
LIFECHARCOS
TEMPORARY PONDS
A NATURAL HABITAT TO BE PROTECTED!
"CONSERVATION OF TEMPORARY PONDS IN THE SOUTHWEST COAST OF PORTUGAL"
LIFE12NAT/PT/997
www.lifecharcos.lpn.pt
Life
NATURA 2000
Photo: LPN

1 BIODIVERSITY OF THE MEDITERRANEAN TEMPORARY PONDS

Priority Habitat

The species of fauna and flora that colonize temporary ponds – many of which considered rare and endangered – are adapted to the specific ecological conditions of this habitat, such as the seasonality of available water, that is a typical feature of the Mediterranean climate. **Thus, these species have the ability to survive underwater during months, and therefore endure conditions of extreme draught.**

Life diversity in a temporary pond is very high and generally greater than the one found in other freshwater habitats, such as permanent pools or streams. **The spatial and temporal dynamics determine pond species composition and zonation.**

In early spring it is possible to find fluctuating water plants with leaves and flowers on the surface. Amphibious plants then appear, which begin their vegetal development still underwater and bloom only when the pond begins to dry, thus persisting until the arrival of dry season (beginning of summer).

In terms of fauna, temporary ponds are used as feeding and reproduction sites by several species of amphibians, reptiles, mammals and invertebrates, which are crucial for the existence of various **uncommon species with limited distribution**, such as amphibians and Large Branchiopoda crustaceans.

Iberian spadefoot toad (*Pelobates cultripes*)
Photo: Luis Guilherme Sousa

Photo: Paula Canha

- **EUROPEAN POND TURTLE (*Emys orbicularis*)**
  The largest national populations of this freshwater reptile are found in the temporary ponds of the southwest coast.
  In Portugal they have the conservation status of *Endangered*.

Photo: Ana Rainho

- **BATS**
  These flying mammals visit the temporary ponds in different times of the year, with greater activity during the flooded season, during which they come up to drink water and feed on the enormous amount of flying insects.
  The *Myotis daubentonii* – Daubenton's bat (in the photo) can capture insects landed on the water surface.

Photo: Joaquim Pedro Ferreira

- **CABRERA'S VOLE *(Microtus cabrerae)***
  This is the only endemic rodent of the Iberian Peninsula.
  It uses the tall grass found in the surroundings of the temporary ponds as feeding areas.

BIODIVERSITY THAT 'ADDS COLOUR' TO TEMPORARY PONDS:

- Plants
- Amphibians
- Crustaceans
- Reptiles
- Mammals

Photo: LIFE

BIODIVERSITY


Photo: C. Pinto-Cruz

Eryngium corniculatum
The leaves of this plant have two distinct shapes: when the pond is flooded they are thick and hollow, and when the pond begins to dry they become thorny and rigid.
An indicator species of the priority habitat 3170.


Photo: C. Pinto-Cruz

Isoetes setaceum
A flowerless plant that reproduces itself through spores instead of seeds. The sporangia – organs that produce and contain the spores – are not covered by any kind of membrane.
An indicator species of the priority habitat 3170 with the *Near Threatened* status in the IUCN Red List.


Photo: Luís Guilherme Sousa

SOUTHERN MARBLED NEWT
(Triturus pygmaeus)
This amphibian is an Iberian endemic species.
It uses temporary ponds for reproduction, preferring sites with plenty of aquatic vegetation. The females place each egg under a broad leave, in a total of 150-350 eggs.


Photo: Luís Guilherme Sousa

PARSLEY FROG _(Pelodytes sp.)_
It prefers temporary ponds as reproduction sites. There is a suspicion that the amphibians of the *Pelodytes* genus in the south-western region of Portugal belong to a distinct genetic lineage, although this has not been completely clarified.

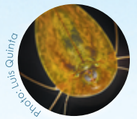
Photo: Luís Quinta

TADPOLE SHRIMPS (in the photo: _Triops vicentinus_)
The Triops vicentinus, the most emblematic species of these Large Branchiopoda, is an endemic species of the farthest Southwest regions of Portugal, that has only been described in 2010. Their presence is registered in temporary ponds since the Late Triassic - Early Jurassic period - the age of dinosaurs.

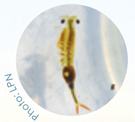
Photo: LPN

FAIRY SHRIMPS (in the photo: _Branchipus cortesi_)
These Large Branchiopoda have the ability to swim with the ventral part up. Some of the species have life cycles of only 15 days, being fully adapted to the ephemeral nature of these ecosystems.


