UNIVERSITÀ degli STUDI di CATANIA | ORTO BOTANICO

INVASIVE ALIEN SPECIE IN THE MEDITERRANEAN ISLANDS: THE CARE-MEDIFLORA PROJECT

2nd Mediterranean Plant Conservation Week

Session 2 - *In situ* plant species conservation: technical aspects, methodology and monitoring

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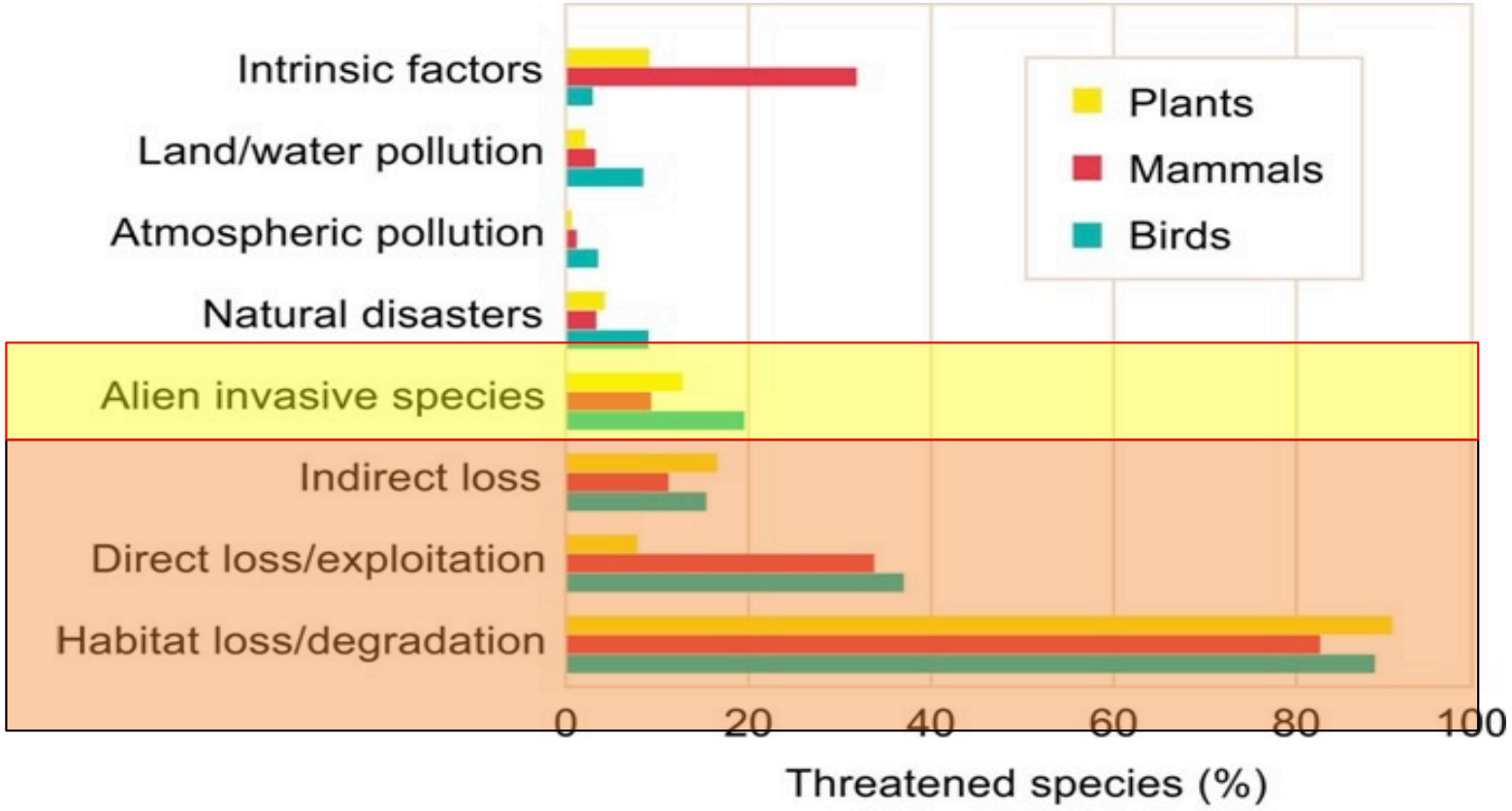
CARE MEDIFLORA

