

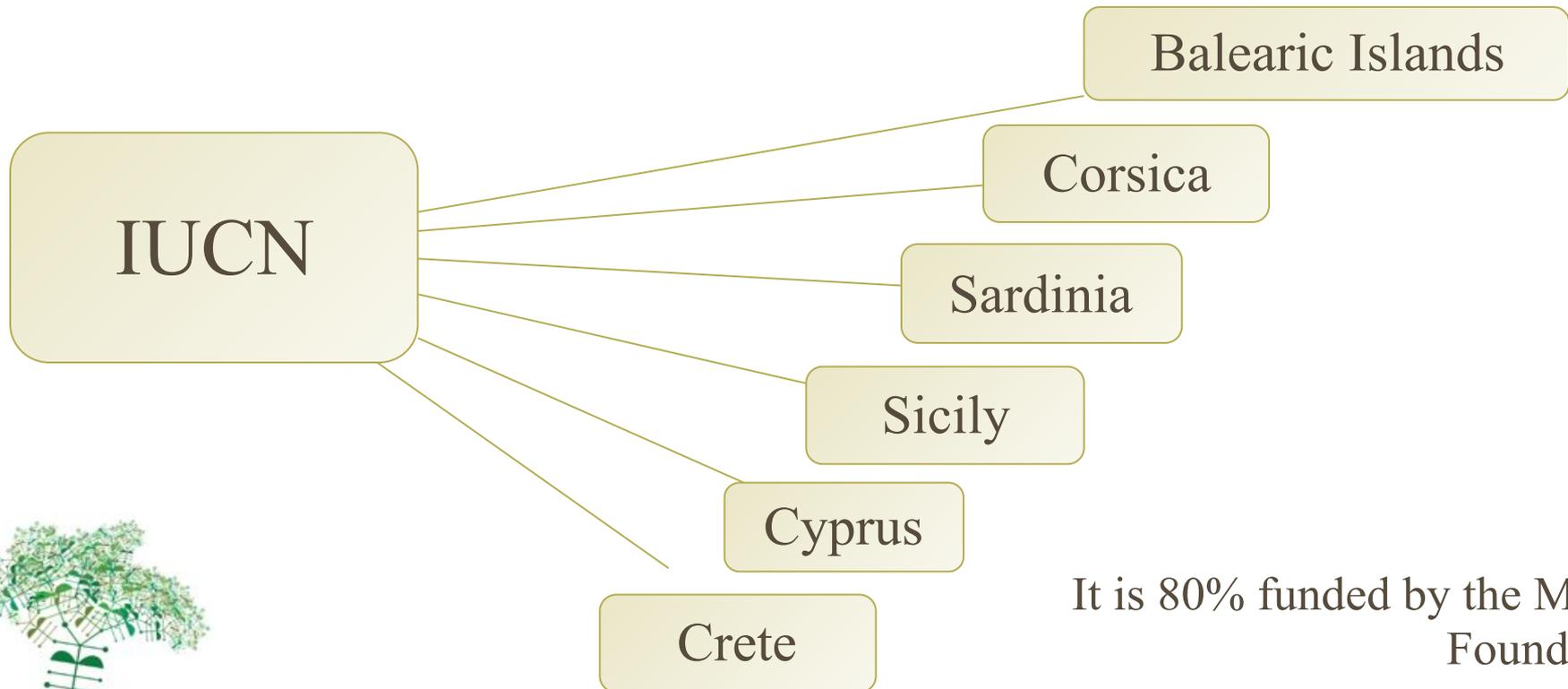
# **THE PROJECT CAREMEDIFLORA: CONSERVATION ACTIONS FOR RARE AND ENDANGERED ISLAND MEDITERRANEAN FLORA**

Gianluigi Bacchetta, Donatella Cogoni, Giuseppe Fenu, Cristini  
Fournaraki, Gianpietro Giusso, Panogiota Gotsiou, Angelos Kyratzis,  
Charalambos S. Christodoulou, Carole Piazza, Magdalena Vicens, Bertrand de Montmollin



