



Groundsel bush (*Baccharis halimifolia*)

Managing groundsel bushes in the Grande Brière Mottière marshes

Brière regional nature park

- The park, initiated by the Ecology ministry in 1970, is managed by a board with members from the 20 towns in the park, from the two “gateway towns” (Nantes and Pornichet), the Loire-Atlantique department, the Pays de la Loire region, the Grande Brière Mottière commission (CSGBM) and the board for the Brivet river basin (SBVB).
- Its main missions include:
 - protecting the natural heritage, notably through suitable management of the natural environment and landscapes (marshes, wet meadows, reed beds, canals, etc.);
 - contributing to territorial planning;
 - contributing to economic, social and cultural development and to the quality of life;
 - welcoming, educating and informing the public;
 - carrying out experiments or outstanding projects in the fields mentioned above and contributing to research programmes.
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Intervention site

- The Brière regional nature park covers a total of 55 000 hectares, of which approximately one-third are wetlands listed as a Ramsar site (18 250 hectares).
- In conjunction with the Donges marshes, the Brière park is also listed as Natura 2000 and ZNIEFF sites. The park is home to numerous emblematic species (Eurasian bittern, black terns, bluethroats, European otters, etc.) and remarkable flora, notably in the amphibious grasslands and the oligotrophic meadows.
- In the middle of the park, the Grande Brière Mottière marshes (a joint property) cover 7 000 hectares.
- The groundsel bushes were introduced in 1915 as ornamental plants on the Guérande peninsula and then spread widely throughout the Guérande salt marshes (the female plants can produce up to one million seeds that are easily dispersed by the wind).
- In the Grande Brière Mottière marshes, a small number



Key

- Park limits
- Road
- Hydrographic network of the marshes
- Grande Brière Mottière marshes
- Forests and semi-natural environments
- Urbanised areas
- Marsh
- Salt marsh

1. The Brière regional nature park and the different sectors.

of groundsel bushes were observed prior to 2000, but the number grew considerably starting in 2005 (124 bushes inventoried in 2005, over one thousand in 2006 and 2007).

- The sites are located on mounds, e.g. areas where work had been done (soil from cleared areas, landfill, etc.), but rarely on farmed, natural elevations.
- In most places, the bushes are isolated and dispersed, however, in some spots (probably the first sites colonised) the plants form groups of 5 to 36 bushes.
- The CSGBM commission, with the support of the park board, decided in 2007 to take action against the development and to destroy the existing bushes, on the basis of the precautionary principle given the highly invasive nature of the species and its potential negative impacts on biodiversity.

Disturbances and issues involved

- The ecological impacts concern the closing in of the environment with the loss of native plant species and degradation of nesting sites for Charadriiform birds (pied avocet [*Recurvirostra avocetta*], black-tailed godwit [*Limosa limosa*], northern lapwing [*Vanellus vanellus*]).
- The impacts on land use and activities concern more uniform landscapes, a drop in aesthetic value (in a tourist area) and limited access to certain sites.

Interventions

- Since 2007, the CSGBM commission and the regional nature park have worked together to combat the invasive alien species. The CSGBM funds and executes the work to eliminate the plants, the regional nature park sets up the work programme, monitors the plants and the work, participates in the work and supplies boats. The Loire-Atlantique departmental federation of pest-control groups (FDGDON) was commissioned in 2007 to kill the stumps, the only year in which this technique was used.
- Groundsel bushes are one of the species targeted by the list of invasive alien aquatic plants revised each year since 1999 by the regional nature park.
- The purpose of the work is to significantly reduce its presence in the Grande Brière Mottière marshes and if possible to eliminate it.
- Two different processes were used, depending on the size of the bushes:
 - young plants (10 cm to 1.5 metres in height) were manually uprooted with the removal of the entire plant, taking care to avoid breaking roots in order to avoid regrowth, including the soil surrounding the roots;
 - bushes over 1.5 metres in height were cut off at the foot and the stump was killed by applying ammonium sulphamate (Attilex) in the fall, when the sap was flowing down (this product is now prohibited in the EU).
- The uprooted bushes were initially left on site to avoid dispersing the seeds and were then incinerated during the winter. During the first few years, incineration took place on site because of the large volumes and the need to avoid dispersal. Subsequently, the groundsel bushes were stored along the edges of the wetlands and then sent to a civic amenity site.
- In 2007, the work took place over three periods, in February, during the summer (May to June) and in the fall (end of October and beginning of November). That was a test year used to acquire the technical know-how and to determine the feasibility and effectiveness of the method.
- The following years, the work was done over a single period, generally in parallel with the work on water primrose in order to take advantage of the joint resources in terms of logistics, funding and human resources. The work is easier at the end of summer and beginning of fall when the bushes are still green and easy to identify.

