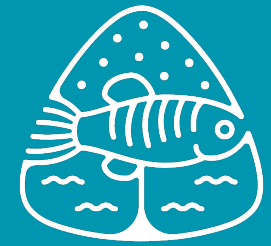




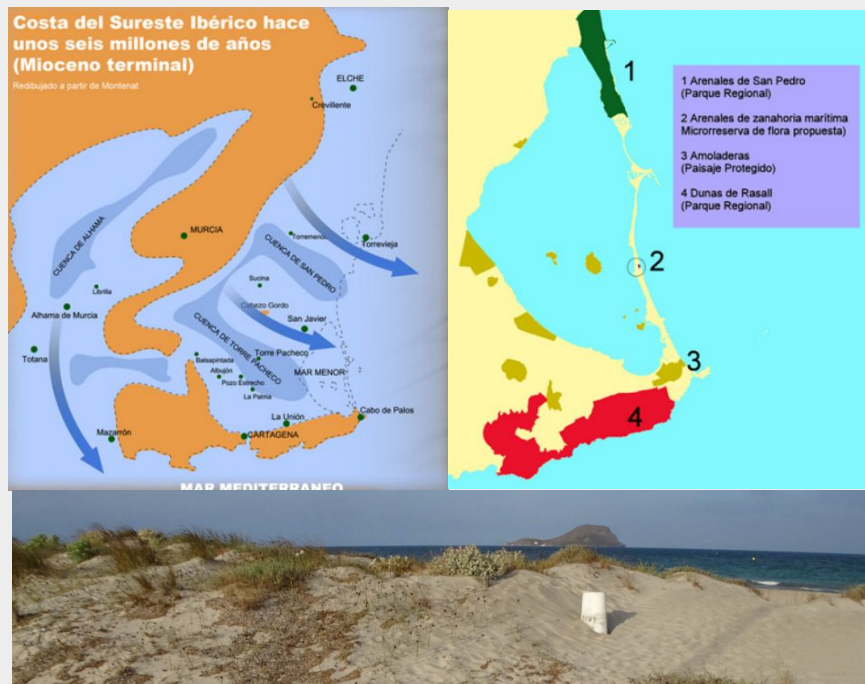
## Coastal ecosystem restoration in the South East of Spain

Ángel Sallent,, Teresa Gil, Marina Albentosa,  
Alicia Prieto and Pedro García.

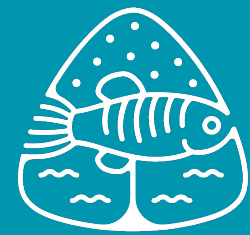




## 1. Introduction of the Manga del Mar Menor and the sandy beaches



- La Manga is a seaside spit of Mar Menor formed in the Quaternary by the natural deposition of sandy sediments brought from the mouth of the Segura River, which collided with Cape Palos and were deposited on the volcanic-type elevations as Monte Blanco, as well as the Tertiary sandstone rocks of the Pedrucho, Estacio and Punta de Algas promontories. Two thousand years ago it was almost completely closed, forming the lagoon of the Mar Menor.
- It is 21 km long and the cause of the formation of the Mar Menor, one of the largest hypersaline coastal lagoons in Europe.
- La Manga del Mar Menor currently has a great urban impact, leaving only a few small patches unbuilt. The Monte Blanco and Caleta del Estacio sandbanks, are two of them.



# RESALAR: Regeneration of salt flats and sandbanks in the Mar Menor

## 2. Habitats and botanical species of interest.



Priority habitat type 2250\* Coastal dunes with *Juniperus* ssp.

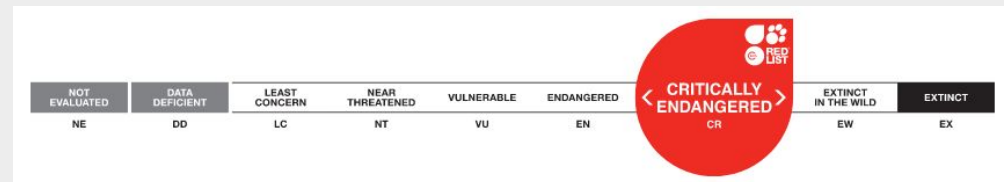
*Juniperus phoenicea turbinata* and *J. macrocarpa*. Both species formed an extensive forest that occupied the entire Manga and was cut down in the 16th century to prevent pirates from taking refuge. *J. Macrocarpa* is listed as Endangered.