1st Mediterranean Plant Conservation Week  
“Building a regional network to conserve plants and cultural diversity”  
Ulcinj (Montenegro) – 24-29 October 2016

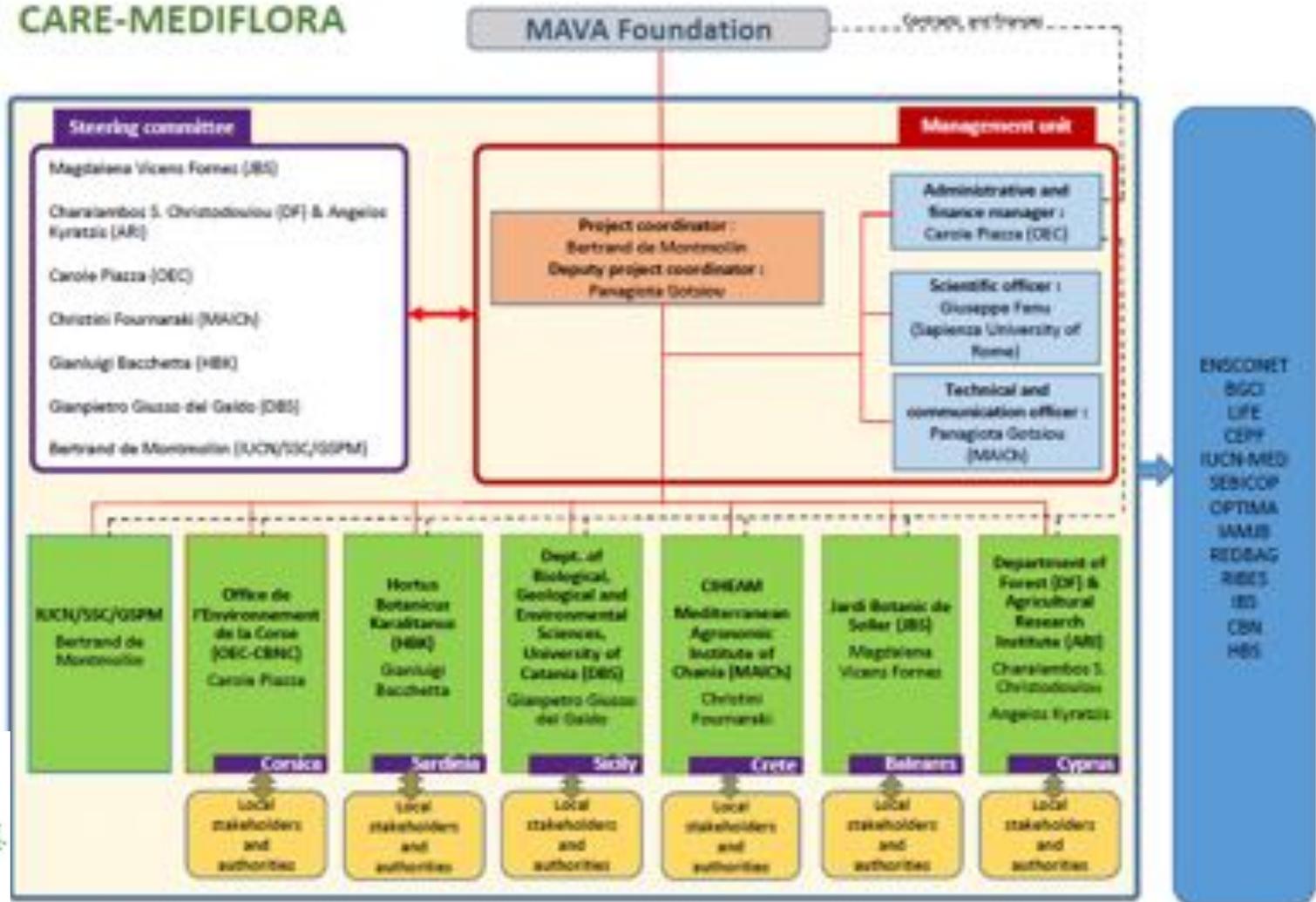
**CARE-MEDIFLORA**, "*Conservation Actions for Threatened Mediterranean Island Flora: ex situ and in situ joint actions*", is a project implemented by institutions of six Mediterranean islands and the IUCN/SSC Mediterranean Plant Specialist Group.



