Ponderful
PONDS FOR CLIMATE

CATALONIA, SPAIN

PONDSCAPE : ESTANYS DE L'ALBERA

European Commission

Pond Ecosystems for Resilient Future Landscapes in a Changing Climate

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WHAT IS A PONDSCAPE ?

DEFINITION

A pondscape is a network of ponds with spatial proximity (“connectedness”) and the surrounding landscape matrix.

The boundaries of a pondscape may be determined by physical or ecological settings (a valley, a catchment, a set of ponds in a nature reserve) or even determined by societal or political criteria (urban ponds, provincial or national boundaries).

PRESSURE/THREATS ON PONDS AND PONDSCAPES

50-90% of pond losses in European countries over the past century. Furthermore, ponds are largely neglected in water- and nature-related national and EU policies and strategies, including the EU-WFD.

WHY IS IT IMPORTANT TO PROMOTE THEM ?

BIODIVERSITY ENHANCEMENT

Largely neglected and generally undervalued, ponds are remarkably important for biodiversity conservation. Pondscapes represent biodiversity hotspots.

DISASTER RISK REDUCTION

Ponds and pondscapes play a fundamental role in mitigating flooding and also constitute a water reserve to fight fires.

HUMAN HEALTH

Ponds and pondscapes provide a wide range of co-benefits for human societies such as support for human health and quality of life, spaces for physical activities, or social interaction, but also aesthetic experiences and educational and recreational activities.

CLIMATE CHANGE MITIGATION AND ADAPTATION

Given their abundance and their high productivity, ponds influence markedly the carbon cycle by acting as both carbon sinks and sources.

WATER MANAGEMENT

Pondscapes provide a water reserve that is particularly important in the context of water scarcity. It is particularly useful for watering animals and for irrigation.

CONTEXT

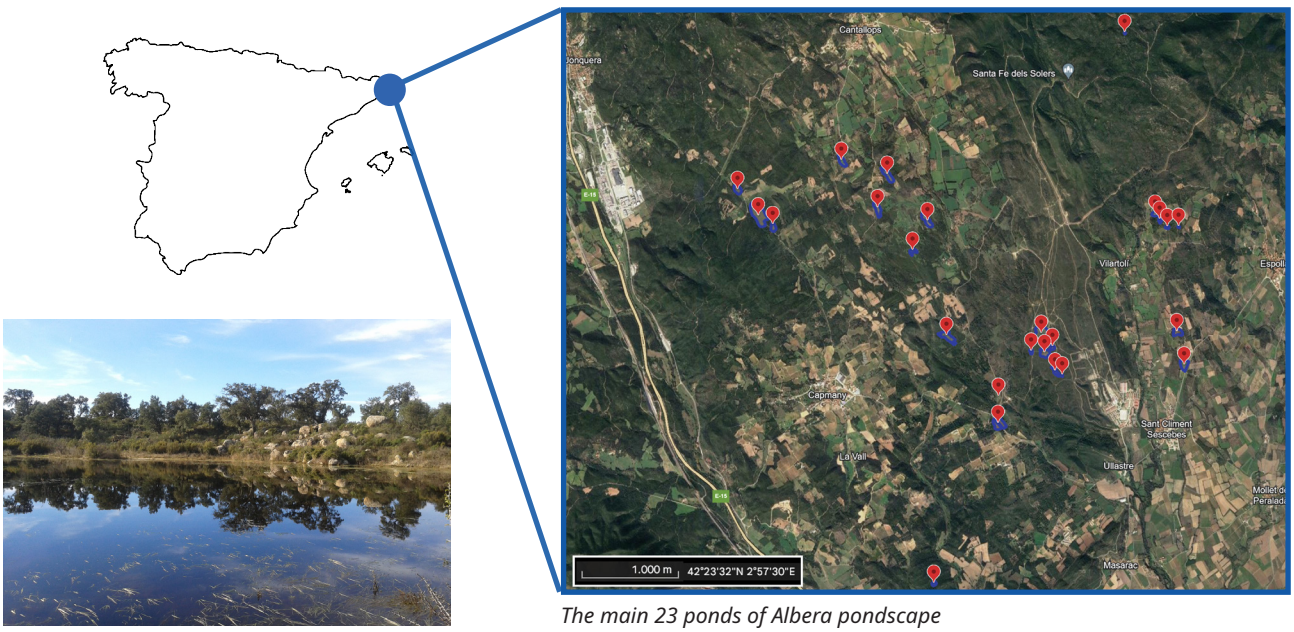
Albera ponds are situated at the foot of Albera mountains. The climate and vegetation of this area is typically Mediterranean. Although there are 23 main ponds, the pondscape consists of 241 floodable depressions with different degree of flooding (called hydroperiod), all of them of natural origin. All ponds are very shallow and temporary, some with relatively short hydroperiods (from around 2 to 9 months), and some years all the ponds can remain completely dry due to lack of rainfall. In the past, several of these ponds were drained for agricultural purposes. Nowadays low intensity agriculture is practiced in the region, mostly vineyards and olive groves. The main pressures on the pondscape are some pig farms and livestock farming, mostly cows.
Some of these ponds are priority habitats of European Habitat Directive: «3170 Mediterranean temporary ponds» and «3130 Oligotrophic to mesotrophic standing waters with vegetation of the *Littorelletea uniflorae and/or of the Isoeto-Nanojuncetea*». This pondscape plays an important role in biodiversity conservation because: i) it is home to priority plants for conservation, ii) it is an important amphibian breeding site, iii) it supports specialist aquatic invertebrates of temporary waters and iv) it is located on the path of one of the most important bird migratory routes across the Pyrenees.

