

# XV ENCONTRO REGIONAL DE EDUCAÇÃO AMBIENTAL

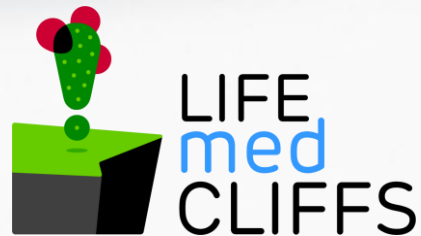
A EDUCAÇÃO  
AMBIENTAL  
ENQUANTO PILAR  
DE UM FUTURO  
SUSTENTÁVEL



GOVERNO  
DOS AÇORES

Secretaria Regional do Ambiente  
e Alterações Climáticas





# Engaging society in the management of invasive plants to improve the conservation of Mediterranean coastal cliffs

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GERARD CARRION | Cap de Creus Natural Park - DACC



# XV ENCONTRO REGIONAL DE EDUCAÇÃO AMBIENTAL



Towards an integrative management of Invasive Alien Plant Species in Mediterranean sea cliffs of European interest

LIFE20 NAT/ES/001223  
Biodiversity

DURATION  
1/10/2021 – 30/9/2026

TOTAL BUDGET  
1,408,273 €

EU Co-funding  
843,814 €

[www.lifemedcliffs.org](http://www.lifemedcliffs.org)

## 6 PARTNERS

Research  
Government  
Productive sector  
Civil society

## COORDINATING BENEFICIARY:



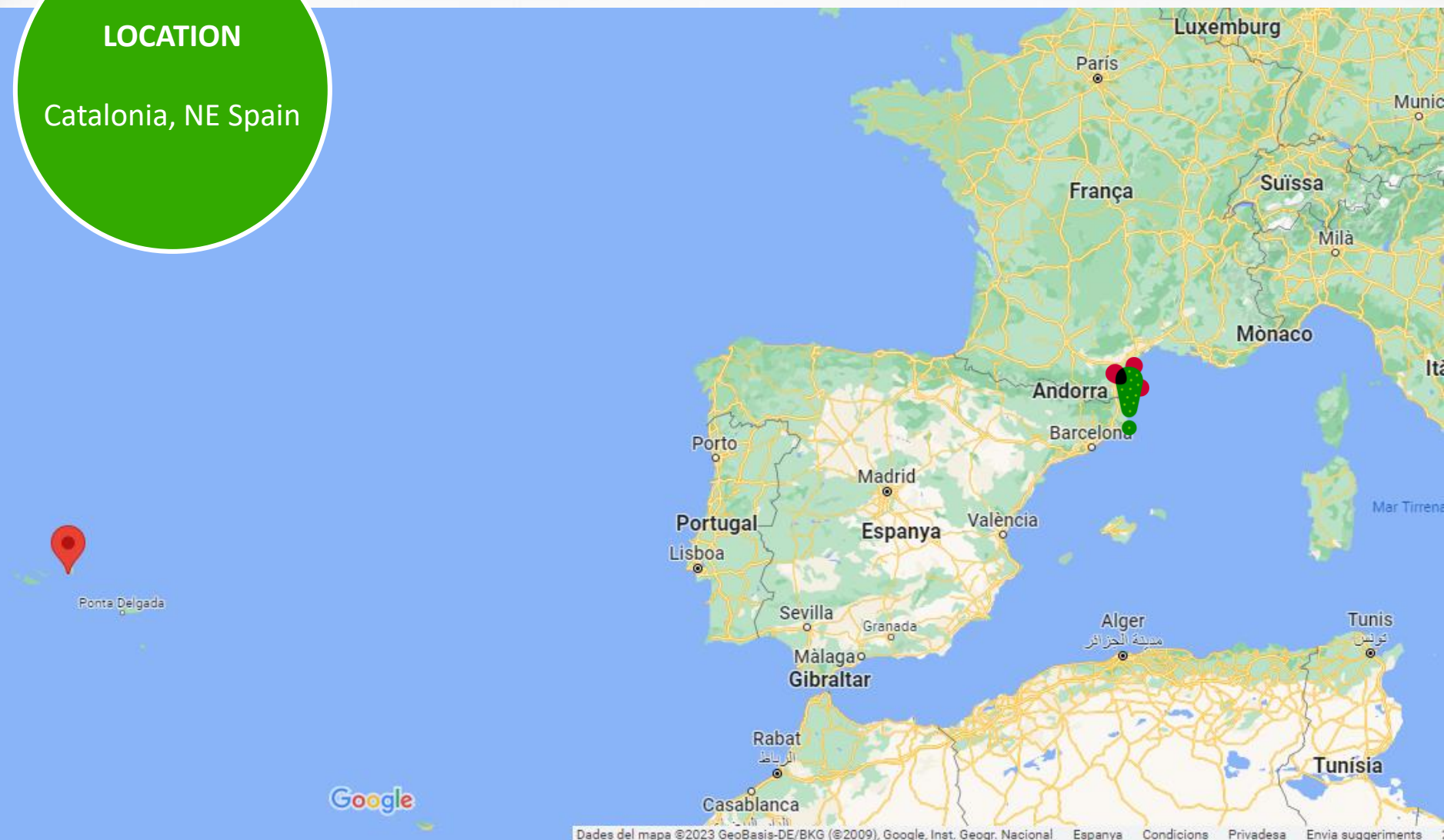
## ASSOCIATED BENEFICIARIES:



