



La protezione della flora delle coste dell'isola del Giglio attraverso la rimozione del Fico degli Ottentotti
The protection of the coastal flora of Giglio Island through the removal of the Sally-my-handsome

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Conferenza finale
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Progetto realizzato con il cofinanziamento della Commissione Europea



Project implemented with co-funding from the European Commission

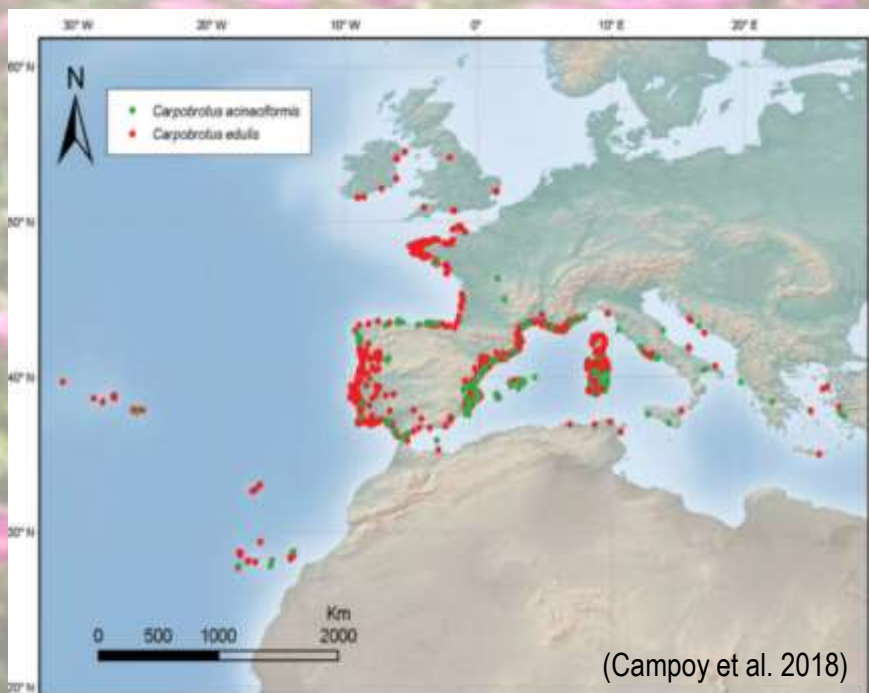


Carpobrotus edulis (L.) N.E.Br., *C. acinaciformis* (L.) L. Bolus and their hybrids, are considered among the most threatening invasive alien species in Mediterranean ecosystems

