



Integrated Management in the Mediterranean of the remarkable peri-urban coastal habitats of the Calanques

European Life Habitats Calanques project



The financial instrument for the environment (LIFE)

Since 1992, the European Commission has supported environmental conservation projects through the LIFE programme. Its purpose is to finance and promote innovative operations to halt the loss of biodiversity in Europe. The LIFE programme is aimed at public and private project holders. There are two sub-programmes: environment and climate.

LIFE Habitats Calanques is a 'Nature'-type project which is part of the LIFE environment sub-programme. The aim of these projects is to conserve and improve the environmental status of natural habitats in the Natura 2000 network.



The Natura 2000 network

The Natura 2000 network consists of a set of natural, terrestrial and marine sites, and aims to ensure the long-term survival of species and habitats of special concern with high conservation stakes in Europe. This European approach is based on the Birds Directive (79/409/EEC) and the Habitats Directive (92/43/EEC) which have two main objectives:

- preserving the biological diversity and natural heritage
- taking into account economic, social and cultural requirements, as well as regional specificities.

In France, the Natura 2000 network includes Special Areas of Conservation (SACs) in application of the Habitats Directive, and Special Protection Areas (SPAs) in application of the Birds Directive. The daily management of the sites is based on concrete measures known as Natura 2000 contracts, implemented on the basis of 'documents of objectives' (DOCOB). In Provence-Alpes-Côte d'Azur, the Natura 2000 network consists of 128 sites which cover approximately 30% of the total regional area. The LIFE Habitats Calanques project intervenes on the Natura 2000 site FR9301602, within the Calanques national park, as well as in 7 terrestrial habitats of Community interest out of the 21 existing ones. This represents 38% of the total area of the Natura 2000 site's coastal habitats of community interest.

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Preserving our coastline

The Mediterranean basin is an **exceptional floristic region** which accounts for 10% of the world's known plant diversity for 1.6% of the Earth's land surface - this, associated with a high rate of endemism. This incredible richness makes it one of the planet's 36 biodiversity hotspots.