It is 80% funded by the MAVA  
Foundation



## CARE-MEDIFLORA



## The Partners



### **Mediterranean Plant Specialist Group (IUCN/SSC)**

It is responsible for the project.

It was formed in 1995, and it currently includes 62 members.

Its objectives are to evaluate and monitor changes in Mediterranean plant diversity and to establish, co-ordinate and implement conservation Action Plans and to promote sustainable conservation of plants and their habitats among decision makers and the public.

# The Partners



## **Sóller Botanical Garden Foundation (JBS)**

It is responsible for all actions in the Balearic Islands.



JBS is a Foundation dedicated to the conservation of Balearic Islands flora, research in conservation biology and education.

JBS works close to the Balearic Government in the in situ plant conservation plant programmes.

A Seedbank was established in 1989 to improve the integrated in situ-ex situ conservation plans of Balearic flora.

The Herbarium hosts two historical collections (Bonafe and Bianor) and the modern collection since the 1980s.

The Botanic Garden was founded in 1984. It hosts the biggest and the most complete living plant collection of the Balearic Islands.

# The Partners



Conservatoire Botanique National



## **Office of the Environment of Corsica (OEC) – Conservatoire Botanique Nationale de Corsica (CBNC)**

It is responsible for all actions in Corsica.

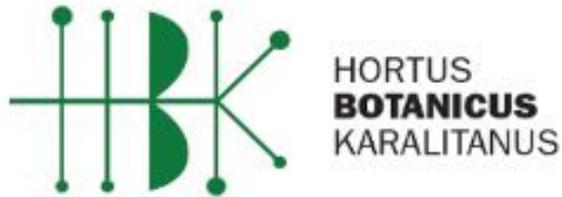
The OEC's mission is to finance, follow and develop programs of protection and management of the flora and the wildlife of Corsica.

CBNC is a department of the OEC which is devoted to:

- The inventory of the flora and habitats of Corsica and its satellite islands
- The mapping of habitats
- The management of a database of about 300 000 data (flora and habitats)
- Expertise for accounts of the public authorities and the services of the

state

# The Partners



## Hortus Botanicus Karalitanus (HBK)

(HBK), is responsible for the scientific management of the project and for all actions in Sardinia.

HBK is part of the University of Cagliari.

Its research topics include biodiversity and both in situ and ex situ conservation studies of the Mediterranean vascular flora, and biosystematic and taxonomic studies of the Cyro-Sardinian taxa.

Ex-situ conservation in its various aspects is carried out in the building of the Sardinian seed bank (The Sardinian Germplasm Bank, BG-SAR) that hosts the rooms and the devices for germplasm curation, characterisation and storage.

# The Partners



## University of Catania, Sicily

It is responsible for all actions in Sicily.

Researches of the Plant Biology section are focused on plant biology, ecology, systematics, biodiversity, plant/habitat conservation, management and environmental education.

The Herbarium (CAT) consists of some historical collections as well as several modern collections.

The Botanical Garden, founded in 1858, is well known for its rich collections of exotic plants, especially succulents and palms, but also for the so-called “Sicilian Garden” where hundreds of native plants are cultivated, and where the most representative environments featuring the Sicilian landscape have been created.

A Seed Bank was established in 2004 for enhancing the ex-situ conservation of the Sicilian flora, especially for those endemic or endangered taxa whose taxonomic, phytogeographical and ecological value is rather relevant.

# The Partners



## **Mediterranean Plant Conservation Unit (MPCU) of CIHEAM - Mediterranean Agronomic Institute of Chania (MAICh)**

It is responsible for the technical management and the communication actions of the project and for all actions in Crete.

MAICh provides postgraduate education leading to the degree of Master of Science (M.Sc.) and undertakes basic and applied research related to the sectors of economics, rural development, management, and applied biological, technological and environmental sciences, addressing to problems in the Mediterranean area.