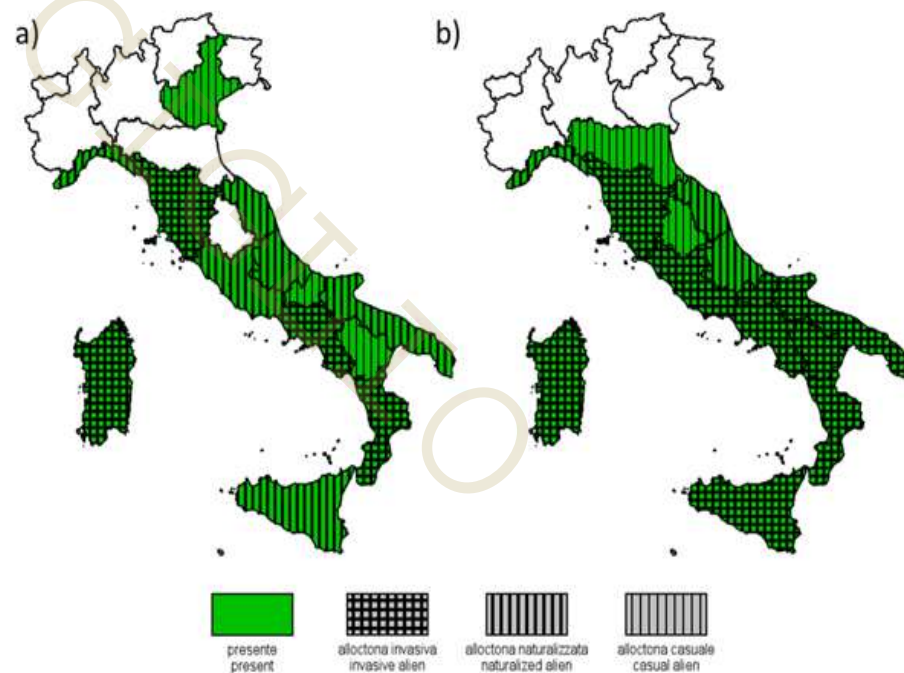


Perennial succulent plant with creeping herbaceous stems, more than 2 meters long, that grows more than a meter per year (GUILLLOT ORTIZ et al., 2008). The fleshy fruits (2-3 cm in diameter) contain up to 1000 seeds (BARTOMEUS & VILÀ, 2009).

Introduced to Europe from South Africa in the 17th century (Botanical Garden of Leiden); in the Mediterranean and on the Atlantic coasts, its spread began between the late 1800s and early 1900s (SANZ-ELORZA et al., 2004) but it gained significant momentum in dune areas after World War II (ALVINO, 1950)



▪ Distribuzione di a) *C. edulis* e b) *C. acinaciformis* in Italia (da <http://dryades.units.it/floritaly/index.php/>)



In Tuscany, this plant has naturalized along all the coasts from Livorno to Burano and, until a few years ago, throughout the entire Archipelago.



At **Giglio island**, it was reported by the botanist Sommier in 1894 at Cala dell'Arenella

The fruits are consumed and dispersed by various mammals such as **rabbits** (D'ANTONIO, 1990) and **rats** (BOURGEOIS et al., 2005). The fruits that are not consumed can remain on the plant for several years and then fall to the ground, forming a sort of seed bank containing 557-2,229 seeds per square meter (D'ANTONIO, 1990) and medium- to long-distance dispersal by opportunistic consumers facilitates the invasive success of *Carpobrotus*.



Regional Law 30/2015 prohibits its use for the maintenance of public green spaces and for the stabilization of dunes and slopes

- ✓ The invasion by *Carpobrotus* causes significant ecosystem changes at different scales, leading to a decrease in native plant richness and diversity^{1,2,3,4,5}
- ✓ The impacts include alterations in soil pH, salinity, moisture level, nutrient content, and microbial activity^{1,3,6,7}
- ✓ These can cause inhibition of germination, survival, growth and reproduction of native plants^{6,8,9,10} and in the facilitation of nitrophilous species^{2,3,5}



Presence at beginning of the project:

approximately 61.000 m² (most on cliffs or rocky areas), of which approximately 50.000 m² are strictly invaded



WHY IS CARPOBROTUS SO WIDESPREAD ON THE ISLAND OF GIGLIO?

- ✓ High degree of **anthropization** in some areas of the island.
- ✓ Likely transportation of the species to the island on multiple occasions, which has probably increased the **genetic variability** of the populations, strengthening their resilience and promoting their spread in natural contexts.
- ✓ Presence of **optimal substrates** for the species (granite slabs) that the native species in those contexts cannot colonize as effectively. This allows *Carpobrotus* to make the best use of the resources of space (and light) at the expense of other species, such as the endemic *Limonium sommierianum*, which can only establish itself in the fractures between the rocks.
- ✓ High spread of invasive alien animal species (**rat** and **rabbit**, but also mouflon).
- ✓ Significant reproductive population of the **yellow-legged gull**.





1240 "Vegetated sea cliffs of the Mediterranean coasts with endemic *Limonium* spp."

1430 "Halo-nitrophilous scrubs (Pegano-Salsoletea)"



5320 "Low formations of *Euphorbia* close to cliffs"



Impacts on species of high conservation value



Areas of intervention:

Approximately 31,000 m² in two distinct areas, in the wilder parts of the island.

