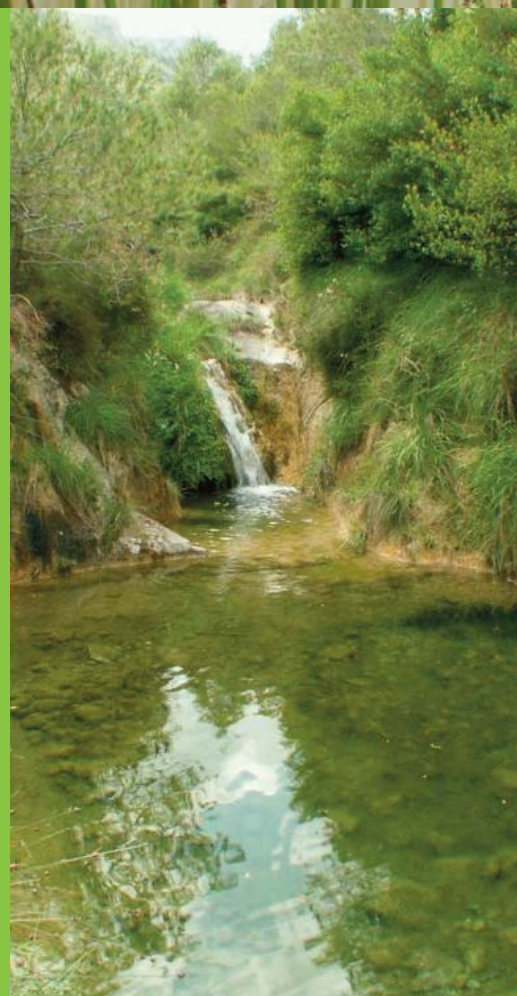
A new **subsidy** has been drawn up specifically for pond owners. Subsidies in 2007 amounted to 30.000 eur while in 2008 the amount was increased to 40.000 eur.

29 requests were analysed for their quality, number of threatened species if benefited, conservation interest, degree of urgency, expected results and other criteria. Out of the 29 requests, **15 projects** were finally selected and carried out.

Beneficiaries included 7 town halls, 5 ngos, 2 private individuals and 1 university.

The life **coordinator** has overseen works, provided technical advice and certified their correct execution. In some instances environmental wardens and natural areas staff have provided useful **collaboration**.

Subsidised works performed in two sites are presented herebelow:



Recovery of the pond at la Masia Ull de Canals (Banyeres) SIC Mariola-Font Roja. Beneficiary: Llar de Mariola Foundation



Dredging of the pond



The pond as it appeared after works were completed and the substrate had been put back



The pond nowadays full with water



Travelling exhibition "Amphibians double life" in the interpretation center of Mariola Natural Park.

Recovery of ponds in La Murta (Alzira) SIC Serra Corbera. Beneficiary: Municipality of Alzira



