



# Hottentot fig

(*Carpobrotus edulis*, *Carpobrotus acinaciformis* and their hybrid)

## Management of Hottentot fig on several sites in Finistère and Côtes-d'Armor

### Association of Managers of Breton Natural Areas (AGENB)

- Association created in 2016 as project operator of the Network of Managers of Breton Natural Areas (AGENB).
- Its actions are based on two areas of intervention:
  - optimising the management of natural areas by networking stakeholders;
  - supporting projects in favour of natural areas.
- In 2019, AGENB received a trainee to draw up an inventory of the presence of Hottentot fig species in Brittany (distribution of the three taxa, abundance of populations, habitats colonised, management implemented and formulation of guidelines for the management of the species).
- The management of the AGENB was transferred to the Breton Biodiversity Agency in 2020.
- Contact: Maud Bernard, Breton Biodiversity Agency - [maud.bernard@biodiversite.bzh](mailto:maud.bernard@biodiversite.bzh).

### National Botanic Conservancy of Brest (CBNB)

- A local public institution created in 1987 which has the legal status of a local authority grouping.
- As independent scientific and technical contact persons, the national botanic conservancies carry out their knowledge enhancement, conservation, consultancy and awareness-raising remits for local authorities, professionals and citizens.
- As part of the management of invasive alien species (IASs), the CBNB is assigned by its various public partners to:
  - monitor the distribution of invasive plants in the area for which it is responsible;
  - put forward and keep up-to-date the lists of invasive species so as to support and guide public policies on biodiversity conservation: identify species requiring management, regulatory and/or informative and prevention measures to slow their spread; prioritise IAS works, in agreement with the existing regional invasive species monitoring committees.
- The CBNB contributed to the supervision of the course.
- Contacts: Agnès Lieurade - [a.lieurade@cbnbrest.com](mailto:a.lieurade@cbnbrest.com), Eva Burquin - [e.burquin@cbnbrest.com](mailto:e.burquin@cbnbrest.com)

### Intervention site



1 - Chemin du Sillon noir



2 - Ploumanac'h



3 - Îlot aux vaches



4 - Île Callot



5 - Pointe du Dibennou



6 - Cap de la chèvre



7 - Postolonnec



8 - Saint-Nicolas-des-Glénan

1 - Map of intervention sites Source: CBNB.

■ Due to their significant presence on the Breton coast, management work on these species has been carried out on many sites have been the subject of and this feedback on experience covers 8 of them, located in 7 communes.

■ In Brittany, Hottentot fig species develop in dune habitats, high on pebble beaches and on cliffs. The technical itineraries and complexity of the works are determined by the accessibility of the colonised areas.

#### Accessibility of different worksites

Sites	Towns	Accessibility
Chemin du Sillon noir	Pleubian (22)	Easily accessible
Landrellec-Ilot aux vaches	Pleumeur-Bodou (22)	Easily accessible
Ploumanac'h	Perros-Guirec (22)	Easily accessible
Île Callot	Carantec (29)	Easily accessible
Île de Saint-Nicolas dans l'archipel des Glénan	Fouesnant (29)	Easily accessible
Pointe de Dibennou	Guissény (29)	Easily accessible
Postolonnec	Crozon (29)	Not accessible without equipment
Cap de la Chèvre	Crozon (29)	Not accessible without equipment

## Disturbance and issues involved

■ In Brittany, Hottentot fig species are mainly found in Habitats of Community Interest (EU 2110, EU 2120, EU 1230, EU 1220). They strongly modify the floristic composition of the plant communities characteristic of these habitats and thus affect their conservation status.

■ Stands of plant species with high natural heritage value may be impacted, particularly those characterised by the presence of *Crambe maritima*, *Eryngium maritimum*, *Isoetes histrix* or *Ophioglossum lusitanicum*.