Areas that are poorly accessible and difficult to reach:

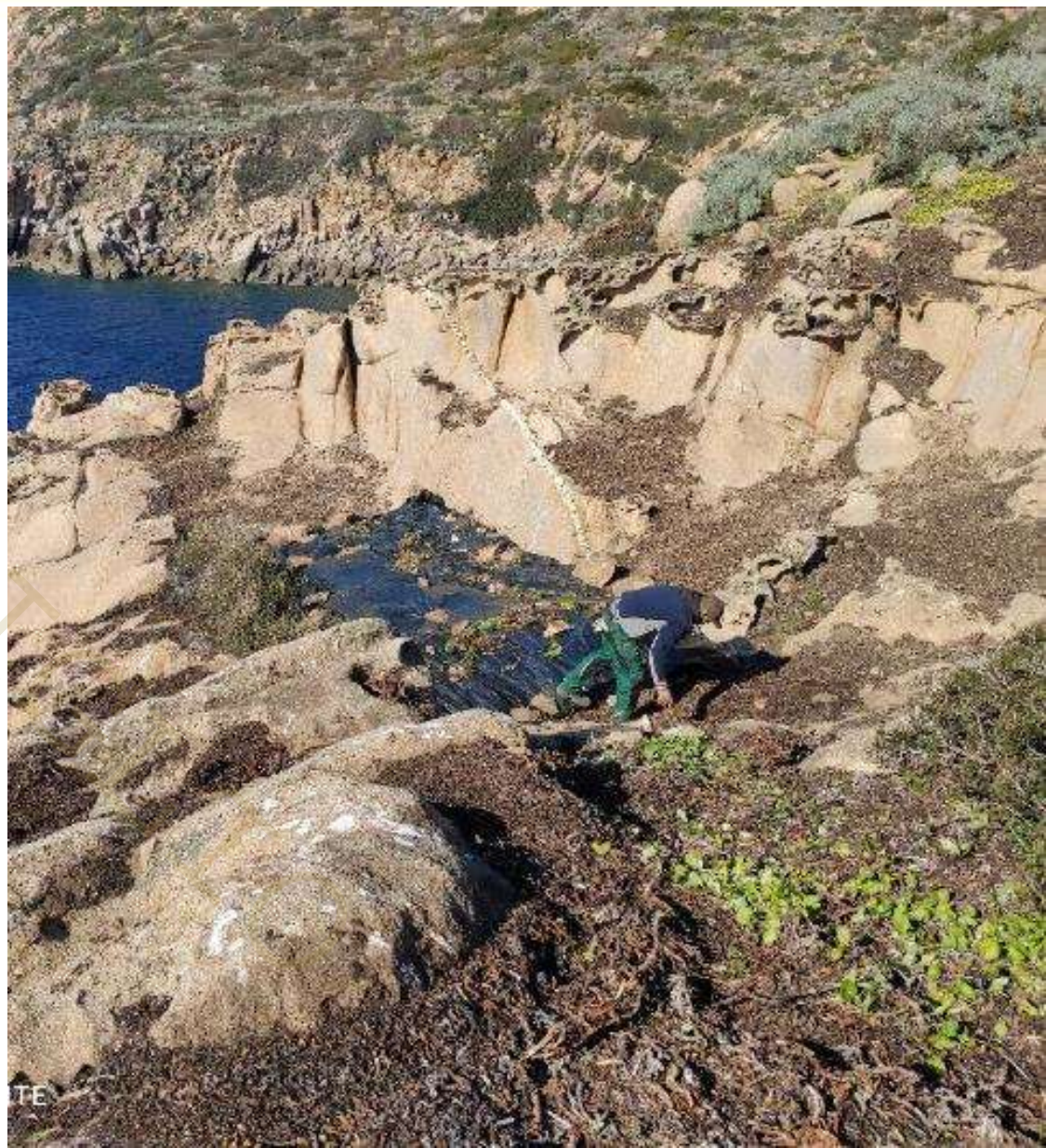
- ✓ walking on paths or more often through tracks in the Mediterranean scrub
- ✓ by nautical means
- ✓ with equipment for work at heights