IUCN

A major threat to biodiversity Invasive Alien Species



- *Invasion by AS of new territories is a phenomenon of global importance*
- *IAS, as one of the greatest drivers of biodiversity loss, pose a severe threat to ecosystem integrity and function*

GLOBALIZATION and EXPANSION OF HUMAN POPULATIONS

what are Invasive Alien Species

AS, often referred to as non native, non indigenous or exotic species, are plants, animals, fungi and micro-organisms that have been transported unintentionally or intentionally across ecological barriers and have **established themselves in areas outside their natural range**

Not all alien species are harmful, but many can become aggressively invasive, spreading rapidly across the natural environment, interacting with native species and **posing threats to native ecosystems**

How many Invasive Alien Species

4.979 in 2016 (after RBG Kew. 2016. The State of the World's Plants Report. Royal Botanic Gardens, Kew)

6.075 in 2017 (after Willis, K.J. (ed.) 2017. State of the World's Plants Report. Royal Botanic Gardens, Kew)

Main features Invasive Alien Species

- *Rapid reproduction and growth*

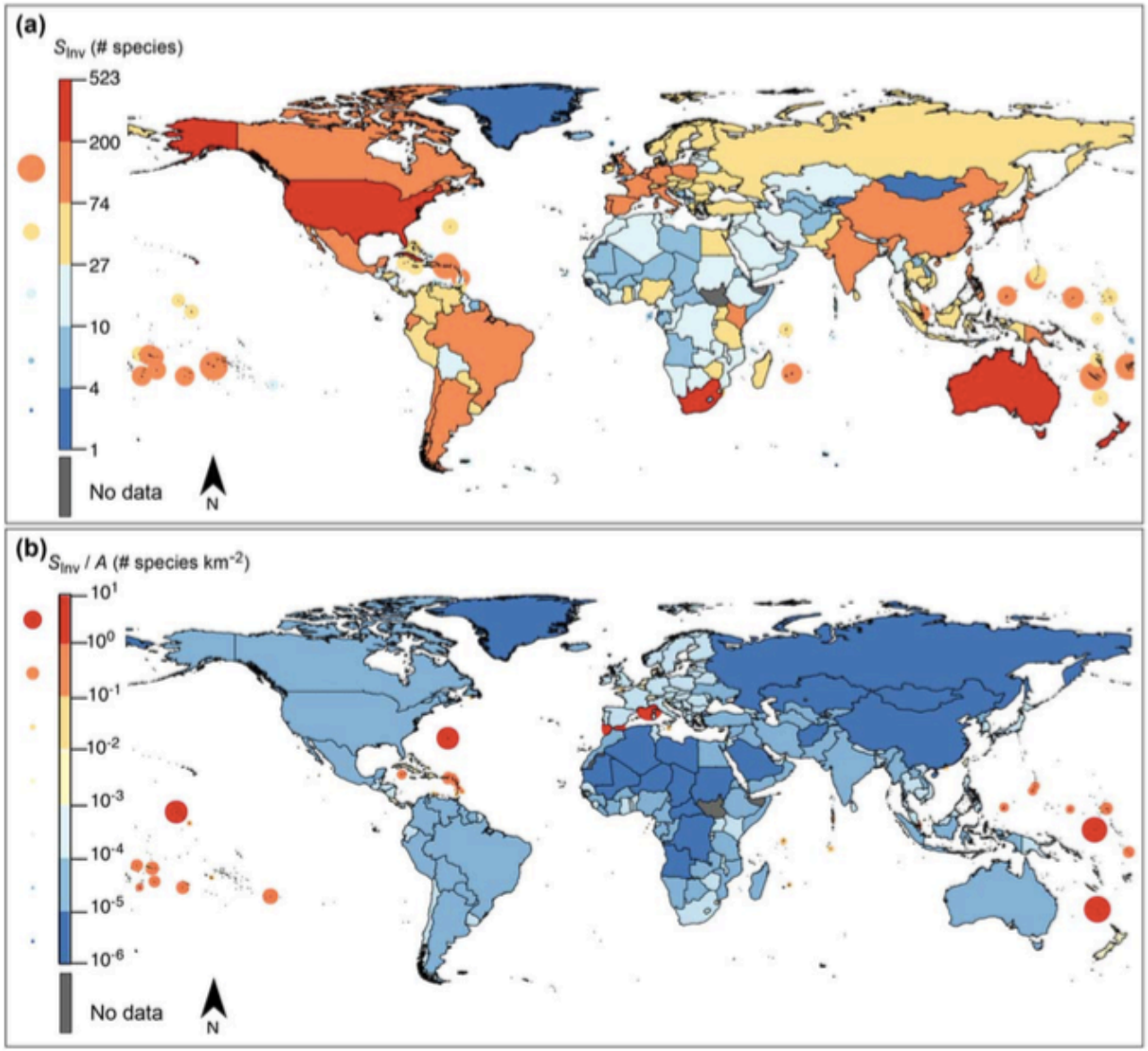
- *High dispersal ability (ability to move from one place to another)*
- *Ability to adapt physiologically to new conditions*

