



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

Arnau Bosch-Guiu

Conferenza finale

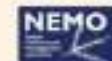
Isola del Giglio 23,24 Ottobre 2024



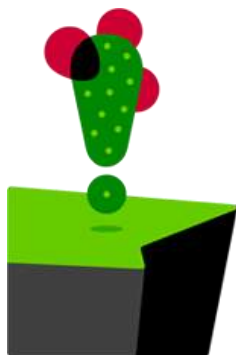
Project co-financed with
ERDF through the Italian Ministry of
Regional Development



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LIFE
med
CLIFFS



**LIFE
med
CLIFFS**



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

6 PARTNERS
Research
Government
Productive sector
Civil society

COORDINATING BENEFICIARY:



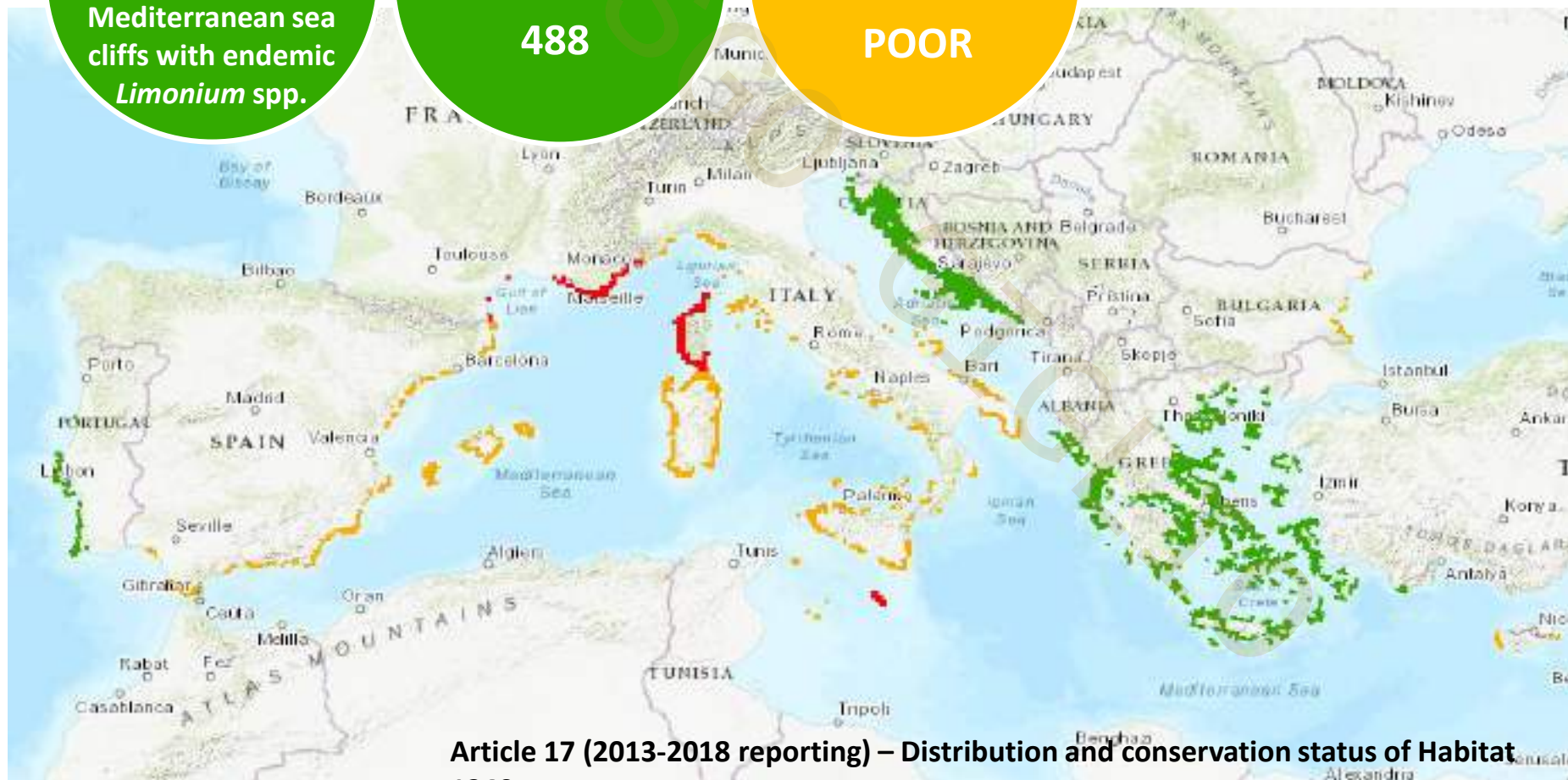
ASSOCIATED BENEFICIARIES:



