



Ayuntamiento de Málaga
Área de Sostenibilidad Medioambiental



Gerencia Municipal de Urbanismo,
Obras e Infraestructuras



LIFE LUNGS

LIFE18 CCA/PT/001170

Towards a more resilient Lisbon Urban Green Infrastructure as an adaptation to climate change

Hacia una Infraestructura Verde Urbana más Resiliente como Adaptación al Cambio Climático en Lisboa

INICIO	Junio 2019
FIN	Junio 2024
SOCIOS	
LISBOA	Câmara Municipal de Lisboa
MÁLAGA	Ayuntamiento de Málaga (Área de Sostenibilidad Ambiental)
	Gerencia Municipal de Urbanismo (Planeamiento y Gestión Urbanística; Programas Europeos)
PRESUPUESTO TOTAL	2.739.725 €
PRESUPUESTO MÁLAGA	336.120 €



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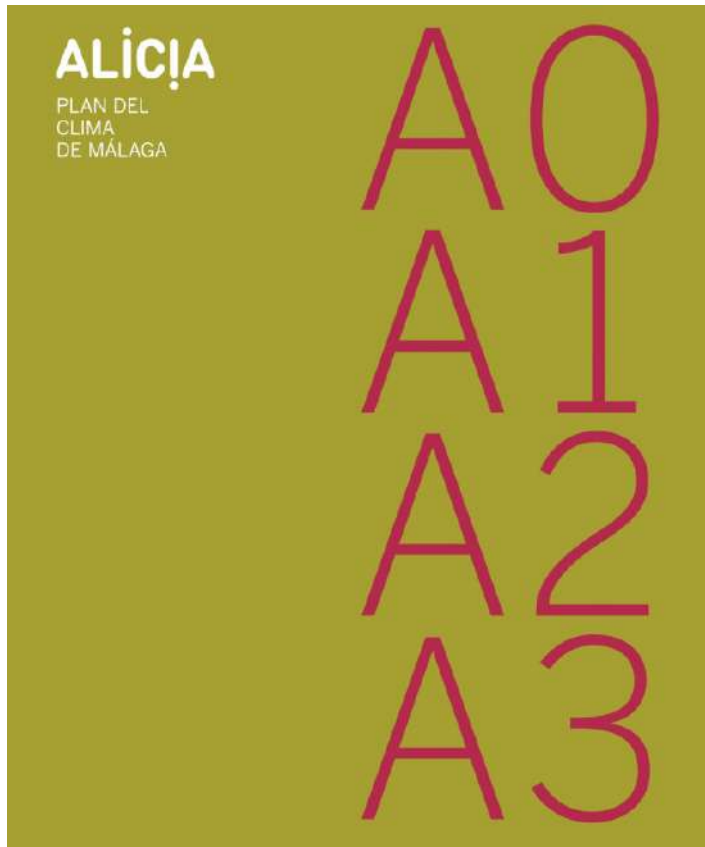


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MÁLAGA: Framework

Alicia, Climate Plan



4.1 Design criteria for adaptation to cc of green areas

29.1 Promote adapted to cc forest masses for the improvement of capacity of drainage of the land, as for native forests ecosystems

H1: Good practice guide for the resilience increase of forest masses against cc (with Málaga University)

H4: Restore and reforest with species and communities adapted to cc

3.1: The green city: increase of green áreas, parks and gardens, giving priority to the 15 green corridors and the green ring around the city