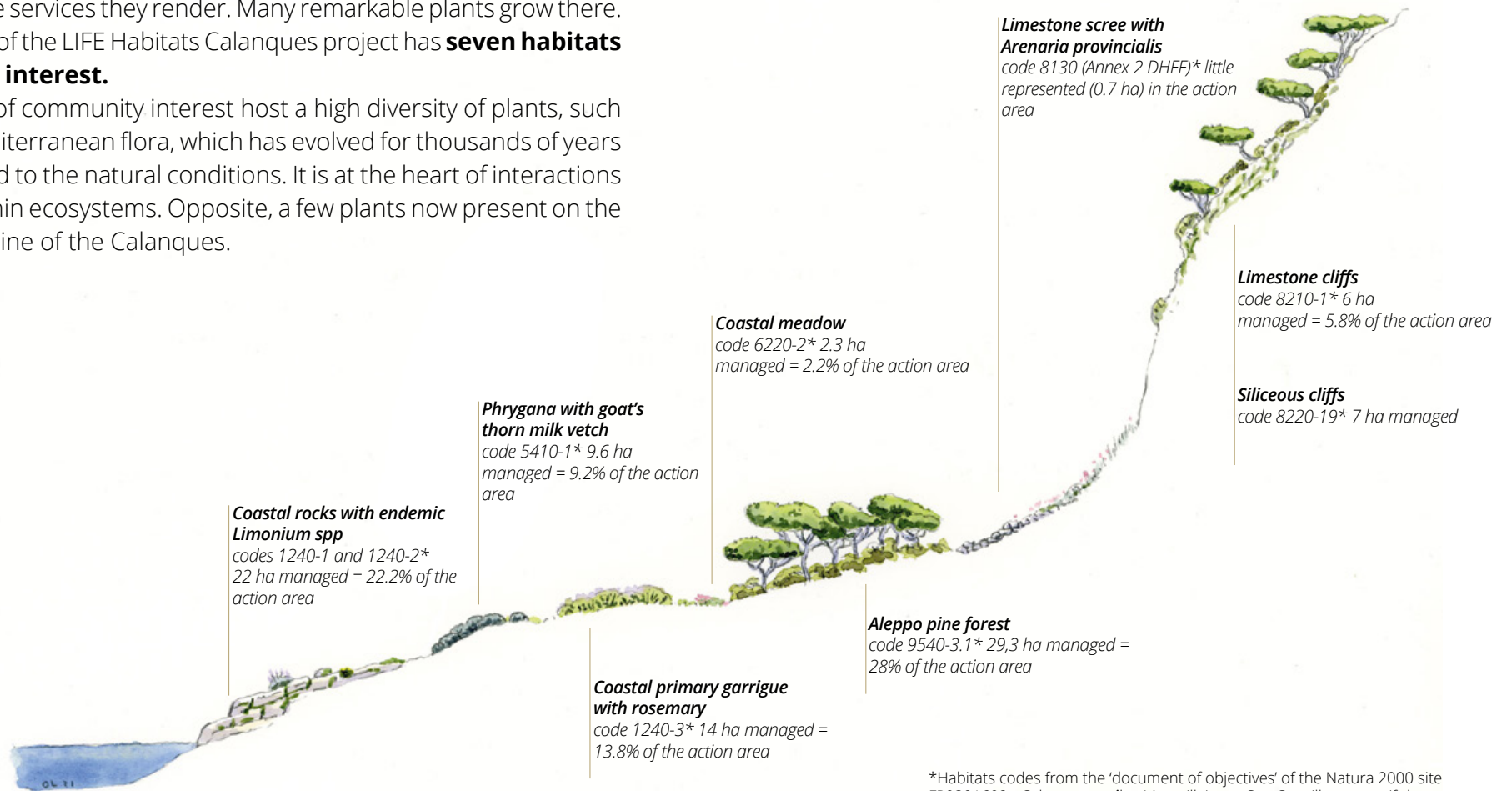
Located in the heart of the first peri-urban national park in Europe, the coastline of the Calanques national park is subject to strong natural and anthropogenic pressures: **urbanisation, over visitation, pollution, development of invasive alien species, climate change, etc., which lead to the degradation of natural environments and loss of the species inhabiting them.**

The conservation of this coastline is the responsibility of all of us, and in particular those on the ground in charge of its sustainable management.

A wild coastline

The coastal habitats of the Calanques are of **exceptional heritage interest** owing to their considerable floristic richness, their formation, their location, and the services they render. Many remarkable plants grow there. The action area of the LIFE Habitats Calanques project has **seven habitats of community interest**.

These habitats of community interest host a high diversity of plants, such as the local Mediterranean flora, which has evolved for thousands of years and has adapted to the natural conditions. It is at the heart of interactions with wildlife within ecosystems. Opposite, a few plants now present on the Provence coastline of the Calanques.



*Habitats codes from the 'document of objectives' of the Natura 2000 site FR9301602 - Calanques et îles Marseillaises - Cap Canaille et massif du grand Caunet - July 2013

The flora

1. Goat's thorn milk vetch (*Astragalus tragacantha*):
In France, 90% of goat's thorn milk vetches grow in the Calanques.

2. Awl-leaved plantain (*Plantago subulata*):
this small cushion-forming plant is in strong decline on the Frioul islands.

3. Thyméele tartonraire (*Thymelea tartonraira*):
with the goat's thorn milk vetch and awl-leaved plantain, it is a structuring plant of the phrygana, a habitat of community interest which is emblematic of the coastline.

4. Sea lavender (*Limonium pseudominutum*):
this salt-tolerant plant grows between faults in the rocks on the seashore.

5. Gold coin daisy (*Pallenis maritima*):
this local plant with golden-yellow flowers is abundant on the rocky coastline of Provence. Absent elsewhere, it is a flagship species of the Calanques.

6. Aleppo pine (*Pinus halepensis*):
pine native to the Mediterranean basin, it bends and twists under the influence of the wind on the cliffs of the Calanques.