■ Hottentot fig can alter the physico-chemical balance of soils through the emission of tannins and antibacterial substances causing their acidification and an increase in their nitrogen concentration. The hydrological characteristics of invaded soils can also be modified and become less favourable to native species and more conducive to establishment of alien species. This can also have a decisive impact on revegetation following uprooting operations.

■ Depending on the site, social and economic issues such as accessibility to recreational sites or landscape impact were among the reasons for the work carried out.

## Intervention

### Objectives

■ In the short term: limit Hottentot fig proliferation in high-stake sectors in areas where colonisation is low and where action is technically possible in order to preserve species with natural heritage value;



2 - Easily accessible station on Île Callot (condition before works).

3 - Cliff site with difficult accessibility on the Toulinguet Signal Station site.

\*Community of Communes of Crozon peninsula and Aulne Maritime.



- In the long term: eradicate the species on all sites.
- The decision to carry out the work is based on:
  - the presence of species and/or habitats with conservation issues (protected, rare or threatened plants, habitats of community interest, breeding, feeding or resting sites for avifauna) threatened by Hottentot fig invasion;
  - socio-economic issues (public access to the site, leisure, landscape impact);
  - the age of the Hottentot fig population: the more recent the invasion, the greater the chance of successful eradication and the lower the costs;
  - as for site accessibility, resource availability at each site was also a decisive factor in the decisions to intervene (financial, human and material resources).

### ■ Methods used

- Due to the shallow rooting of Hottentot fig, manual uprooting, involving few technical means, was carried out on all accessible sites (Table on previous page). The uprooted plants were stored in big bags and then transported to a trailer, or a horse-drawn plough, or a tractor, depending on the site.
- On several stations, annual monitoring was carried out to remove any regrowth. This monitoring is mainly carried out on sites where Hottentot fig occupied limited areas, such as on the site of the Island of Saint-Nicolas in the Glénan archipelago.
- On sites with difficult accessibility, officers specialised in cliff work (rope access technicians) were involved. The Postolonnec station in the Regional Nature Reserve of the geological sites of the Crozon Peninsula, managed since 2015, required regular work by rope access technicians.
- The plant waste was then incinerated or transported to waste disposal sites. The Hottentot fig removed after management on Île Callot were reused via a composting process. However, there is still a risk of regrowth following this process due to the possibility of cuttings propagating or seed resistance.
- Following the uprooting operations, an annual monitoring must be carried out to remove any regrowth.
- This monitoring is to continue for 10 years.

## Results and assessment

### ■ Technical results

- The scale of the works depends largely on the resources available, particularly human resources. Works often involve volunteers and students supervised by managers (see table on next page).
- The main difficulties brought up by the operators are the storage, drying and export of the uprooted plants, which are bulky and heavy. In addition, no fragments should be left on site to avoid any risk of further spread.
- On all the sites treated, regrowth was observed following the works, but regrowth decreased as monitoring and work progressed.



4 - Manual uprooting on Landrellec-îlot aux vaches.  
 5 - Hottentot fig removed after management on Île Callot.  
 6 - Waste *Carpobrotus sp* from works on Île Callot.  
 7 - Removal by animal power, Île Callot, May 2019.

Technical results and human resources involved per site.