Name of the pondscape : Estanys de l'Albera
Name of neighboring large town (in a 30 km radius): Figueres (45'000 habitants)
Bioclimatic zone : Meditterranean

Dominant land use :
Mediterranean scrub

Pondscape area : 25 km^2
Pond : number: 23 (+218 floodable depressions)
density: 0.9 ponds/km^2 (9.6 floodable depressions/km^2)
surface areas : 460 to 62'000 m^2
depths : 0.4 to 1.5 m

Land owner : Private land owned by inhabitants of neighboring villages (La Jonquera, Cantallops, Capmany, Sant Climent Secebes, Espolla)
Land manager : Catalan Government
Public access : 70 % of the area is accessible
Public amenities : several footpaths

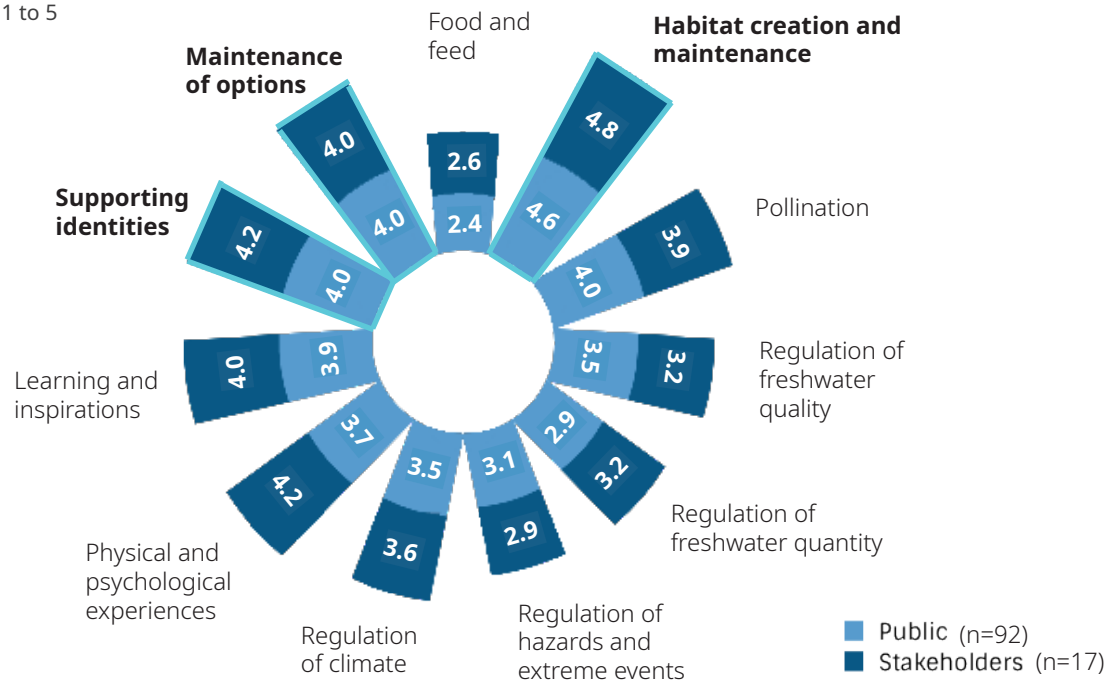


The main 23 ponds of Albera pondscape

LOCAL COMMUNITY EXPECTATIONS

The 11 Nature-contribution to people (NCPs)

Scale : scores from 1 to 5



The expectations rely mainly on (i) the provision of habitats for biodiversity and (ii) the direct use of these natural areas by people (physical and psychological experiences, supporting identities, learning).

LOCAL POLICIES

- 31% of 2'500 ha is protected, as a PEIN (Plan of areas of natural interest in Catalonia) and Natura 2000. **31%**

- 20 Albera ponds are within the Catalan Inventory of Wetlands, however many other ponds are not included in the inventory. **20**

- Passages under roads were built near two ponds to protect the amphibian population, in the context of the Catalan Green Infrastructure **2**

3 Albera ponds are monitored: every three years by the Catalan Water Agency, in the context of European Water Framework Directive, to evaluate their ecological status. **3**

The pondscape has no management team or management plan, or an annual budget to support management actions.
Albera ponds, which are priority habitats according to the European Habitats Directive, are catalogued as agricultural land (in the GIS-PAC system, according to the Common Agricultural Policy), as they are dry most of the time. This is a serious contradiction and problem for their management and conservation.

MAIN CHALLENGES AND OBJECTIVES

BIODIVERSITY ENHANCEMENT

Especially aquatic plants, amphibians, and birds.

HUMAN HEALTH

A peaceful place to walk and relax. Supporting identities for the local community.

WATER MANAGEMENT

Buffer the water flow in lowlands, reducing the risk of flooding in downstream areas.