# XV ENCONTRO REGIONAL DE EDUCAÇÃO AMBIENTAL

## LOCATION

Catalonia, NE Spain





## XV ENCONTRO REGIONAL DE EDUCAÇÃO AMBIENTAL

### HABITAT OF COMMUNITY INTEREST

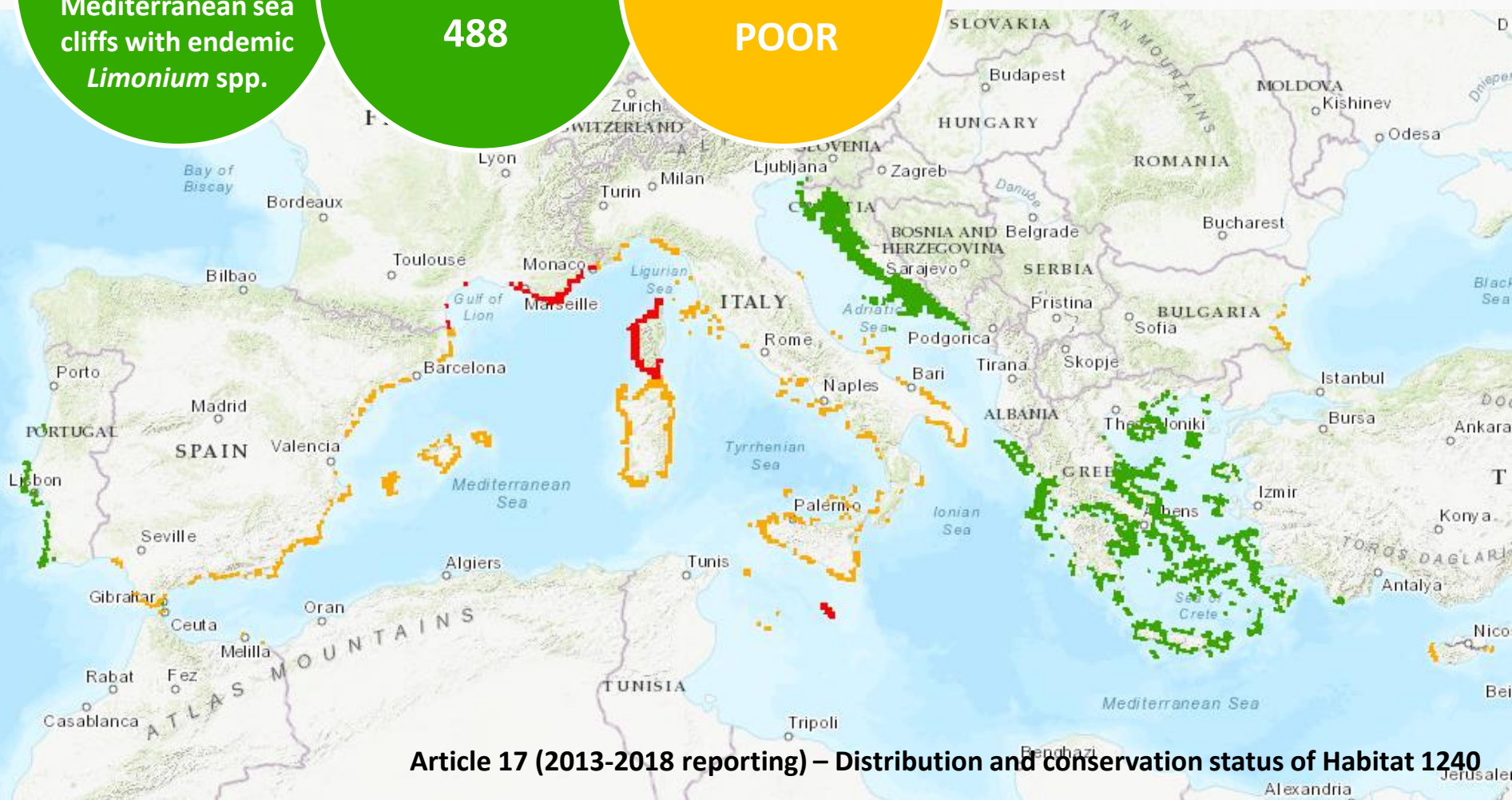
1240 - Vegetated  
Mediterranean sea  
cliffs with endemic  
*Limonium* spp.

Natura 2000 sites

488

Conservation status  
EU

POOR



Article 17 (2013-2018 reporting) – Distribution and conservation status of Habitat 1240