H.4 Greening of grey disused spaces



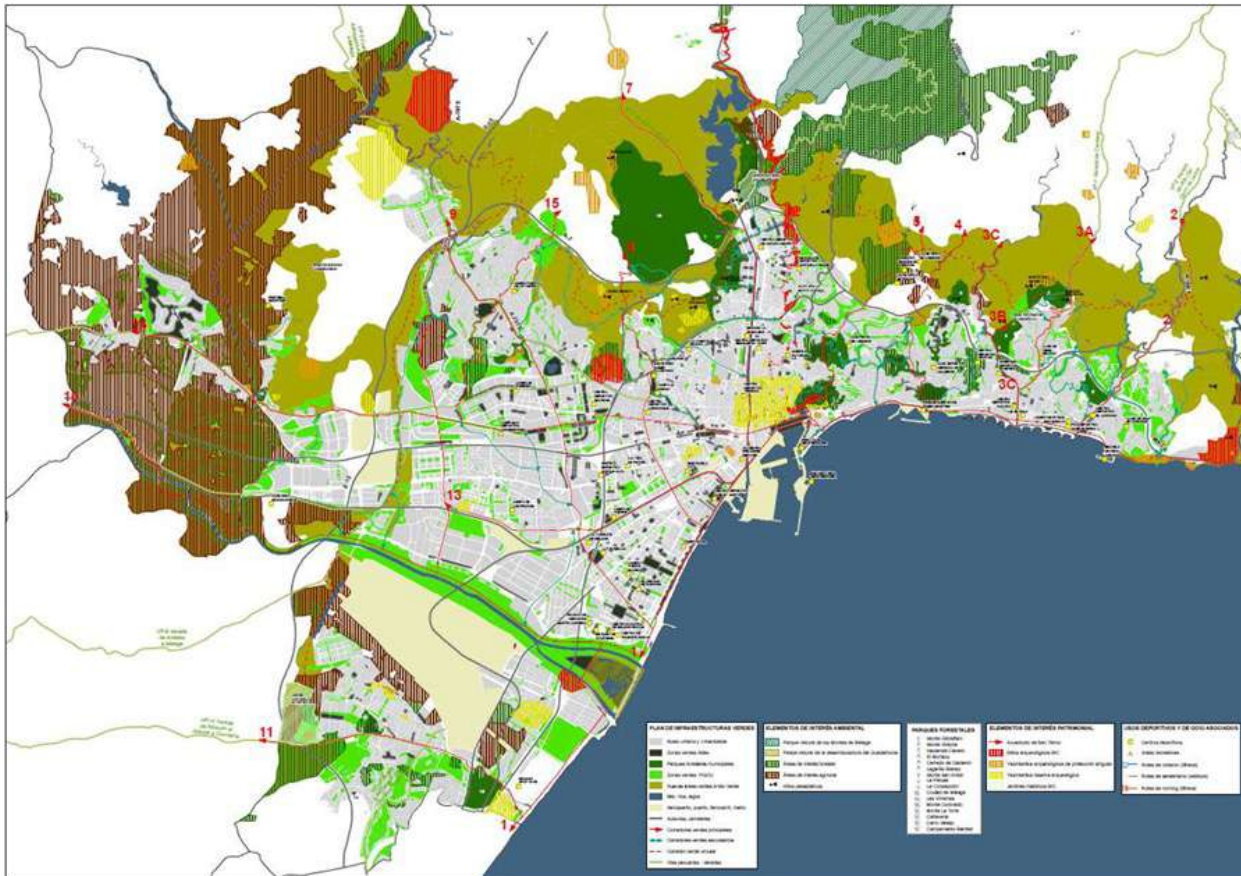
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Green Ring of Málaga in ALICIA Plan del Clima





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LIFE LUNGS IMPLEMENTATION ACTIONS IN LISBOA

- C1 Biodiverse rainfed grasslands improvement, installation and operation
- C2 Sheep flock as an urban Non-mechanic vegetation control and soil conservation agents
- C3 Water management measures
- C4 Increase of tree cover density along Lisbon Urban Green-Infrastructure
- C5 Open Desk Office to foster project replication and transference in Lisbon Metropolitan area
- C6 Results transference and replication by stakeholder involvement

LIFE LUNGS IMPLEMENTATION ACTIONS IN MÁLAGA

As a replication of actions implemented in Lisboa:

- C1 Biodiverse rainfed grasslands installation and operation**
- C4 Increase of tree cover density + forest management**



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LIFE LUNGS IN MÁLAGA

PLANNING

- **ACTION PLAN:** places and criteria for adaptation to CC of green infrastructure
- **COMMUNICATION PLAN** encompassing **2 MESSAGES** (RBG and forest management)
- **ENGAGEMENT PLAN:** participative actions with scholars about biodiversity increase + planting actions with families