**HABITAT OF
COMMUNITY
INTEREST**
1240 - Vegetated
Mediterranean sea
cliffs with endemic
Limonium spp.

Natura 2000 sites
488

**Conservation status
EU**
POOR

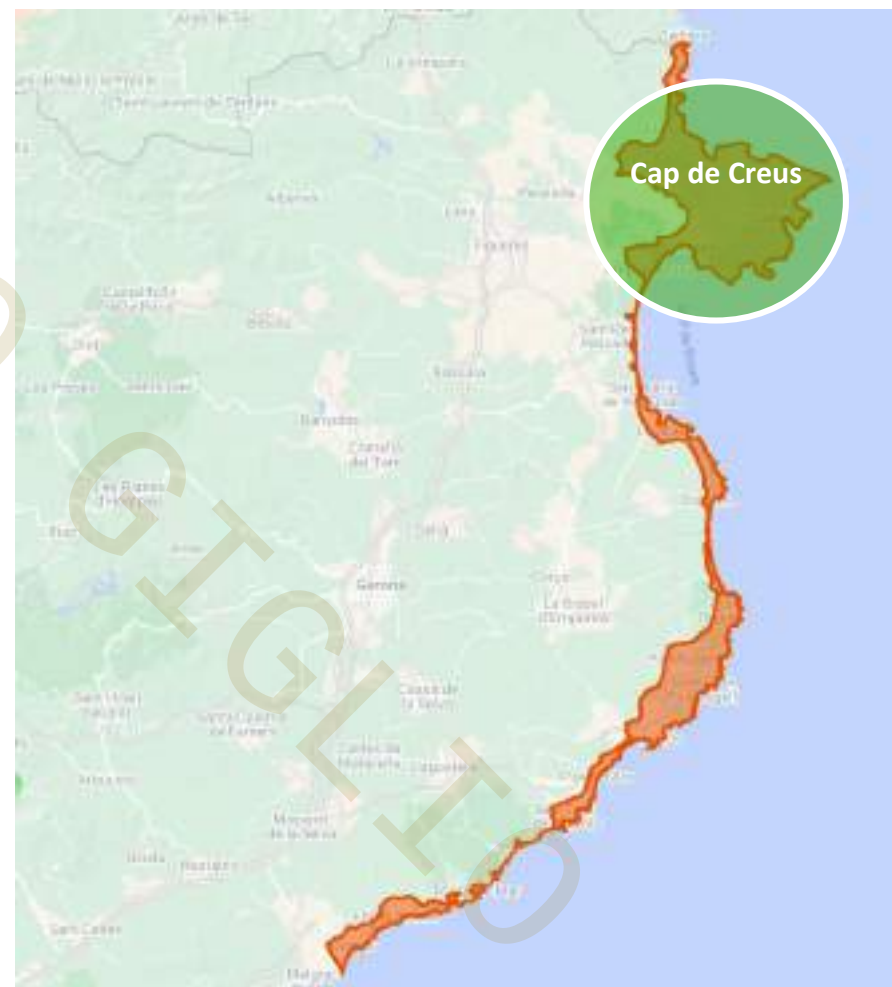


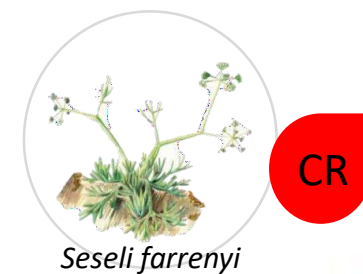
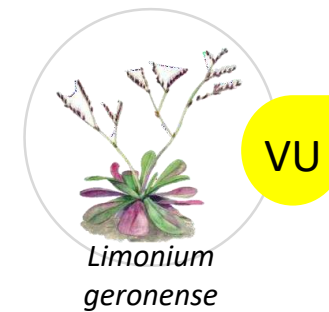
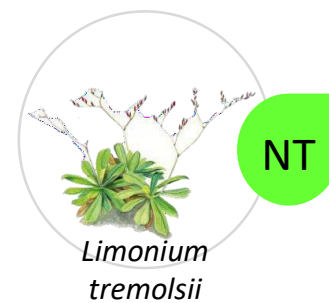
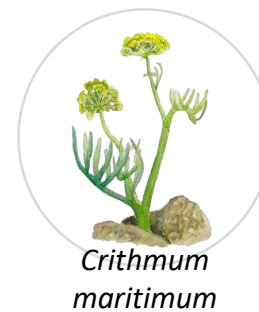
Article 17 (2013-2018 reporting) – Distribution and conservation status of Habitat 1240





Map of HCI1240 in Costa Brava







• *Opuntia ficus-indica*



• *Limonium tremolsii* NT





• *Carpobrotus* sp.