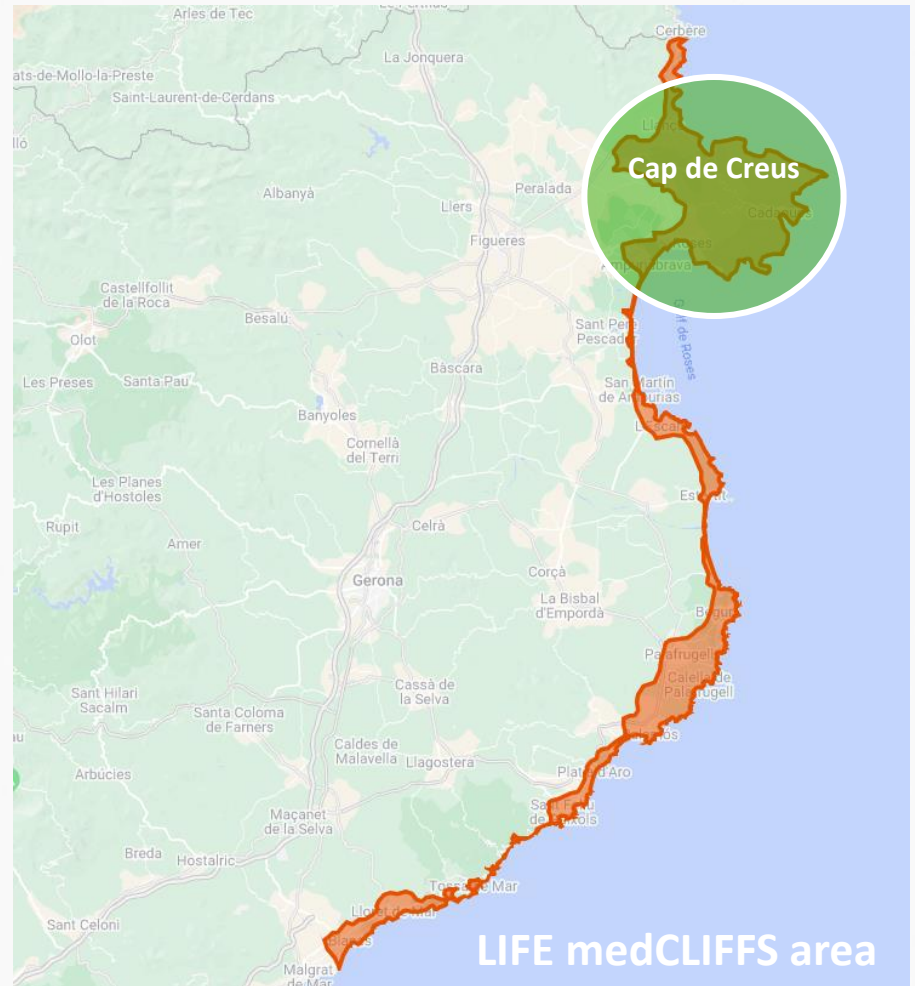






# XV ENCONTRO REGIONAL DE EDUCAÇÃO AMBIENTAL

Map of HCI1240 in Costa Brava





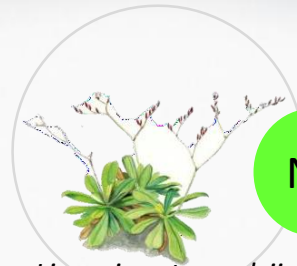
## XV ENCONTRO REGIONAL DE EDUCAÇÃO AMBIENTAL



*Crithmum maritimum*



*Armeria ruscinonensis*



*Limonium tremolsii*

NT



*Limonium geronense*

VU



EN

CR



*Seseli farrenyi*



*Polistes dominula*









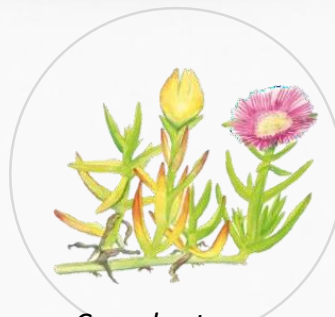






# XV ENCONTRO REGIONAL DE EDUCAÇÃO AMBIENTAL

## INVASIVE AND POTENTIALLY INVASIVE PLANT SPECIES



*Carpobrotus* sp.



*Opuntia* sp.



*Gazania rigens*



281 observacions

*Opuntia ficus-indica*



193 observacions

*Pittosporum tobira*



151 observacions

*Carpobrotus edulis*



138 observacions

*Senecio angulatus*



120 observacions

*Opuntia stricta*



112 observacions

*Agave americana*



107 observacions

*Carpobrotus acinaciformis*



88 observacions

*Aloe maculata*



84 observacions

*Chenopodium nutans*



84 observacions

*Kalanchoe × houghtonii*

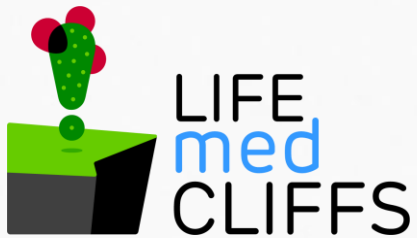












**PREVENTION**

**EARLY  
DETECTION**

**RAPID  
RESPONSE**

**ERADICATION**

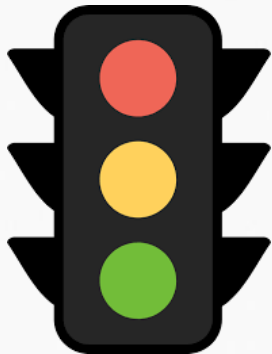
## PREVENTION



### IAPS COLLABORATIVE WORKING GROUP

Multisector: producers & users

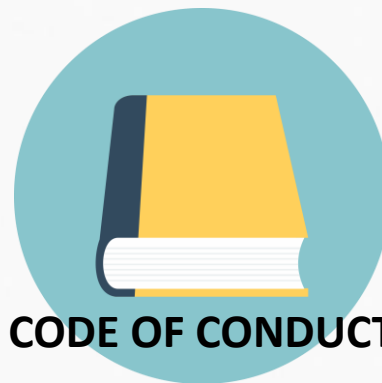
Multidisciplinary: administration, managers, research & academia, botanical gardens, plant nurseries, landscape gardeners



CONSENSUS LIST

WATCH LIST

WHITE LIST



CODE OF CONDUCT





## EARLY DETECTION

### LIFE medCLIFFS OBSERVERS NETWORK

<https://www.inaturalist.org/projects/life-medcliffs>

Potential detection of 180 sp

84 members. 2505 observations. 92 species



**iNaturalist**



### LIFE medCLIFFS VOLUNTEERING NETWORK

<https://www.floracatalana.cat/flora/cienciaciudadana/life>

73 volunteers monitoring 78 transects



**Flora Catalana**

*Viu, gaudeix i aprèn amb la nostra flora*

# XV ENCONTRO REGIONAL DE EDUCAÇÃO AMBIENTAL

## MAPA DELS TRANSECTES. LIFE medCLIFFS

| Treball de camp | Tots els transectes | Mapa | T. disponibles | T. assignats |



*Tunts, fem el catàleg! Ciència ciutadana a Flora Catalana*



EL CATÀLEG + BIRIOFITS + PLANTES VASCULARS + EINES + C. CIUTADANA + INTERN +

## ADOPTA UN TRANSECTE. LIFE medCLIFFS

| Treball de camp | Mapa | Tots els transectes | T. disponibles | T. assignats |

*Tunts, fem el catàleg! Ciència ciutadana a Flora Catalana*



Codi de transecte: C03

Nom: Transecte zona centre, número 3

Disponibilitat: ASSIGNAT

Dificultat: MITJA

Fitxer KML: [C\\_03\\_0.kml](#)