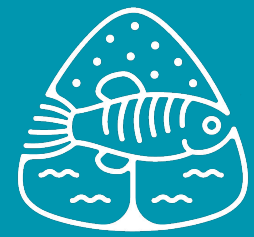


*Asparagus macrorrhizus* is a wild asparagus from the coastal sands endemic of Mar Menor. The species has been relegated to a few localities in which barely two hundred specimens survive, sometimes on urban or developable land. Recently (March 2023) it has become part of the Spanish Catalog of Endangered Species with the category of "Endangered".



Other species species as *Echinophora spinosa* (Sea carrot), are locally endangered.





# RESALAR: Regeneration of salt flats and sandbanks in the Mar Menor

## 3. Problematic, urbanization of La Manga and marginal areas that have remained

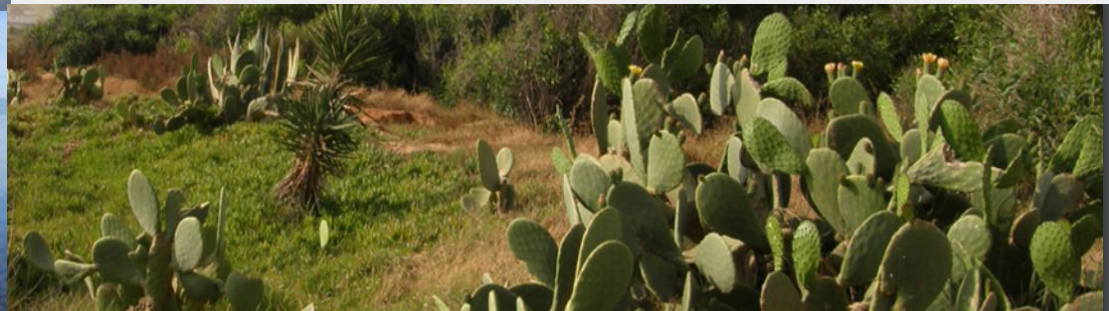


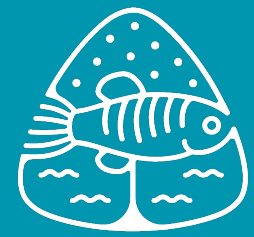
**Direct habitat destruction:** urbanization of La Manga during the 70's and 80's.

**Alteration of sand transport:** the regression of the coastline, hydraulic works, indiscriminate removal of Posidonia deposits and breakwaters.

**Climate change:** rising sea levels due to climate change will be felt on low, sandy coasts.

**Invasive alien species:** garden plants that “escape” and colonize sandy areas, displacing native species. Above all they are several species of genus *Acacia*.





## 4. RESALAR project. 3 areas of restoration in La Manga. 16 hectares

### Salinas de Marchamalo

Restoration of 9 has. of abandoned salinas and recovery of the salt production since it strengthens the natural ecosystem, creating more biodiversity. Linked with the salinas, IEO-CSIC is studying the role of the oysters as NbS for the eutrophication of Mar Menor.



### Caleta del Estacio

Restoration of 6 ha of dunes and coastal habitats in an area invaded by alien species, mainly *Acacia* trees.

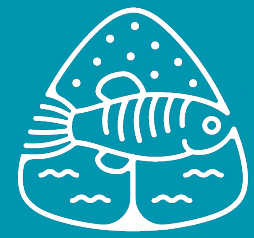


### Monte Blanco

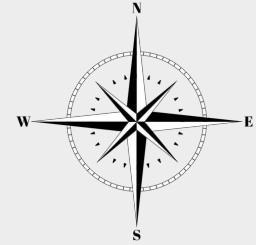
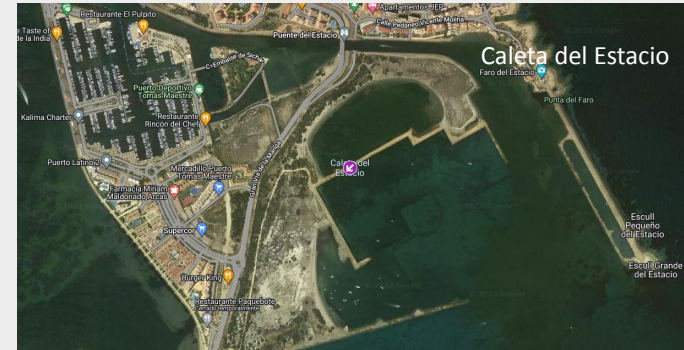
Control of invasive Alien Species in a 1ha area that belongs to the Municipality of Cartagena were ANSE works since 10 years ago.