• *Limonium geronense* VU





• *Gazania rigens*

• *Sesseli farrenyi* CR

One of the most threatened plants
in Catalonia







PREVENTION



IAPS COLLABORATIVE WORKING GROUP

Multisector: producers & users

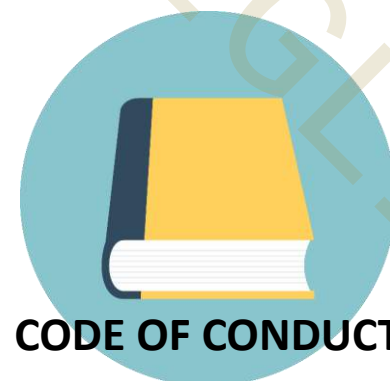
Multidisciplinary: administration, managers, research & academia,
botanical gardens, plant nurseries, landscape gardeners



CONSENSUS LIST

WATCH LIST

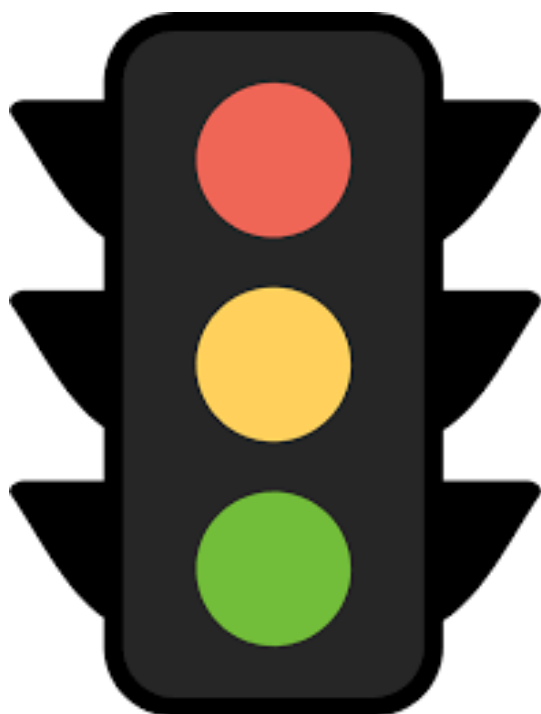
WHITE LIST



CODE OF CONDUCT



Prevention: Work done



CONSENSUS LIST



94 taxa

- Forbidden species by law
- Detected IAPS by researchers and regional government
- Interdisciplinary expert working group criteria

WATCH LIST



39 taxa

- Detected IAPS by researchers and regional government
- Interdisciplinary expert working group criteria

WHITE LIST



2250 taxa

- Interdisciplinary expert working group criteria



Prevention: Next steps

Short term

- Creation of a guide with **1-3 ornamental alternatives** to most commercialised IAPS
- Integration of lists and Code of Conduct into **governmental recommendations**
- Development of a **quality seal**

Long term

- Creation of a **Catalan catalogue of forbidden invasive alien plant species**



EARLY
DETECTION

Creation of two citizen science networks:

(1) LIFE medCLIFFS OBSERVERS NETWORK

(2) LIFE medCLIFFS VOLUNTEERING NETWORK



iNaturalist



nat

museu de
ciències naturals
de Barcelona



Flora Catalana

Viu, gaudeix i aprèn amb la nostra flora



Early detection: Observers Network

- General iNaturalist project – Captures observations of **183 species**



The image shows a screenshot of the iNaturalist website for a project titled "LIFE medCLIFFS - Xarxa d'Observadors". The header includes the iNaturalist logo, navigation links (Explora, Comunidad, Más), and a login/register button. The main banner features a coastal landscape with a cactus in the foreground. To the right of the banner, there is a green box with text in Catalan about invasive species and a link to "Acerca de". Below the banner, a summary bar displays statistics: 6.250 OBSERVACIONES, 112 ESPECIES, 363 IDENTIFICADORES, and 601 OBSERVADORES. A button labeled "Estadísticas" is also present.

iNaturalist Explora Comunidad Más Acceder o Crear una cuenta

LIFE medCLIFFS - Xarxa d'Observadors

Acerca de Miembros 112

Saber on creixen les espècies de plantes al·lòctones invasores és clau per conservar la flora autòctona dels penya-segats de la Costa Brava, bressol d'endemismes únics al món. Ens hi ajudes? LIFE medCLIFFS vol millorar la gestió actual de plantes al·lòctones invasores que amenacen la