- *Ability to survive in a wide range of environmental conditions*

For becoming a "good" invader, a species must follow three steps: introduction, establishment and spread

…luckily invasion is linked to a series of low-probability events, whose occurrence is enhanced in disturbed habitats (e.g. urban areas, coastal areas, river banks, etc.)

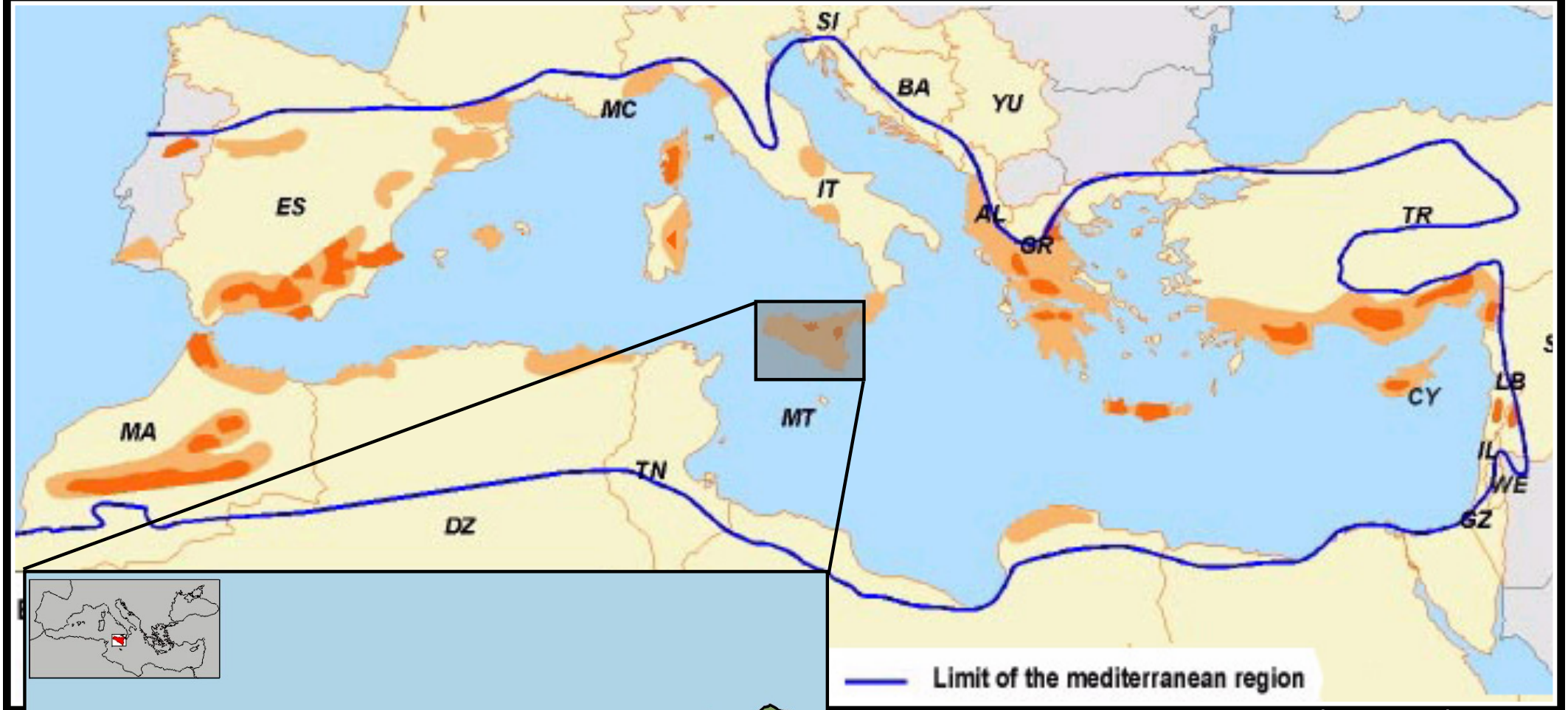
Mapping the global state Invasive Alien Species