IMPLEMENTATION

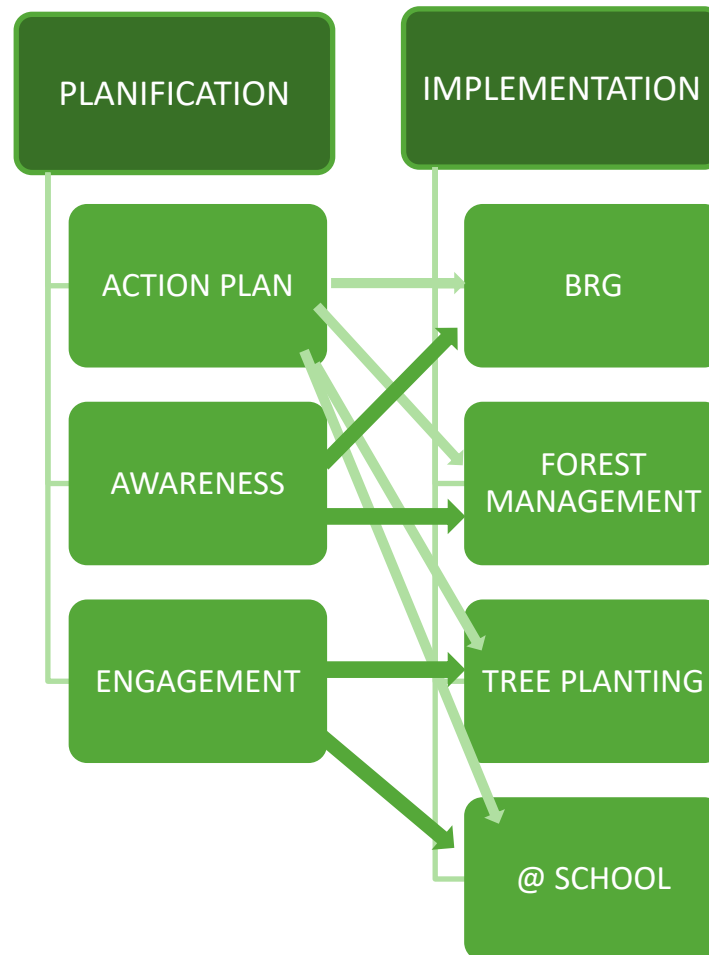
- **1** Implementation of a **BRG** in a green area of the city (**Jane Bowles**; Virreinas)
- **2 Forest management** in **San Antón** mountain (pine forest) for biodiversity increase
- **3** Increase of tree cover density –and diversity- : **tree planting** in Mount Calvario
- **4** Demonstrative implementation: actions for adaptation to climate change in the courtyard of **Nuestra Señora de Gracia** primary school



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PLANNING





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ACTION PLAN

General Criteria: catalogue of adaptation to climate change good practice **measures** to be introduced in Green Infrastructure components design and maintenance

Catalogue of different types of generic **actions**

Catalogue of specific **spaces** of the city where green action is required, with suggested specific actions for it



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AWARENESS RAISING/COMMUNICATION PLAN

2 messages:

RBG

Forest Management





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ENGAGEMENT/PARTICIPATION PLAN

- Workshops at school : biodiversity shelters building
- Workshops with scholars : biodiversity shelters installation at Mount Victoria and BRG
- Workshops with scholars for building water management solutions at Mouny Victoria
- Planting as participative action





