

# Invasive plants

in the Barrier Islands  
of Ria Formosa



LIFE  
ilhas  
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# Invasive plants

in the Barrier Islands of Ria Formosa

A SHORT GUIDE ABOUT INVASIVE ALIEN SPECIES  
THAT THREATEN THE NATIVE FLORA OF THE  
BARRIER ISLANDS AND WHAT TO DO TO PRESERVE  
THIS NATURAL HERITAGE

# The dunes of barrier islands

Dunes are formed by the action of the sand carried by the wind that, upon encountering an obstacle (a plant or stone), deposits itself and slowly begins to take shape.

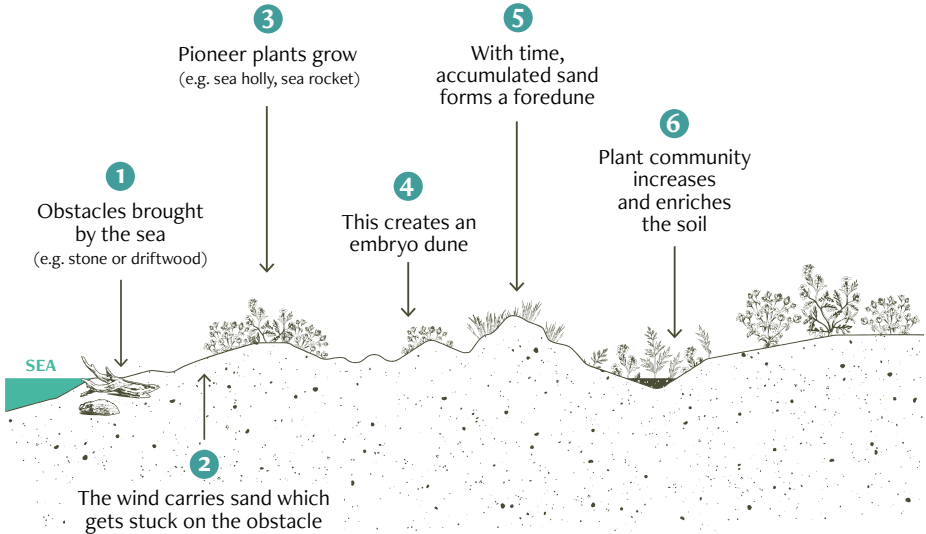
These are inhospitable environments where water is scarce and the wind is the dominant factor in their evolution. Coastal

dunes can be flooded by the sea or buried by the sand from the adjacent beach.

The size and morphology of coastal dunes depend on the complex interaction between the intensity of the wind, the supply of sediments, the rate of growth of vegetation, and the geomorphology of the environment close to the coast and the beach.

## HOW ARE DUNES FORMED?

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## The dunes of barrier islands

The dunes can be divided into those that are formed from the direct supply of sediments from the beach (primary dunes) and those that are formed from the subsequent modification of the primary dunes (secondary dunes).

Secondary dunes, or **grey dunes**, can be formed by ridges and valleys and are characterized by having shrubbier vegetation, greyish. The substrate (sand) is more stabilized due to the action of plants, and

