

The eradication of *Carpobrotus spp.* on the Island of Giannutri (Tuscan Archipelago, Italy): insights and first results from a low-impact approach

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CALL2013: LIFE+ Nature: project developed on NATURE2000 sites focused on habitat or species listed in EU directives.

Broad-spectrum approach: EUR 3,123.67 million

The project aims the re-naturalization of complex systems altered in part by human intervention, so as to protect sea birds and avifauna; endemic reptiles and typical Mediterranean habitats

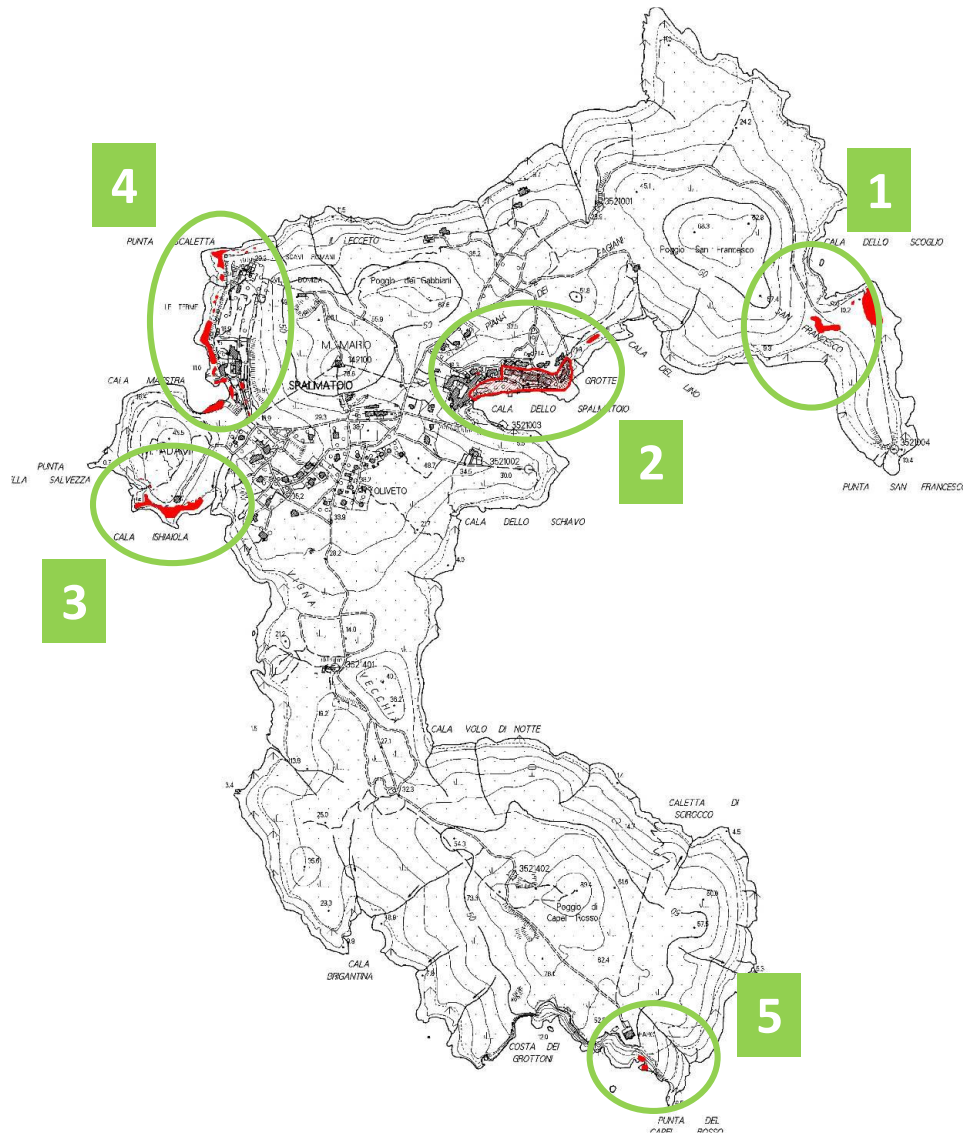
The Tuscan Archipelago National Park (TANP)