Photo: Paula Canha

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PHOTO-N

2 MEDITERRANEAN TEMPORARY PONDS

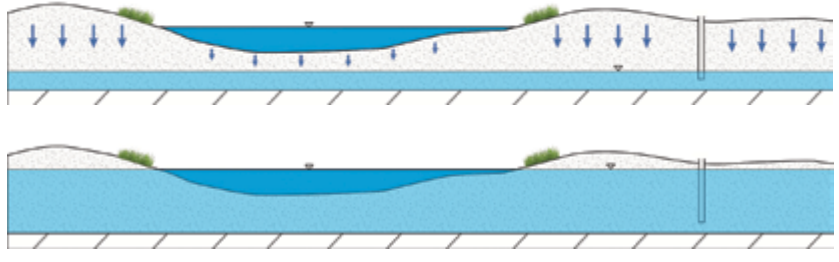
The Mediterranean Temporary Ponds are found in shallow depressions and have seasonal shift between dry and flooded period. These are considered one of the most remarkable and singular freshwater habitats in Europe, having a quite important role as connectors between other freshwater habitats.

The Mediterranean Temporary Ponds (3170) are considered a priority habitat according to Annex I of the Habitats Directive (92/43/CEE).

HYDROGEOLOGY OF TEMPORARY PONDS

The period of time during which a wetland is covered by water (i.e. hydroperiod) is crucial to pond biodiversity. It defines species suitability for such habitat conditions, thus they are rare, endemic and endangered. However, the hydroperiod varies greatly from pond to pond and from year to year based on climate conditions.

Temporary ponds appear in **depressions along the upper layer** of the soil during the first occurrences of rain in the hydrological year, where **rainwater accumulates due to the existence of a soil layer inside the ponds (with a lower permeability than the surrounding soils) which enables water retention**. The first flooding occurrences are ephemeral, since these first waters end up infiltrating and evaporating. However, **these ponds are hydraulically connected to the subterranean waters**, and from the moment the groundwater level reaches and surpasses the base elevation of the pond, water storing period becomes longer. Thus, **the hydroperiod of most of these ponds, although seasonal, is higher than that one corresponding to simple accumulation of rainwater in soil depressions with low permeability.**



1st flooding stage
Pond disconnected from the underwater level (ephemeral flooding)

2nd flooding stage
pond connected to the underwater level (longer hydroperiod)

3 THREATS TO THE CONSERVATION OF TEMPORARY PONDS AND THEIR BIODIVERSITY

This priority habitat is **increasingly endangered due to anthropogenic actions, ecological fragility and lack of knowledge of its natural value.** This has specifically been the case of the Site of Community Importante of the Southwest Coast, where over the last two decades industrialized agriculture and tourism pressure have caused an accelerated decline of this habitat.

Traditionally seen as unproductive areas, temporary ponds are **currently subject to intensive farming techniques**, such as deep soil tillage, drainage, irrigation and fertilization of cultures in the vicinity of ponds, surface earthworks and transformation in permanent irrigation reservoirs.

The threats over this habitat also include **tourism pressure, forestation, vehicle circulation, overgrazing or absence of grazing, invasive species and climate changes.**

The great biological and ecological value of this habitat is simply ignored by the majority of the population. This **unawareness and lack of information** represent also a threat to its conservation.

Photo: C. Pinto-Cruz

THREATS TO CONSERVATION

CHANGES IN THE AGRICULTURAL AND LIVESTOCK PRACTICES

a) tillage,

b) drainage,

c) excavation for construction of permanent reservoirs,

d) irrigation of cultures,

e) overgrazing or absence of grazing,

f) fertilization (nutrient input) and use of agrochemicals, and

g) invasive species (flora and fauna).

HABITAT FRAGMENTATION

IMPOVERISHMENT OF THE RELATED BIODIVERSITY

LACK OF INFORMATION/ UNAWARENESS

TOURISTIC PRESSURE

FORESTRY ACTIVITY

CLIMATE CHANGE

Photo: Luís Quinta

Triops vicentinus
(ventral angle)

4 PROJECT LIFE CHARCOS

LIFECHARCOS

The Project LIFE + 'Conservation of Temporary Ponds in the Southwest Coast of Portugal' (LIFE12NAT/PT/997), whose acronym is **LIFE Charcos, intends to support and promote conservation of Mediterranean Temporary Ponds. These ponds are increasingly endangered** due to their ecological fragility and to lack of knowledge of their natural value.

The singularity of this habitat is associated to the **diversity and peculiarity of the hosted organisms.** Some of the present species, for instance freshwater crustaceans, are endemic* and have a very restricted distribution area.