NATURE BASED SOLUTIONS (NBS)

Protection, restoration and management are the Nature-based Solutions (NbS) implemented in this pondscape to address three societal challenges identified.

1992 First partial protection with the approval of the PEIN

1994 A private owner restored Sendo Pond

2006 Increase of area protected and inclusion in Natura 2000

2010 Start of the agreements between private landlords and environmental NGOs to protect and manage some ponds.

2012 Approval of the Catalan Inventory of Wetlands (including 20 ponds in Albera)

2014 Catalan Water Agency starts monitoring 3 Albera ponds every three years.

2015 Restauration of Prat de Rosers Pond.

2017 Approval of Catalan Green Infrastructure Plan with some actions planned in Albera pondscape. Underpasses for amphibians were built in two ponds.

2017-TO NOW continuous monitoring the water temperature and level of 4 ponds

PONDS AND PONDSCAPE MANAGEMENT

- Protection status
- Ponds restoration
- Measures to provide connectivity for amphibian populations

- Creation and maintenance of trails and nature observation points
- Creation and maintenance of information boards

- Ponds restoration to retain water
- Monitoring the ecological status of ponds

NATURE CONTRIBUTIONS TO PEOPLE AND MEASURED INDICATORS

AQUATIC BIODIVERSITY

SPECIES RICHNESS
Aquatic plants : **68**
Amphibians : **10**
Water birds : **22**
Dragonflies : **27**
Families of invertebrates : **12**

AMOUNT OF
Species on Habitat Directive Annexes : **10***
Marsilea strigosa (aquatic plants), Mauremys leprosa (reptiles), Triturus marmoratus, Alytes almogavarii, Discoglossus pictus, Pelobates cultripes, Epidalea calamita, Hyla meridionalis (amphibians), Oxygastra curtisii (dragonflies), Lutra lutra (mammals)

CONTRIBUTION TO REGIONAL RICHNESS

FLAGSHIP SPECIES :


Elatine alsinastrum


Pelobates cultripes


Mauremys leprosa


Burhinus oedicnemus

SUPPORTING IDENTITIES

Number of dolmens and menhirs within Albera pondscape **24**

For the local community, ponds and megalithic heritage are essential components of their identity. During the eighties, members of local hiker club discovered and restored several dolmens and menhirs. Most of them were assigned names related to ponds (e.g. Menhir Estanys I, Dolmen Estanys II).

