



Hottentot fig

(*Carpobrotus edulis*)

Managing Hottentot fig on the Natura 2000 sites of the islands of Ouessant, Molène and Sein

Armorique regional nature park (PNRA)

- PNRA is the second regional nature park to have been created in France. It covers an area of 125 000 hectares and comprises 44 towns in the Finistère department, ranging from the islands in the Iroise Sea to the heathlands and peat bogs east of the Monts d'Arrée hills.
- Its missions are laid out in its 2009-2023 charter targeting “desired landscapes in Amorique”. PNRA manages seven Natura 2000 sites, including the terrestrial parts of the islands in the Iroise Sea, and it is for this reason that it also manages the invasive alien species on the islands.
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Intervention site

- Management work takes place on the islands of Ouessant, Molène and Sein. The islands are listed as Natura 2000 sites (FR 5300018 Ouessant – Molène and FR 5302007 Chaussée de Sein). They are also listed as biosphere reserves (UNESCO).
- A number of habitats of Community interest may be found on the islands, including vegetation of drift lines with sea beets (1210), vegetated crevices in sea cliffs with rock samphire (1230), salt-tolerant grass (1230), dry heaths with western gorse and bell heather (4030), etc.
- There are also several species of Community interest, including sea kale (*Crambe maritima*), shore dock (*Rumex rupestris*), and protected species, including least adder's-tongue (*Ophioglossum lusitanicum*), land quillwort (*Isoetes histrix*), etc.
- Inventories carried out on the three islands have revealed that emblematic shore habitats have been colonised by a number of invasive alien species, including Hottentot figs (*Carpobrotus edulis*).



Position of the three islands off the coast of Brittany.

Disturbances and issues involved

- Hottentot figs colonise cliffs, dry heaths and swards of salt-tolerant grass. They enter into competition with and can supplant the local flora, including protected species such as least adder's-tongue and land quillwort. The result is a loss of plant biodiversity.

Interventions

- On easily accessible sites, the objective is to eliminate the species. Along cliffs, the objective is to avoid colonisation of the swards of short grass.
- On the accessible sites, the management technique employed is to manually uproot each plant. The stalks can be fairly easily uprooted by gripping the base of the plant. The waste is put directly into a bag to avoid dissemination.
- Once all the plants have been removed from a site, the dead leaves of the plant on the ground are collected using a rake. It is important not to leave any plant fragments on the site because the species sprouts easily.
- Special equipment (see the Costs section) is required for work along cliff edges to ensure safe work conditions and avoid any risk of a fall. Workers using a harness and rope tied the other end of their rope to a vehicle (three people maximum for a light truck) or to a large rock. The objective is to remove all Hottentot figs from a strip three metres wide along the cliff edge. The same manual uprooting technique is used and the waste is placed directly in bags once uprooted.

■ **Ouessant Island**

- In the summer of 2015, an inventory of the colonised areas listed 86 Hottentot-fig sites covering a total surface area of 23 000 square metres, most of which were difficult to access.
- Only two sites were easily accessible on the island and they were treated in 2012 and 2016. The first was small (one square metre). A park employee uprooted the plants in 2012. This work took about two hours. In 2016, a social-reintegration group was brought in to handle the second site (approximately five m²). Eight people worked for two hours to uproot the plants.
- In both cases, the plants were stored on a special platform in a disposal centre and subsequently burnt.
- The two sites are monitored annually and any new sprouts are eliminated.
- A map setting priorities for work on sites along cliffs was established, based on criteria concerning habitats and flora.

■ **Sein Island**

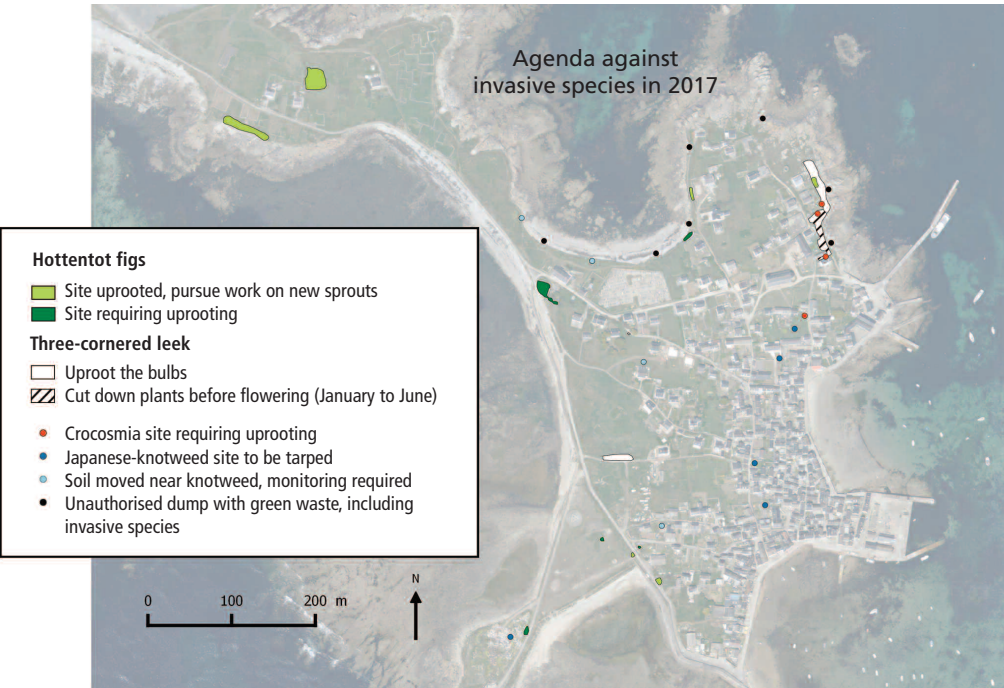
- In 2013, in the framework of an information campaign on invasive plants for the general public, a participatory effort was organised to uproot Hottentot fig from an area ten square metres in size. This work occupied six people for four hours. Subsequently, the park employee based on the island since 2015 eliminated virtually all the Hottentot-fig plants remaining on the island. The uprooted stalks were disposed of with standard household waste.
- The employee also monitored the treated sites once annually for a period of three years.
- This uprooting and monitoring work over three years, for a total surface area of approximately 1 500 m², required a total of 140 hours.