GIANNUTRI

- Eradication of *Carpobrotus* spp.
- Control of *Mesembryanthemum cordifolium*, *Senecio angulatus*, *Opuntia monacantha*
- Restoration of habitats covered by the thick mat of *Carpobrotus* planting native species such as *Euphorbia dendroides*, *Juniperus phoenicea* subsp. *turbinata* and *Pistacia lentiscus*
- Dealing with resident and seasonal population
 - Increasing public awareness,
 - Suggest/Provide alternative ornamental plant species

Carpobrotus spp. on Giannutri: 5 sites of invasion



1. P.ta S.Francesco (4800 m²)
2. Cala Spalmatoio (ca 1000 m²)
3. Cala Maestra – P.ta Scaletta (5000 m²)
4. Cala Ischiaiola (3200 m²)
5. Grottoni (150 m²)

Tot about 14000 square meters



Carpobrotus spp. on Giannutri: 5 sites of invasion



Carpobrotus spp. on Giannutri: 5 sites of invasion



Treatment trials in 2012

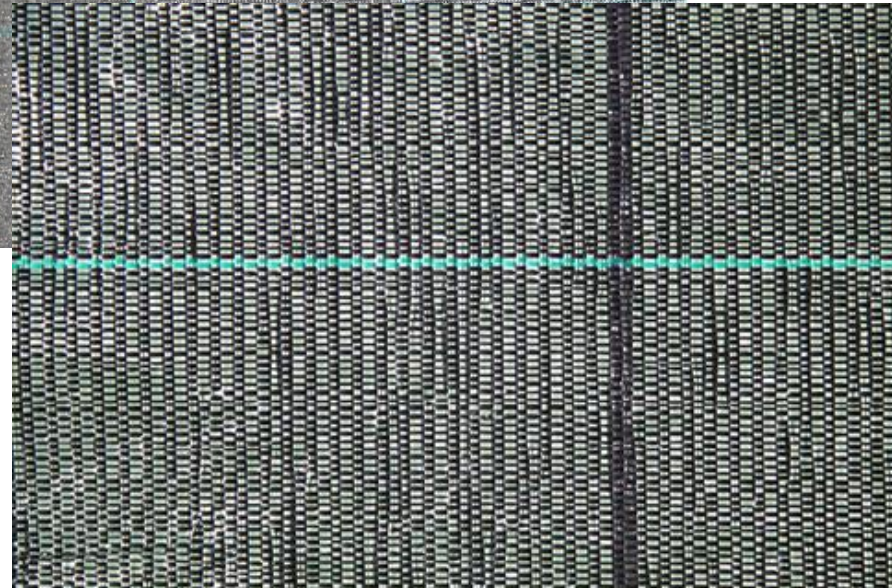


Treatment trials:

- Chemical treatment with various concentrations of:
 - **Gliphosate**
 - **Triclopyr (+ Fluoroxipir)**
 - **Picloram**
- Manual removal
- Covering with mulching sheets

Treatment trials in 2012

Landscape fabric mulching sheets resulted more effective and more resistant than common black nylon mulching sheets



The final plan for the eradication

2014 – approval of the EU Life project “RESTO con LIFE”

2015 – accurate survey of *Carpobrotus* presence on the Island and preparation of the eradication plan

Choice of 2 different treatments (manual removal and covering with mulching sheets), mainly basing on :

- Inclination of the substratum
- Presence of non-target species (especially if conservational interest)
- *Carpobrotus* spp. stand surface and cover ~100%

About 14000 square meters of *Carpobrotus* mats

- Mostly treated with mulching sheets (about 90 %)
- Remaining 10 % manually treated, and mostly accumulated under the mulching sheets



Manual Removal – spring/summer 2016



Covering with mulching sheets - spring/summer 2016



Covering with mulching sheets – spring/summer 2016



September 2016 – removing the mulching sheets

Due to a rainy season the sheets we removed after 4 months instead of only 2 months



November 2016 – removing the mulching sheets



May 2017 – removing the mulching sheets



May 2017 – looking for seedlings and resprouts



In may 2017 we found ONLY about 100 seedlings, almost only in the areas manually treated. Few more in June 2017