Population of exotic fish in La Murta ponds



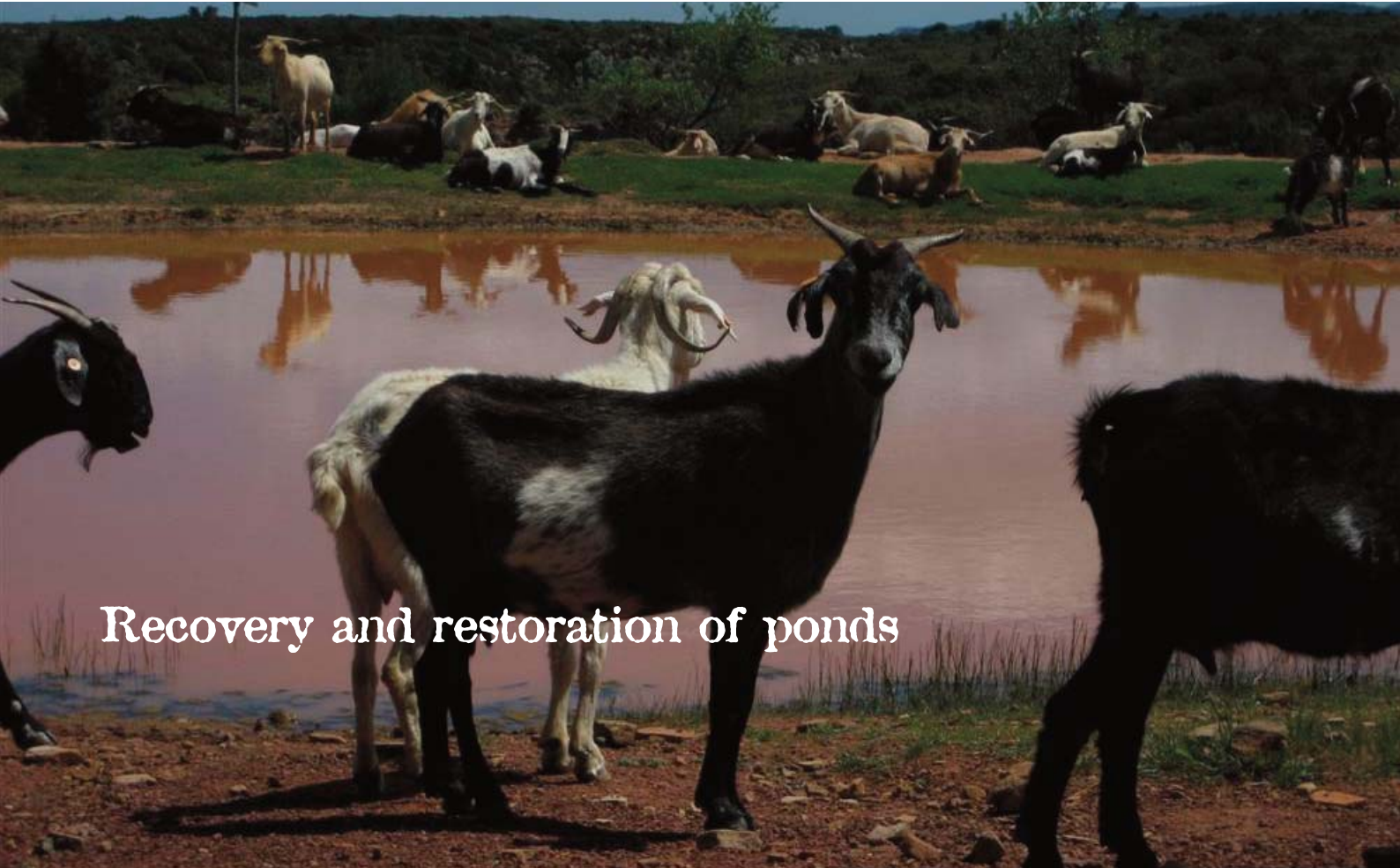
View of the ponds once fissures were restored



Information board explaining the interest for amphibians of the area in the Font de la Casella site

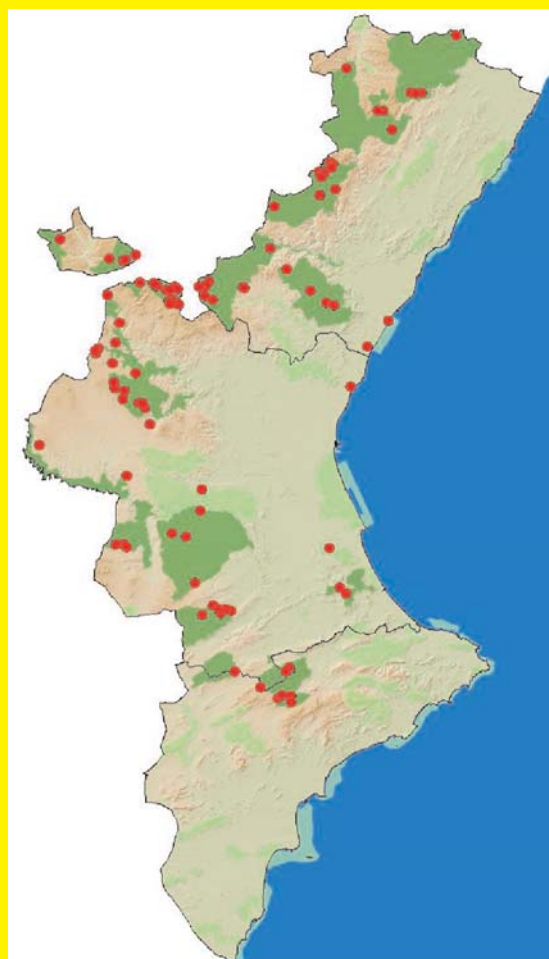


One of the boards fixed explaining the importance of amphibians and of the life project.