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IMPLEMENTATION





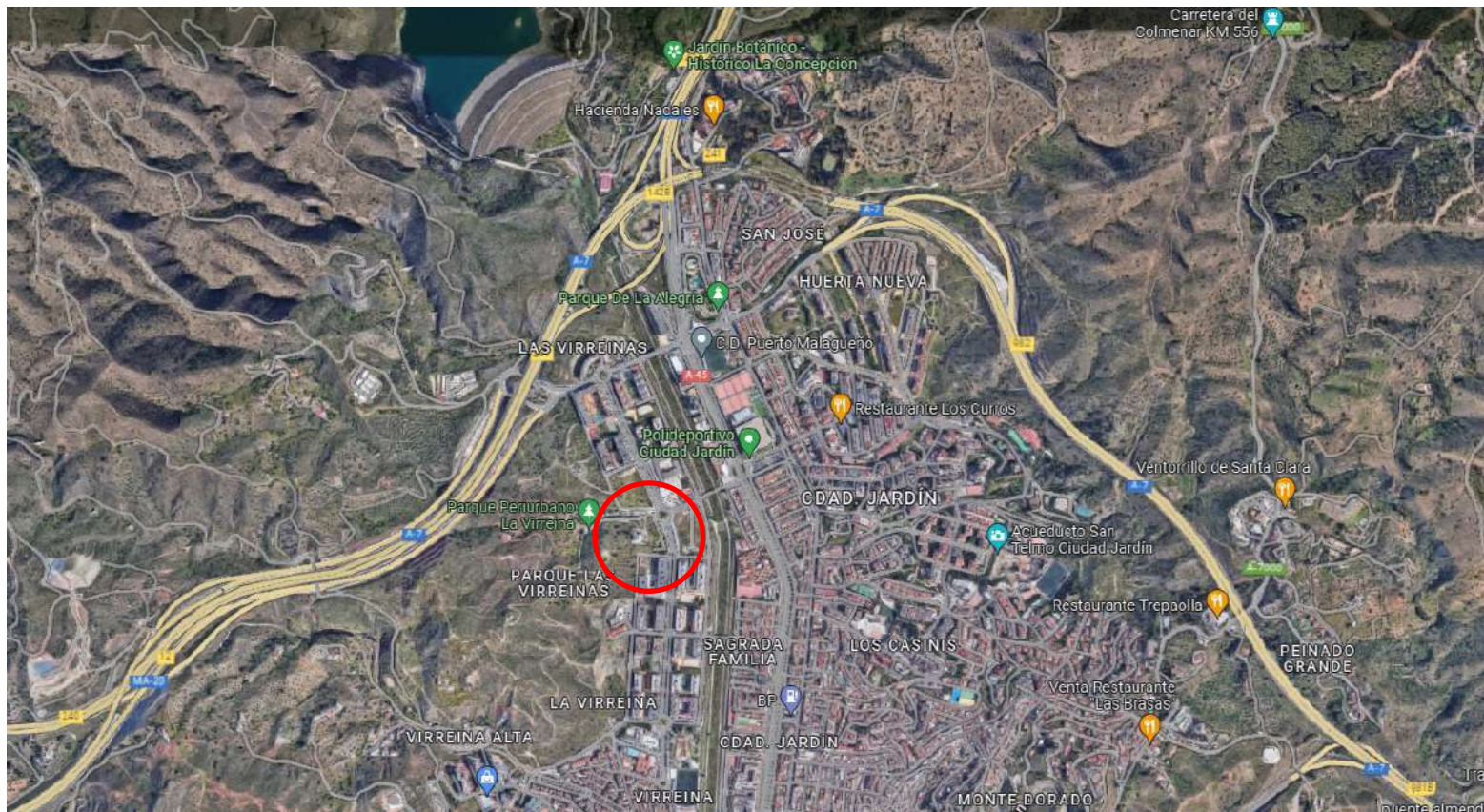
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1 Rainfed Biodiverse Grassland: Jane Bowles Avenue, Virreinas





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1 Rainfed Biodiverse Grassland: Jane Bowles Avenue, Virreinas





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1 Rainfed Biodiverse Grassland: Jane Bowles Avenue, Virreinas

ACTIONS

1. External fence
2. Cleaning of the surface, respecting trees and medium-big bushes, soils clearance with provision of vegetal soil where required
3. Irrigation system installation, connected to public supply net
4. Seed planting as recommended by the seeds supplier
5. Installation of biodiversity shelters (as a **participative action**)
6. Monitoring of watering and cuttings as for seasonal chart
7. Collection of waste from the actions carried out on site
8. Photo report including pre and post states of the site



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1 Rainfed Biodiverse Grassland: Jane Bowles Avenue, Virreinas

SEEDS

90% herbaceous, of wich:

75% Cultivated species: Festuca arundinacea , Cynodon dactylon , Lolium perenne , Festuca rubra , Medicago polymorpha.