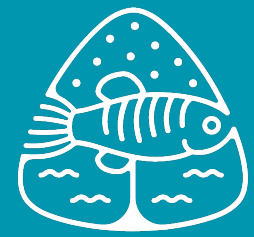


# RESALAR: Regeneration of salt flats and sandbanks in the Mar Menor



## 6. Location

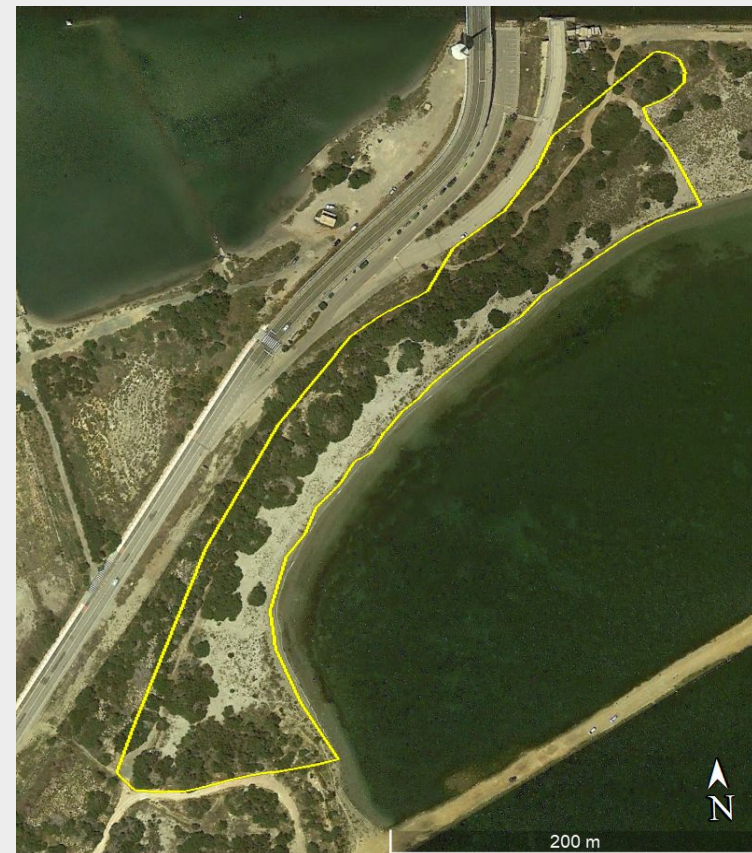




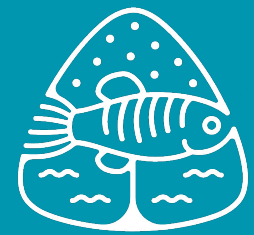
# RESALAR: Regeneration of salt flats and sandbanks in the Mar Menor

## 7. Caleta de El Estacio

In yellow, area for which there is already authorization from the Coastal Demarcation in Murcia (2.6 ha). In green, area for which authorization has been requested (3.7 ha)



Areas of original dune vegetation in good condition and areas of cryptowetland with a high water table characterized by the presence of characteristic vegetation such as *Juncus acutus*, *Juncus maritimus* and *Scirpus holoschoenus*.



## 8. Removal of Invasive Alien species detected



**Acacia trees.** At least, three different species from Australia. *A. saligna*, *A. cyclops* and *A. retinoides*. These species has a strong capacity of transformation of the habitat.

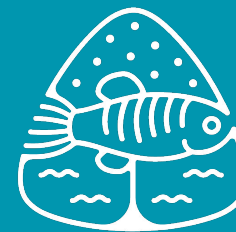
Other species found that can transform the habitat are ***Carpobrotus edulis*** and ***Spartina patens***.



Many other alien invasive species are detected in both, Caleta del Estacio ana Monte blanco, as ***Agave americana***, ***Opuntia sp.*** ***Nicotiana glauca*** or ***Lantana camara***.