[Conocer más >](#)

[Diario del proyecto](#)

6.250 OBSERVACIONES **112 ESPECIES** **363 IDENTIFICADORES** **601 OBSERVADORES**

[Estadísticas](#)

Early detection: Volunteers Network

- Limited iNaturalist project – Captures **33 species**
- **112 volunteers** monitor 1km of coast once per year
Out of **104 transects** → **101 adopted**
- Volunteers receive:
 - Online formation
 - In-person formation (botanical field trips)
 - Monitoring protocol
 - Supporting material
 - Feedback
- All observations are validated by our professional staff



Acting as a preventive action as well!



Early detection: Volunteers Network

- *Acacia dealbata*
- *Agave americana*
- *Ailanthus altissima*
- *Araujia sericifera*
- *Arundo donax*
- *Carpobrotus* sp.
- *Cenchrus longisetus*
- *Cenchrus setaceus*
- *Cylindropuntia pallida*
- *Delairea odorata*
- *Dimorphoteca eklonis*
- *Disphyma crassifolium*
- *D. floribundum*
- *Chenopodium nutans*
- *F. baldschuanica*
- *Gazania rigens*
- *Ipomoea indica*
- *Kalanchoe tubiflora*
- *Kalanchoe x houghtonii*
- *Lonicera japonica*
- *M. cordifolium*
- *Opuntia ficus-indica*
- *O. engelmannii*
- *O. stricta*
- *Oxalis pes-caprae*
- *Phyllostachys aurea*
- *Pittosporum tobira*
- *Senecio angulatus*
- *Senecio inaequidens*
- *Senecio pterosphorus*



Early detection: Volunteers Network



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

Codi de transecte: N38

Nom: Transsecte zona nord, número 38

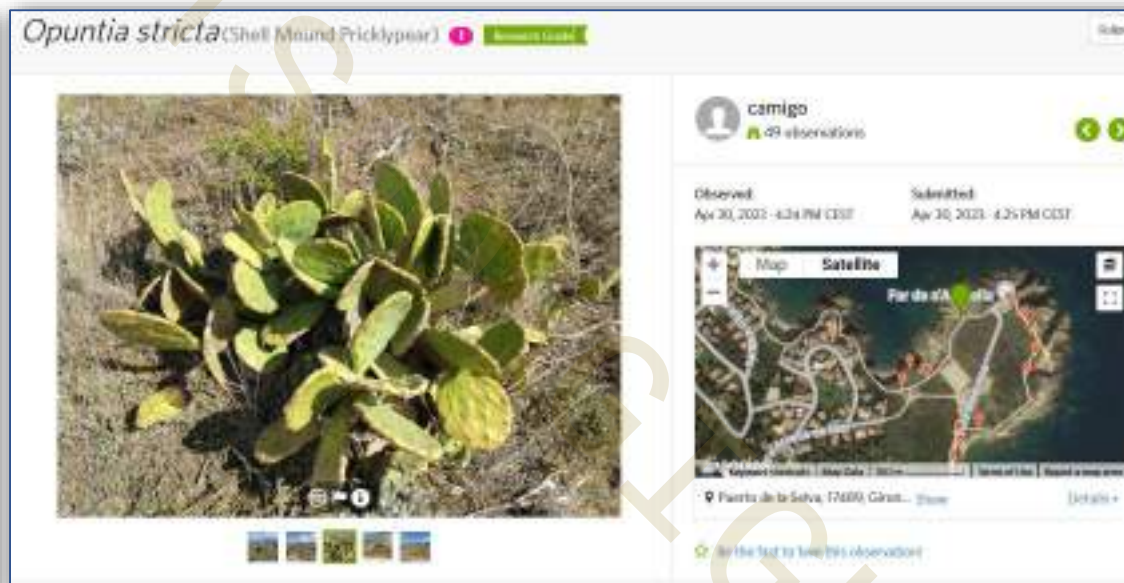
Disponibilitat: ASSIGNAT

Dificultat: BAIXA

Fitxer KML:  **N_38.kml**



Early detection: Volunteers Network



✓ Observation Fields (10)

Codi del transecte:
N38

Presència d'adults reproductors:
no

Presència d'adults senescents o morts:
no

Presència d'adults vegetatius:
si

Presència de Dactylopius opuntiae:
no

Presència de plantules/juvenils:
si

Validació:
si

Àrea (m2):
més de 20 m2

- Observations are associated with additional info provided by the volunteers
 - a. Transect
 - b. Developmental stage
 - c. Area