15% Wild grasses: Bromus ssp., Brachypodium distachyum, Aegilops ssp.

10% Wild flowers: Anagallis ssp., Anthemis arvensis, Bellardia trixago, Bellis perennis, Centaurium erythraea, Cleonia lusitanica , Glebionis macrotum, Echium ssp., Iberis umbellata, Leucanthemum vulgare, Mentha pullegium, Papaver roheas, Salvia verbenaca/pratensis, Silene ssp., Tuberaria guttata, Omphalodes linifolia, Origanum virens, Taraxacum officinalis, Tolpis barbata, Calendula arvensis, Trifolium incarnatum, Vaccaria hispanica, Convulvulus tricolor, Matricaria recutita, Anacyclus clavatus, Lupinus angustifolius, Spergularia (rubra/purpurea/arvensis).



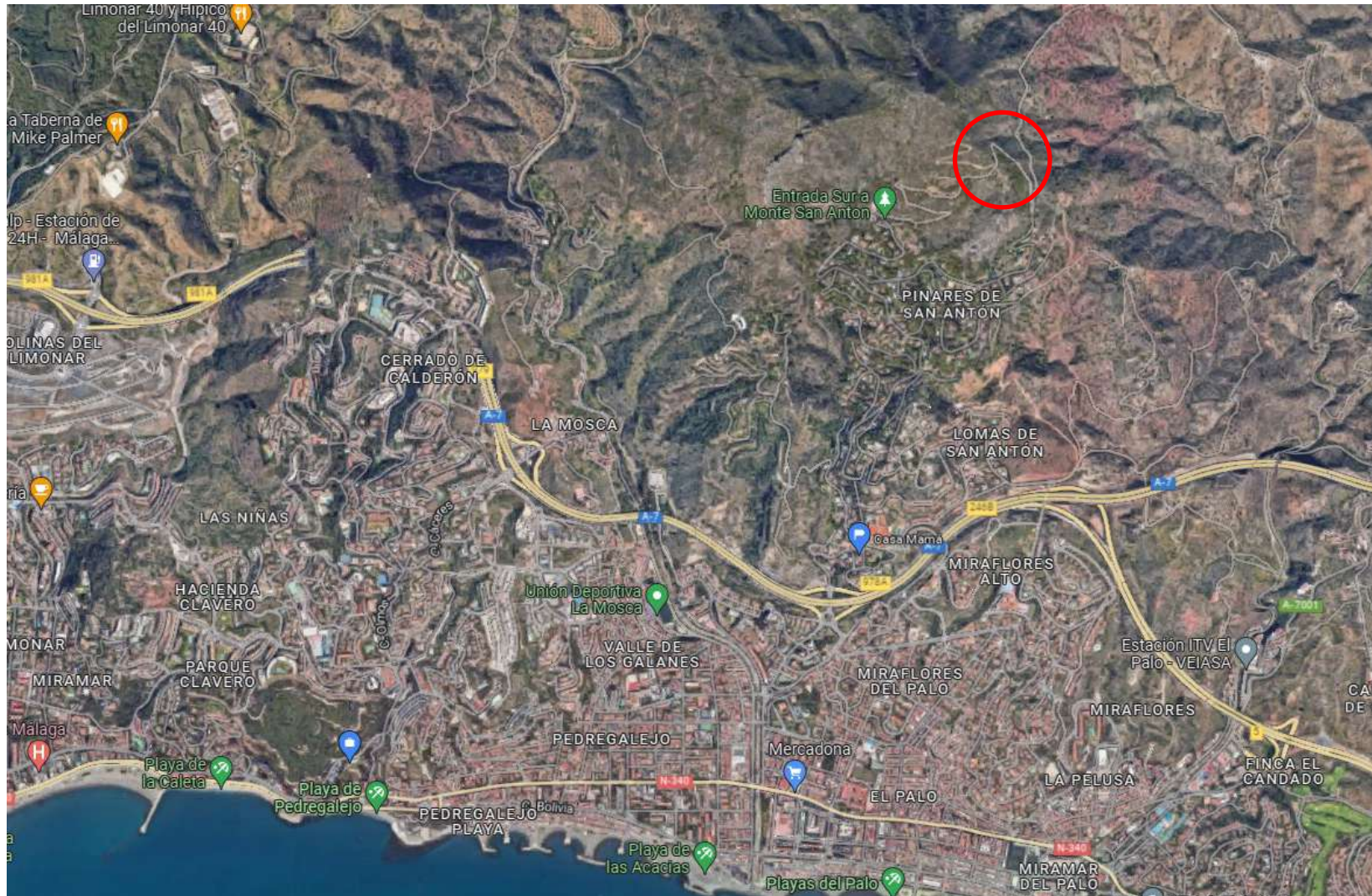
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2 Forest management: Mount San Antón pine forest