■ **Molène Island**

- In 2014, Hottentot-fig plants on two sites representing a total of 15 m² were uprooted by volunteers in the framework of a European exchange programme. The work occupied approximately 15 young people over two days.



1. The Hottentot fig (on the right) is a threat to the swards of salt-tolerant grass comprising least adder's-tongue and land quillwort, two very rare species.
2. Uprooting Hottentot-fig plants on Ouessant.
3. Uprooting Hottentot-fig plants on Molène.



Map of uprooting sites on Sein in 2017. Agathe Larzillière, PNRA.





■ During the management operations, a test was run on the results when the litter (dead leaves, etc.) was collected with the plants or left behind. When the litter was removed, the original flora redeveloped, however numerous Hottentot-fig seedlings also sprouted. When the litter was not removed, brambles developed. Currently, the litter is removed from all sites. This required regular monitoring over three years to eliminate any new sprouts.

Results and costs

■ Results

Number of sites and uprooted surface areas on each island.

	Number of sites	Surface area treated (square metres)	Time spent (hours)
Ouessant	2	10	4
Sein	22	1500	140
Molène	2	15	12

■ Inspections are run monthly on the sites to eliminate any new sprouts. This work takes approximately one to two hours per month on each island. Over time, a reduction in the number of new sprouts has been observed.

■ Costs

■ The cost of the uprooting work by volunteers was not calculated. It did not require any specific equipment with the exception of the plastic garbage bags.

■ The cost of uprooting work by salaried employees was estimated at between 15 and 30 euros per hour, depending on the employee.

■ The special equipment for the work along cliff edges comprises the following (per person):

- 1 harness (EU standard EN361);
- 1 static rope, 60 metres long, diameter 11.5 mm;
- 1 fall arrester sized for the rope diameter;
- 3 carabiners minimum (EN362);
- 1 safety helmet;
- 1 big bag;
- 3 slings (loops), EN795 class B, 80 cm, 1.20 m and 1.50 m long;
- 4 metal stakes, one meter long each, and a sledge hammer.

The total cost of the special equipment for one person is approximately 300 euros.

■ For the work on Ouessant by the social-reintegration group, a partnership agreement was signed between the Landscape and Horticultural Association in Saint-Grégoire (35), PNRA and the town of Ouessant. In the agreement, PNRA provided funding for lodging up to 2 000 euros for five days. Given that the work on Hottentot figs lasted only one half-day, the cost was 200 euros.

Information on the project

- Reports on the work were made during the meetings of the management committees of the island Natura 2000 sites in the park and were made available to the public via the PNRA internet site.
- Articles published in the municipal bulletins made the information available on the local level.
- The organisation of participatory work sites, where the conditions allow, served to raise awareness in the local population and enable people to become active stakeholders in the preservation of natural areas.

Outlook

- On Ouessant, photo surveys are run every five years on a number of sites on the Stiff cliffs (NW part of the island) to monitor the colonisation speed of Hottentot figs and one particular site is monitored to determine the colonisation speed on a sward of salt-tolerant grass comprising least adder's-tongue and land quillwort. Work has been planned on priority sites along cliff edges starting in 2020.
- On the islands of Molène and Sein, treated sites are monitored annually. In the meantime, other sites have been discovered and are systematically treated by personnel or with the assistance of volunteers.
- PNRA also undertakes management work on other invasive alien species on the islands, including three-cornered leek (*Allium triquetrum*), Japanese-knotweed (*Reynoutria japonica*), pampa grass (*Cortaderia selloana*), etc.

Authors: Harmonie Coroller, Agathe Larzillière, PNRA, and Doriane Blottière, IUCN French committee, for the Resource Centre on invasive alien species. October 2019. Published by the French Biodiversity Agency.

For more information...

- PNRA. 2010. Document presenting objectives for the Natura 2000 sites Ouessant-Molène and Chaussée de Sein, 608 pp. (In French)
- Ecological and naturalist monitoring on the terrestrial sections of Natura 2000 site FR5300018, Ouessant Island, reports for the years 2014, 2015, 2016, 2017. (In French) Documents available on request.

This management report fills out the collection already published in the second and third volumes of the book titled "Invasive alien species in aquatic environments, Practical knowledge and management insights", in the Knowledge for action series published by the French Biodiversity Agency.

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