During a long time, Mediterranean Temporary Ponds were dominant elements of the Southwestern Portuguese landscape, and their conservation was compatible with traditional and extensive soil uses. However, **in the last two decades witnessed their degradation and accentuated regression of distribution area.**

With this project we intend to **reduce the declining trend and promote recovery of temporary ponds that are in unfavourable conservation conditions.**

***Endemism:**
taxon (specie, genus, etc.) whose geographical distribution is restricted to a certain geographic area.

GOALS OF THE PROJECT

The Project LIFE Charcos ***intends to improve the conservation status of temporary ponds in South-western Portugal*** *by fulfilling the following goals:*

- ***Compilation of the available biological data and update the cartography;***
- *Promote the* ***reduction and elimination of identified threats;***
- ***Demonstrate management and restoration techniques*** *that improve the conservation status of this habitat;*
- ***Establish a seed bank*** *(page 15), as a tool for conservation and restoration actions, and as plant biodiversity safeguarding;*
- ***Promote dissemination of knowledge*** *on the ecology and function of this habitat, on a local basis, by demonstrating sustainable management practices;*
- *Contribute towards* ***long term protection of this habitat*** *by engaging landowners, farmers, decision makers, and other interested parties;*
- ***Raise public awareness*** *about the conservation needs of this habitat and about the value of the ecosystem.*

INTERVENTION AREA

The Project LIFE Charcos will be implemented at the ***Site of Community Importance (SCI) of the Southwest Coast within the Natura 2000 Network*** *(partially overlapping the Natural Park of Southwest Alentejo and Costa Vicentina – PNSACV). The main areas are specifically located in coastal plateau of Odemira and Vila do Bispo municipalities, where are the main concentrations of Mediterranean Temporary Ponds known in Portugal.*

The SCI of the Southwest Coast is located along the coastline of the Iberian Peninsula and ***it includes areas from the municipalities of Sines, Odemira, Aljezur and Vila do Bispo.*** *This area is also described as costal plateau due to its wavy landscape and absence of sharp slopes - except for the valleys near the water lines.*

At a national level, ***this area is of the utmost importance, since it contains some habitats considered as biodiversity hotspots, which are vital for many rare and endangered species.***

This SCI also accommodates an ***extraordinary natural heritage,*** *which includes the Mediterranean Temporary Ponds, along with their flora and fauna. Such heritage may be used to* ***boost sustainable local development, and also ecotourism.***

FRAMEWORK OF THE PROJECT'S INTERVENTION AREA

Site of Community Importance (SCI) of the Southwest Coast
118.267 hectares
Land area = 99.457ha
Marine area = 18.810ha

5 ACTIONS WITHIN THE PROJECT LIFE CHARCOS

1 - PREPARATORY ACTIONS

The preparatory actions shall **consolidate scientific knowledge** on the hydrological functioning and biological diversity of temporary ponds.

The compilation of data, along with a **cartography update**, and its **integration within a GIS** (Geographic Information System) will assist management decisions.

This project also intends to **establish evaluation criteria regarding the conservation status of temporary ponds**, in order to create an index that allows assessing its conservation status and set out directives for its management.

2 - SPECIFIC CONSERVATION ACTIONS

2.1) Management of a favourable conservation status for temporary ponds

Some temporary ponds have a reasonable conservation status, and in these cases light interventions might be a decisive contribution towards their long term conservation.

Therefore, the project intends to **avoid soil drainage and deep tillage, and restrict the access of cattle**, resorting to fences and water troughs.

Such actions will work as a practical **demonstration of management measures**, which may be used in future agro-environmental commitments.

2.2) Actions for recovery and/or restoration of temporary ponds

Being a pioneering effort in Portugal, the intention is to **rehabilitate and recover the degraded temporary ponds**, thus promoting the re-establishment of biophysical conditions that allow their long term maintenance.

The foreseen interventions include reconstructing the topographical profile of the ponds, removing the invasive flora and re-establishing the characteristic pond flora.

2.3) Recovery of a temporary pond to raise awareness

Due to their particular characteristics, temporary ponds allow the performance of different activities and may even serve as **real 'open space laboratories'.**

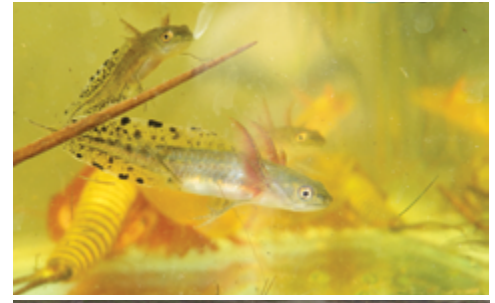
The **recovery of a temporary pond for educational purposes** – which would be accessible to general population – would serve as an example of ecological restoration. This action is a combination of two main goals: on one hand, the recovery of a pond in a symbolic area of this habitat, and on the other, create another communication vector towards general population in order to raise their awareness about the importance of its conservation.

2.4) Establishment and maintenance of a seed bank

The Mediterranean Temporary Ponds are increasingly rare, and the unique vegetal species that characterize it may disappear along with them.