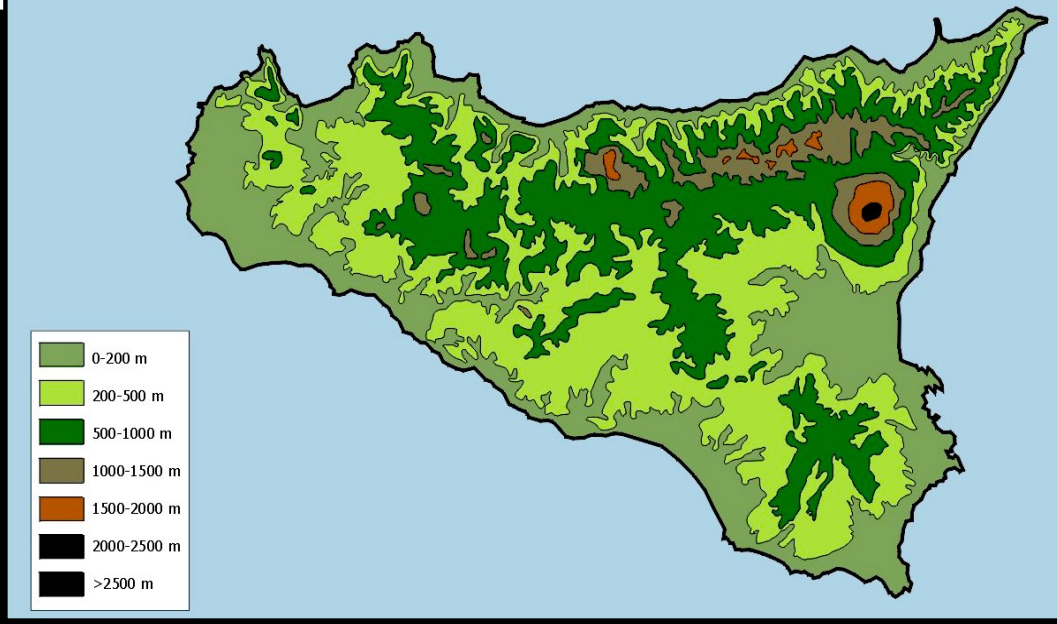
[*after Turbelin et al. (2017*]

Geological, geophysical and climatic factors made the Mediterranean one of the most biodiverse region of the world. The same factors (geological, climatic and human) have facilitated, in combination with the volume, intensity and range of human activities, biological invasions, thus making the Mediterranean, with its geographical specificities, exceptionally susceptible to invasions by plants.

