Experiences of adaptation to climate change in protected natural areas of Catalonia

Planning & Programmes Unit
Subdirectorate of Biodiversity
Generalitat de Catalunya

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PLANNING PROTECTED AREAS TO CLIMATE CHANGE ADAPTATION

LEGAL FRAMEWORK

In the Catalan legal framework we have two instruments that define strategies in this field:

- Catalan Strategy for Adapting to Climate Change (ESCACC) horizon 2013-2020
- The Climate Change law passed on July 27th, 2017.

ESCACC
2013-2020

http://canviclimatic.gencat.cat/web/.content/home/campanyes_i_comunicacio/publicacions/publicacions_de_canvi_climatic/Planificacio_i_estrategies_cc/resum_executiu_escacc_angles.pdf

Catalan Strategy for Adapting to Climate Change

Respecting Natural Protected Areas, Catalan Strategy for Adapting to Climate Change (ESCACC) horizon 2013-2020 provides a list of effects on natural systems to mitigate:

Biodiversitat	Canvis fenològics
	Canvis deguts a la menor disponibilitat d'aigua
	Migració d'espècies
	Canvis en la composició de les espècies
	Canvis funcionals
Biodiversitat ecosistemes marins	Disminució de la capacitat d'embornal
	Degradació d'hàbitats
	Alteracions de les comunitats tròfiques
	Menor freqüència de mortalitats massives
	Tropicalització de les espècies
Gestió de l'aigua	Afectacions en la disponibilitat d'aigua
	Alteracions fisicoquímiques de l'aigua
	Alteracions en masses d'aigua subterrànies
	Alteracions sobre els règims estacionals
	Afectacions degudes a fenòmens extrems de precipitació
	Afectacions sobre les aigües residuals i el seu tractament
	Implicacions econòmiques
Gestió forestal	Canvis en la distribució de les espècies
	Major aridesa i erosió dels sòls
	Canvis fisiològics (d'embornals a fonts de CO_2)
	Reducció de l'àrea d'espècies de fusta productiva
	Augment del risc d'incendis forestals

Catalan Strategy for Adapting to Climate Change

Respecting Natural Protected Areas, Catalan Strategy for Adapting to Climate Change (ESCACC) horizon 2013-2020 provides a list of action to mitigate:

BIOVERSITY

WHAT CAN WE DO?

Promote research into the effects of climate change on biodiversity and, in particular, the habitats and species most vulnerable to climate change.

Promote the development of economic and fiscal instruments to guarantee and incentivise activities that maintain the environmental services of ecosystems.

Safeguard genetic material (e.g. through germplasm banks) of species most at risk of disappearing.

WATER

WHAT CAN WE DO?

Apply financially sustainable measures to ensure the complete, progressive restoration of ecosystems and management of the water cycle.

Implement the variable flow maintenance regime in the final section of the River Ebro, in accordance with the proposal of the Terres de L'Ebre Sustainability Committee.

Extend the surpluses obtained through savings and efficiency to the aquatic ecosystems and, in emergency situations, to urban supply through a public water rights exchange system.

Climate Change Law

Respecting Natural Protected Areas, the recently approved Climate Change Law provides for the **identification of natural systems**, territories and the **most vulnerable** economic sectors and the **assessment of the impacts of climate change** on planning and management measures for natural areas in Catalonia, **preservation of ecological permeability** and effectiveness of the **payment policies for environmental services** to encourage activities that maintain and improve ecosystem services:

- **To reduce the vulnerability** of the population, socio-economic sectors and **terrestrial ecosystems, and to reduce adverse impacts of climate change**, as well as create and strengthen national capacities to respond to these impacts.

- Adapt the productive sectors and **incorporate the analysis of the resilience to climate change in the planning of the territories**, activities, infrastructures and buildings.

Climate Change Law

ACTIONS

Evaluate the impacts of climate change on the planning and management mesures of natural forests to ensure the conservation of biodiversity.	Make an inventory of the **priority habitats** and promote policies for the preservation of the **prairies of marine phanerogams** and of the other habitats with the capacity of storage CO_2.
Review the plans of management of the natural protected areas in the climate field	Set a new **forest reserves destined for the natural dynamic** area which is representative of the diversity of the forest ecosystems of Catalonia, focusing primarily on woodland and high natural value areas