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2 Forest management: Mount San Antón pine forest





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2 Forest management: Mount San Antón pine forest





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2 Forest management: Mount San Antón pine forest

ACTIONS

Forest management consisting of:

- Pruning of lower branches for reducing risk of fire and also between trees and higher bushes in order to avoid fire by horizontal continuous contact
- Dead elements will be taken down and poorly grown, dominated or with slight thickness in proportion to height individuals will be eliminated, with the purpose of gaining space for the existing pines to reach their growing peak without competition
- In order to increase biodiversity, we will introduce other trees, bushes and herbaceous species: they will attract insects, reptiles and birds, which will as well enhance the conditions of the forest against risk of plagues as processionary moth, and nematode among others, and fires
- We will introduce shrubs and herbaceous plants that are currently merged with the existing masses, fostering the Mediterranean forest, in order to make this environment more permeable to fauna and vegetation.



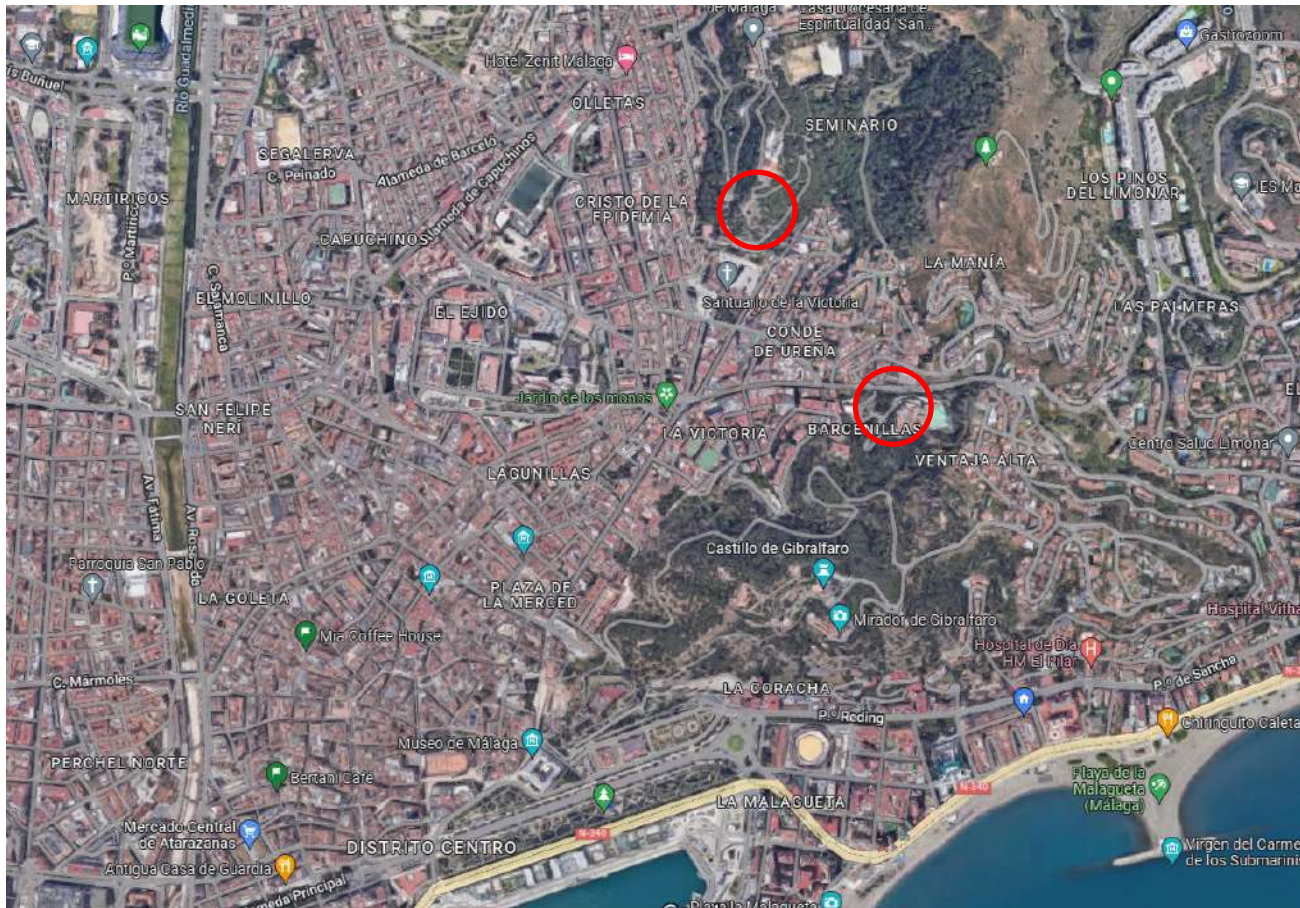
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3 Tree planting in Mount Calvario + 4 School Playground