COORDENADES

Lat. NE: 41.830700

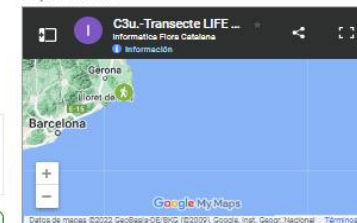
Long. NE: 3.083390

Lat. SO: 41.826400

Long. SO: 3.086650

Observacions del transecte

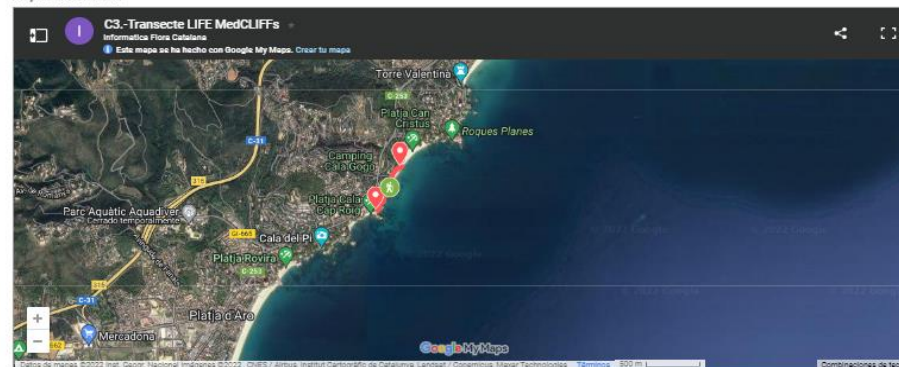
Mapa de situació



Desnivell



Mapa del transecte





# XV ENCONTRO REGIONAL DE EDUCAÇÃO AMBIENTAL



**Flora Catalana**

Catàleg de Flora

EL CATÀLEG +

BRIÒFITS +

PLANTES VASCULARS +

EINES +

C. CIUTADANA +

INTERN +



Informació

*Disphyma crassifolium*



Informació

*D. floribundum*



Informació

*Einadia nutans*



Informació

*Fallopia baldschuanica*



Informació

*Gazania rigens*



Informació

*Ipomoea indica*



Informació

*Kalanchoe tubiflora*



Informació

*Kalanchoe x houghtonii*



Informació

*Lonicera japonica*



Informació

*Matthiola incana*



Informació

*M. cordifolium*



Informació

*Opuntia aurantiaca*



Informació

*Opuntia ficus-indica*



Informació

*Opuntia linguiformis*



Informació

*Opuntia stricta*



Informació

*Oxalis pes-caprae*



**Flora Catalana**

Fla, gaudia i cura del la nostra flora

B3. Plantes no enfiladisses i no postrades

**B.3.1. Arbre o gran arbust**

- B311. *Acacia dealbata*. Fulles compostes amb moltíssims folíols molt petits.
- B312. *Alnus alba*. Fulles compostes amb folíols grans de fins a 12 cm.
- B313. *Alnus robur*. Fulles simples, ovals, coriàcies (es trenquen al doblegar).

**B.3.2. Planta de menys de 2 m. amb flors més o menys vistoses**

- B314. *Antennaria dioica* (*Osteospermum ecklonii*). Flors grans (en forma de margarida) blanques, rosades o violades.
- B322. *Memphis incana*. Flors rosades o violades, de vegades blanques.
- B323. *Senecio jacobaeus*. Flors grogues (forma margarida).

**B.3.3. Planta diferent a les anteriors (diferent de B.3.1 i B.3.2)**

- B331. *Agave americana*. Roseta de fulles grosses, gruixudes, amb dents i acabades en una espina.
- B332. *Arundo donax*. Canya no ramificada amb plomall terminal.
- B333. *Phyllostachys aurea*. Canya ramificada, rara vegades s'observa en flor.



Col·labora! Fes-te voluntari. Adopta un transecte



El projecte LIFE medCLIFFS. Coneix-lo!



## RAPID RESPONSE



### RESEARCH ARTICLE

Methods in Ecology and Evolution

## Rapid spatial risk modelling for management of early weed invasions: Balancing ecological complexity and operational needs

Jens G. Froese<sup>1</sup> | Alan R. Pearse<sup>1,2</sup> | Grant Hamilton<sup>1</sup>

<sup>1</sup>School of Earth, Environmental and Biological Sciences, Queensland University of Technology (QUT), Brisbane, Qld, Australia

### Abstract

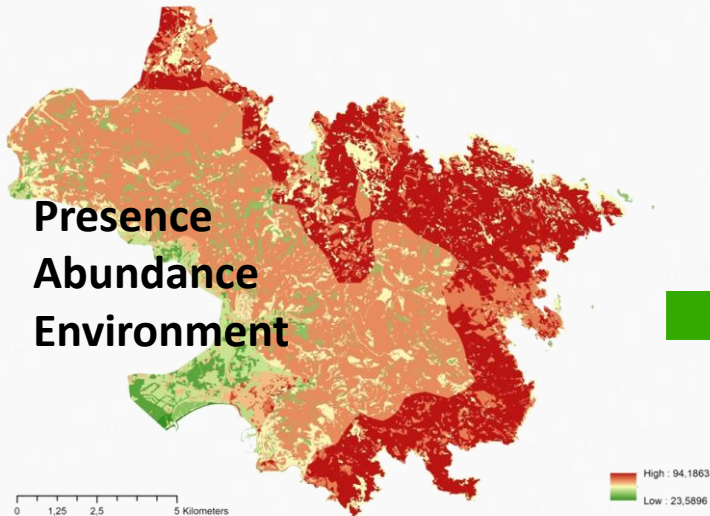
1. When an invasive alien 'weed' emerges in a previously uninhabited landscape, land