Inhabitants of Albera restoring the «Menhir Estanys II» (November 1987)

NATURE CONTRIBUTIONS TO PEOPLE AND MEASURED INDICATORS

PHYSICAL AND PSYCHOLOGICAL EXPERIENCE

Number of people visiting the pondscape (leisure, tourism, fishing, nature watching etc.) (number/year)

62’000

70% Area inside the pondscape accessible to the public

Self-reported satisfaction well-being (scale 1 to 5)

4

Most popular activities :
wildlife observation (28%), hiking (24%) and leisure (21%)

WATER QUANTITY

180’000m³ Volume of water stored during a severe flood event (m^3)

WATER QUALITY

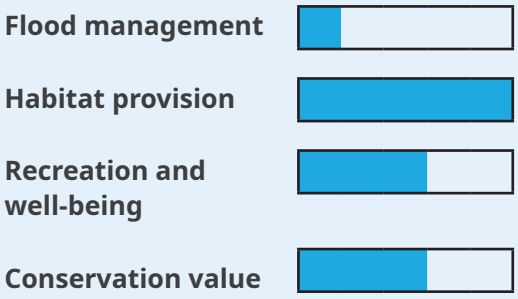
Nutrients : **GOOD**

Although most of Albera ponds could be considered pristine or in good ecological status, some of them have high nutrients concentrations due to presence of cattle around them.

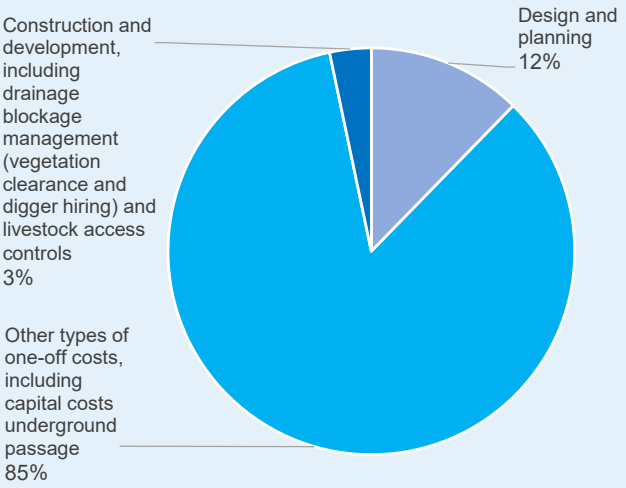
COSTS AND BENEFITS ANALYSIS

OVERALL COSTS ASSESSMENT

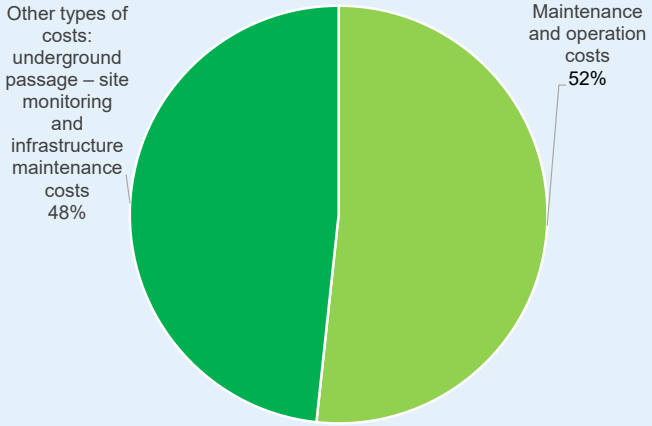
BENEFITS ASSESSMENT



SHARE OF COSTS FOR NBS ACTION



Relative cost of NbS creation measures



Relative cost of ongoing NbS management measures

SUITABLE FINANCE INSTRUMENTS TO REDUCE THE GAP

- ☑ **1. Voluntary contributions /donations**
- ☑ **2. Grants**

FUNDING GAP ASSESSMENT

REMAINING THREATS

1. Changes in hydrology linked to climate change, including the timing and quantity of rainfall. Low rainfall reduces the hydroperiods of Albera ponds and smaller ponds are likely to be lost.