Spatial Risk Assessment of 16 IAPS

RESEARCH ARTICLE

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

Jens G. Froese¹ | Alan R. Pearce^{1,2} | Grant Hamilton¹



Software Note  **N-SDM: a high-performance computing pipeline for Nested Species Distribution Modelling**

Antoine Azis, Pierre-Louis Roy, Philipp Brun, Nathan Kitting, Fabian Popp, Florian Altmann, Olivier Broennimann, Anthony Lehmann, Blaise Petitpierre, Niklaus E. Zimmermann ... [See all authors](#)

First published: 06 April 2023 | <https://doi.org/10.1111/ecog.05540> | Citation: B



Ecography 36: 872–878, 2012
doi: 10.1111/j.1600-0587.2011.02666.x
© 2012 The Authors. Ecography © 2012 Nordic Society Oikos
Subject Editor: Bengt Rydgren, Accepted 11 May 2012

The MIGCLIM R package – seamless integration of dispersal constraints into projections of species distribution models

Robin Engler, Wim Hantelt and Antoine Guisan

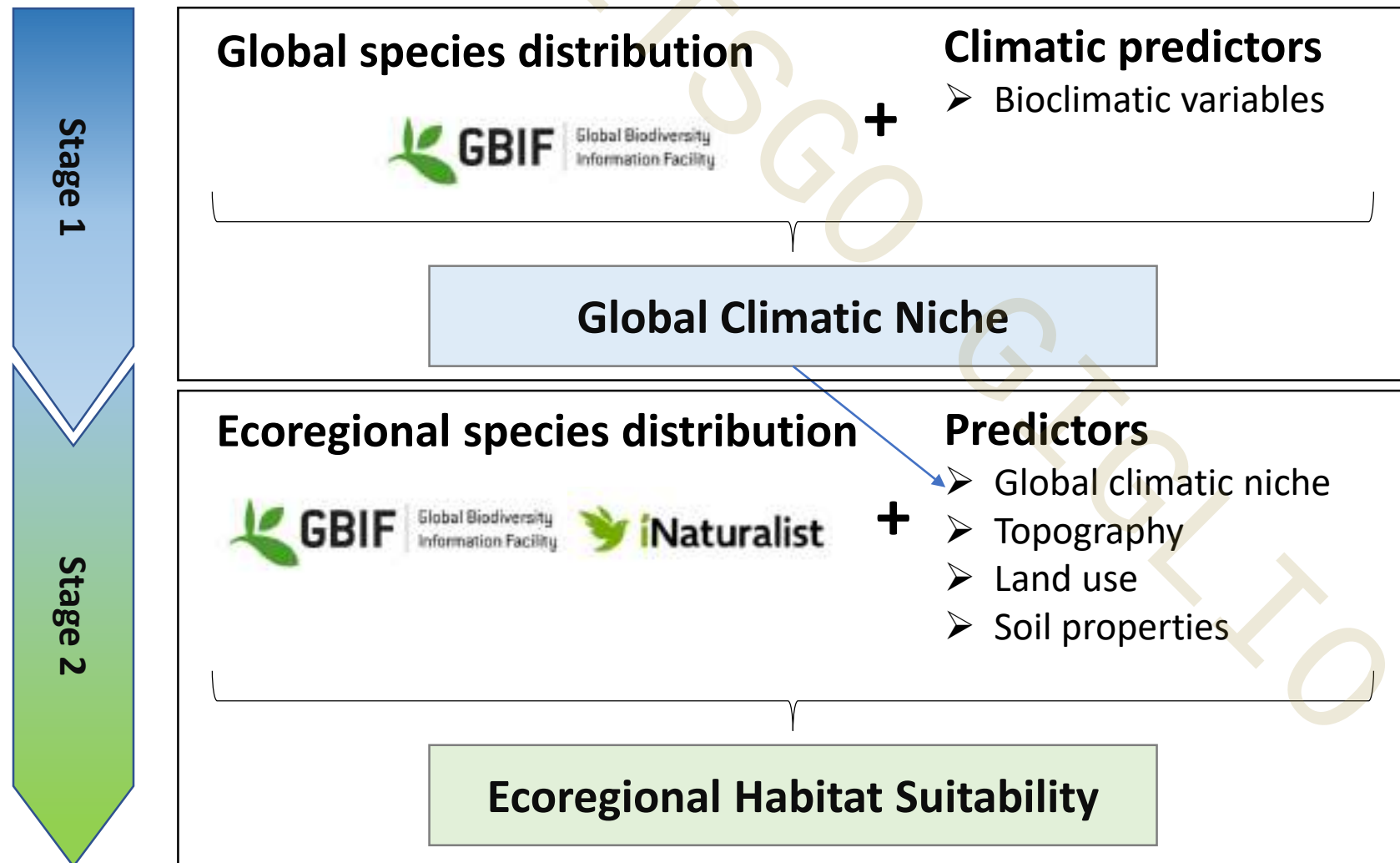
R. Engler (robin.engler@gmail.com), W. Hantelt and A. Guisan, Dept of Ecology and Evolution, Univ of Lausanne, CH-1015 Lausanne, Switzerland