riskmapr

Idoneïtat

*Opuntia ficus-indica*

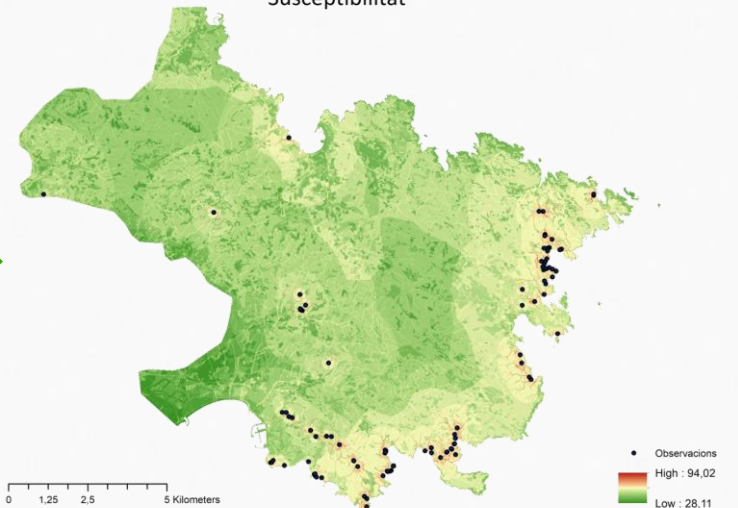
Presence  
Abundance  
Environment



Susceptibilitat

*Opuntia ficus-indica*

PROPAGULE  
PRESSURE



HABITAT SUITABILITY

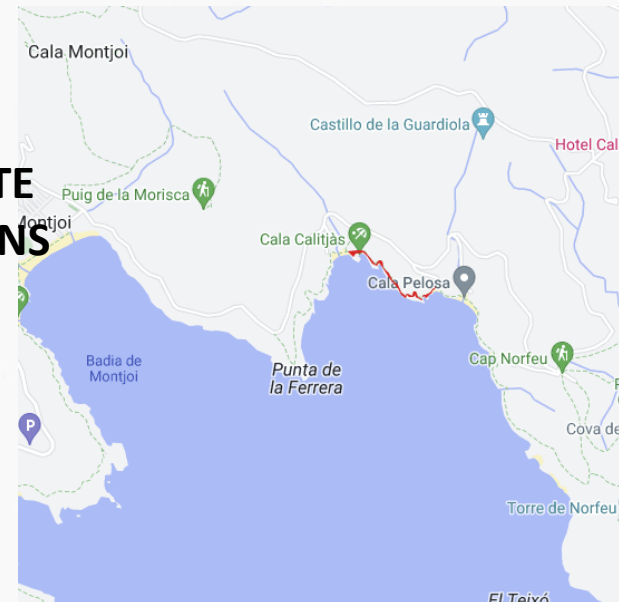
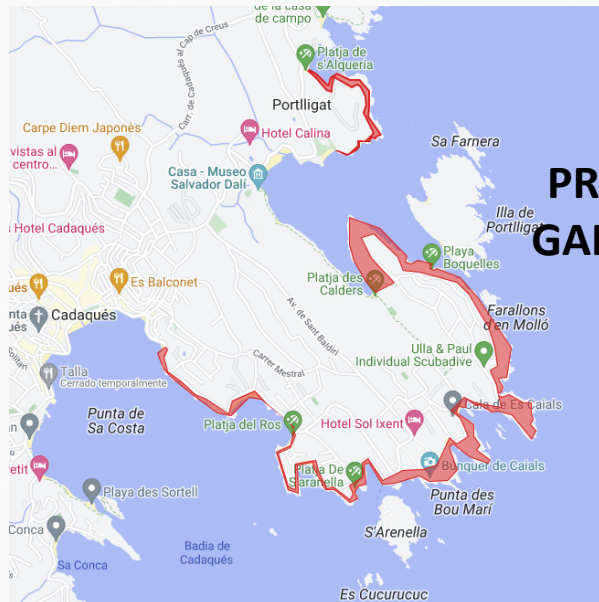
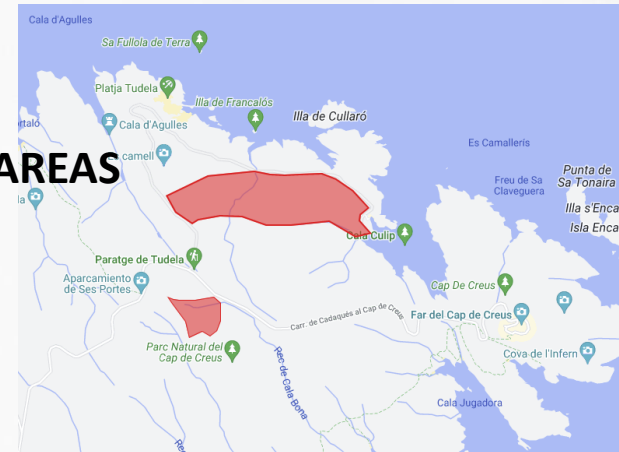
HABITAT SUSCEPTIBILITY