MEASURES

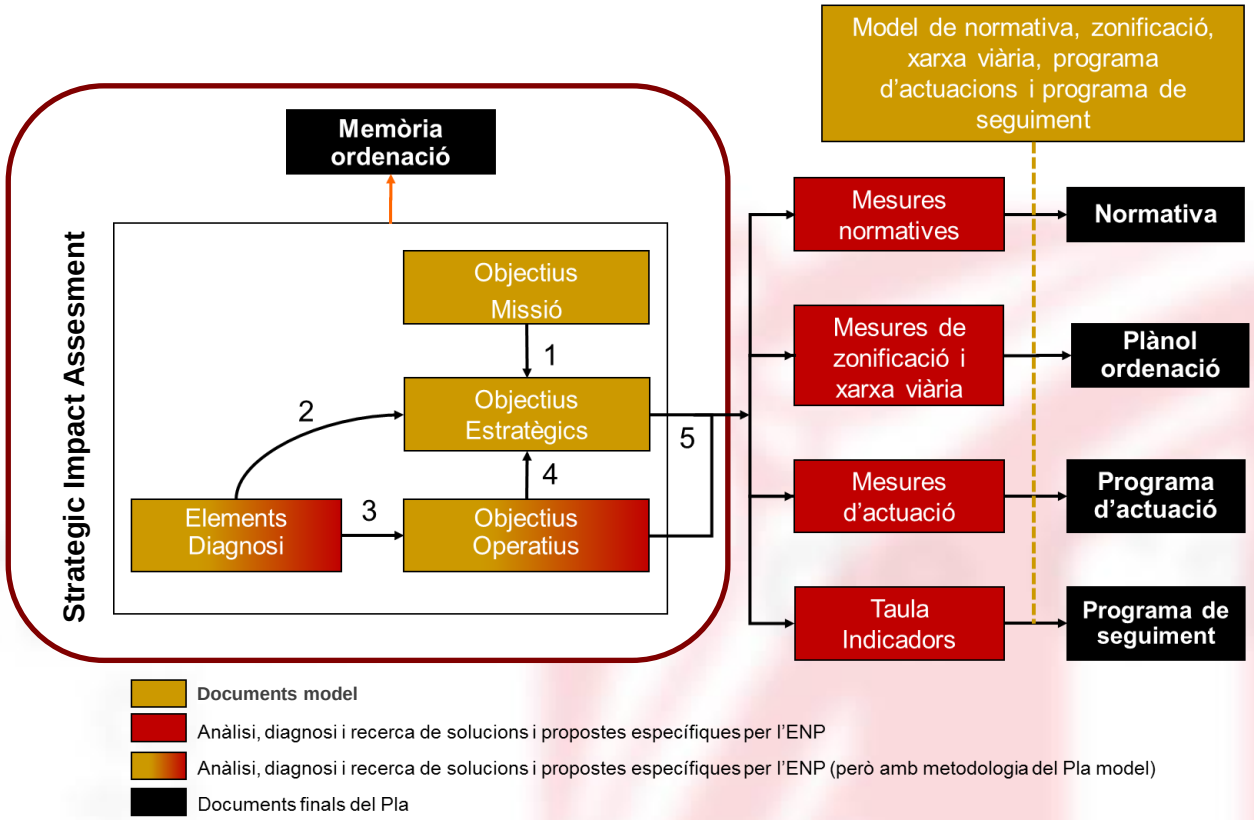
- **The preservation of ecological permeability** and the non-fragmentation of habitats and natural systems, and the guarantee, in the planning and territorial incidence, of the connectivity
- **The preservation of the natural environment and biodiversity** with a structural element of environmental policy.
- The need **to avoid proliferation in the natural environment of invasive species** that could represent a of the autonomous ecosystems

Principal subjects in planning

Some aspect to take in account when we plan protected areas are:

- Coherence of planning action (systemic approach) *we are not alone - SCALE
- Internal coherence of each plan (logical framework - Europarc.España) *
- Adaptation of each plan to the changes (adaptive management)
- Integral planning (planning and management)
- Strengthening the evaluation of the objectives (monitoring plan)