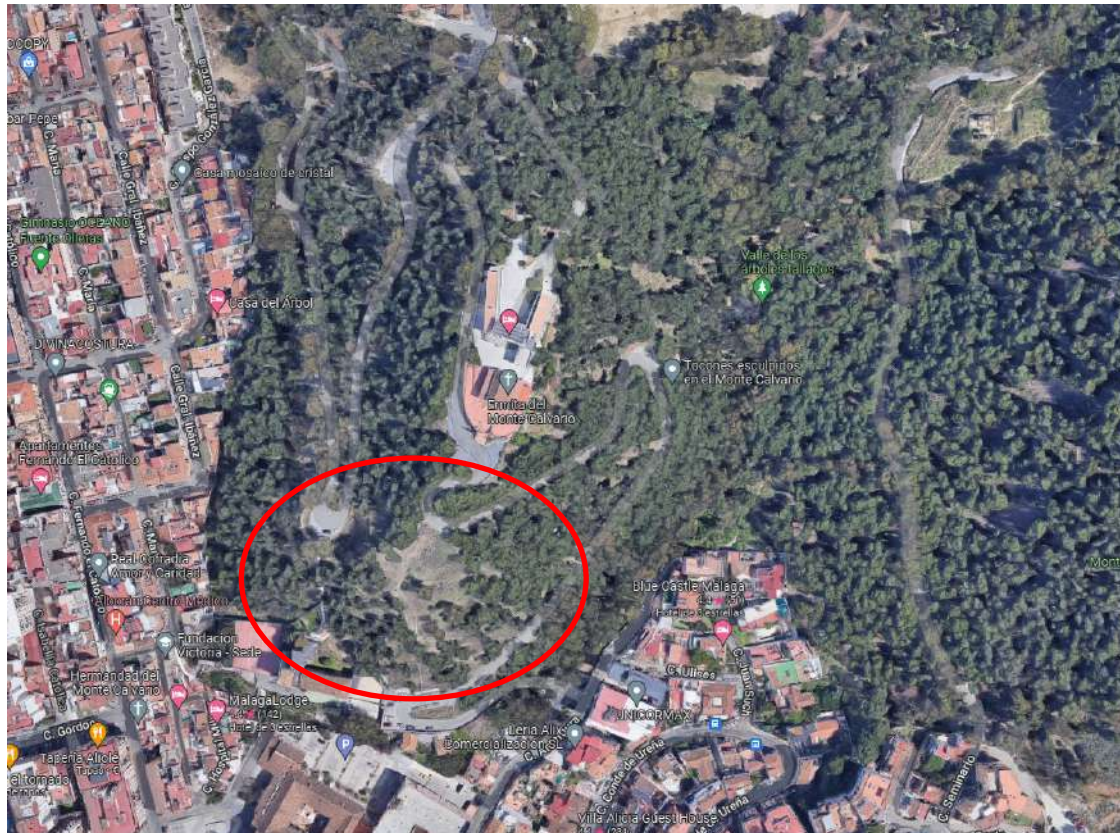
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3 Tree planting in Mount Calvario