Recovery and restoration of ponds

The recovery and restoration of ponds has been one of the most important goals of this project and **196.685,74 euros** have been invested in these works.



Works have been carried out in 51 of the sites included in the project (98% of the total), although the total number of sites where actions have been carried out is **97**. That is, 46 new sites not included in the initial project have benefited from management actions. These new sites include the 15 sites that have been awarded subsidies. Altogether 25 SICs have benefited from works. Here below information on some of the implemented actions is provided

In red: location of the points of action of the project.

In light green: SICs of the Valencian Community.

In dark green: SICs included in the project.





Balsa Blanca (Enguera).

The waterways that allow runoff to enter the pond have been restored. The area is now a Fauna Reserve and an informative board with information on natural values has been set up. The regional agricultural council has developed a project for the modernization of watering schemes in the area. One of the pipes runs close to the pond and adequate measures were taken to avoid works altering the pond and its water catchment.

Above: the pond before the works, with a reduced water holding capacity

Below: the pond nowadays with a restored catchment area

SIC Puebla de San Miguel

This SIC is located in the Rincon de Ademuz, a very remote hard to reach part of the Valencian region. The area consists of continental arid highlands and therefore ponds are scarce. Works have been consisted in the restoration of the catchment area of three ponds and the creation of a new pond.: Charca Piqueras, Navajo Cañada de Jorge, Fuente del Maderero and Fuente de las Blancas.

Above right: Charca Piqueras with a restored water catchment.

Below right: Fuente de las Blancas, the habitat of Common Midwife Toad and a potential habitat for Spanish Painted Frog.

Above left: Fuente del Maderero. the pond before restoration works.

Below left: Fuente del Maderero. small ramp to facilitate access to amphibians.





Production of aquatic plants and control of helophytes

Aquatic plant **production** was the result of an agreement between the Life project and SEMCLIMED, a project of INTERREG IIB program. One of the members of this project is the Generalitat Valenciana through its Experimentation and Research Centre (CIEF). In coordination with the fish nursery of the Generalitat (CIP) and the germplasm bank of the University of Valencia the plants of major conservation interest for the Life project have been produced, with seeds and propagules taken from some of the ponds within the project.

Plant material from **12 ponds** of SIC Arroyo Cerezo and SIC Lavajos de Sinarcas and SIC Sabinar de Alpuente has been obtained and propagated in the CIP El Palmar and in the CIEF. Plant material has been kept in these two premises until plantation works. Up to date plantations have been carried out in 8 ponds.

The goal of **helophytic plant control** has been to favour diversity within ponds, since helophytes like *Typha*, *Phragmites* or *Juncus* gradually take up all available habitat.

Works have consisted in **manual pulling** of some or all the helophytes so as to increase open water habitats and ultimately pond biodiversity.



Eradication of exotic fauna



The presence of **exotic animal specie** is one of the main threats to amphibians and pond biodiversity.

These works were carried out in conjunction with **volunteers and regional technicians**.

Some of the works that were performed include:

Removal of:

- **red swamp crayfish** (*Procambarus clarkii*)
- **ducks** and **geese**
- **Florida terrapins** using different traps
- **exotic fishes**

These actions have favoured the recovery of native species. In some ponds where exotic fishes were removed the populations of Common Midwife Toad and Iberian Marsh Frog have substantially recovered.

Monitoring of physico-chemical and biological parameters

The **University of Valencia** has been in charge of this part of the life project. 67 water habitats of different typologies have been studied and their physico-chemical and biological variables monitored. Some of the conclusions have been:


- some of the **most interesting ponds** are Lavajo de Abajo, Balsa Blanca, Mas de Alberta, la Charca de Benirrama y El Rebalsador.
- the conservation of the **hydroperiod** peculiar to its water habitat in addition to its morphometry is of vital importance
- the shallow waters shelter the most interesting and rare animal (Conchostracean) and plant (*Marsilea*) **communities**.