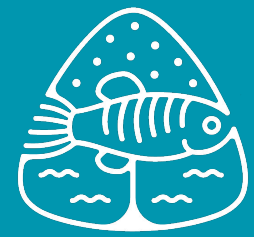


## 9. Elimination of invasives species

### Canal del Estacio:

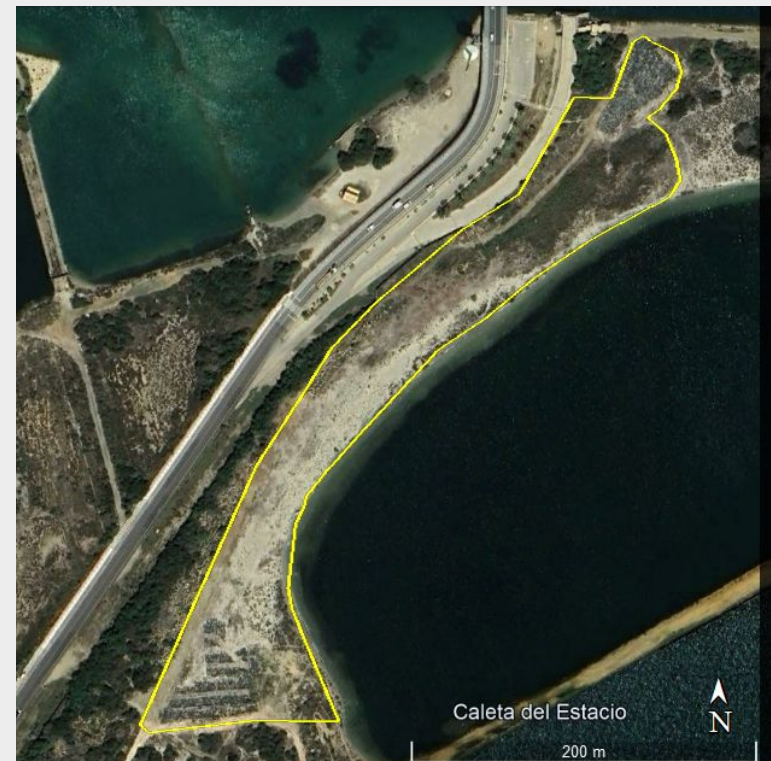
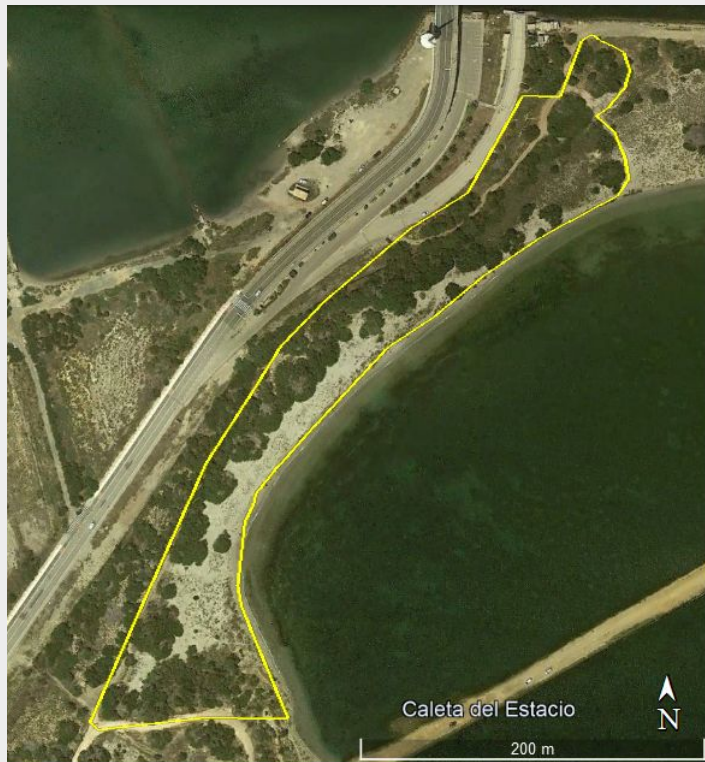
1. Removal of Alien Invasive Species
2. Solarization with high density plastic.

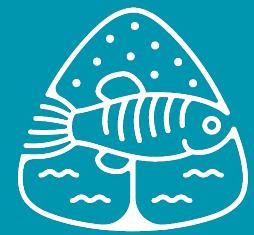




# RESALAR: Regeneration of salt flats and sandbanks in the Mar Menor

## 10. Caleta de El Estacio. Removal of Acacia trees.





## 11. Plantation of native species



Native species used:

*Cyperus capitatus*  
*Chritmun maritimum*  
*Glacium flavum*  
*Helycrisum stoechas*  
*Juncus acutus*  
*Lotus creticus*  
*Sporolobus pugens*  
*Saccharum ravennae*  
*Scirpus holoschoenus*  
*Tamarix gallica*

Other species planned to be reintroduced:

*Juniperus phoenicia turbinata*  
*Asparagus macrorrhizus*

1. Control of seedlings of Acacias and other alien species
2. Plantation of native flora



# Thank you very much for your attention!

<https://www.fundacionanse.org/resalar/>

RESALAR) has the support of the Biodiversity Foundation in the call for aid to support large transformative projects of a scientific-technical nature for the promotion of the bioeconomy and the contribution to the ecological transition 2021 within the framework of the Recovery, Transformation and Resilience Plan (PRTR), financed by the European Union - NextGenerationEU.