Mechanistic models

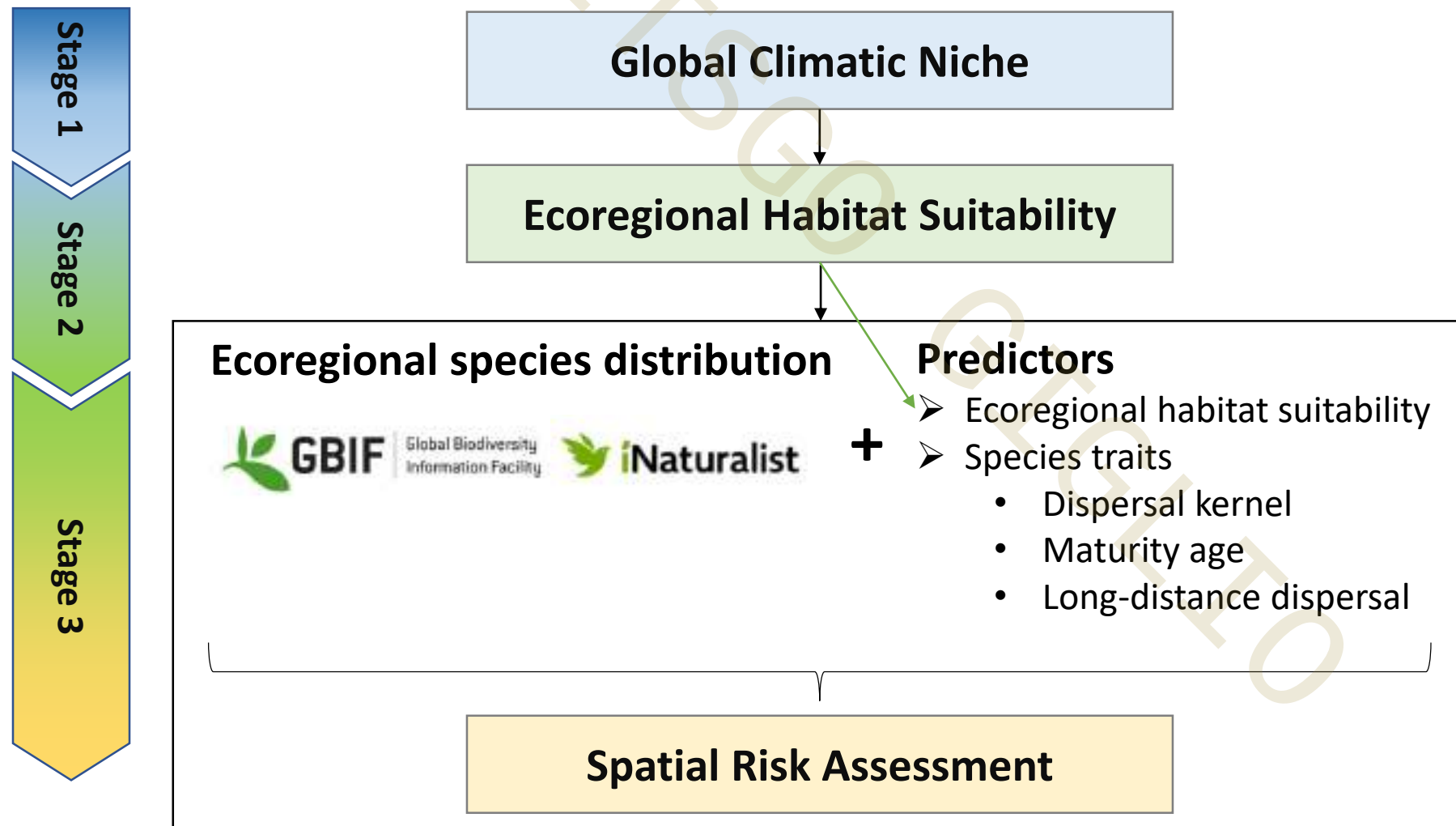
Correlative models



Rapid response: Hierarchical framework



Rapid response: Hierarchical framework





PUBLIC AREAS



Diputació de Girona



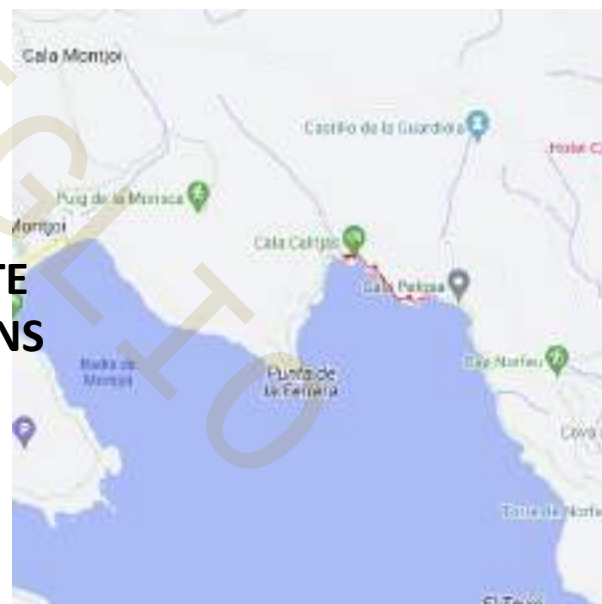
**Generalitat de Catalunya
Departament d'Acció Climàtica,
Alimentació i Agenda Rural**