The Mediterranean Plant Conservation Unit (MPCU) of MAICh aims at the study and conservation of wild native plants of the Mediterranean and comprises a Seed Bank which works in a close association with the Botanical Garden where endemic and threatened plants are cultivated for demonstration and education purposes.

The Herbarium of the Unit hosts specimens from the most important plant species of Crete and disposes all the required facilities for taxonomic plant identification in the area.

# The Partners



## **Agricultural Research Institute (ARI)**

It is responsible for all ex situ actions in Cyprus as well as management and communication project actions.

The Agricultural Research Institute (ARI) undertakes research within the wider domain of plant and animal production. The National Gene Bank and the Herbarium are stationed at the ARI.

The main activities of the Genebank concern the collection, conservation, characterisation and evaluation of plant genetic resources. Focus has been given to genetic material threatened with genetic erosion or extinction such as landraces, endemic plants and plants of the national red book. Another area of interest is the collection of crop wild relatives, e.g. species that can be used for breeding or aromatic, medicinal, ornamental and edible plants.

It is estimated that more than 10,000 named specimens are kept in the Herbarium. Many specimens are sited to the “Flora of Cyprus” giving them high historical value.



# The Partners



## Department of Forests (DF)

It is responsible for all in situ conservation actions in Cyprus as well as management and communication project actions.

It has a dual mission: it is the Forest Authority of the country and the Managing Authority of the state forest estate.

DF is also engaged with forest education, applied forest research, management of forest protected areas including Natura 2000 sites, forest recreation including development and management of nature trails, picnic and camp sites, visitor centres and botanical gardens.

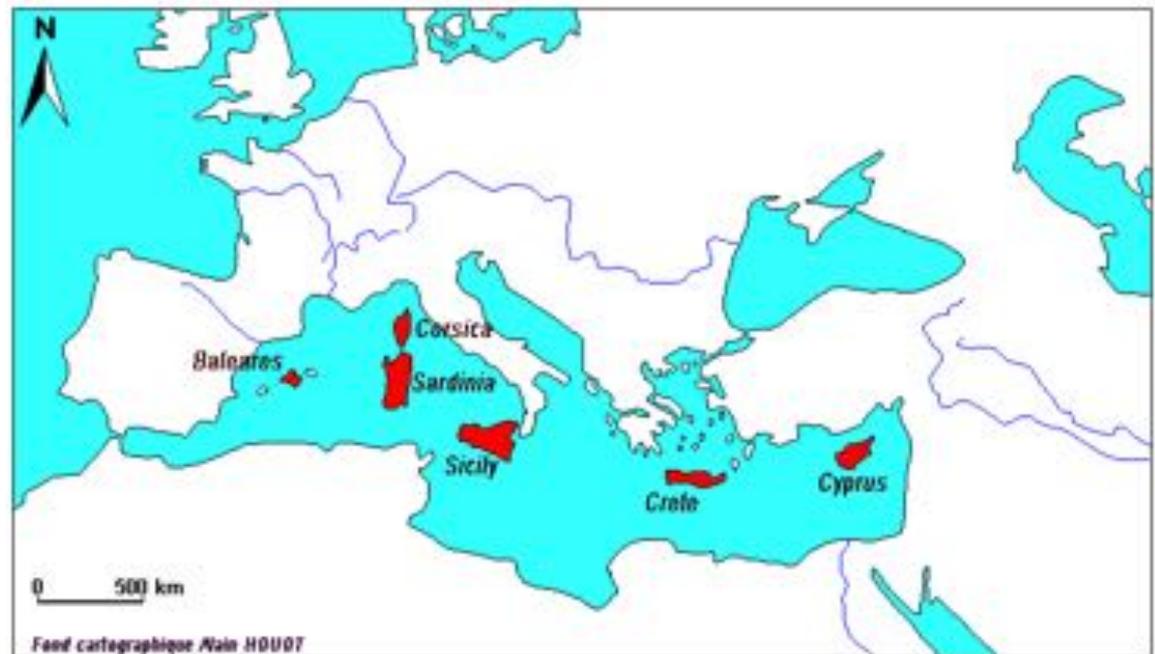
It is also responsible for the establishment of roadside plantations along highways and the tending of green spaces in main government buildings.