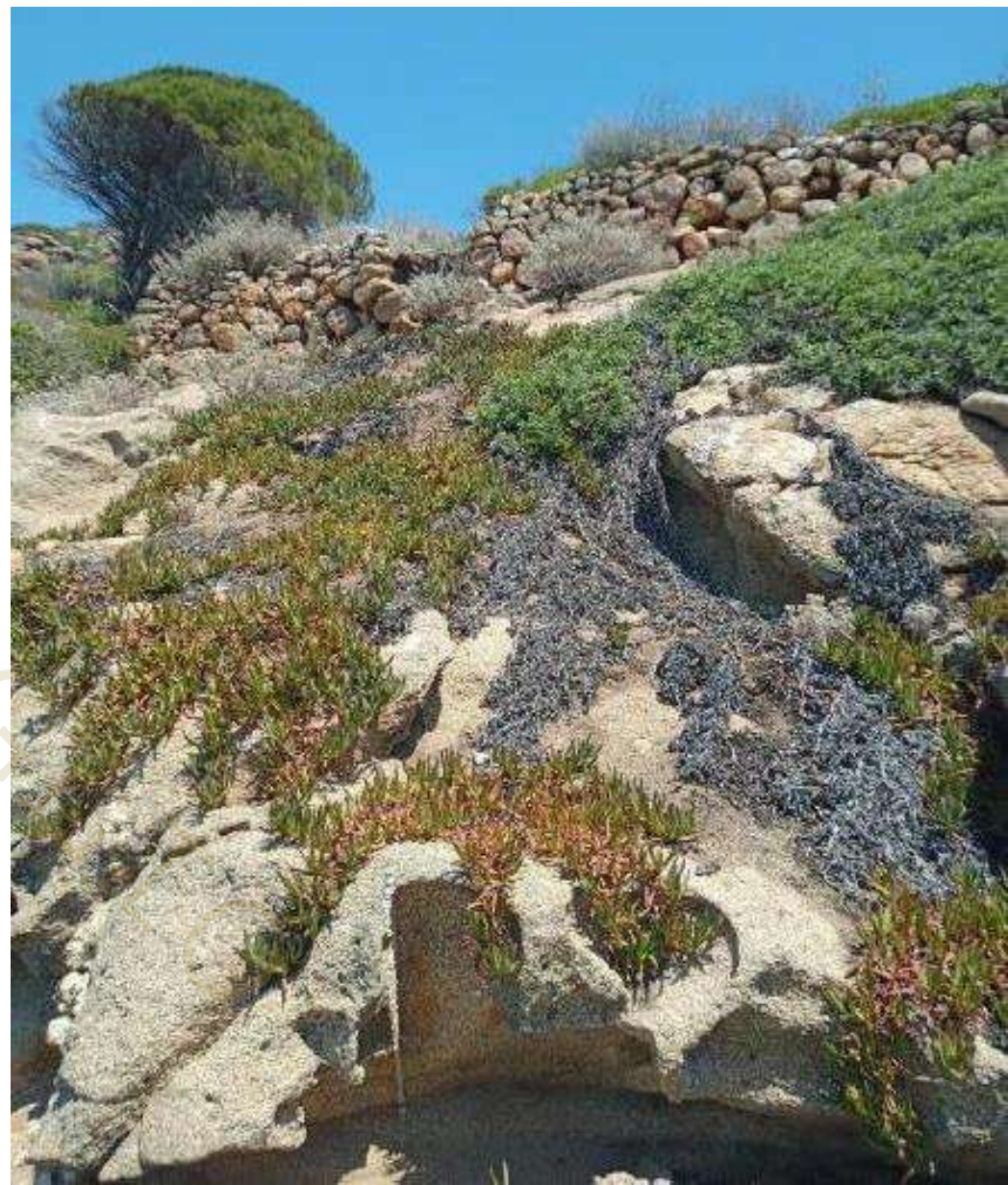
Methods:

- ✓ Mulching sheet coverage for totally invaded surfaces (100%)
- ✓ Manual removal and concentration of the removed plants in areas without soil (rocky surfaces or branches of shrubby plants) or piled up under mulching sheets