Methodology to incorporate Climate Change in Plans



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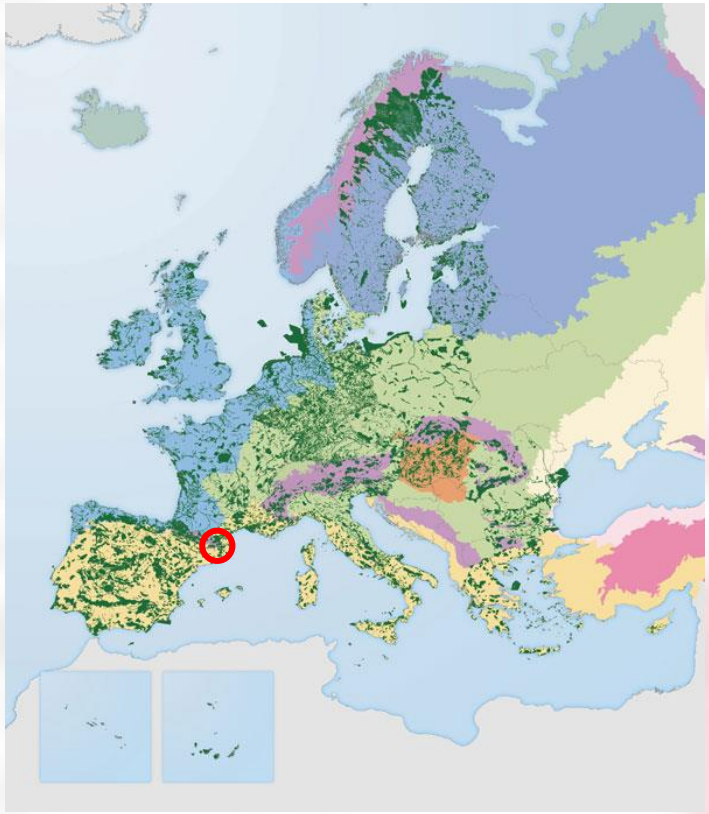
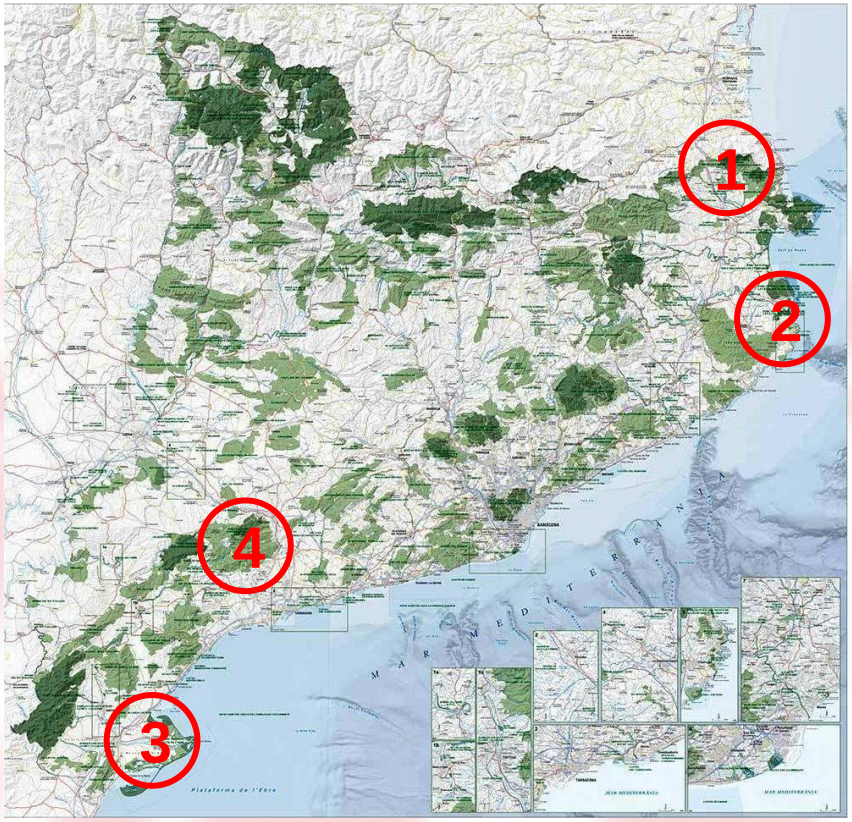
TERRITORIAL FRAMEWORK



