

#### PLATTFORM MEETING ON INVASIVE ALIEN SPECIES (IAS)

Life Experiences of IAS management in marine and littoral habitats in Andalucía

Soledad Vivas

REGIONAL MINISTRY OF ENVIRONMENT AND PLANNING. JUNTA DE ANDALUCÍA



#### **What is Conhabit?** LIFE CONHABIT ANDALUCIA LIFE13/NAT/ES/586

Specific actions on 10 habitat types, 15 Nature 2000 network & more than 6 species.

Threats: urbanisation, industry, and intensive farming, invasive species.













Preservation and improvement in priority habitats on the Andalusian coast.



2.654.268 € 60% cofinancing
5 years (2014-2019)
2 beneficiaries Environmental Council + Environmental Agency.
More than15 collaborating organisations









#### Actions related to alien invasive species

Code Nature 2000	Name Nature 2000	Habitat type	Invasive species	Benefited surface
ES6150001	Laguna de El Portil	2250 * Coastal dunes with Juniperus spp.	Opuntia dillenii Opuntia ficus-indica	> 7 ha
ES0000025	Marismas del Odiel	2130 * Fixed dunes with herbaceous vegetation (grey dunes)	Oenothera drummondii	123 ha
ES6150004	Lagunas de Palos y las Madres	2250 * Coastal dunes with Juniperus spp.	Eucaliptus globulus	12 ha
ES0000024	Doñana	4020 * Temperate Atlantic wet heaths with <i>Erica ciliaris</i> and <i>Erica tetralix</i>	Eucaliptus globulus, Eucaliptus camaldulensis, Acacia dealbata Acacia saligna	3 ha
ES6170002	Acantilados de Maro-Cerro Gordo	5220 * Matorral with <i>Zyziphus</i> 6220 * Pseudo-steppe with grasses and annuals of the <i>Thero-Brachypodietea</i>	Acacia sp. Agave fourcroydes Agave americana Opuntia subulata Opuntia ficus-indica Prodanea ricasoliana? Arundo donax	1,20 ha
ES6110006	Ramblas de Gérgal, Tabernas y Sur de Sierra Alhamilla	5220 * Matorral with Zyziphus	Agave sisalana, Agave fourcriydes, Cyperus eragrostis	16 ha
ES6110005	Sierra Cabrera-Bédar	1510 * Mediterranean salt steppes (Limonietalia)	Cynodon dactylon, Acacia dealbata	0,8 ha



# **Opuntia dillenii** ES6150001

Habitat 2250: \* Coastal dunes with Juniperus spp.





# **Opuntia dillenii** ES6150001





Origin & Invasion history (IH)	Social perception of actions / method	Biology	Control methods & Biomass removal (BR)
Dispersion from old	+ / +	Perennial	Manual scythe and pitchfork (small plants,
plantations (birds and		Prickly‼	disperse) ;
mammals);		↓growth rate	Mechanical (big plants, close to roads)
IH >100 years		Wasp nests!	BR: transfer to dump



**Oenothera drummondii** ES0000025



Habitat 2130: \*Fixed dunes with herbaceous vegetation (grey dunes)





#### **Oenothera drummondii** ES0000025







Origin & Invasion history (IH)	Social perception of actions / method	Biology	Control methods & Biomass removal (BR)
Accidental introduction Dispersion by wind and herbivores (hares) IH: ca. 30 years	+ / -	Perennial ↑↑growth rate	Chemical (pilot trial) Others* BR: bagging & dump



# Agave spp. ES6110006

#### Habitat 5220: \*Matorral with Zyziphus











### Agave spp. ES6110006

Unexpected social rejection (local platform "save the sisal") Specific meetings and workshops: all stakeholders included Shock response campaign: Facebook, twitter.







## Agave spp. ES6110006

Unexpected social rejection (local platform "save the sisal") Specific visits, meetings and workshops: all stakeholders included

Shock response campaign: Facebook, twitter.











# Conclusions

- Life Conhabit Andalusia involves specific actions on 10 priority habitat types, 15 Red Natura localities & 6 species.
- Actions related to invasive species control include different priority habitat types and 10 species.
- Specific solutions adapted to invasion history, the biology of the species and the social perception were developed.
- Actions related to education and training are key to local communities more aware of the Natural 2000 network and understand the actions carried out by the LIFE project.