DF is extensively involved into the systematic study of Cyprus flora and fauna and especially into the conservation of endemic, rare and threatened plants.

The Mediterranean Basin is one of the world's most bio-diverse regions, included among the world's 34 biodiversity hotspots.

They count roughly 30,000 different plant species, of which approximately 13,000 are Mediterranean endemics.

In particular, Mediterranean island floras show a percentage of endemic plants higher than mainland floras; many of these plants are narrow endemic and thus, particularly sensitive to any environmental change.



Many plant species in the Mediterranean are facing the extinction risk or a severe impoverishment and require urgent protection measures.

While in-situ conservation is the fundamental approach to biodiversity conservation, ex-situ conservation is a complementary and effective way to prevent immediate extinction events.

The project is based on the knowledge that although in situ conservation measures are the best methods for preserving plant diversity, ex situ conservation provides an alternative and complementary method for preventing immediate extinction of threatened plants.

Cross-border cooperation projects appear as one of the most effective tools for the contribution to the joint development of an indispensable management plan.



Main aim is improving knowledge and conservation of threatened island plants representative of the entire Mediterranean Basin.



*in situ conservation* of some of the most endangered plant species of the Mediterranean islands through in situ management actions.



**ex situ conservation** of the most endangered plant species through the collection, seed banking and duplication of accessions representative of the overall diversity of selected taxa.



**the reinforcement and enlargement** of the 'GENMEDA-Network of Mediterranean Plant Conservation Centers' connecting the scientific institutions involved in the project.



# Activities

The project is structured in these major activities:

---

**A1** - Conservation priorities and selection of target species in the different islands

---

**A2** - Planning *in situ* and *ex situ* activities

---

**A3** - *In situ* conservation actions

---

**A4** - *Ex situ* conservation actions

---

**A5** - Networking and communication

**A1** - Elaboration of conservation priorities and selection of target species in the different islands

**Objective:** To use a common criteria to prioritise the conservation actions and to select plant species that will be included in the project, specifically:

**Regional responsibility** (*priority will be given to both endemic plants and plants deserving a conservation interest for an island - e.g. Peripheral and Isolated Plant Populations*)

**Threat degree** (*sensu IUCN, Red Lists*)

**Inclusion in the Annexes of the Habitats Directive** and/or in other national and local regulations

Plants associated with **wetlands** will have a particular focus and will be selected for conservation actions.

## A1 - Elaboration of conservation priorities and selection of target species in the different islands

### Activity 1.1.1

Define a common set of criteria among partners

#### *Result*

- Conclusion on the criteria for prioritizing conservation actions of the project

#### *Indicator*

- 1 list of common criteria

### Activity 1.2.1

Use of the common set of criteria by each island to elaborate the list of species

#### *Result*

- Conclusion on the target species selection of the project

#### *Indicator*

- 6 local lists of target species (1 per island)
- 1 compiled list of target species

## A1 - Elaboration of conservation priorities and selection of target species in the different islands

The results of this phase will be a set of common criteria used for conservation priorities and a dynamic list of selected plant species for each island.