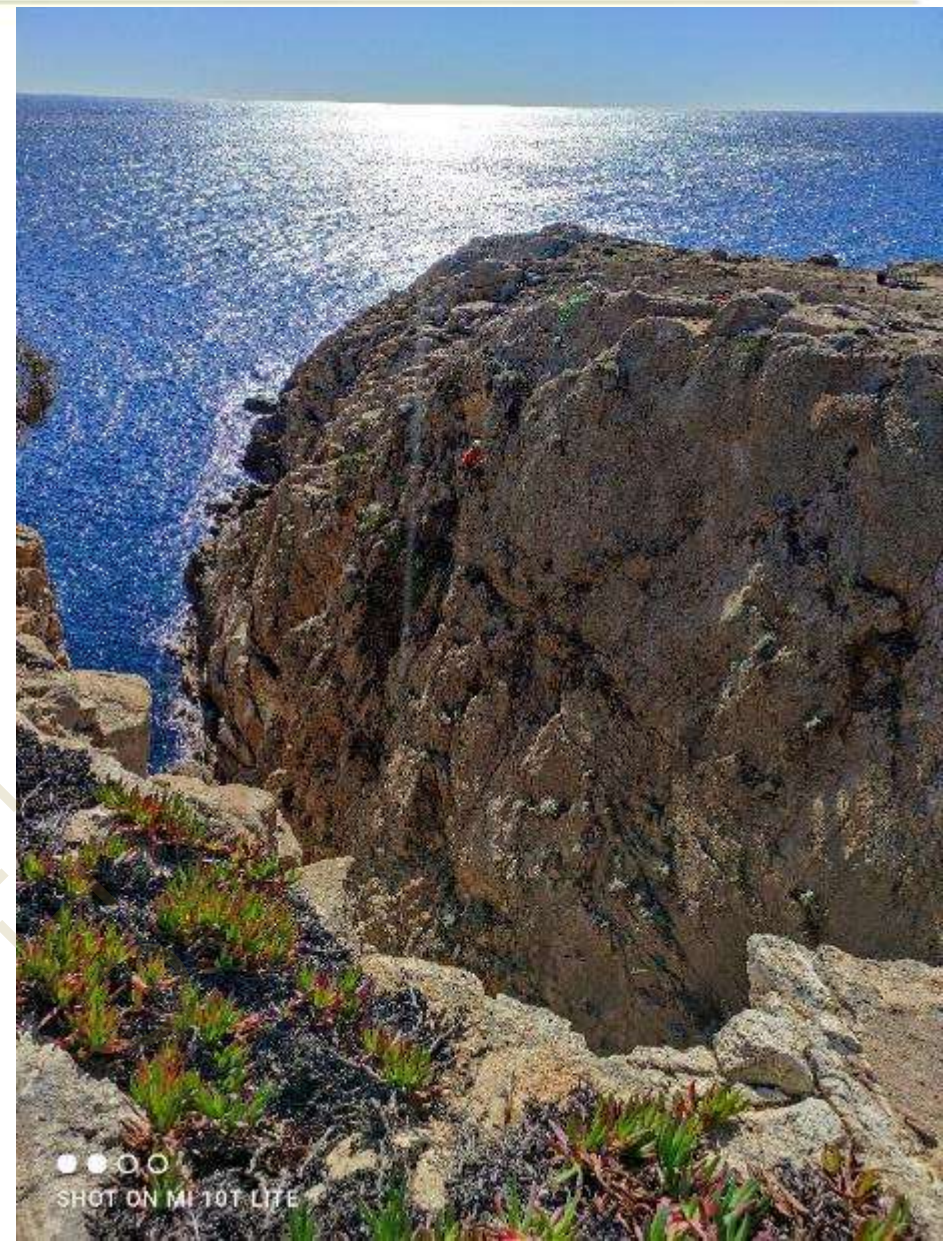


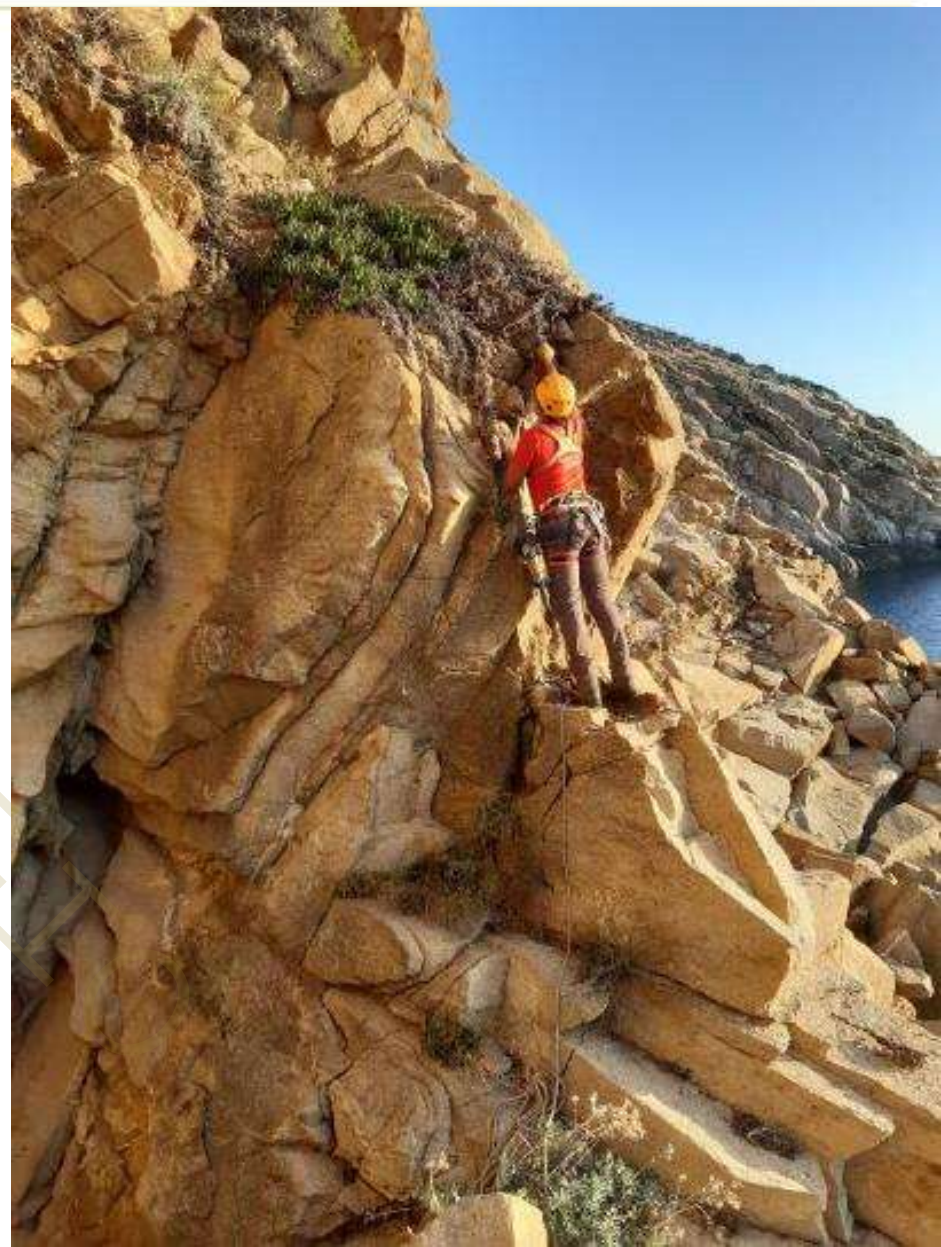
















Spontaneous return of native species (*Jacobaea maritima* subsp. *maritima*, *Lotus cytisoides* and *Limonium sommierianum*)











Wild rabbit



Number of checks: 7 (first in January 2022, last in September. 2024).







Grazie per l'attenzione