Nature 2000 sites in Europe



Protected Natural Areas in Catalonia – Cases study

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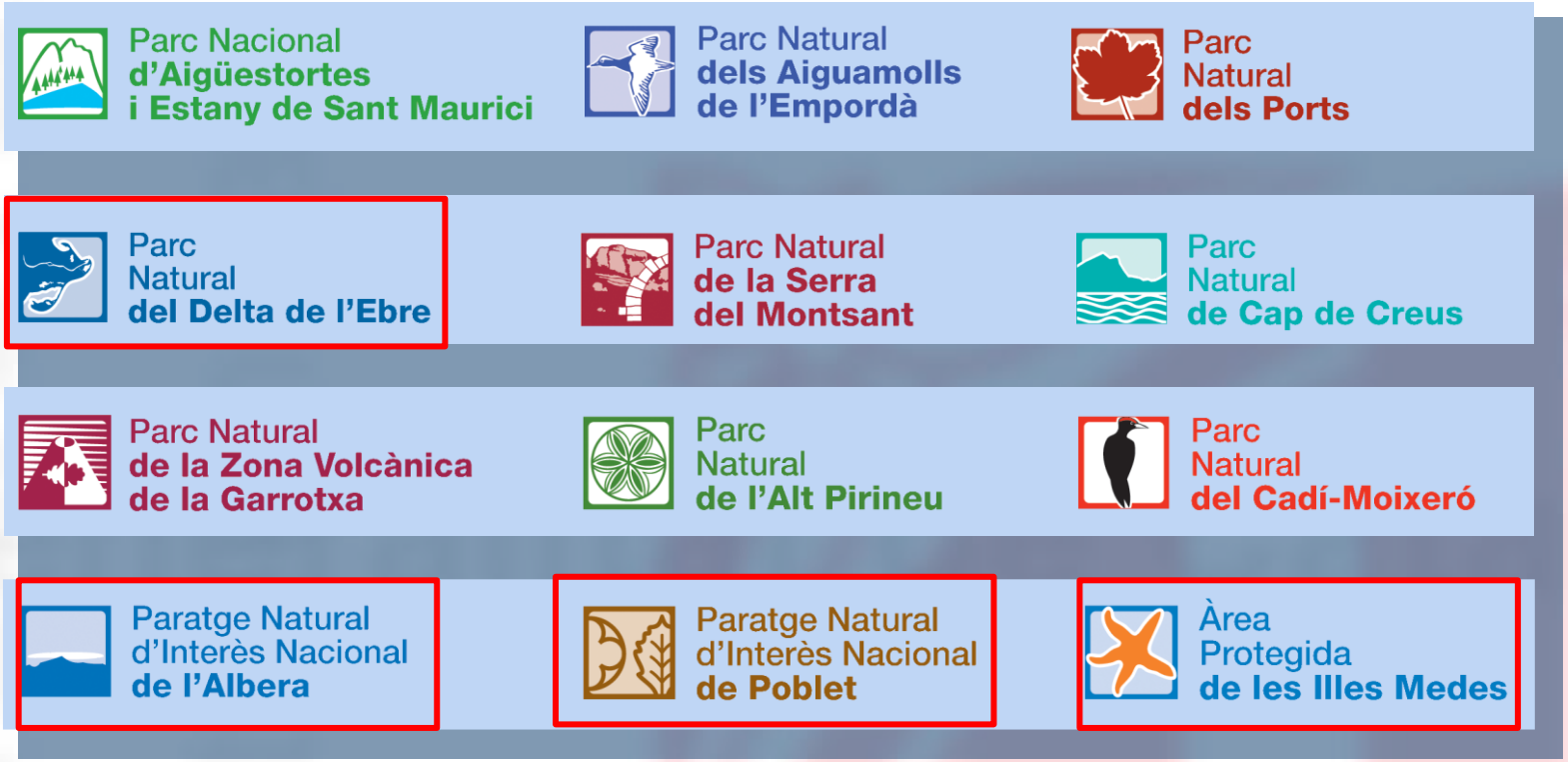
EUROPARC ESPAÑA

Experiences of adaptation to climate change in protected natural areas of Catalonia

MANAGING PROTECTED AREAS TO CLIMATE CHANGE ADAPTATION



CASES STUDY OF ADAPTATION ACTIONS

1. **MEDACC**: Adapting the Mediterranean to climate change in three representative basins of Catalonia (L´Albera)

2. **Pletera**: Desurbanization and recovery of ecological functionality in coastal systems (Medes – Montgrí - Baix Ter)

3. **Delta Lagoon**: Restoration and habitat management in two coastal lagoons of the Ebre´s Delta (Delta de l´Ebre)

4. **Taxus:** Improvement in conservation of european yew forests of Catalonia (Paraje de Poblet - Alta Garrotxa - Serres de Cardós - Llaberia)

MEDACC

Demonstration and validation of innovative methodology for regional climate change adaptation in the Mediterranean area

MEDACC aims at testing innovative solutions in order to adapt agro-forest and urban systems to climate change in the Mediterranean basin. Thus, MEDACC contributes to the design and implementation of adaptive strategies and policies which are being developed at national and regional level in the Euro-Mediterranean area. In Catalonia, MEDACC will be a useful tool in the implementation of the Catalan Strategy for Climate Change Adaptation (ESCACC 2013-2020).