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ERADICATION

PUBLIC AREAS



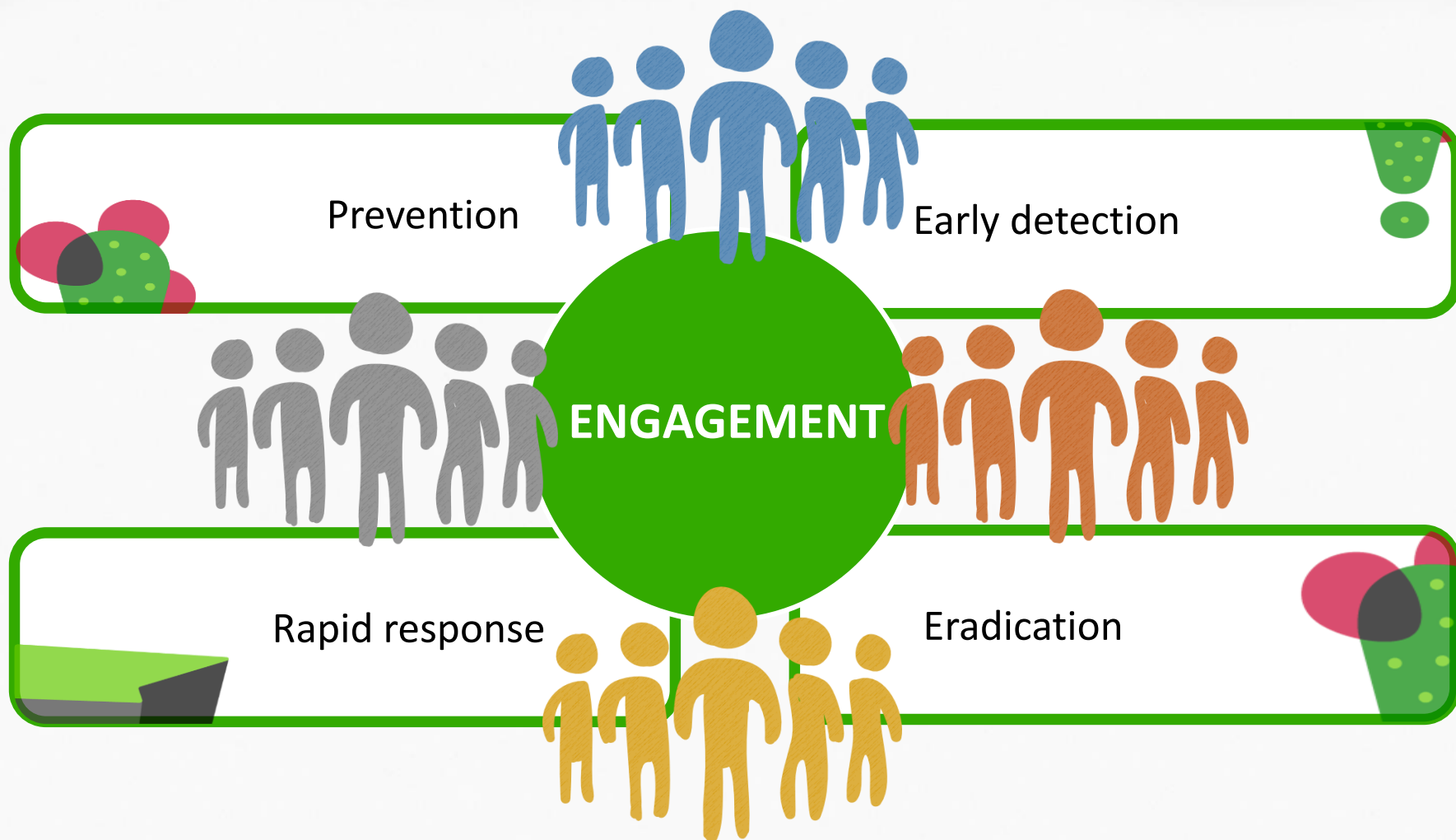














A green circle with the text 'COMMUNICATION & DISSEMINATION' inside.

## COMMUNICATION & DISSEMINATION

### MATERIALS

- ✓ General roll-up
- ✓ General leaflet (CAT, ES, EN, FR)
- ✓ Observer's flyer (CAT)
- ✓ Volunteers leaflet (CAT)
- ✓ Leaflet for the promotion of the code of conduct (CAT)
- ✓ Sticker, pen, textile bag, folder
- ✓ Promotional materials for volunteers
- ✓ Notice boards
- ✓ **Exhibition** (2 copies, CAT, ES, EN FR)

### ACTIVITIES

- ✓ Botanical guided routes along the Costa Brava
- ✓ Informative talks
- ✓ Support of 54 local entities: 34 city councils and local administrations, 10 local SMEs or associations related to tourism and sports, 7 NGOs and 3 botanical gardens.
- ✓ Door to door to make contact with 72 owners of private gardens.



# XV ENCONTRO REGIONAL DE EDUCAÇÃO AMBIENTAL

## Management of invasive plant species on the Mediterranean cliffs of Costa Brava

### The LIFE medCLIFFS project

**What is the project about?**

LIFE medCLIFFS is a nature conservation project funded by the European Union's LIFE programme. It is being carried out in the coastal area of north-eastern Catalunya, specifically in Costa Brava and in the Cap de Creus Natural Park.

**What are the objectives of the project?**

The main objective of the LIFE medCLIFFS project is to improve the current management of invasive alien plant species that cause serious damage to the conservation of plant biodiversity on Mediterranean sea cliffs. These habitats are home to a number of endemic plant species, that is, plant species that only grow in a specific place, such as the Cap de Creus Seseli (Seseli ferrii), found only in the Cap de Creus Natural Park.

1. Prevention of the introduction of new invasive or potentially invasive plant species.
2. Implementation of two participatory networks for the early detection and monitoring of invasive plant species (IAPS) in priority areas.
3. Improvement of the response to the evolution of the distribution of detected IAPS.
4. Control, containment, and eradication of the most problematic invasive plant species in Cap de Creus.

## The cliffs and endemic species of Cap de Creus

One of the habitats most affected by invasive alien plant species in the Mediterranean basin are the Mediterranean cliffs with endemic sea lavender (*Linum sp.*). This habitat is formed by coastal cliffs and rocky shores influenced, to a lesser or greater extent, by the action of seawater.

Two species of sea lavender are found in the Cap de Creus Natural Park. These plants are home to several endemic species, some of which are endangered. The most characteristic endemic plant species, which the LIFE medCLIFFS project aims to focus on, are the Seseli (Linum ferrii) and the Seseli (Linum ferrii).



**Sea lavender (Linum sp.)**  
This plant is endemic to the Cap de Creus Natural Park and is found in the coastal area of north-eastern Catalunya. It is a small, perennial herb with a single stem and small, opposite leaves. The flowers are small and tubular, with a long corolla. The plant is found in the coastal area of north-eastern Catalunya, specifically in the Cap de Creus Natural Park.

**Sea lavender (Linum ferrii)**  
This is a perennial herbaceous plant, with single stems, which do not usually exceed 40 cm in height. It has a single stem and small, opposite leaves. The flowers are small and tubular, with a long corolla. The plant is found in the coastal area of north-eastern Catalunya, specifically in the Cap de Creus Natural Park.

**Cap de Creus or Seseli (Seseli ferrii)**  
This is a perennial herb 6 to 10 cm tall. It is found in the coastal area of north-eastern Catalunya, specifically in the Cap de Creus Natural Park. It is a small, perennial herb with a single stem and small, opposite leaves. The flowers are small and tubular, with a long corolla. The plant is found in the coastal area of north-eastern Catalunya, specifically in the Cap de Creus Natural Park.