Human-induced habitat modifications over the last century accelerated this process, and the impacts of invasive species have been significantly enhanced



[*after Médail & Quézel 1997*]



25.832 Km²; higher elevation 3.340 m a.s.l.; >5.400.000 inhabitants, etc.

- ~ 3.250 vascular plants
- ~ 400 endemics
- ~ 680 plant communities

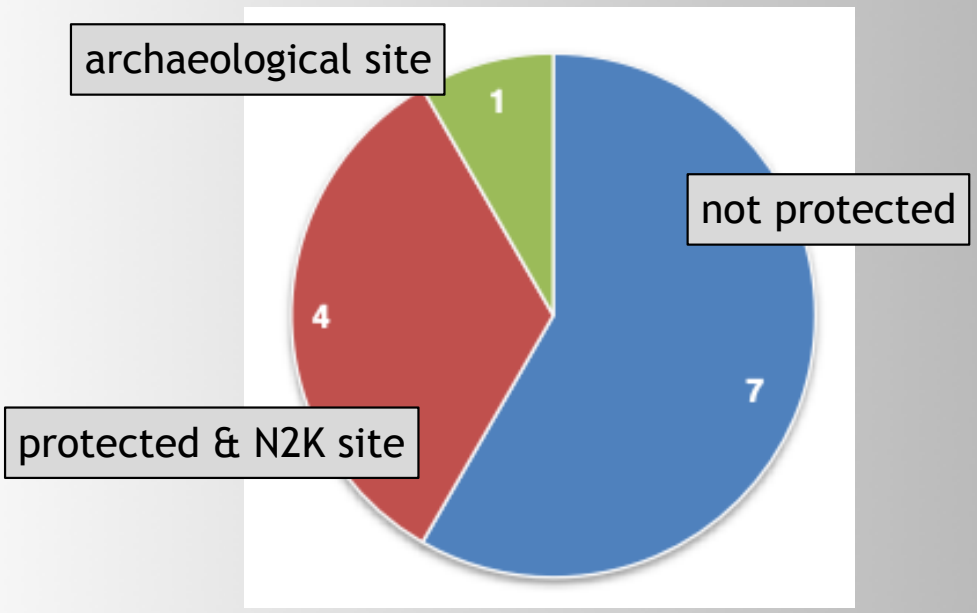
Mediterranean Islands and CARE-MEDIFLORA project

	FAMILY	TAXON	LIFE FORM	ORIGIN
1	Poaceae	*Paspalum distichum*	Hemycryptophyte	America
2	Berberidaceae	*Mahonia aquifolium*	Chamephyte	NW America
3	Fagaceae	*Quercus rubra*	Phanerophyte	NE America
4	Pinaceae	*Pinus sp. pl.*	Phanerophyte	-
5	Pinaceae	*Abies sp. pl.*	Phanerophyte	-
6	Fabaceae	*Acacia saligna*	Phanerophyte	SW Australia
7	Cactaceae	*Opuntia ficus-indica*	Phanerophyte	Tropical America
8	Aizoaceae	*Carpobrotus edulis*	Hemycryptophyte	South Africa
9	Asteraceae	*Cirsium arvense*	Geophyte	Throughout Europe
10	Cactaceae	*Opuntia maxima*	Nanophanerophyte	America
11	Cactaceae	*Opuntia ammophila*	Nanophanerophyte	America
12	Cactaceae	*Opuntia subulata*	Nanophanerophyte	America
13	Verbenaceae	*Lantana camara*	Nanophanerophyte	America