Next survey in may 2018



A breakdown of time and costs

Main intervention :

- 11-20 may + 25 may to 1 June – 18 days
- 4 to 5 people (80 pp*days)

Monitoring of the mulching sheets

- Further 2 days in June and July – 4 pp*days

Removing the mulching sheets

- September 2016 – 3 pp * 5 days – 15 pp*days

Plantation of demonstrative native plants in the settlement

November 2016 – 4 pp * 3 days – 12 pp*days

**INCLUDING FURTHER INSPECTION ON THE ISLAND TO MONITOR THE
RESULTS AND TO LOOK FOR RESPROUTS AND SEEDLINGS**

TOT 140 pp*days

TOTAL COST ABOUT 100.000 Euros

MEAN COST OF ABOUT 7 EUROS PER SQUARE METER

Monitoring the effects of the treatments

Rocky cliffs

Manual
Removal

Mulching
Sheets

Control



Loose soil

Mulching
Sheets

Control

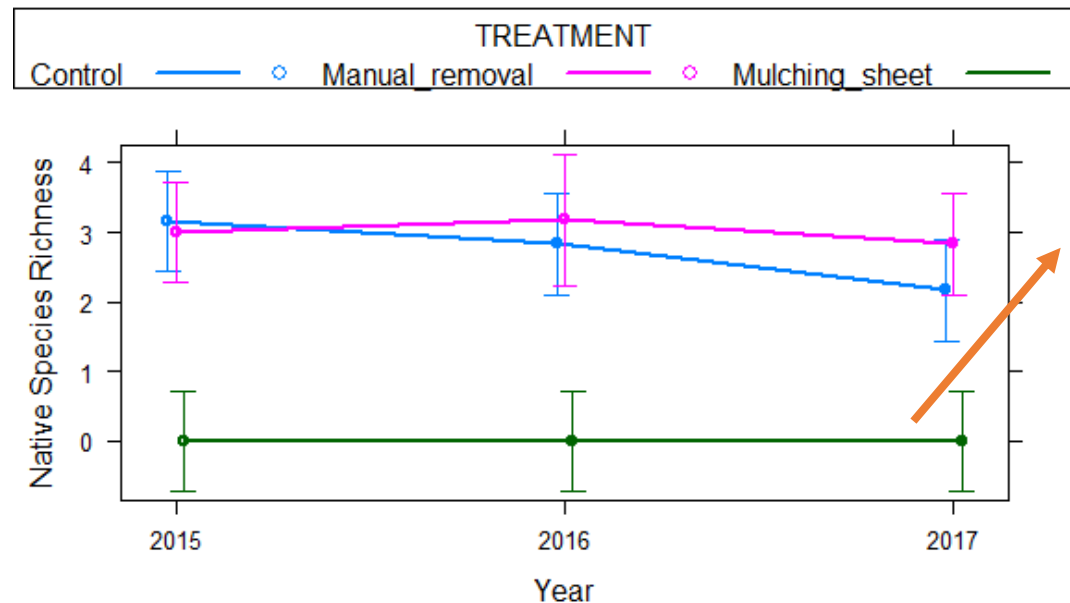
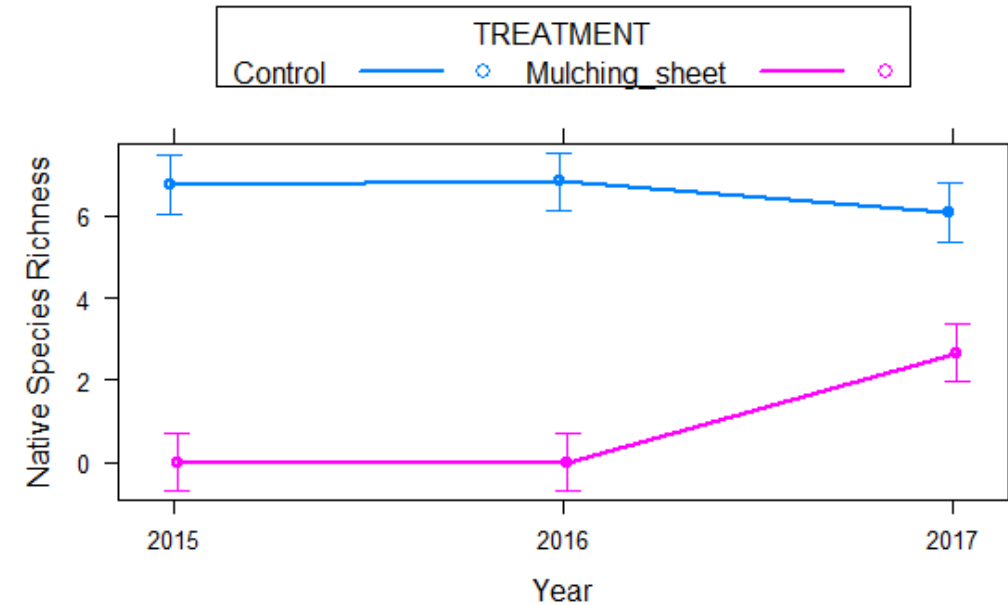