No.	Taxon "Plant list"	island(s) of occurrence						Distribution type	Criterion				Action(s)		
		BI	CO	SA	SI	CR	CV		BI	RR	HO	WP	In situ	Ex situ	Location
1				1				NE	1	1			1	1	Sardinia
2	<i>Apulegia rugosensis</i> Arrigoni et E. Nardi			1				RC	1	1		1	1	1	Sardinia
3	<i>Borago morisiana</i> Bigazzi et Ricceri			1				NE	1	1		1	1	1	Sardinia
4	<i>Borago pigmaea</i> [DC.] Charit & Greuter		1	1				IE	1	1		1	1	1	Sardinia
5	<i>Centauria magibrorum</i> Arrigoni et Camarda			1				ENE	1	1			1		Sardinia
6	<i>Centranthus amaronum</i> Frödl. et A. Raynal			1				NE	1	1	1		1		Sardinia
7	<i>Dactyloctenium aegyptium</i> (L.) S. Wats. subsp. <i>uniquipedale</i> [Wild]		1	1				ENE	1	1		1	1	1	Sardinia
8	<i>Dianthus morisianus</i> Vahl			1				ENE	1	1			1	1	Sardinia
9	<i>Gentiana lutea</i> L. subsp. <i>lutea</i>		1	1				W		1	1		1	1	Sardinia
10	<i>Halimolobos amplexicaulis</i> [Vahl] Cec., Pass. & Gibelli			1	1		1	W		1	1		1	1	Sardinia
11	<i>Hypericum virgatum</i> Boeckl., Brullo & Salmeri [unresolved]			1			1	NE		1		1	1	1	Sardinia
12	<i>Limonium azei</i> (De Not.) Brullo & Erben [unresolved]			1	1		1	W	1	1		1			Sardinia
13	<i>OphioGLOSSUM vulgatum</i> L.		1	1	1		1	W		1	1		1		Sardinia
14	<i>Rhamnus persicifolia</i> Moris			1				RC		1	1		1	1	Sardinia
15	<i>Ribes multiflorum</i> Kl. ex Roem. et Schult. subsp. <i>sardanicum</i>			1				RC	1	1			1	1	Sardinia
16	<i>Ribes sardanicum</i> Martelli			1				ENE	1	1	1		1	1	Sardinia
17				1				NE		1		1	1	1	Sardinia
18	<i>Silene velutina</i> Loisel.		1	1				IE	1	1	1		1	1	Sardinia
19	<i>Anchusa crissa</i> Vici. subsp. <i>maritima</i> [Vahl.] Selva & Bigazzi			1				NE	1	1	1			1	Sardinia
20	<i>Anchusa crissa</i> Vici. subsp. <i>crissa</i>		1	1				W	1	1	1			1	Sardinia
21	<i>Anchusa crissa</i> Vici.			1				ENE	1	1				1	Sardinia
22	<i>Anthyllis barba-petri</i> L.		1	1	1			W		1				1	Sardinia
23	<i>Anthyllis hermanniae</i> L.		1	1				RC		1				1	Sardinia
24	<i>Antirrhinum scyllum</i> Mill.			1	1	1		W		1				1	Sardinia

## A2 - Planning in situ and ex situ activities

**Objective:** Identification of plant populations which need urgent in situ conservation measures (e.g. management, alien plant eradications, fences, translocations) and of populations where seed collection should be performed for germplasm conservation.



## A2 - Planning in situ and ex situ activities

### Activity 2.1.1

Assessment and selection of the plant populations for in situ and ex situ actions

#### *Result*

- Elaboration of assessment reports for all target species per island and conclusion on the target populations of each target species for in situ and ex situ actions

#### *Indicator*

- 6 preliminary assessment reports for target species and populations
- 6 updated assessment reports for project target species and populations
- 6 final assessment reports for project target species and populations

### Activity 2.1.2

Preparation and update of action plans

#### *Result*

- Elaboration and update of time plans for ex situ actions
- Elaboration and update of management plans for all in situ actions

#### *Indicator*

- 6 initial local plans for ex situ actions
- 6 updated local plans for ex situ actions
- 6 final local plans for ex situ actions
- Minimum a total of 30 initial management plans for in situ actions
- Minimum a total of 30 updated management plans for in situ actions
- Minimum a total of 30 final management plans for project in situ actions

**Objective:** to improve the conservation status of the selected species/populations.

### Methods

Translocations (reintroductions and/or reinforcements)

Passive defence measures (i.e. fencing the population area from livestock)

Measures such as eradicating or controlling pest plants, planting native vegetation within or around the area, and reconnecting isolated remnants.