Depending on the **composition of the crustacean** communities ponds can be classified as follows:


- Group 1.- species that prefer permanent or semipermanent waters (*Macrocyclus albidus*, *Megacyclus viridis*, *Eucyclops serrulatus*, etc.)
- Group 2.- characterized by cladocerans *D. atkinsoni* y *A. elegans* the anostracean *Branchipus* and the diatom *Neolovenulla alluaudi*.
- Group 3.- characterized by the anostracean *C. diaphanus*, the diatom *M. incrassatus* and cladocerans *C. quadrangula*, *A. azorica* and *D. crassa*.
- Group 4.- Lavajo de Sinarcas y Balsa del Cavall. They share the presence of *Hemidiaptomus ingens*. These are the only sites to shelter this rare species.

Finally, limnological monitoring works have allowed to improve the known distribution of most species and new populations have been found of the conchostraceans *Maghrebestheria maroccana* (formerly known only from the Duero basin and the lower Guadalquivir) and *Isaura mayeti* (first record for the Iberian Peninsula)





Monitoring of emergent and aquatic plants



The study was undertaken by the **Polytechnic of Valencia** (Agroforestry department). The results and conclusions can be summarised as:

- **revegetation** of charophytes and other macrophytes is quick and simple and simply requires the collection of charophytes from neighbouring ponds in the reproductive stage. Plants must then be allowed to dry and in March of the following year the dry charophytes must be laid in the ponds where revegetation is required.
- the **topography** of ponds is an important factor determining the composition of organisms. The shape of the pond must allow a variation in the degree of water loss and ultimately drying. This allows for maximum complexity and variability in the organism types at different scales in their life strategies.
- **botanic singularity** of different ponds is very high. Each of the studied ponds shelters particular species and communities and this does not allow classification on the basis of studied parameters
- an **hydrological model for ponds** has been developed to assist in the determination of the pond shape that allows higher biodiversity and to establish the hydroperiod of a given area within a pond.
- some of the aquatic **taxa** that were identified are very **rare** in the Valencian region or have never been recorded before, such as the bryophyte *Drepanocladus aduncus*, the charophytes *Chara pedunculata*, *Chara vulgaris* f. *crassicaulix*, *Chara vulgaris* f. *gymnophylla*, *Chara vulgaris* f. *gobiana*, *Chara vulgaris* f. *oedophylla*, *Chara globulares* var. *virgata*, *Nitella tenuissima*, *Nitella gracilis*, *Pellia* sp. *Tolypella nidifica* var. *glomerata* and *Tolypella nidifica* var. *intricata* and *Zanichellia contorta*.



Monitorisation of the amphibian communities of ponds

Census and identification of amphibian communities has been carried out in 55 ponds during the project. A standardized monitoring procedure has been drafted so that these tasks are performed consistently by forest wardens, local technicians or volunteers.

A study on the **phenology** of amphibians was carried out by the University of Valencia. During years 2008-2009 the amphibian communities of SIC Enguera were surveyed in order to compare the degree of colonization of different types of ponds and the restoration works that had been performed.

The following **classification** of ponds has been established depending on their amphibian communities:

- permanent ponds: presence and reproduction of *Pleurodeles waltl*, *Pelobates cultripes* and *Rana perezi*.
- Temporary ponds: presence and reproduction of *Bufo calamita* and *Pelodytes punctatus*.
- Fountains: reproduction of *Alytes obstetricans*, *Bufo bufo* and *Rana perezi*.
- Water courses: reproduction of *Bufo bufo* and *Rana perezi*.

The ability of amphibians to colonise project sites in SIC Enguera has been studied and results show that Natterjack Toad and Parsley Frog are the first species to establish themselves in newly created ponds. Subsequently other species such as Common Toad and Iberian Ribbed Newt arrive.