	HABITAT
1	temporary ponds
2	riparian woods
3	hygrophilous scrubland along mountain streams
4	rocky coastal area
5	sandy coastal area
6	abandoned fields & tree orchards
7	roadside

No. of action(s)	ALTITUDINAL RANGE (m a.s.l.)
8	0-100
3	300-700
1	1600-1700

Mediterranean Islands and CARE-MEDIFLORA project

where…	
when…	**from July 2017 until October 2018**
how…	**manually (or chemically in 1 case) …on ca. 35.000 sqm**

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why…

	FAMILY	TAXON	ACTION	IUCN	DISTRIBUTION	ISLAND
1	Elatinaceae	*Elatine brochonii* Clavaud	increasing the area	VU	w	Corse
2	Rhamnaceae	*Rhamnus persicifolia*	translocation (new population)	EN	narrow endemic	Sardinia
3	Asteraceae	*Centaurea magistrorum*	increasing the area & fencing	CR	narrow endemic	Sardinia
4	Asteraceae	*Tripolium pannonicum*	translocation (new population)	DD	w	Sicily
5	Caryophyllaceae	*Dianthus rupicola* subsp. *rupicola*	translocation (new population) & fencing	LC	narrow endemic	Sicily
6	Plumbaginaceae	*Limonium creticum*	translocation (new population) & fencing	DD	narrow endemic	Crete
7	Resedaceae	*Reseda minoica*	increasing the area & fencing	DD	w	Crete
8	Fabaceae	*Astragalus suberosus*	translocation (new population)	EN	w	Cyprus
9	Asteraceae	*Anthemis tomentosa*	increasing the area	EN	w	Cyprus
10	Brassicacae	*Maresia nana* var. *glabra*	population reinforcement	CR	narrow endemic	Cyprus
11	Asteraceae	*Crypsis hadjikyriakou*	translocation (new population)	CR	narrow endemic	Cyprus
12	Ranunculaceae	*Ranunculus bullatus*	translocation (new population)	VU	w	Mallorca

replacing…

Before…

…and after eradication

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monitoring …

mid- and long-term monitoring plans

- *Alien plant distribution (distribution maps, photos, etc.)*
- *Alien plant control measures implemented & success rate achieved (e.g. resprouting, seed bank IAS, etc..)*
- *Evaluate presence/abundance of target species (in case of combined actions, e.g. translocations, increasing the area for, etc.)*
- *Evaluate re-vegetated areas (in case of combined natural vegetation restoration actions) in order to detect and quantify the development of other species (e.g. transects, phytosociologal relevés, etc.)*

Mediterranean Islands and CARE-MEDIFLORA project

Train, inform and communicate…

- *local experiences shared among partners*
- *Involving of local authorities and protected area managers*
- *Increase public awareness and education*

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Conclusive remarks…

- *reduction/disappear (local) of habitats*
- *habitat alteration (e.g. soil properties, plant hybridization, pests, vegetation structure, species composition, endemic species, etc.)*
- *human health*
- *economy*

- **PREVENTING NEW INVASIONS**
- **EARLY DETECTION OF NEW INVADERS (CITIZEN SCIENCE?)**
- **RAPID RESPONSE TO NEW INVADERS**
- **CLOSER COLLABORATION BETWEEN INSTITUTIONS AND ORGANISATIONS WORKING WITH IAS**
- **SCIENTIFICALLY-BASED RESEARCHES, INCLUDING LONG-TERM MONITORING PLAN FOR EVALUATING SUCCESS**
- **MORE EFFECTIVE EXCHANGE OF RESEARCH FINDINGS AND PRACTICAL EXPERIENCES BETWEEN SCIENTISTS AND EXPERTS WHO ARE MANAGING NATURAL AREAS AND IMPLEMENTING INTERVENTIONS, TO REDUCE THE GAP BETWEEN KNOWING AND DOING**

nature COMMUNICATIONS

ARTICLE

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Global threats fr
twenty-first cent
capacities

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Thanks for your attention…