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3 Tree planting in Mount Calvario





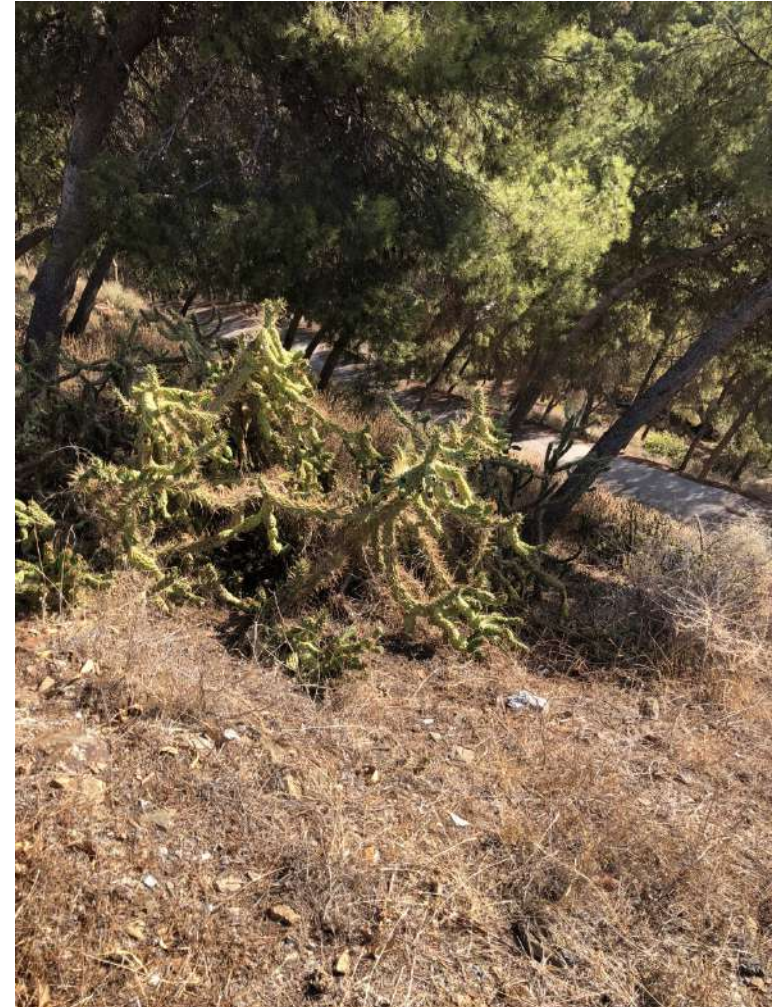
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3 Tree planting in Mount Calvario





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3 Tree planting in Mount Calvario





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3 Tree planting in Mount Calvario

ACTIONS

There are quite mature pine trees in this area, but scarcely any other tall species, nor are there shrubs or herbaceous plants.

Scarcity of rains and the high temperatures of this year -wich will most probably happen the upcoming ones- will turn out in very little success of survival rate if we plant species (even being Mediterranean) in open areas without vegetation, even with the support of water supply, because there would be 100% of insolation and previous experience of recent years has tells us that seedlings with 1 or 2 saps (saviás) do not prosper in this way, so they will be planted in áreas sorrounded or cohabiting with existing trees.



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4 School Playground





4 School Playground





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4 School Playground





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4 School Playground

ACTIONS

1. Removal of hard soil for increasing permeability
2. Enlargement of the vegetable garden
3. Creation of low walls
4. Installation of a sandbox
5. Supply of trees and plants for the vegetable garden