Recommendations for the design of new ponds have also been drafted, among which valuable advice on how to increase diversity of microenvironments within a pond, how to create groups of adjacent ponds with different typologies, how to shape pond banks for stability and gentle slopes or how to create traps for sediments in order to slow down silting processes



Awareness raising and dissemination



One of the main goal of this LIFE project has been the **environmental education campaign**, which was awarded to a private firm A.T.S.A NERIUM S.L. The team responsible for its implementation included a coordinator, 4 biologists specialized in environmental education and a psychopedagogue. A summary of the actions that have been carried out during the project and their impact (estimated as number of persons that have been reached) is presented herebelow:

School children	Activities	Impact
Talks	92	1597
Workshops	36	766
Tale telling	2	40
Wall painting	1	85
Exhibition	2	-
Total	133	2488

Adults	Activities	Impact
Activities		
Talks	21	493
Field trips	11	452
Publications	3	1700
Radio	7	8500
TV shows	2	82000
Workshops	10	185
Exhibition	10	-
Total	64	93130

3rd European Pond Conservation Network Workshop

València, 14th to 16th May 2008

The organization of an international congress, the **3rd European Pond Conservation Network Workshop**, focused on the study, management and conservation of amphibians and their habitats has been one of the actions of the project.

It took place in Valencia during may 14 to may 16 and it was focused on technical staff and scientifics involved in research, conservation and sustainable use of European ponds be it from a scientific, management or educational perspective.

The congress was attended by **130 managers** from Germany, Check Republic, Sweden, Italy, Poland, France, Belgium, Switzerland, United Kingdom, Holland, Austria, USA, Greece, Ireland, Island, Mexico and Spanish technical staff and scientists from different regions including Baleares, Madrid, Andalucía, Cataluña, Castilla-León, Galicia, Extremadura and Valencian Region. 120 communications were presented (33 oral and 87 posters).


The **technical and scientific standards** were very high, and congress was the perfect forum to disseminate not only the contents of the LIFE project itself but the strategy of habitat and species conservation that has been adopted by the Generalitat Valenciana. Additionally, it offered the opportunity for exchange of experiences, documents and information at international level.

Updated information on this workshop is available at www.lifeanfibios.com/epcn.





Conclusions



The project has improved the **conservation** of a high number of ponds, especially mediterranean temporary ponds (priority habitat of Habitats Directive). **Fauna reserves** for amphibians allow long term management and conservation of the most interesting ponds. Additionally, publication of **Conservation Plans** for Amphibians will permit the protection of the most interesting sites for the reproduction of amphibians.

Long term **monitoring** of amphibian populations will allow to establish which actions have had an impact on amphibian populations. Indicators will be the populations of Iberian Ribbed Newt, Spanish Painted Frog and Western Spadefoot Toad. Another useful indicator will be the number of fauna reserves for amphibians that will be created from now on. Finally the revision of the **Inventory of ponds** and the characterisation of threats in each of these sites will provide information on the suitability of conservation measures.

Ponds provide a **direct benefit to the population**, at least in those cases where they are still used as a water sources for cattle or cinegetic species. Ponds are also part of the ethnological and cultural heritage. Since they can be found all over the territory they are an excellent resource for educational and dissemination purposes in rural areas. Indirect ecosystems services include and increase in biodiversity and the conservation of amphibians, which in turn act as biological pest controllers.

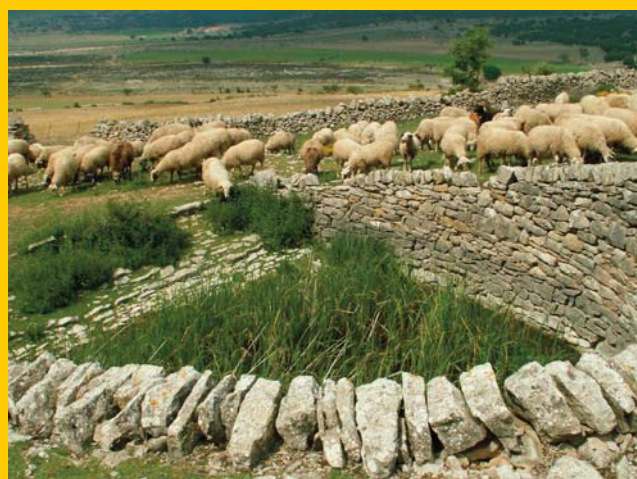


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Collaborators