ACTIONS

- **Monitoring** of adaptation measures in the forest management sector
- **Assessment** of the main impacts of climate change and territorial vulnerabilities in the river basin.
- **Identification of those areas,** systems and economic sectors most sensitive to climate change.
- **Diagnosis of what adaptation measures** have been applied previously to the study basins and their effects**.**
- **Definition** of new adaptation measures and implementation of some of them as pilot tests as water management scenarios.
- **Monitoring the effects** of pilot testing in the three basins.
- **Divulgation of results** in different networks and platforms.

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MEDACC

Demonstration and validation of innovative methodology for regional climate change adaptation in the Mediterranean area

In the forest of Requesens (Natural Place of National Interest of the Albera) are being applied different management treatments in the holm oak. The objective of the experimental tests is to see which type of management is most appropriate in the territory to make forests more resilient to the effect of climate change, particularly **to the effects of drought and fire risk**.

RESULTS

Expected project results will contribute to quantify how adaptation measures can reduce the vulnerability of natural systems and human activities to climate change. In addition, the project will assess the environmental and economic costs related to the application or not of adaptation measures.

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Pletera

Building deconstruction and restoration of ecological functioning in the coastal systems

Reduce the effects of climate change

Another of the project's aims is to provide an adequate response to climate change, which foresees a rise in sea level and more frequent and more serious gales and storms. The restoration of these coastal marshes will also help increase the area's capacity to fix CO2 and reduce carbon emissions.

Restoring of marsh systems

Recovery of dune systems

Fartet - Spanish toothcarp (*Aphanius iberus*)

Kentish plover (*Charadrius alexandrinus*)

- Improve the structure of wetlands
- Stop the recoil of wetlands
- Reduce the effects of climate change
- Preventing the effects of sea level rise
- Improve fartet habitat (endemic pupfish)

Corretjola de platja *(Calystegia soldanella)*

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Pletera

Building deconstruction and restoration of ecological functioning in the coastal systems

Mains actions

- Deconstruction of urban infrastructure (promenade, streets, services, piles of rubble, etc.)
- Creation of lagoons
- Restoration of the saltmarsh vegetation
- Restoration of the dune systems
- Removal of the embankment alongside the Fra Ramon lagoon
- Creation of parking areas
- Removal of stands of reeds
- Creation of walking trail
- Construction of observation points
- Reorganization of public access to the area
- Monitoring of ecological indicators

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Pletera

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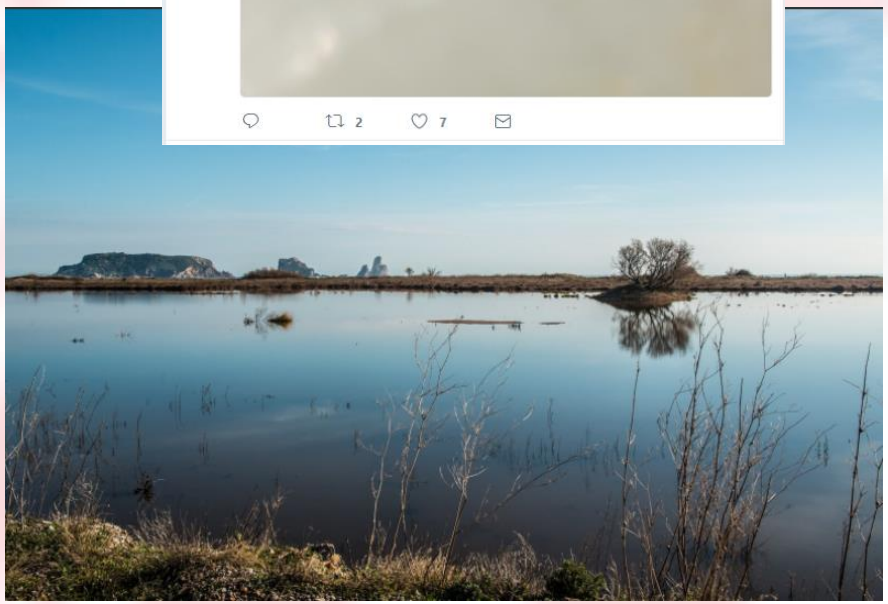