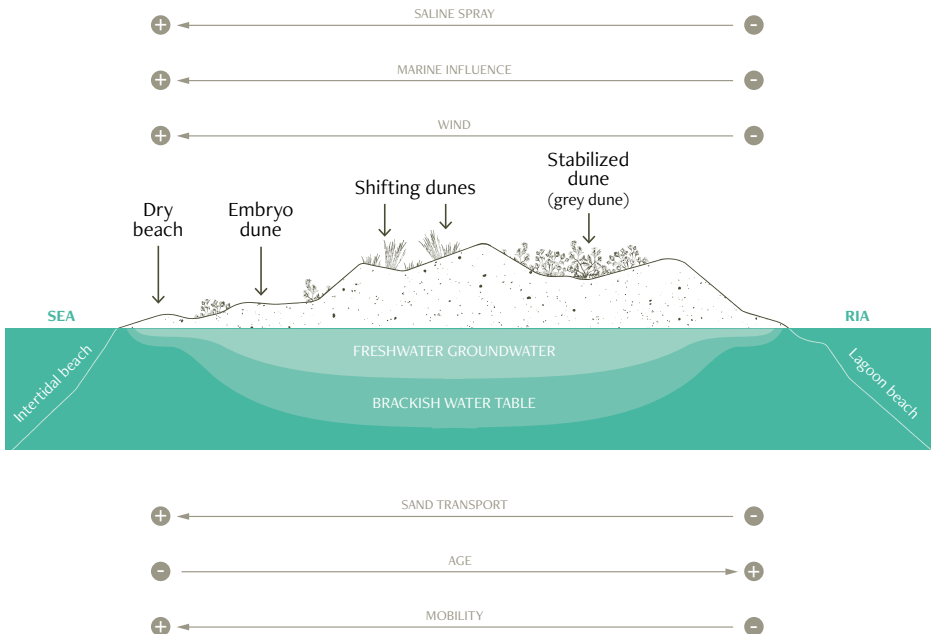
protected or removed from marine effects, having more availability of water and nutrients and therefore also hosts a greater diversity in its flora and fauna.

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**Did you know** that the dunes are a dynamic system that evolves over time, by the action of the wind?

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### CUT CROSS-VIEW OF THE DUNE SYSTEM



The dunes of barrier islands

# Why are dunes important?

The dunes provide several services vital to human survival and well-being:

- ❁ Natural protection against flooding and rising sea levels.
- ❁ They are the habitat of a large number of endemics and restricted distribution plants.
- ❁ They are a valuable source of leisure and contemplation.

The biggest threats to the dunes are marine erosion, trampling and invasive plants.

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**Did you know** that grey dunes are an ecosystem whose protection is a priority?

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That is why, to reach the beach, we often need to go along elevated walkways that are placed over this type of dunes, thus avoiding trampling on them.



Grey dune © Spea

The dunes of barrier islands

# The native plants of the dunes

A plant is native to the habitat when occurs naturally, without man intervention.

Native plants create a natural balance in ecosystems:

- ✿ Provide shelter and food for wildlife.
- ✿ Help to retain water in soils.
- ✿ Are more resistant to pests.
- ✿ Provide oxygen and help regulate the climate.
- ✿ Contribute to dune cord resilience (through their role in soil retention and dune sand stabilization).
- ✿ Contribute to the prevention of catastrophic phenomena and protection of interior areas.



Sea holly *Eryngium maritimum* © Spea



Cotton weed *Otanthus maritimus* © Spea

## Invasive species

# What is an invasive alien plant?

An **alien** or **exotic plant**, unlike native plants, occurs outside its natural distribution area through human action. These introductions into areas where the species is not native can lead to the expansion and dispersion of this species to adjacent areas.

There are plants, which by their characteristics as high dispersion capacity or greater competitiveness, are considered invasive. They tend to expand quickly and have a negative impact on the native biodiversity.

But beware, not all exotic species are invasive!

### Most invasive plants:

- ✿ Have fast growth.
- ✿ Have a high capacity of propagation.
- ✿ Produce many seeds.