## A3 - In situ conservation actions

### Activity 3.1.1

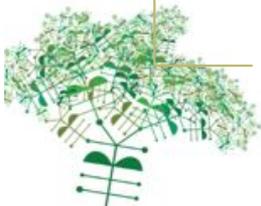
Field actions (management actions & monitoring)

#### *Result*

- Improvement of the conservation status of the selected species/populations of Mediterranean threatened plants
- Contribution to plant in situ conservation strategies
- Secure sustainability of actions by elaborating long-term monitoring plans

#### *Indicator*

- 60 in situ conservation actions (for at least 30 plant species)
- 60 long-term monitoring plans (for implementing after the end of the project) elaborated for each in situ conservation action



## A3 - In situ conservation actions

Minimum 30 target plants (minimum 5 plants per island covered by minimum 10 actions).

No.	Taxon "Plant List"	Action #		
		In situ	Ex situ	Location
3	<i>Borago morbida</i> Bigazzi et. Ercotti	1		Sardinia
4	<i>Borago pygmaea</i> [DC.] Chabert & Greuter	1		Sardinia
5	<i>Centaurus magabrorum</i> Amigoni et Camarda	1		Sardinia
6	<i>Centranthus amazonum</i> Fiedl. et A. Raynal	1		Sardinia
7	<i>Dactyloctenium aegyptium</i> (L.) Gaertn. subsp. <i>aequipedale</i> [Walt.]	1		Sardinia
12	<i>Limonium awei</i> (De Not.) Brullo & Urban (unresolved)	1		Sardinia
13	<i>OphioGLOSSUM vulgatum</i> L.	1		Sardinia



## A4 - Ex situ conservation actions

**Objective:** Collection, curation and storage of seeds / fruits for germplasm conservation of the selected target species.



### Methods

Accessions: duplicated in the seed banks of other partners of this project or with other institutions in order to ensure the conservation of the collected germplasm.

Seed germination tests: in order to obtain the germination eco-physiology of the collected germplasm.

Germination tests will be carried out only for those species whose distribution allows the collection of adequate quantity of seeds to be used both for ex situ conservation and seed germination tests.



## A4 - Ex situ conservation actions

### Activity 4.1.1

#### Seed collecting and banking

##### *Result*

- Ensure the conservation of germplasm of Mediterranean threatened plants
- Maximize stored genetic diversity of Mediterranean threatened plants
- Contribution to plant ex situ conservation strategies

##### *Indicator*

- 600 accessions (seedlots) from a minimum of 120 species collected
- 600 accessions (seedlots) stored in seed banks
- 300 accessions duplicated
- Minimum 120 germination experiments

### Activity 4.2.1

#### Plant nursery

##### *Result*

- Guarantee plants availability to be used for in situ actions
- Exhibition of threatened plants in Botanical Gardens

##### *Indicator*

- 9000 plants (corresponding to 120 target species) ex situ cultivated and in exhibitions of Botanical Gardens

## A4 - Ex situ conservation actions

600 accessions of  
120 target *taxa*  
(100 accessions  
for minimum 20  
*taxa* per island).

No.	Taxon "Plant List"	Action(s)		
		In situ	Ex situ	Location
27	<i>Armenia sarda</i> Spreng.		1	Sardinia
28	<i>Armenia sarda</i> Spreng.		1	Sardinia
29	<i>Armenia sarda</i> Spreng.		1	Sardinia
30	<i>Artemisia campestris</i> L. subsp. <i>variabilis</i> (Ten.) Greuter		1	Sardinia
31	<i>Astragalus urvillus</i> subsp. <i>gemargenteus</i> (Moris) Arca		1	Sardinia
32	<i>Astragalus gemargenteus</i> subsp. <i>gemari</i> (Beoch. & Br		1	Sardinia
33	<i>Astragalus thymoides</i> Vahl		1	Sardinia
34	<i>Berberis setina</i> (L. Presl		1	Sardinia
35	<i>Bianum dispar</i> (Schott) Talavera		1	Sardinia
36	<i>Bituminaria montana</i> (Pignatti et Melisio) Greuter		1	Sardinia
37	<i>Brassica insularis</i> Moris		1	Sardinia
38	<i>Brassica tyrrhena</i> Giotta, Ficotta et Arrigoni		1	Sardinia
39	<i>Bunium alpinum</i> subsp. <i>corydalinum</i> (DC.) Nyman		1	Sardinia
40	<i>Bupleurum fruticosum</i> L. (unresolved)		1	Sardinia
41	<i>Buxus balearica</i> Lam.		1	Sardinia
42	<i>Calicotome spinosa</i> (L.) Link		1	Sardinia
43	<i>Campanula forsythii</i> (Arcangel) Podlech		1	Sardinia
44	<i>Carlini macrocephala</i> Moris		1	Sardinia
45	<i>Cephalaria bigazzi</i> Beoch., Brullo et Giussà		1	Sardinia
46	<i>Cerastium supramontanum</i> Arrigoni		1	Sardinia