Protected plants – Red
Non-protected local plants – Green
Invasive alien plant species – Black

7. Lentisk (*Pistacia lentiscus*):
structuring element of the garrigue, the lentisk is abundant in the Calanques. Some individuals are several hundred years old.

8. Rock samphire (*Crithmum maritimum*):
eaten by sailors in the past, it is still present in the protected natural area of the Calanques.

9. Century plant (*Agave americana*):
the century plant flowers only once and then dies.

10. Prickly pear (*Opuntia* spp.):
the smallest fragment of the plant (seeds and pads) can give rise to a new individual.

11. Pigface (*Carpobrotus* spp.):
often escaped from gardens, pigfaces form compact carpets covering the ground and preventing the development of other plant species.

12. Moon trefoil (*Medicago arborea*):
once fallen to the ground, these seeds form a thick carpet at the base of the plant where nothing grows.



Acting directly on the threats

The coastal habitats of the Calanques extend over 20 km between Marseille, Cassis and La Ciotat, and are restricted to a thin coastal fringe of about a hundred metres. This area is the theatre of **many nature / human interactions**. Although Calanques shoreline plants are adapted to extreme natural conditions (drought, sea spray, wind, poor or absent soil, relief and rocks), they are subject to **anthropogenic threats** such as trampling, pollution, climate change and the spread of invasive alien plant species, which have led to the **decline of the local and protected fauna and flora**.

Lack of knowledge



Climate change



Trampling and anarchic flow



Polluted sea spray



Invasive alien plant species

Trampling and anarchic flow

The local slow growth vegetation growing on the ground level does not have time to regenerate under the repeated trampling and random wandering of walkers, causing soil erosion and the loss of plant diversity. This leads to a strong fragmentation of natural habitats in the form of discontinuous patches of vegetation.

Lack of knowledge

Scientists, managers, visitors and inhabitants have much to learn from this fragile and changing ecosystem, in order to address existing threats and adopt good practices for its conservation.

Invasive alien plant species (IAPS)

The exceptional propagation and multiplication capacities of invasive alien plant species prevent the local flora from developing, depriving it of light, water, space and resources in the soil. Native plant diversity is declining and then tends to disappear.

Polluted sea spray

After treatment in wastewater treatment plants, the surfactants of our household products find their way into the sea. This pollution is carried by the sea spray onto the leaves of seashore plants. The polluted sea spray destroys their protective layer which then becomes permeable to salt and degrades. This can lead to the death of these plants.

Climate change

Extreme climate factors limit the growth and regeneration of shoreline plants. Brief and heavy rains, summer drought, violent winds and soil erosion can lead to the loss of young seedlings. By the end of their first summer, however, they have developed a sufficiently resistant root system to survive.

The life habitats calanques project: 24 actions over 5 and a half years*



KNOW

	2017		2018				2019				2020				2021				2022				
	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV	
Defining the communication strategy and the graphic charter																							
Producing a state of the art																							
Analysis of the zones and methods of intervention for trail improvement operations																							
Preparatory studies for the restoration of goat's thorn milk vetch populations																							
Preparing interventions on invasive alien plant species																							
Training teams on the surveillance and management of coastal habitats																							



ACT

Implementing trail improvement operations to restore ecological continuity																							
Reinforcement and introduction of goat's thorn milk vetches on the continent																							
Invasive alien plant species uprooting campaigns																							
Cultivating local plants for the restoration of some uprooting sites																							
Reinforcement of awl-leaved plantain populations on the Frioul islands																							
Strengthening surveillance and awareness-raising in natural environments																							
Awareness campaigns for the general public, institutions, local communities and school pupils																							
Developing and sharing support tools for the management of coastal habitats																							
Networking and cooperation at the local, national and European scale																							