Monitoring the effects of the treatments

Recover of species on loose soils treated with mulching sheets



Still few recover in rocky cliffs treated with mulching sheets - None in monitoring plots



Restoration of the sites – preliminary transplants

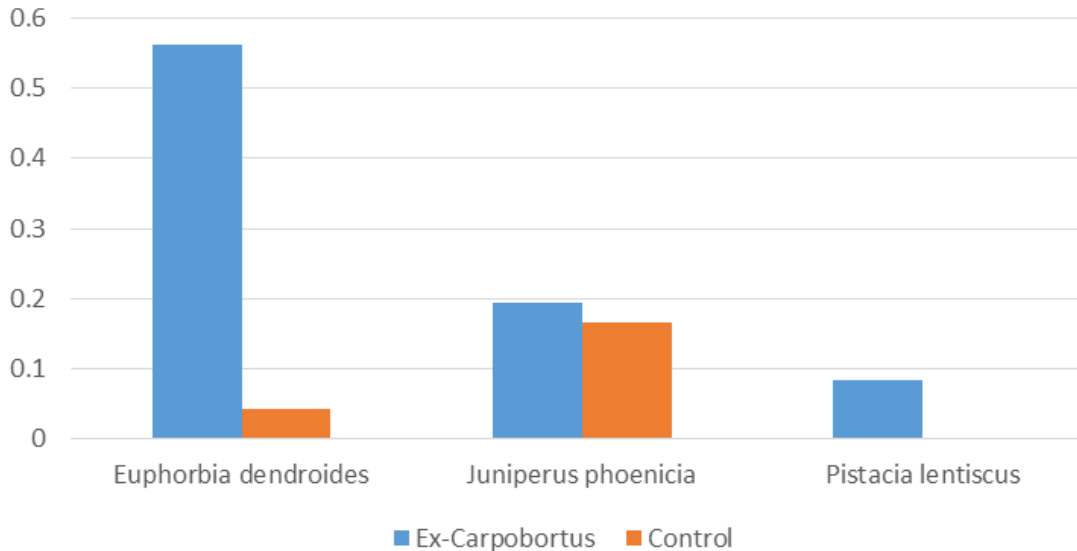
<i>Pistacia lentiscus</i>	24
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<i>Euphorbia dendroides</i>	72
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<i>Juniperus phoenicia</i>	48
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Proportion of survived transplants



Restoration of the site – plantation in 2017

350 plant transplanted in the site with loose soil

Further 350 are going to be transplanted in autumn 2018



Increasing Public Awareness

- 1) Meetings with the resident population to explain the action
- 2) Plantation of ~100 individuals of native species to substitute *Carpobrotus* in the settlement
- 3) Further meetings, with the dissemination of a list of suggested species to replace alien invasive species toward a “green gardening” in Giannutri



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LISTA DI SPECIE PER GIARDINAGGIO CONSAPEVOLE A GIANNUTRI



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PROGETTO LIFE13 NAT/IT/000471

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