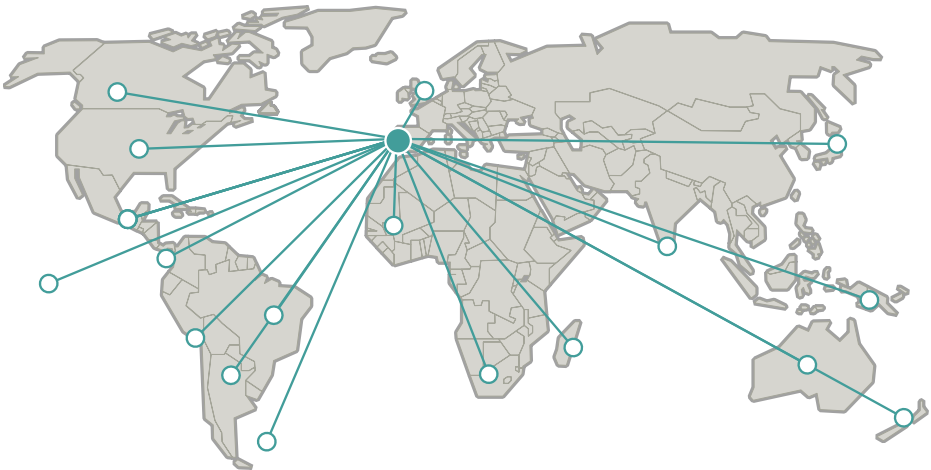


Hottentog fig *Carpobrotus edulis* © Spea

Invasive species

# Where do the invasive alien plants in Portugal come from?

From many and varied points on the globe.



Origin of invasive plants in Portugal

## How did these plants spread to the barrier islands of Ria Formosa?

Many of these plants were introduced intentionally in our territory for ornamental purposes. Others were introduced either to reduce erosion on the islands or for food production. However, the introduction of

these plants might also have happened accidentally due to the movement of people and goods on a global scale (for example seeds on the footwear of tourists).



Invasive species

# What are the problems caused by these plants?

Invasive alien plants are currently one of the main threats to biodiversity. By competing for resources, they can lead to the disappearance of the native species in the areas they occupy.

## Did you know that?

- ✿ The establishment of exotic invasive plants has negative impacts, often difficult to reverse.
- ✿ These impacts can include habitat degradation, changes in soil moisture and structure, reduction in biodiversity and damage to socio-economic activities such as agriculture, fishing and tourism, and thus affect the country's economy.
- ✿ The native species of the islands are generally not used to competing with others, as their main defence is the difficulty of accessing their habitat!
- ✿ Species that are not invasive in some places, can be invasive in others.
- ✿ The best tool to fight invasive species is prevention. Avoiding the establishment of new invasive species saves effort and money in their control and prevents irreversible damage to natural habitats.



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**Did you know that** the Hottentog fig was introduced to help retain the sand in the dunes and prevent the sand to reach the resident's houses?

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The Hottentog fig: this plant grows very quickly and forms a mantle of shallow roots that impede the development of native plants. Its roots are less effective than those of native plants in controlling wind and sea erosion. On the other hand, native shrub plants, taller than the Hottentog fig, are a more effective barrier to the wind, managing to better retain the movement of sand.

## COMMON NAME

# Hottentog fig

## SCIENTIFIC NAME

## *Carpobrotus edulis*

### Description

It is a succulent perennial creeping sub-bush with stems that can reach several meters and that creates roots in the knots.

### Flowering

Yellow or pink/purple solitary flowers 8 – 10 cm in diameter, which bloom between March and June.

### Origin

From South Africa, it was introduced in several countries for ornamental and medicinal reasons, but it has also been used to retain sand and stabilize the dune surface.

### Impacts

Forms dense, continuous mats practically impenetrable by other plants, ending up completely dominating the available space. This happens due to its high capacity to reproduce by vegetative propagation (seedless) and to produce seeds. It is a very resistant plant to drought and salinity

and contributes to the chemical alteration of the soil, due to the high production of organic matter, affecting the ability of other plants to survive in the same space. Thus, the presence of the Hottentog fig will be a serious threat to the conservation of natural vegetation and lead to a profound change in the constitution and dynamics of the ecosystems of the sites where it is introduced.

### Control/removal

Manual removal is one of the most effective methods and works relatively well on sandy substrates, and should preferably be carried out outside the flowering season. As it is pulled out, the various fragments or portions of the mat should be left with the roots exposed and preferably rolled over itself to reduce the dispersion of small fragments. It must be ensured that there are no larger fragments in the ground, which easily take root, creating new outbreaks of invasion. It can also be covered with a mulching sheet to accelerate its destruction/degradation.