ASSESS

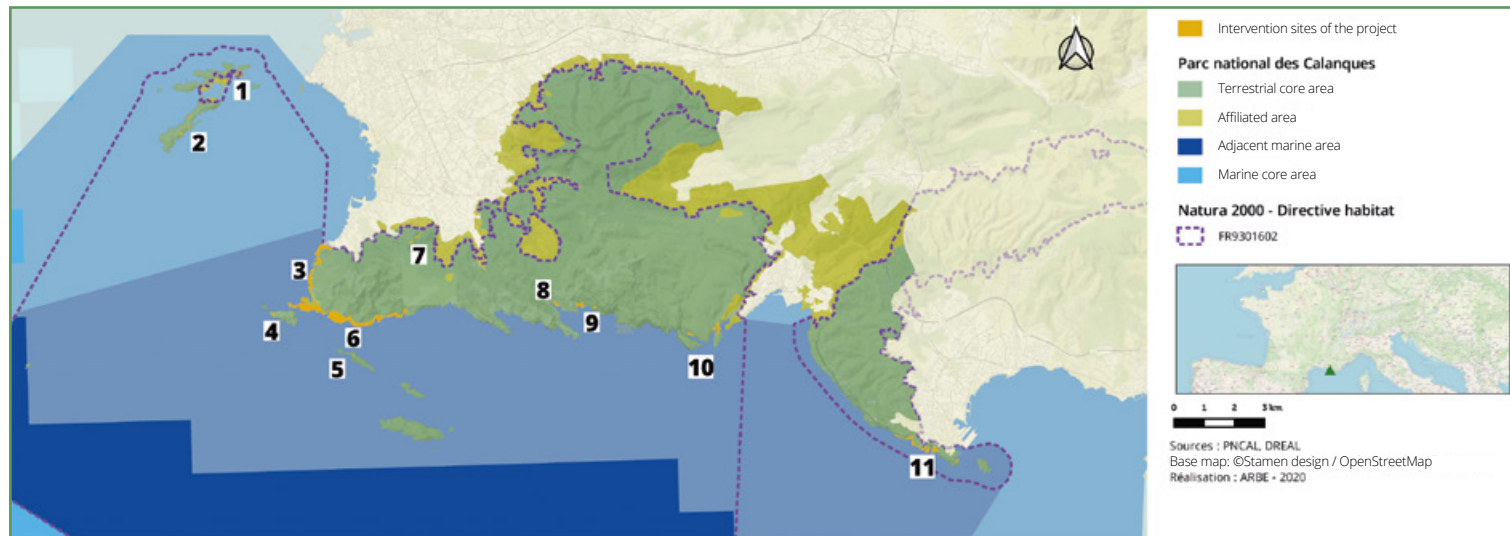
Assessment of the success of trail improvement operations (with «no go» areas) in coastal habitats																							
Assessment of the phrygana's restoration by planting milk vetches on the continent																							
Assessment of invasive alien plant uprooting campaigns																							
Monitoring of the awl-leaved plantain population reinforcement operation on the Frioul islands																							
Assessment of the socio-economic impact of the actions undertaken																							
Assessment of the project's impact on ecosystem services																							



OVERSEE

Coordination of the multi-partner project																							
Collection and analysis of project progress and success indicators																							
Development of an after-project action plan																							

Our intervention area



Sites name:

- 1 Ratonneau
- 2 Pomègues
- 3 Pointe Sud
- 4 Maire
- 5 Jarre
- 6 Calalongue – Podestat
- 7 Anjarre – Roy d'Espagne
- 8 Morgiou
- 9 Sugiton
- 10 En-vau – Port-Pin
- 11 Sainte Frétoise – Bec de l'Aigle

Objectives

Facing the many issues related to the Calanques coastline, ten stakeholders from the region (see page 18) have come together and proposed to develop a European LIFE project to preserve the most threatened coastal habitats of community interest of the Calanques: **the LIFE Habitats Calanques**.