**Parc Natural
de Cap de Creus**



**PRIVATE
GARDENS**



Eradication: Target species



Opuntia ficus-indica



Opuntia stricta



Carpobrotus aff. acinaciformis

Carpobrotus edulis

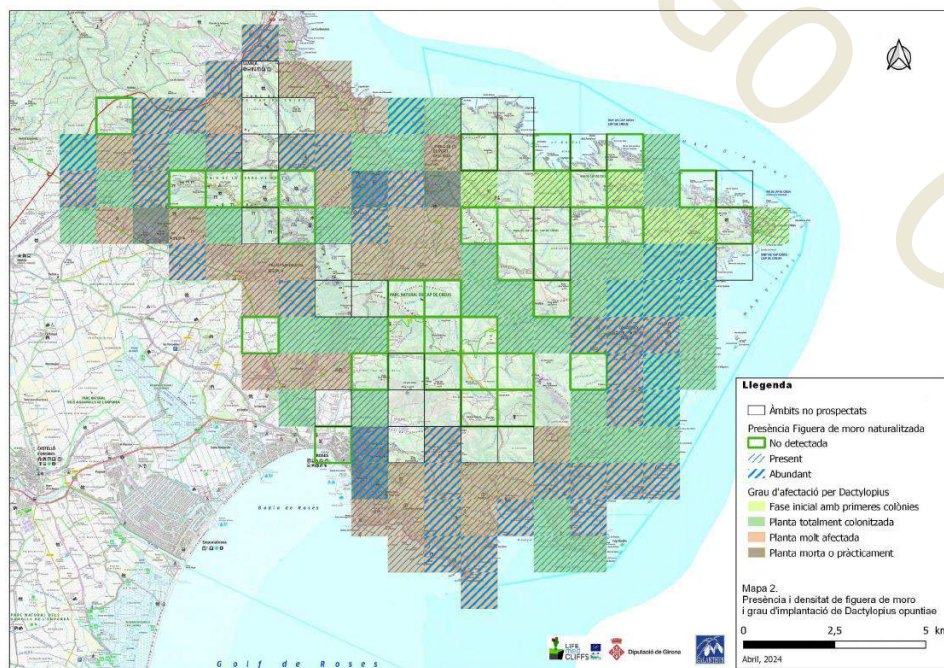


Gazania rigens



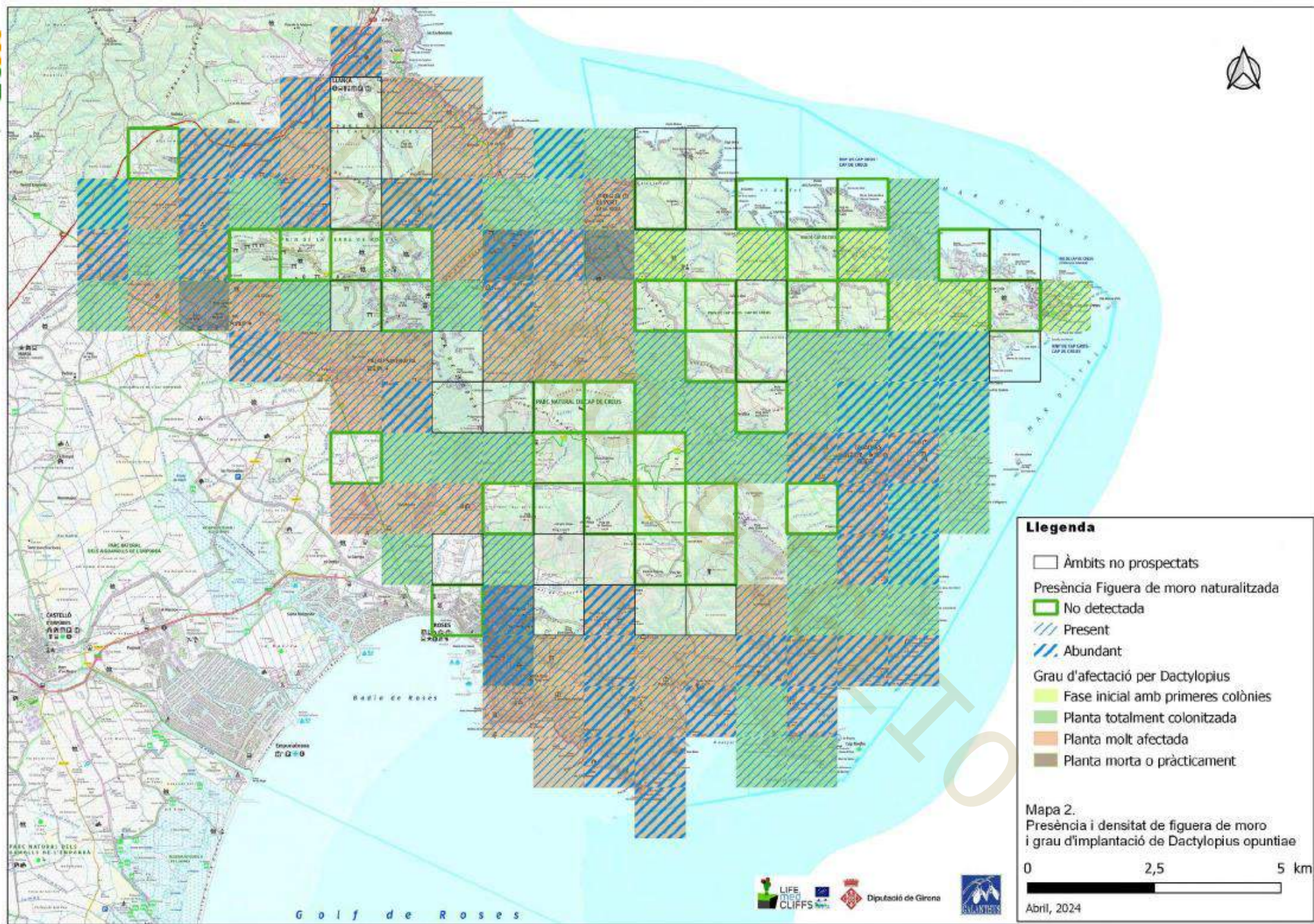
Eradication: *Opuntia* spp.

- **Biological treatment**
 - Accelerating the dispersal of *Dactylopius opuntiae*



- **Chemical treatment** in sensible areas (natural reserve)





Eradication: *Carpobrotus* sp.

- **Manual treatment**
 - Horizontal works
 - Vertical works



Eradication: *Gazania rigens*

- **Chemical treatment**
 - Glyphosate at low concentrations
 - Manual removal afterwards



It did not work ☹️



- Considering other Asteraceae specific herbicide?



Additional info: *Agave americana*

- We got *Scyphophorus acupunctatus* without any effort/cost!



Eradication: Private gardens



Eradication: Private gardens

- 167 surveyed properties



- 95 identified properties with IAPS inside the Natural Park



- 86 contacted successfully

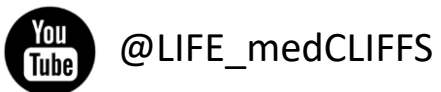
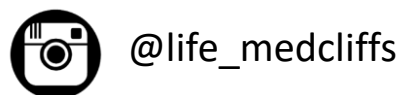


- 49 signed – 19 showed willingness to sign – 4 refused completely





THANK YOU!



WWW.LIFEMEDCLIFFS.ORG