The **ex-situ preservation of plant diversity** may be achieved on the long term by **establishing a seed bank.**

The collection and conservation of germplasm – seeds and other propagulum – represent an



Photos: LPN

important repository for safeguarding species in these environments. Many of these species are only found in these habitats and their inclusion in a seed bank will allow their use to support restoration actions, thus ensuring their future availability and conservation of Mediterranean Temporary Ponds.

2.5) Promotion of extensive grazing

Both overgrazing and the absence of grazing cause changes in vegetation cover, which have a very negative effect in the habitat. The **promotion of extensive grazing** intends to demonstrate the benefits of this practice in the maintenance and conservation of temporary ponds.

2.6) Promotion of habitat connectivity

The temporary ponds of the Southwest Coast occur in clusters, thus resulting in an aggregation of ponds.

A disturbance in one pond – besides disrupting it – may also cause a decrease in the connectivity between an entire system of ponds.

Therefore, the project intends to prove the **efficiency by using simple and inexpensive measures – which do not hinder other soil uses – minimizing the effects of fragmentation in the associated biodiversity** of temporary ponds, and thus promote the movement and interchange of specimens between ponds.

2.7) Nature Stewardship Network

The main purpose of a Nature Stewardship Network is to raise awareness and promote an active participation in conservation, as well as to encourage the correct use of natural, cultural and/or landscape resources.

This project seeks to **unite various stakeholders that may directly or indirectly support a Nature Stewardship Network for Mediterranean Temporary Ponds**. Stewardship agreements or 'Commitment Letters' will be settled, which shall function as voluntary statements of intent regarding the protection of this habitat.

3 – ENVIRONMENTAL AWARENESS AND DISCLOSURE OF RESULTS

The general public is not aware of the great biological and ecological value of temporary ponds. This lack of knowledge is the greatest indirect threat to their conservation.

Raising awareness amongst the population in the distribution area of this habitat is crucial towards its preservation and to ensure its long term conservation. This action will be directed to particular key groups, such as landowners and farmers, but also to children and young students, as well as to general public.

Photo: C. Pinto-Cruz

CREDITS
Edition coordination: Liliana Barosa, Edgar Gomes, Cristina Baião, Artur Lagartinho e Rita Alcazar (LPN).
Text production and revision: Liliana Barosa (LPN), Edgar Gomes (LPN), Rita Alcazar (LPN), Cristina Baião (LPN), Ana Lumbreras Corujo (UÉvora), Anabela Belo (UÉvora), Carla Pinto-Cruz (UÉvora), António Mira (UÉvora), J. Tiago Marques (UÉvora), Paulo Sá Sousa (UÉvora), Luis Guilherme Sousa (UÉvora), Margarida Cristo (UAlg), Margarida Machado (UAlg), José Paulo Monteiro (UAlg), Núria Salvador (UAlg), Manuela Silva (UAlg).
Translation: Rui Marovas
Graphic design: Hortelã Magenta
Print: A3 Artes Gráficas
Edition: Universidade de Évora (2014)
Print run: 8000 copies in Portuguese and 2000 copies in English – 1st Edition, Évora, 2014

Printed in 100% recycled paper, made exclusively from post-consumption waste, according to chlorine free processes.

Projeto LIFE Charcos (contract LIFE12NAT/PT/997)
'Conservation of Temporary Ponds in the Southwest Coast of Portugal'

Coordinating beneficiary: Liga para a Protecção da Natureza (LPN) [Nature Protection League]
Associated beneficiaries: University of Évora (UÉvora), University of Algarve (UAlg), Municipality of Odemira (CMO) and Association of Beneficiaries of Mira (ABM)
Duration: 1st of July 2013 until 31st of December 2017
Total budget of the Project: 1.977.465€ (European Union contribution of 75%)

*The **LIFE Programme** is a EU funding instrument for the environment. The general goal of LIFE is to contribute towards the implementation, update and development of EU environmental policy and of the legislation for pilot projects or demonstration of European added value. The LIFE – Nature programme in particular co-funds projects seeking to restore and conserve endangered habitats and protect priority conservation species within EU.*

***Natura 2000 – Europe's nature for you!** This project was implemented within the European Natura 2000 Network. The fact that it includes some of the most endangered species and habitats in Europe was the reason for its selection. All 28 countries of the European Union are working together for the Natura 2000 Network in order to protect the diverse and rich natural heritage of Europe for the benefit of all.*

Project Coordination Contact:
LPN – Liga para a Protecção da Natureza
Environmental Education Centre of Vale Gonçalinho

Herdade do Vale Gonçalinho
Apartado 84, 7780 – 909 Castro Verde, Portugal
Tel.: +351 286 328 309
E-mail: lpn.cea-castroverde@lpn.pt
www.lifecharcos.lpn.pt

Coordinating beneficiary:

Associated beneficiaries:

Community funding:

LIFE 12/NAT/PT/997 – financial contribution of the Programme LIFE by the European Union