Sites	Managers	Workdate	Accessibility	Number of people involved	Composition of teams	Works duration (hours)	Works duration x number of people involved (hours)	Land area covered (m <sup>2</sup> )	Amount of waste removed* (m <sup>3</sup> )
Chemin du Sillon noir, Pleubian (22)	Lannion Trégor Community	25/06/19	Easily accessible areas	10	4 volunteers + 3 LTC officers + 3 nature reserve officers	2	20		10
Landrellec - îlot aux vaches, Pleumeur-Bodou (22)	Lannion Trégor Community	05/07/17	Easily accessible areas	15	12 volunteers + 3 officers	2	30		12
		04/07/18	Easily accessible areas	22	19 volunteers + 3 LTC officers	2	44		10
Ploumanac'h, Perros-Guirec (22)	Perros-Guirec Commune	07/09	Easily accessible areas	3	2 coastal rangers + 1 seasonal worker	7	14h – 21	100	9
Île Callot, Carantec (29)	Morlaix Community/ Finistère Departmental Council	05/19	Easily accessible areas	31	29 nature management students + 2 teachers	14	434		23
Île de Saint-Nicolas dans l'archipel des Glénan, Fouesnant (29)	Glénan Islands National Nature Reserve	09/05	Easily accessible areas	26	6 technicians + 20 students	14	364, or 52 days	300	16
		10/11	Easily accessible areas	28	6 technicians + 19 students + 1 trainee + 2 volunteers	14	392, or 56 days	450	23
Pointe de Dibennou, Guissény (29)	Natura 2000 Site-Guissény	08/16	Easily accessible areas	25	Volunteers	4-5	64h - 100	150	20
Postolonnec, Crozon (29)	Crozon Peninsula-Aulne Maritime Community of Communes - Nature Reserve	05/16	Non-accessible area (on cliffs)	1	1 specialised officer – rope access technician	7	7	5	0,8
Cap de la Chèvre, Crozon (29)	Crozon-Aulne Maritime Peninsula Community of Communes	11/12	Non-accessible area (on cliffs)	1	1 specialised officer – rope access technician	21 (3 days)	21		5

\* Volume calculation was based on equivalent mass in tonnes.

## ■ Costs

■ Financial details are available for the following three sites:

Postolonnec Crozon (29), Île Callot (29), Ploumanac'h, Perros-Guirec (22).

Financial details.

Sites	Accessibility	Duration	Number of people	Total expenses (€)
Postolonnec, Crozon (29)	On cliffs, rope access technician	7 h	1	2 500
Île Callot, Carantec (29)	Area accessible with students	2 days	+/- 30 school children and students	3 500
Ploumanac'h, Perros-Guirec (22)	Accessible area, action by officers	7 h	3	777 (for labour only)



- The resources needed strongly depend on site accessibility. The need for rope access on the cliffs has led to higher costs. The involvement of a large number of volunteers and students during works on accessible sites made it possible to balance the overall management costs.

Detailed financial aspects for the management of the Île de Callot site (easily accessible).

Details of costs (€)	
Preparation, installation and removal of the trailer (Driver, crane truck, trailer)	240
Green waste composting	200
Works coordination	~ 300
Animal-power removal	1 040
Grant for Suscinio High school (Morlaix Commune)	1 500
<b>Total</b>	<b>3 280 (~3 500)</b>

N. B. For these works, a financial assessment of entrusting them to a social integration company was estimated at €18,000, including €16,000 for labour.

### Information on the project

- Raising public awareness through volunteer uprooting operations.
- Press articles.
- Communication on the digital social networks of the Île Callot management site.

### Outlook

- Continuation of uprooting operations on several sites in Brittany.
- Consideration of how to reuse the uprooted residues (e.g.: recovery by the company Yves Rocher).
- Improvement in the sharing of experience at regional level, through the development and implementation of a regional IAS strategy (under development).

N. B. The 2019 course was financially supported by the company Yves Rocher, which uses *Carpobrotus edulis* in a range of cosmetic products. Considerable management feedback from a broad network of managers was consulted and summarised. Out of the 420 managers and partners contacted via the AGENB mailing list, 25 responded to the survey.

Authors: Eva Burguin, National Botanic Conservancy of Brest, Marion Thery, AGENB, and Clara Singh, IUCN French committee in the framework of the Invasive Alien Species Resource Centre. November 2021. Published by the French Biodiversity Agency (OFB).

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8 - Publication of a post on digital social networks of the Île Callot management site.

**For more information...**

- AGENB, CBNB et YR, 2019 - Les Griffes de sorcières en Bretagne - État des lieux et orientation pour un contrôle de leur développement en espaces naturels. AGENB, Ploufragan, 93 pp.