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Delta Lagoon

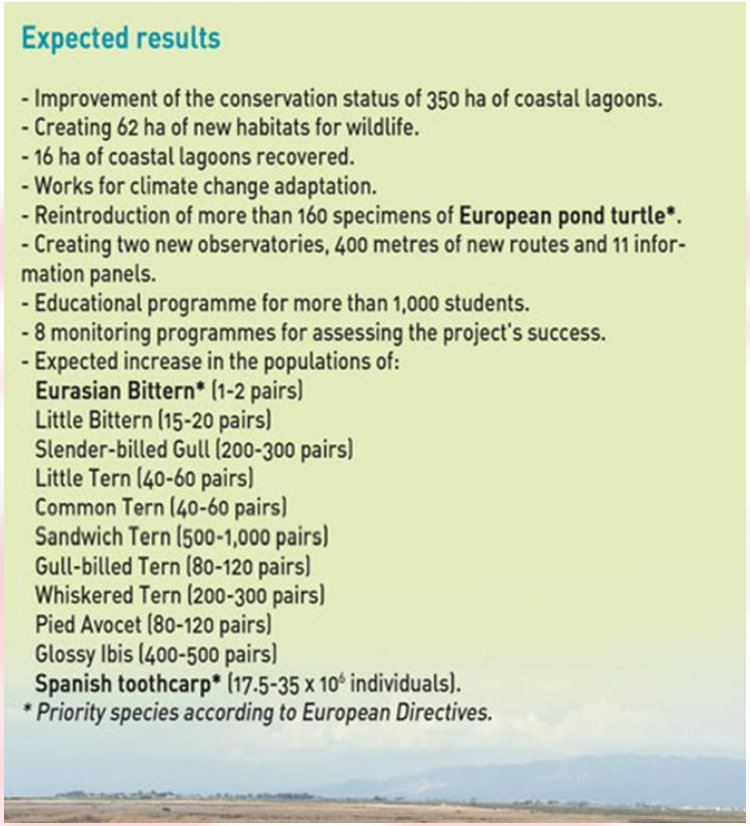
Restoration and management of the habitat of two coastal lagoons in the Ebro Delta: L'Alfacada y La Tancada

Main objective:

Improve the ecological and hydrological connectivity of 2 lagoons with the implementation of restoration measures designed **to mitigate the effects of regression of the sea and climate change** and improve the status of priority habitats and species

Resultado esperado:

Increase resilience and adaptability of coastal lagoons to the effects of climate change, for example, sea level rise and coastal regression in a climate change context.



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Delta Lagoon

Restoration and management of the habitat of two coastal lagoons in the Ebro Delta: L'Alfacada y La Tancada

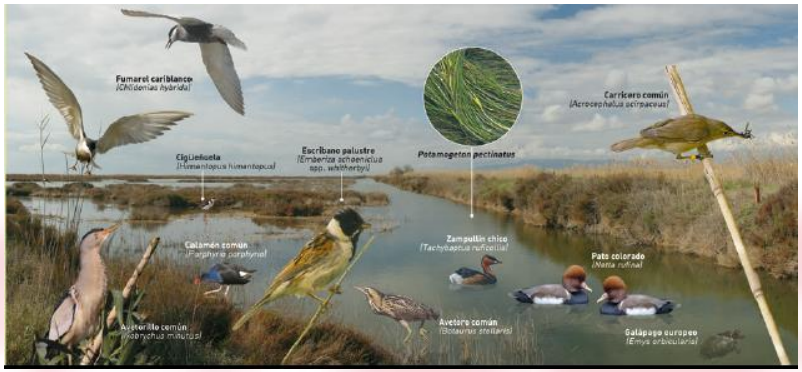
Actions and measures involved

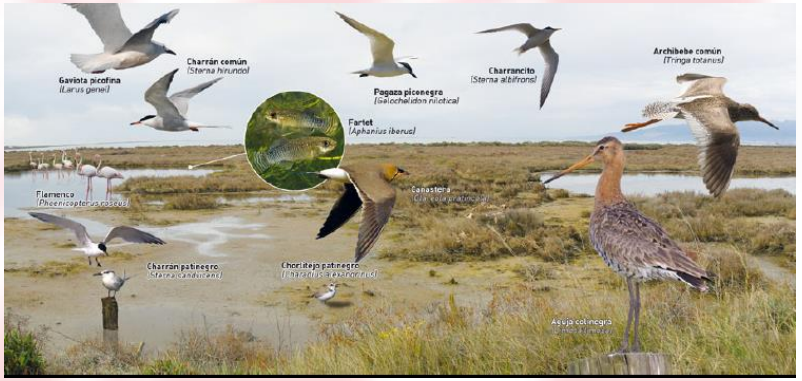
L'Alfacada lagoon:

1 – Improve the hydrological network.
2 – Hydrological connection of the salt marshes.
3 – Creating nesting areas for laro-limicolous sea birds.
4 – Naturalization of rice fields.
5 – Creation of a pedestrian walk and an ornithological observatory for public use.
6 – Reintroduction of European pond turtle (*Emys orbicularis*).
7 – Creation of two ornithological observatories for technical use.
8 – Building an access bridge.