# OBJETIVES



This project LIFE + Nature has been developed in the nine most western Sites of Community Importance (SCI) of the Mediterranean that harbour Posidonia oceanica

2.800.142 € 60% cofinancing
6 years (2011-2016)
7 beneficiaries
1 co-financer
Regional government Andalusian: CB

JUNTA DE ANDRLUCIA COASLERÁ DE MEDIO AMBRIVE Y DEDENACIÓN DEL TERRITORIO





# OBJETIVES

#### Mitigate the main threats to Posidonia: Control of invasive algae spread

CAULERPA CYLINDRACEA				
ORIGIN	Endemic species of Southwest Australia. The causes of its introduction in the Mediterranean are somewhat speculative, but maritime traffic and trade (acuarifolia) seem the most plausible routes.			
IDENTIFICATION	Green algae with stoloniferous longitudinal growth axes fixed to the substrate by small rhizoids, and erect fronds forming small vesicles.			
DISTRIBUTIÓN IN ANDALUSÍA	To date, the species has only been observed in the province of Almeria: seabeds of eastern Almeria; Cabo de Gata-Nijar Natural Park and Posidonia Barrier Reef Natural Monument in Roquetas del Mar (the last two confirmed by early detection monitoring works carried out by LIFE POSIDONIA). Although the precise coverage of the species in the province is not known, it is known to exceed 200 hectares (mainly in eastern Almeria).			
EFFECT ON POSIDONIA MEADOWS	Seemingly restricted to clear patches and the first few cm of meadow, unless the latter has been cleared for other reasons. Increases the amount of easily degra- dable organic matter in sediments, which could negatively impact meadows.			









- Update he map of the presence of invasive macroalgae in the 9 SCIs (Mapping in detail the surface of Caulerpa racemosa in Isla de Terreros); Early detection of marine IAS network-Control-erradication actions. Introduction routes analyses.
- 2. Monitoring the behaviour of Caulerpa racemosa in three control stations.
- 3. **Prevention**. Most vulnerable SCI to macroalgae invasions were identified in the 9 SCIs included in the project.
- 4. Definition of areas of exclusion







 Update cartography of invasive macroalgae in the 9 SCI; Early detection network-Controlerradication actions. Introduction routes analyses.



2008 : 4 has. Life project Proposal 2009: + 100 has.









 Update cartography of invasive macroalgae in the 9 SCI; Early detection network-Controlerradication actions. Introduction routes analyses.



Early detection network-Control-erradication actions

Cabo de Gata SCI- Special protected area 2012: focus of invasion of Caulerpa was detected- 4 m<sup>2</sup> 2014: another focus in the same MPA- 2 m<sup>2</sup>

These focus were eradicated by mechanical methods

In both cases the specie reinvaded the treated areas







 Update cartography of invasive macroalgae in the 9 SCI; Early detection network-Controlerradication actions. Introduction routes analyses.









2. Monitoring the behaviour of Caulerpa racemosa in three control stations



**Extreme variability between** years! There is not a clear behaviour of expansion in the limits of the patches

But there is a clear expansion in the total area and in the bathymetric range



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2. Monitoring the behaviour of Caulerpa racemosa in three control stations





#### **Extreme variability between stations!**

**Coverage evolution: There is not significant differences between years** 







3. Prevention. Most vulnerable SCI to macroalgae invasions were identified in the 9 SCIs included in the project.



- Distance to invaded focus
- Presence of commercial harbours
- Presence of nautic harbours and number of berths
- Types of fisheries in the fishing harbours
- Direct connection by *ferry* with a harbour infected
- Indirect connection by ferry with a harbour infected
- Ocean currents influence





 Prevention. Most vulnerable SCI to macroalgae invasions were identified in the 9 SCIs included in the project.



Habitat study. Substrate typologies: favourables habitats to Caulerpa cylindracea, considering the ecological requirements of this exotic specie Posidonia oceanica habitat Conectivity: A fragmented habitat with larger areas of edge has more areas of opportunities to the invasive species settlement. Habitats with highest species richness has higher abilities to compete with IAS for space and resources







posidonia andalucía

Caulerpa cylindracea: shows no clear behaviour at the local scale: coverage and density were found to increase in some localities but to decrease in others, showing no apparent specific pattern.

In contrast, the propagation of this species and other macroalgae is indeed clear at the regional scale, as both the number of invaded localities and the area occupied by Caulerpa racemosa have increased in eastern Almeria. And during the course of the project the invasion progressed towards the south-west.

The routes of introduction of these species may be several (water currents, boats, remnants at depths lower than the limit of distribution of Posidonia...). The two attempts of early eradication carried out during the course of the project technically achieved the eradication of the foci of invasion in the short-term, but proved ineffective in the medium-term, since the cleared surfaces were re-colonized again within less than a year.





lifeconhabit.cmaot@juntadeandalucia.es
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