2. Many wind power stations are planned within the pondscape and around of it. The biodiversity and functioning of hydrological system of ponds could be impacted by the earthworks to construct wind turbines, electrical evacuation lines and new forest trails because some of them were planned under or near floodable depressions within the Albera pondscape.

3. Albera ponds are catalogued as agricultural land (in the GIS-PAC system, according to the Common Agricultural Policy). This is a serious problem for their management and conservation. For example, many ponds are used as pastures for herds with high density of cows during all the year and other ponds areand cultivated as part of arable fields.

4. The pondscape has no management team or management plan, or funding to support conservation action.

SUCCESS STORY AND TRANSFERABILITY

RESTAURATION OF NATURAL HYDROLOGICAL FUNCTIONING THROUGH DRAINAGE REMOVAL

For centuries, inhabitants have built drainage systems to avoid water retention in the Albera pondscape. This has led to the disappearance of many ponds and the reduction of the length of time that the ponds are flooded. Some initiatives have reversed this situation by restoring the natural functioning of ponds.

In 1994, the owner of the Sendo Pond (or North Cardonera) funded the restoration of the pond's natural hydroperiod by blocking the drainage system.

In 2015, a project financed by the Andrena Foundation and developed by Gutina Cellar, IAEDEN, Geoserveis and UVic-UCC, made it possible to locate and block an underground drainage that has allowed the recovery of Prat de Rosers pond.

In both cases, these actions have allowed the recovery of a habitat of community interest with its associated flora and fauna species. Moreover, these restored ponds are peaceful places to walk and relax, and to educate people about nature.

UNDERPASSES TO PROTECT AMPHIBIANS

The road GI-602 was built in the middle of 20th century close by Pous pond and through the middle of the Cardonera pond. This caused catastrophic mortality of amphibians (frogs, toads and newts). In 2017, underpasses were built in both ponds, which have significantly reduced amphibian mortality. The action was requested by the Catalan Society of Herpetology and financed by the Catalonian Government in the context of Catalan Green Infrastructure Plan.

SUCCESS STORY AND TRANSFERABILITY

LAND USE MANAGEMENT IN THE PONDSCAPE

The conservation status of ponds not only depends on possible direct impacts on ponds, but it also strongly depends on the land uses in the whole pondscape and its catchment.

From 2010, IAEDEN, an environmental NGO, has set up agreements with 29 private landowners (14 hectares). In this collaborative framework, low-impact agricultural management is promoted and different projects for environmental conservation are developed.

For example, vineyards and olive groves are cultivated using nature-friendly techniques, without herbicides and insecticides. The grasslands are cut by scything rather than grazed by livestock. This allows for the conservation of the natural plant community and reduces nutrient inputs into ponds.

SUPPORTING IDENTITIES

The local community of Albera have a strong cultural identity linked to the landscape. This region has been inhabited for thousands of years.

Throughout of Albera pondscape there are many ponds and flooded depressions as well as many historical monuments, including 24 menhirs and dolmens (3500-1800 B.C.), seven Romanic churches (9 to 12th century) and hundreds of kilometers of stone walls. For the inhabitants of this region, ponds and the romanic and megalithic heritage are essential components of their identity.

There are several organisations who restore, maintain and disseminate information about this heritage (e.g. Empordanès Excursionist Club, Art and Work Group, Jonquerenc Excursionist Club, Cantallops Cultural Action Association). Some megalithic monuments were assigned names related to ponds (e.g. Menhir Estanys I, Dolmen Estanys II).

Similary one Romanic church (Santa Cristina de Canadal) shares name with two ponds (Canadal petit pond, Canadal Gran pond). Moreover, the most important trail in the area is called «Itinerari dels estanys» (i.e. itinerary of lakes/ponds), showing how central ponds are to the cultural heritage of the Albera region.

HANDBOOK :

APPENDIX :

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