It consists in:

1. Restoring the goat's thorn milk vetch and awl-leaved plantain populations
2. Channelling visitors by improving the trail network to reduce the impact of trampling on the vegetation
3. Managing invasive alien plant species in priority sites on flat terrain or cliffs
4. Raising awareness and sharing knowledge from the peri-urban areas bordering the Calanques national park to the international level



Restoring goat's thorn milk vetch and awl-leaved plantain populations

The awl-leaved plantain and the goat's thorn milk vetch play a **key role in the ecosystem**: they are structuring species of the phrygana. Scientific studies have shown the **strong decline** of awl-leaved plantain populations on the Frioul islands and goat's thorn milk vetch populations on the continent between Marseille and Cassis. **The LIFE Habitats Calanques projects aims to reinforce and introduce individuals in priority habitats** along the coast to reconnect and revitalise the populations.



KNOW

- Identifying the planting sites
- Developing a cultivation protocol including the growth specificities of each species (germination test and selection of the microbial inoculum)



DELIVERABLES

- + Map of soil contamination by Trace Metals and Metalloids (TMM) and along the Calanques coastline
- + Map of the ecological niche of goat's thorn milk vetch populations in the continental Calanques
- + Publication on the methods for identifying the microbial inoculum



ACT

- Supervised seed harvest in the natural environment
- Cultivating and planting 530 plantains on the Frioul islands
- Creation of an awl-leaved plantain conservation nursery on the Frioul islands
- Cultivating and planting 3,600 goat's thorn milk vetches between Marseilles and La Ciotat
- Fencing of planted goat's thorn milk vetch areas to ensure their monitoring



DELIVERABLE

- + Technical sheets for the cultivation and planting of goat's thorn milk vetch and awl-leaved plantain



ASSESS

- Monitoring the restoration of awl-leaved plantain on the 5 planting sites
- Monitoring the restoration of goat's thorn milk vetch on the 12 planting sites



DELIVERABLE

- + Assessment of the translocation of goat's thorn milk vetches and awl leaved plantains



ALERT POINTS

1. Required authorisations for the handling of protected plants
2. Ensuring the link between associations and the local population during the operation (information panels, information meetings)



Reducing fragmentation of the shoreline vegetation by improving the trail network

The Calanques coastline is crossed by many trails which allow visitors to enjoy the landscapes and engage in many activities: hiking, kayak, boating, climbing, fishing, etc. With over **3 million visits per year** and an **intensive off-trail wandering**, the shoreline vegetation is trampled, fragmented, and rapidly degrades. The partners, landowners and site managers have gathered for an order grouping to implement trail improvement works in the Calanques. This **new association** has enabled consistent and homogeneous works to be implemented throughout the territory, **while addressing ecological, landscape and use issues, which are unique to each site.**



KNOW

- Ranking priority sites for development: environmental issues, uses and sources of random wandering
- Identifying the methodology for implementing the works (or developments) between landowners and managers
- Identifying the types of developments by site



ACT

- Launching and managing a works contract through an order grouping for all sites
- Implementing the works on 10 sites: Frioul, Sablière d'Anjarre – Roy d'Espagne, Mont Rose – Saména, Cap Croisette, Callelongue – Mounine, Marseillevyre, Morgiou, Sugiton, En Vau, Port-Pin



ASSESS

- Monitoring the success of developments through the vegetation study and the improvement of coastal habitats at the plot and landscape level
- Monitoring the trends of random wandering using 15 eco-counters



DELIVERABLES

- + Map of the degree of open lands
- + Report on the observation of uses on the sites concerned
- + Convention setting up an order grouping
- + Natura 2000 impact assessment and environmental impact assessment



DELIVERABLES

- + Acquisition of development permits
- + Delivery of the development works



DELIVERABLE

- + Assessment of the ecological restoration of fragmented habitats following the developments



ALERT POINTS

1. Obtaining the required authorisations to carry out permanent works on a protected site
2. Promoting acceptance of the works by all the local stakeholders
3. Educating visitors through explanatory signs at the entrance of each site with work in progress.



Managing invasive alien plant species



KNOW

Invasive alien plant species (IAPS) **are one of the main causes of biodiversity loss in the world**, and also in the Calanques. An IAPS is a plant species introduced outside of its native territory, which has fast colonisation dynamics in its introduction area owing to an efficient reproduction and which has the capacity to spread rapidly in its new natural environment. There are **80 invasive alien plant species in the Calanques which threaten the local flora**. The LIFE Habitats Calanques acts on 4 of them: prickly pear (*Opuntia* spp.), century plant (*Agave americana*), pig-face (*Carpobrotus edulis*) and moon trefoil (*Medicago arboorea*), which are abundant along the coast.