COMMON NAME

# Acacia

SCIENTIFIC NAME

## *Acacia saligna*

### Description

Shrub or small tree with blue-green leaves.

### Flowering

Golden yellow flowers forming ‘clusters’ from February to May.

### Origin

Western Australia and Tasmania. It was introduced for ornamental purposes and to help stabilize coastal dunes.

### Impacts

Forms dense stands, which impede the growth of native vegetation and cause changes in the soil, due to the deposition of its leaves.

### Control/removal

Manual removal must be carried out during the rainy season, to facilitate the

removal of roots and must ensure that no fragments remain in the soil – this methodology is the most suitable for young plants. Herbicides can also be applied immediately after cutting close to the ground – the most suitable method for older plants.

**Attention!** The application of herbicides must be carried out by experienced people who are certified for the acquisition and application of phytopharmaceuticals.

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**Did you know** that there are more than ten species of invasive acacia trees in Portugal?

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© Doug Beckers



© Krzysztof Ziamek

COMMON NAME

# Century plant, Manguey or Amercian aloe

SCIENTIFIC NAME

*Agave americana*

## Description

Very robust perennial herb up to 8 m. The leaves are light green, very large, fleshy and gathered in a large rosette.

## Flowering

Greenish-yellow flowers, large, set in the centre of the leaf rosette. It flowers only once, around the age of 20 to 30 years, between May and June, and dies after fruit formation.

## Origin

Mexico and Eastern USA. It was introduced for ornamental purposes.

## Impacts

The large leaves cause shade, preventing the development of native vegetation. It is very resistant to dryness and high temperatures.

## Control/removal

For small plants, the recommended method is manual removal. This must be done in the rainy season before flowering and it must be ensured that no larger roots and/or rhizomes remain in the soil. For large plants, cutting combined with the application of herbicide or the injection of herbicide (glyphosate) into the stems can be used. Both should be done before flowering.

**Attention!** The application of herbicides must be carried out by experienced people who are certified for the acquisition and application of phytopharmaceuticals.

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**Did you know that**  
contact with the leaves  
can cause allergies?

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© Green Marlin



© Speca

COMMON NAME

# Bermuda buttercup, Buttercup oxalis, Sour sob

SCIENTIFIC NAME

## *Oxalis pes-caprae*

### Description

Herb that can reach 40 cm in height, with a bulb and an underground annual stem, from which rosette-shaped leaves emerge on the soil surface.

### Flowering

Yellow flowers, 13-26 mm, gathered in clusters, from 4 to 19 flowers that bloom between January and April.

### Origin

From South Africa (Cape region) and introduced for ornamental purposes.

### Impacts

Produces many bulbils that easily break up and help the plant disperse (vegetative reproduction). Due to this high reproduc-

tion capacity, it forms very dense mats that can affect the development of other plants, particularly in cultivated areas.

### Control/removal

Manual removal is the most effective method and can be applied to plants of all sizes. It should be done in the rainy season to ensure that all the bulbs are removed, and frequent pulling helps ensure that no new bulbs form, thus weakening the plant. You can also apply herbicide to the leaves (glyphosate) before the flowering time. Another alternative method is solarization, which can be used on continuous sorrel patches where no native species are present.

**Attention!** The application of herbicides must be carried out by experienced people who are certified for the acquisition and application of phytopharmaceuticals.





## Invasive species

# Caring for your garden

If you have any invasive plants in your garden, here are some recommendations:

- ✿ If possible, remove the plant. If this is not possible, reposition the invading plant to a location further away from the garden boundary, to prevent it from spreading outside the garden;
- ✿ Be aware of the growth of invasive plants and remove them regularly;
- ✿ Dispose of pruning waste with care to avoid seed dispersal by the wind;
- ✿ Get to know the plants before buying them to make sure they are suitable for the location/garden.

- ✿ Regularly wash garden tools to keep them free from plant fragments, seeds or even disease.