## Cat's claw (Carpobrotus edulis)

**Characteristics**  
A common name cat's claw comes from the shape of its leaves, which are sometimes of the shape of this animal. This plant has succulent, fleshy leaves, which are elongated in shape, and supports a small stem that has large flowers up to 10 cm in diameter, with a purple or pink color. The plant is found in the coastal area of north-eastern Catalunya, specifically in the Cap de Creus Natural Park.

**Distribution**  
This plant is native to South Africa and can be found in the Cap de Creus Natural Park. It is a small, perennial herb with a single stem and small, opposite leaves. The flowers are small and tubular, with a long corolla. The plant is found in the coastal area of north-eastern Catalunya, specifically in the Cap de Creus Natural Park.



**Issues**  
The big and bright colored flowers of the Cat's claw are a very attractive element for visitors to the park. However, the plant is a very invasive species, which can cause serious damage to the conservation of plant biodiversity on Mediterranean sea cliffs. The plant is found in the coastal area of north-eastern Catalunya, specifically in the Cap de Creus Natural Park.

## Prickly pear cactus (Opuntia maxima)

**Characteristics**  
The prickly pear cactus is a shrub with fleshy, spiny, rounded stems covered with thorns. The plant can reproduce asexually in the fragments that separate from the mother plant. The plant is found in the coastal area of north-eastern Catalunya, specifically in the Cap de Creus Natural Park.

**Distribution**  
This plant is native to Central America. It is found in the Cap de Creus Natural Park. It is a small, perennial herb with a single stem and small, opposite leaves. The flowers are small and tubular, with a long corolla. The plant is found in the coastal area of north-eastern Catalunya, specifically in the Cap de Creus Natural Park.



**Issues**  
The prickly pear cactus is a very invasive species, which can cause serious damage to the conservation of plant biodiversity on Mediterranean sea cliffs. The plant is found in the coastal area of north-eastern Catalunya, specifically in the Cap de Creus Natural Park.

## Gazania (Gazania rigens)

**Characteristics**  
It is a low-growing herb that grows on sandy soils, at ground level, and reaches a height of 20-30 cm. The plant has opposite leaves and small, tubular flowers. The plant is found in the coastal area of north-eastern Catalunya, specifically in the Cap de Creus Natural Park.

**Distribution**  
It is a species of herbaceous plant from South Africa and Mozambique. It is found in the Cap de Creus Natural Park. It is a small, perennial herb with a single stem and small, opposite leaves. The flowers are small and tubular, with a long corolla. The plant is found in the coastal area of north-eastern Catalunya, specifically in the Cap de Creus Natural Park.



**Issues**  
The Gazania is a very invasive species, which can cause serious damage to the conservation of plant biodiversity on Mediterranean sea cliffs. The plant is found in the coastal area of north-eastern Catalunya, specifically in the Cap de Creus Natural Park.

Exposición de Photo G.C.

European paper map

This map provides details of the entire range of Cap de Creus, from the National Park to the coast, where the most invasive species are found.

LIFE medCLIFFS project

LIFE medCLIFFS project

LIFE medCLIFFS project

LIFE medCLIFFS project

Parc Natural de Cap de Creus

Associació la Sorollona



# Gestió de plantes invasores als penya- segats mediterranis de la Costa Brava

## El projecte LIFE medCLIFFS

### Què és?

Es un projecte de conservació de la natura que forma part del programa LIFE de la Unió Europea i que es desenvolupa a l'illa de l'Estret del nord de Catalunya, concretament a la Costa Brava i al Parc Natural de Cap de Creus.

### Quins objectius té?

L'objectiu principal del projecte LIFE medCLIFFS és recuperar la gestió natural de les roques de penya-segats mediterrànies que són habitatges de plantes penya-segats mediterrànies. En aquesta iniciativa s'han seleccionat tres penya-segats amb diferents tipus de roques i s'han establert zones de gestió natural de les roques de penya-segats mediterrànies.

Per aconseguir aquest objectiu, se han establert tres zones de gestió natural de les roques de penya-segats mediterrànies: la zona de gestió natural de les roques de penya-segats mediterrànies, la zona de gestió natural de les roques de penya-segats mediterrànies i la zona de gestió natural de les roques de penya-segats mediterrànies.

1. Preservació de la biodiversitat de les roques de penya-segats mediterrànies i dels seus hàbitats.

2. Treball de manteniment de les roques de penya-segats mediterrànies per detectar i eliminar les plantes invasores i les plantes exòtiques.

3. Afavorir la gestió de les roques de penya-segats mediterrànies i la gestió de les roques de penya-segats mediterrànies.

4. Controlar i prevenir l'entrada de les plantes invasores i les plantes exòtiques a Cap de Creus.

## Els penya-segats i els endemismes de Cap de Creus

Les roques de penya-segats mediterrànies són un tipus de roques que són molt rars i que són molt importants per a la biodiversitat de les roques de penya-segats mediterrànies. En aquesta iniciativa s'han seleccionat tres penya-segats amb diferents tipus de roques i s'han establert zones de gestió natural de les roques de penya-segats mediterrànies.

Endemisme de Cap de Creus

Endemisme de Cap de Creus

## Ungla de gat (*Carpobrotus edulis*)

El *Carpobrotus edulis* és una planta invasora que creix molt ràpidament i que pot arribar a cobrir tota la superfície de les roques de penya-segats mediterrànies.



El *Carpobrotus edulis* és una planta invasora que creix molt ràpidament i que pot arribar a cobrir tota la superfície de les roques de penya-segats mediterrànies.

## Figuera de moro (*Opuntia maxima*)

La *Opuntia maxima* és una planta invasora que creix molt ràpidament i que pot arribar a cobrir tota la superfície de les roques de penya-segats mediterrànies.