La Tancada Lagoon (old Sant Antoni salt marshes):

1 – Naturalization of the south sector of the old aquaculture facility.
2 – Naturalization of the north sector of the old aquaculture facility.
3 – Creating small islands for nesting areas for laro-limicolous sea birds.
4 – Eliminating land accesses to mitigate the impacts of predators and human frequentation.
5 – Creation of an ornithological observatory for technical use.
6 – Burying the existing overhead electric line.
7 – Protection of the salt marsh.





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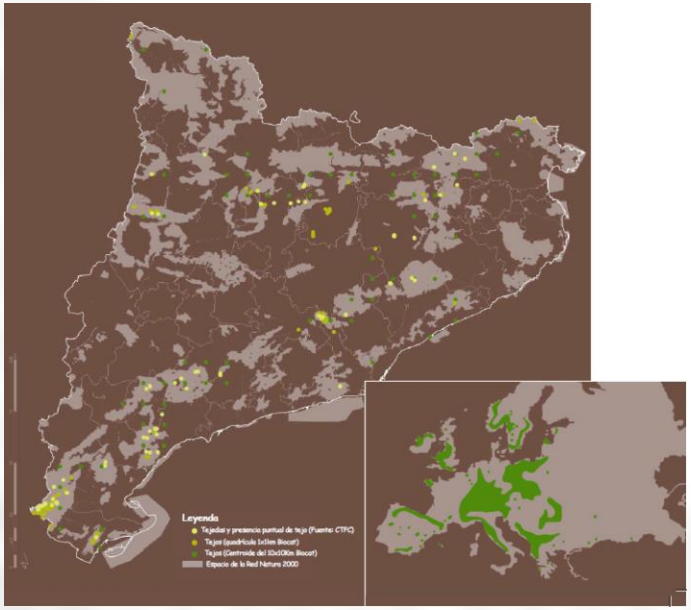
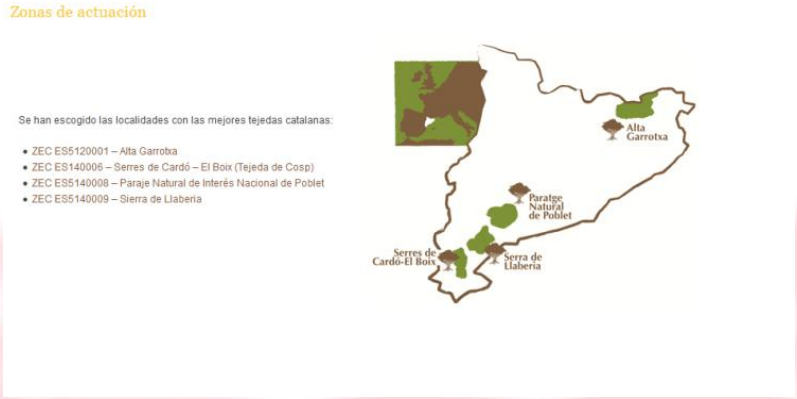
Taxus

Improvement in conservation of european yew forests of Catalonia





Objetives:

- Improve the ecological structure, resilience and functionality to increase maturity and heterogeneity.
- Free the yew from competition with other plants.
- Eradicate fungal diseases.
- Restore yew forests with the planting of yew seedlings and other typical plants.
- Favour the dispersal of the yew.
- Improve the strength of the fire system.
- Regulate the grazing of cattle.

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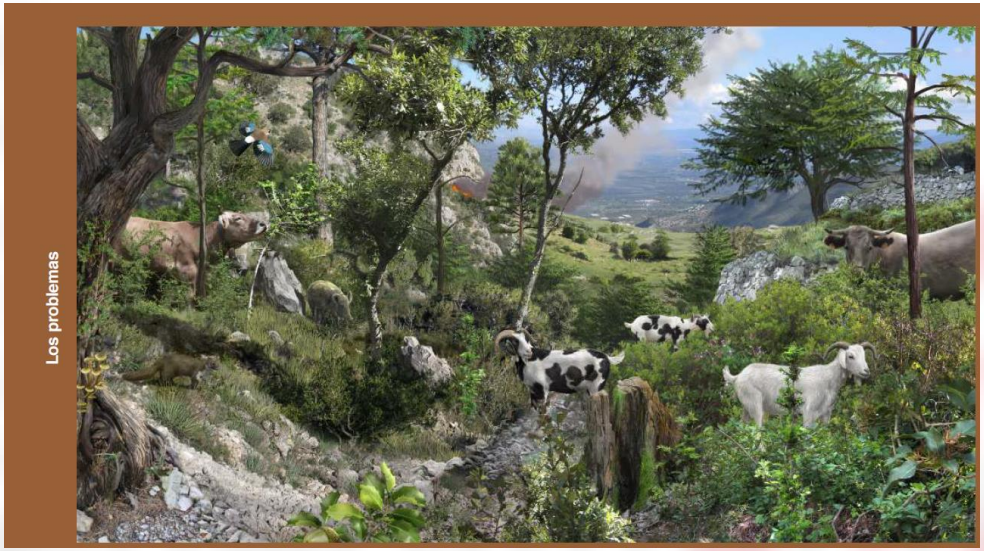