- Inventory invasive alien plant species growing on cliffs
- Identifying sites to be managed and ranking intervention priorities
- Defining technical and logistical itineraries for uprooting and cultivation of local plants
- Identifying local plant species to be cultivated according to the floristic species composition existing on each site
- Training agents in charge of uprooting campaigns



DELIVERABLES

- + Exhaustive invasive alien plant species inventory report and conservation issues between Ste Frétoise and Bec de l'Aigle
- + Report on the prioritisation of sites to be managed for uprooting operations on flat terrain and cliffs
- + Technical itinerary and specifications for operations on invasive alien plants species



ACT

- Supervised harvest of local plant seeds in the Calanques
- Managing 1.5 ha of invasive alien plant species on flat terrain and cliff sites
- Organising community volunteer uprooting days
- Cultivating and planting local plants
- Promoting awareness and commitment among local garden centres with regard to the issues of invasive alien plant species
- Creation of «pilot gardens»: advice and support for individuals on the consideration of local biodiversity in their garden



DELIVERABLES

- + Contract for the management of invasive alien plant species on cliffs
- + Agreement and charter of commitment to local individuals, garden centres and horticulturists in the area
- + Partnership with economic players for the revalorisation of invasive alien plant species



ASSESS

- Monitoring the post-uprooting spontaneous plant recolonisation dynamics on each managed site
- Supporting and monitoring the pilot gardens
- Coming back yearly to eliminate the regrowth of invasive alien plants species over 10 years, on each site on flat terrain and on cliffs



DELIVERABLES

- + Assessment of uprooting operations on flat terrain and on cliffs
- + Renewal of commitment charters
- + Introduction of an evaluation questionnaire for individuals at information meetings and booths
- + Technical itineraries for local plant cultivation



ALERT POINTS

1. Raising awareness among residents to encourage their participation in uprooting works
2. Find out about the waste treatment methods in the region before launching an invasive alien plant species management project
3. Consider invasive alien plant species revalorisation projects with local stakeholders



Focus on the project's communication strategy

The communication strategy is an essential step in the proper deployment of the project. It aims to encourage **a change in behaviour through a mechanism based on engaging communication**. The targets that have an influence on the area have been identified in order to have a positioning best adapted to each of them: inhabitants and visitors are the main targets, local stakeholders are secondary targets, and institutional partners are the other essential targets to educate. The purpose is to reach the general public but also scientists, elected representatives and private and associative structures with **precise and innovative approaches**.

The project is based on **adherence and identification** values with the aim of structuring the messages and creating an evolving and gratifying concept: **«Calanques life, the way of life by nature»**. The communication strategy is deployed with different types of interventions and tools through a single visual identity which unites and gives visibility to the project, the partners and operations.



Raising awareness and sharing knowledge in France, Europe and beyond



KNOW

Raising awareness among various publics is a **major objective** for the LIFE Habitats Calanques project: institutions, elected representatives, scientists, managers, economic and social stakeholders, and the general public. The actions undertaken are aimed at:

- **addressing gaps in the knowledge on the threats and issues** affecting the biodiversity of the Calanques
- **prompting a change in behaviour** among the visitors
- **sharing methods and good practices** for the conservation management of natural coastal habitats applicable to other areas of the Mediterranean basin and beyond.