La *Opuntia maxima* és una planta invasora que creix molt ràpidament i que pot arribar a cobrir tota la superfície de les roques de penya-segats mediterrànies.

## Gazània (*Gazania rigens*)

La *Gazania rigens* és una planta invasora que creix molt ràpidament i que pot arribar a cobrir tota la superfície de les roques de penya-segats mediterrànies.

La *Gazania rigens* és una planta invasora que creix molt ràpidament i que pot arribar a cobrir tota la superfície de les roques de penya-segats mediterrànies.



**ENVIRONMENTAL  
EDUCATION**



*Associació la Sorellona*

**GUIDED FIELD VISITS**

**Engagement to the Observers and Volunteering networks**

**ALERTA FLORA INVASORA (Invasive Flora Alert)**

- 12-16 years old
- 4 hours
- Route along several LIFE medCLIFFS transects
- Participants alert on the invasive species and register the observations using the iNaturalist tools.

**DESCOBERTA DELS PENYA-SEGATS LITORALS (Discovering coastal cliffs)**

- Families and adults
- 3 hours
- Circular route along the coastal cliffs
- Natural & landscape values, native & endemic species, pressures & threats, what can we do to protect them.



ENVIRONMENTAL  
EDUCATION



*Associació la Sorellona*

**COLLABORATIVE BOARD GAMES**

INVASORA A LA VISTA (Invasive Alert)

TEMPS DE MEDCLIFFS (medCLIFFS time)

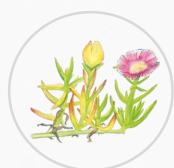
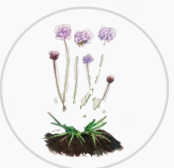
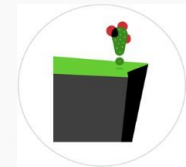
PENYA-SEGATS AMENAÇATS (Threatened cliffs)

INVASOREScide (Invasivescide)



## INVASORA A LA VISTA (Invasive Alert)

- 3-6 years old
- 30-50 min
- All participants together (up to 25 people).
- Participants locate the LIFE medCLIFFS piece in the world map and the plants pieces (native and invasive species) in the cliff magnetised playing board. Participants take a piece of the cliffs and must locate the piece in the world map board, identifying its place of origin.





## TEMPS DE MEDCLIFFS (Medcliffs time)

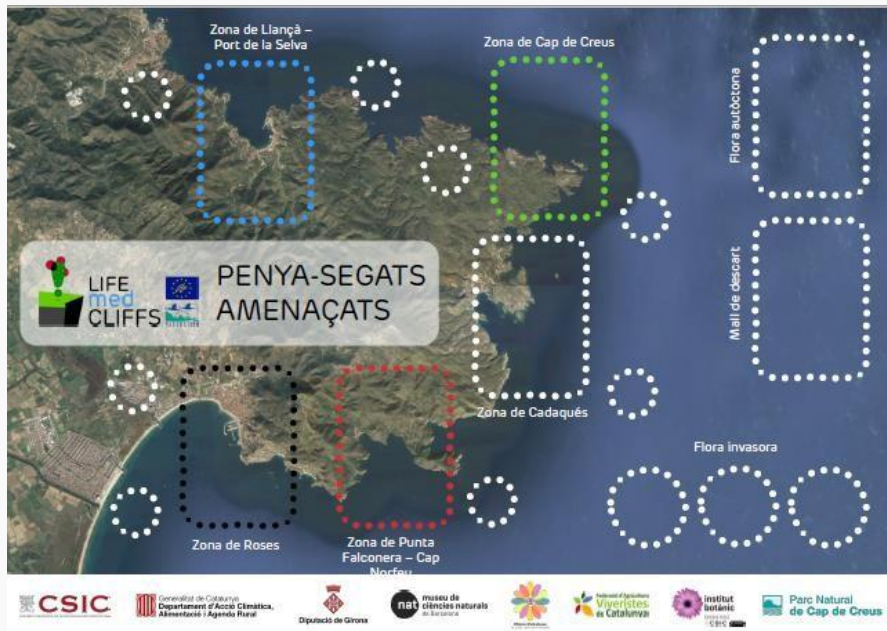
- 6-10 years old and families / all ages
- 45-90 min
- 2 teams of 8-10 people. One team defines the concept of a card, which is guessed by the other team. The team with the most cards guessed wins.
- Three rounds to discover each concept (30 sec/round):
  - 1<sup>st</sup> round - one sentence without using any similar word
  - 2<sup>nd</sup> round - one word
  - 3<sup>rd</sup> round - mimicry





## PENYA-SEGATS AMENAÇATS (Threatened cliffs)

- 8-12 years old
- 90 min
- 5 participants. Players are the volunteers in charge of restoring 5 different areas in Cap de Creus that are affected by IAPS, by forming “families” of native flora. In each round, each player has different options to act in favour of native species and habitat and against the invasives. Participants must play collaboratively in order to get the maximum number of “families” of native species completed.





### INVASOREScide (INVASIVEScide)

- 12-16 years old
- 120 min
- 6 players
- The objective is to avoid the progression of IAPS from the gardens to the cliff.
- First of all the board has to be prepared, locating the cards of invasive species and the pieces of native plants using the eight-sided dices.
- Each player is a volunteer that has a particular gift and can use some tools against IAPS in each turn.
- There are also turns for the invasive species: propagation or new occurrence.





# XV ENCONTRO REGIONAL DE EDUCAÇÃO AMBIENTAL

## Figuretes de voluntaris



## Targetes d'identificació dels voluntaris



# XV ENCONTRO REGIONAL DE EDUCAÇÃO AMBIENTAL







# THANK YOU!

**#LIFEmedCLIFFS #costalliuredinvasores #joconservoelshabitats  
#LIFEProgramme #LIFEProject**

**[WWW.LIFEMEDCLIFFS.ORG](http://WWW.LIFEMEDCLIFFS.ORG)**



@LIFEmedCLIFFS



@life\_medcliffs



@LIFE\_medCLIFFS



# LET'S PLAY!