Yew forests are declining in Mediterranean environments due to the following causes:

- lack of regeneration due to intense herbivory of juvenile yews and lack of fructification,
- interspecific competition for light and **water** with more competitive woody species,
- genetic isolation, **forest fires** and lack of awareness.

These problems can be aggravated by climate change.

Taxus

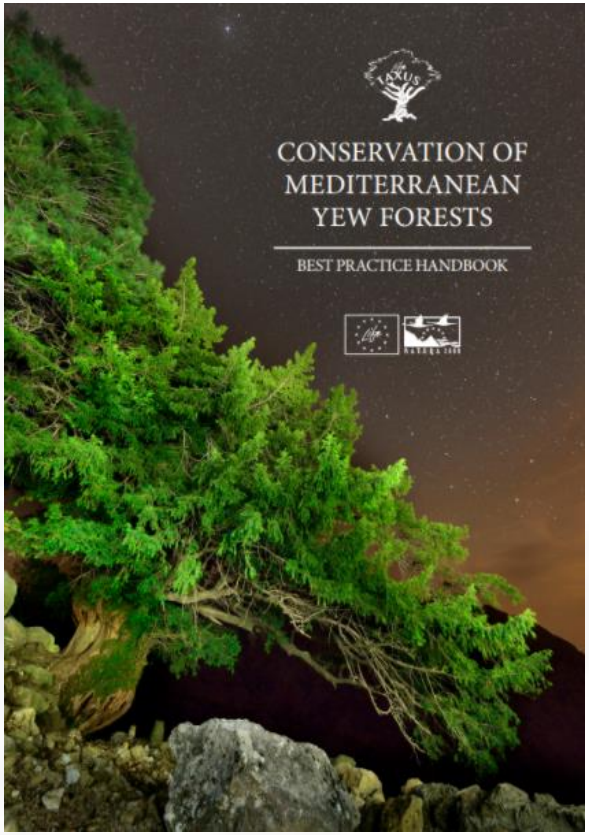
Improvement in conservation of european yew forests of Catalonia

The actions of the project

- Elaboration of a specific conservation plan for the ecological restoration of the habitat.
- Detailed **silvicultural interventions to reduce competition** with other woody species.
- Punctual plantation of yew trees to **reinforce populations** with seed from the yew groups themselves.
- **Treatments against fungal** diseases.
- Dissemination of knowledge and **environmental awareness**.

Taxus

Improvement in conservation of european yew forests of Catalonia



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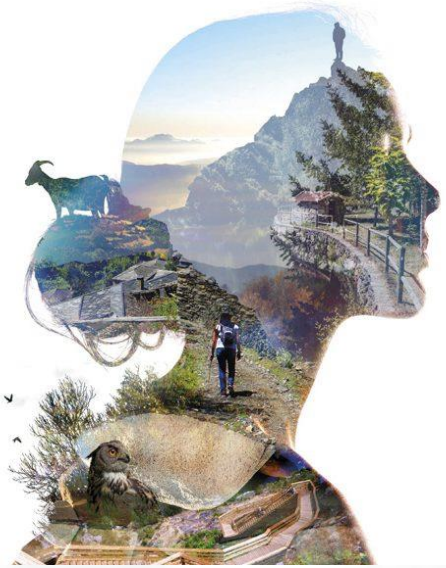

Obrigado pela vossa atenção!
Bedankt voor jullie aandacht!
Tänan teid teie tähelepanu eest!
Takk fyrir athygli þína!
Köszönöm a figyelmet!
Thanks you for you attention!
Merci de votre attention!
¡Muchas Gracias por su atención!
Danke für ihre Aufmerksamkeit!
Hvala na pozornosti!
Děkujeme vám za pozornost!
Благодаря ви за вниманието!
Vă mulțumim pentru atenție!

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