## A5 - Networking and communication

**Objective:** to improve collaboration and effectiveness of plant conservation among the project partners, local institutions and authorities.

### Activity 5.1.1

#### (Communication and networking)

##### *Result*

- Exchange experiences within the partnership and among other stakeholders

##### *Indicator*

- Organize 1 initial workshop between partners
- Organize 1 final workshop between partners and invited guests
- Participate in 1 workshop with stakeholders
- 6 project meetings with field trips
- organization of 6 local events
- 1 new website created for the project

### Activity 5.1.2

#### (Sharing results)

##### *Result*

- Dissemination of project aims and results
- Promotion of a strong and effective community of conservation actors

##### *Indicator*

- 1 English version of the project information
- 3500 leaflets disseminated
- 1000 new visitors in the project website
- 3000 new visitors in the project website
- 2 scientific papers produced
- participation in at least 5 international and/or national external events
- 25 invited guests to the final workshop of the project

### Methods

Communication in its various forms will include the project website, a leaflet, a Layman's report and short videos/spots in English and local languages of the project islands.

Each partner will organize at least one local event to disseminate the aims of the project and the key issues related to the theme of native flora conservation.

The project partners will present the project in scientific meetings (international and national events) and a final international workshop dedicated to presenting the results of the project will be held before the end of the project.



Based on the project structure, the main step that could have some potential risks is the **in situ actions** specifically:

- climatic adversities
- low success of transplanting

In order to avoid or to reduce these potential risks, the previous experience of each partners in its territory will be crucial.

In fact, except the natural phenomena, all eventual critical events will be mitigated by the large background of the partners about threatened island floras, conservation activities as well as the implementation of high-risk programs.

**How will the ecological, financial and social sustainability be guaranteed at the end of the project?**

authorities.



## How will communication be ensured between the technical and financial project partners?

- Communication among all project partners will be ensured through e-mail/skype/phone contacts, but also through physical contacts at regular intervals such as during the project annual meetings and joint field trips.

## How will communication be ensured with pertinent parties involved not actively participating in the project?

- Communication with other parties involved but not actively participating in the project will be ensured through the various tools that will be used for dissemination: website regularly updated, production/distribution of the project leaflet in English and local languages, organization of local events/workshops, publication of press releases/articles, participation of the project partners in related external events organized by other parties to present the project.

## Does the project create synergies with other actions/projects?

- There will be contacts and collaboration with teams and initiatives.

## Can the approach and lessons learned during the project be replicated elsewhere?

- The project actions can be replicated in the partners regions or / and country (in a larger scale) and in other Mediterranean countries with similar environmental features, by other institutions responsible for the management of natural areas, botanical gardens, plant conservation centers, that will be contacted through various project communication actions.

## By whom?

- 
- This project will strengthen the network of Mediterranean Botanical Gardens and Plant Conservation institutions and will allow future collaboration in long term.

## What strategy is foreseen in order to reach these players?

- All information collected on taxa during this project will improve the knowledge on threatened plants (mainly endemics) and therefore will allow their assessment in the IUCN Mediterranean Red List and a better definition and justification of the Important Plant Areas and Key Biodiversity Areas (KBA), which is the new IUCN standard.





**Many thanks for your attention**