Fortunately, there are alternative native plants that you can have in your garden that will help protect this magnificent ecosystem, which are the dunes of the Barrier Islands:

**Marram grasso, european beachgrass**

**Sea lily, sand daffodil, sand lily**

**Sea holly or seaside eryngo**

**Mediterranean strawflower,  
curry plant or eternal flower**

**Cotton weed plant**



Sea lily *Pancratium maritimum* © Elena Regina



Mediterranean strawflower *Helichrysum italicum* © Spea

## Invasive species

# What is Biosecurity?

Biosecurity helps to prevent or reduce damage caused by alien species.

After implementing a program to control and/or remove invasive alien plants, it is necessary to maintain a monitoring plan so that the appearance of new plants can be quickly detected. Seeds from removed plants can remain in the soil for sever-

al years and therefore this monitoring should be carried out in the long term. New shoots that appear should be quickly removed.

On the other hand, it is necessary to prevent the entry of new invasive alien plants in the places where the removal took place, adopting a set of good practices.

### What can each of us do:



Be sure to clean and disinfect chainsaws and other cutting tools as part of routine maintenance and before using them on Barrier Islands



Clean mud, organic material and water from your shoes, bicycles and prams before heading to the Barrier Islands



Please do not bring any plant products or trees when you return from overseas trips



Whenever you visit the Barrier Islands, stay on the tracks



Do not plant exotic species, especially those that are invasive.



Replace invasive plants in your garden with native plants



Participate in invasive species control actions

# The LIFE Ilhas Barreira project

The LIFE Ilhas Barreira project (LIFE18 NAT/PT/000927) aims the conservation of the barrier islands in the Algarve, to protect priority species and habitats. Its main objectives include the assessment of the resilience of these islands to climate change, the study of the populations of Audouin's gull and little tern, and also the study of the impact of fishing activity on the endangered Balearic shearwater.

Regarding invasive alien plants, the LIFE Ilhas Barreira project will carry out an extensive collection of information with the

mapping of these plants on the five barrier islands included in the Ria Formosa Natural Park. The impacts of species such as the Hottentot fig, Acacia and Century plant will be studied, on the ecosystem and particularly on the grey dunes, which are a habitat whose protection is a priority.

All this information will make it possible to define and implement efficient and adequate control or removal plans in the future. On Barreta Island, all invasive alien plants will be removed. On this island, native species will also be mapped and quantified.

To learn more about this project, visit the website  
[www.lifeilhasbarreira.pt](http://www.lifeilhasbarreira.pt)

## OTHER USEFUL LINKS:

Invasive plants in Portugal  
[www.invasoras.pt](http://www.invasoras.pt)

Invasive flora - ICNF brochures  
[www.icnf.pt/api/file/doc/ceb73c20e37b9752](http://www.icnf.pt/api/file/doc/ceb73c20e37b9752)

Decree-Law establishing the legal regime for the control, detention, introduction into nature and repopulation of exotic species (Decreto-Lei n.º 92/2019, de 10 de julho).

[www.dre.pt/home/-/dre/123025739/details](http://www.dre.pt/home/-/dre/123025739/details)

# Glossary

## **Bulb**

Plant organ that has a part corresponding to the stem and serves to store nutrients that the plant uses during the unfavourable season. It also allows the origin of a new plant, without the need for fertilization (vegetative reproduction).

## **Bunches** (inflorescence)

A set of flowers arranged around a common axis.

## **Perennial**

Plants with a long life cycle, in which the leaves remain during the winter period.

## **Rhizome**

A type of underground stem, which grows horizontally and allows the origin of a new plant, without the need for fertilization (vegetative reproduction).

## **Vegetative reproduction** (ou propagação)

A form of asexual reproduction that occurs from organs such as bulbs or rhizomes, for example.

## **Rosette**

Organization of leaves or petals, around a central axis of spiral shape, like the petals of a rose.



# LIFE ilhas barreira

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