- State of the art of the knowledge and practices at the European level
- Participation in international cooperation, conferences, and seminars
- Training ecoguards so that they can understand the issues of the Calanques coastline, the LIFE Habitats Calanques project, and disseminate the right messages
- Developing a communication strategy and a graphic charter



ACT

- Information meetings with inhabitants, neighbourhood committees and private stakeholders
- Organising community volunteer uprooting and planting days
- Awareness workshops for the general public and school pupils, and organisation of events
- Organising international cooperation, conferences, and the project's closing seminar



ASSESS

- Assessment of the knowledge of the target publics
- Assessment of the communication tools produced
- Assessment of the project's impact on ecosystem and socio-economic services



DELIVERABLES

- + Media plan Guide to recognising IAPs
- + Brochure for the general public booth version and field version
- + Booklet to move towards a garden with a rich local biodiversity and with no IAPs
- + Resource website and Facebook page
- + Poster campaign, posters and roll-up
- + Package, games and exhibition for school pupils
- + Management and best practice guide for the project
- + Badges, eco-cup, local plant seed sachets and t-shirts
- + Interactive and documentary tools
- + Information panels at the entrances of the Calanques national park

- + Report on the analysis of indicators and statistics on digital communication
- + Layman's report: summary report on the project results
- + DEFI Calanques tool used in the facilitation of booths and meetings: generalist questions on the issues of the Calanques coastline to test the public's knowledge
- + Synthesis report on the methodology and results of the assessment of ecosystem and socio-economic services rendered by the project and the habitats
- + Results of the survey on users' perception of the project actions

Project stakeholders

Beyond the project stakeholders, other players support the project, at local or European level, and have been involved from the project design stage and throughout the implementation: Métropole Aix-Marseille Provence, Office national des forêts, conservatories, Lycée des Calanques, local neighbourhood associations, naturalists, heritage or education for the environment and sustainable development, private local stakeholders, etc.

Project implemented by:



Agence Régionale pour la Biodiversité et l'Environnement Provence-Alpes-Côte-d'Azur

Associated beneficiary

Project coordinator and in charge of communication actions. Guarantor of the sound project management to the European Commission.



Parc national des Calanques

Associated beneficiary

Responsible for surveillance, trail developments and invasive alien plant species uprooting operations.



Conseil Départemental des Bouches-du-Rhône

Associated beneficiary

Technical assistance in management operations, in particular for the trail improvements and uprooting work.



Conservatoire Botanique National Méditerranéen

Associated beneficiary

Responsible for the restoration of awl-leaved plantain, vegetation monitoring, and referent on invasive alien plant species.



Ville de Marseille

Associated beneficiary

Responsible for the cultivation of goat's thorn milk vetch and local plants. Technical assistant in particular for communication and uprooting operations.



Aix-Marseille Universités

Associated beneficiary

Responsible for preparatory studies on trail improvements as well as on the restoration and monitoring of goat's thorn milk vetch populations.



Le Naturoscope

Associated beneficiary

Responsible for public awareness operations, in particular for school pupils.

With financial support from:



European Commission



Direction régionale de l'environnement, de l'aménagement et du logement Provence-Alpes-Côte-D'azur



Région Sud Provence-Alpes-Côte-D'azur

In a nutshell...

In the Calanques, protecting the vegetation from trampling and random wandering requires trail developments, «no go» areas, and improvement of the signage for walkers.



We have much to learn from one another on the management of coastal natural areas. This is why the LIFE project is initiating a time for cooperation and exchange throughout France, Europe and beyond.

Awareness-raising measures are essential to allow managers to identify more clearly the expectations and perceptions of inhabitants and users, recreate social links, and offer them the possibility to participate actively in the project.



Invasive alien plant species uprooting operations are carried out as part of community volunteer days on flat terrain sites, and by specialised companies trained in rope access work for the cliff sites.



The cultivation of indigenous plant species, including protected species, allows the reinforcement of wild plant populations on uprooting sites or on introduction sites.



2021
Publication director: Anne CLAUDIUS PETIT
Creation: ARBE
© photos: P. RICHAUD / CBNMed /
PN Calanques / AMU
© Illustrations: O. LOIR
Printed with vegetable-based ink on
recycled paper, eco-labelled, without
chlorine by a printing company with
the Imprim'Vert certification
Graphic design: www.loicbeillet.com

 Calanques.life www.habitats-calanques.fr



Direction régionale de l'environnement,
de l'aménagement et du logement