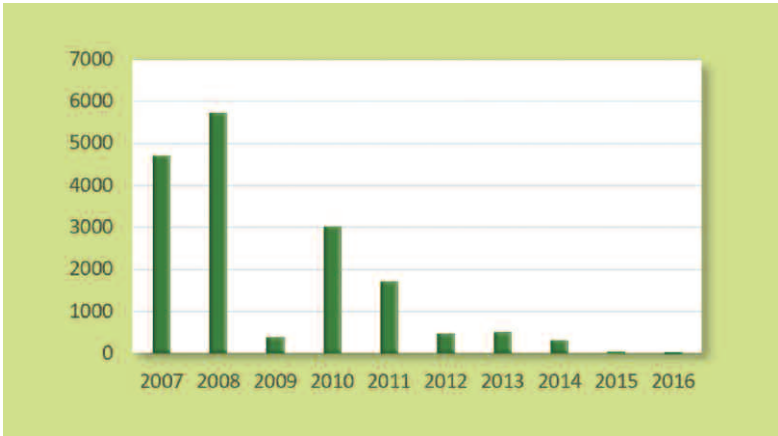


2. Groundsel bushes along the Brière canal.
3. Groundsel seeds on the ground.
4. 5. 6. Manual uprooting of young plants.

Results and costs

■ Results

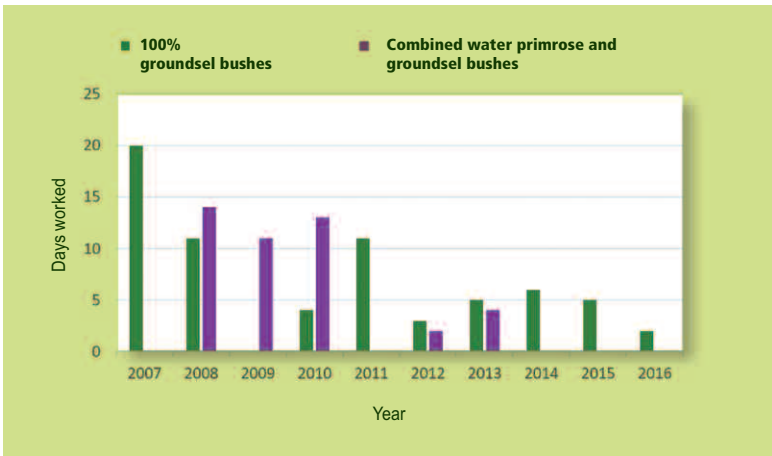
- In 2007, 4 372 bushes were uprooted and 324 stumps were killed, for a total of 4 696 eliminated bushes (99.7% of the inventoried plants). That year represented a major effort using the two elimination techniques.
- Since 2008, given that no older bushes existed, groundsel bushes have been removed exclusively by hand.
- There has been a clear reduction in groundsel numbers over the years, confirming the undeniable effectiveness of the work in the Brière regional nature park.



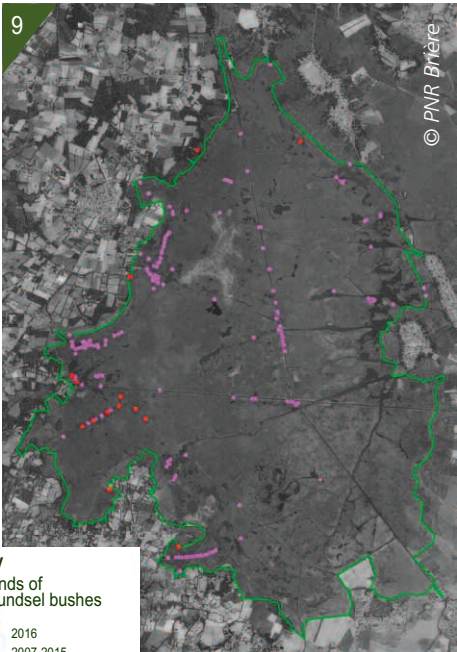
Number of groundsel bushes eliminated each year since 2007.

■ Assessment

- Given that part of the work on groundsel bushes was carried out in conjunction with the work on water primrose, it is difficult to precisely determine the amount of time spent on each species. However, over the past four years, most of the work on groundsel bushes took place during days addressing that species alone.
- Over that period, the plant has become much less common, but the time required to find it and to travel to the sites has resulted in relative stability in the costs, in spite of the reduced numbers of plants eliminated.
- Funding is provided by the Loire-Atlantique departmental council, the Loire-Bretagne Water agency and by the CSGBM commission itself.



Days worked on managing groundsel bushes and water primrose.



7. Killing a freshly cut stump.
8. Stumps one year after being cut and killed.
9. Map of *Baccharis hamifolia* stands in the Grande Brière Mottière marshes, (2007/2008 in purple, 2016 in red).

Work done on groundsel bushes from 2007 to 2016.

Year	Bushes eliminated	Personnel involved	Days worked	Work periods	Estimated cost (€)
2007	4 696	3 to 8	20	February + May/June + October/November	6 130
2008	5 731	2 to 9	25	August to November	6 000
2009	395	4	11	September/October	1 000
2010	3 027	4 to 9	17	May to October	3 700
2011	1 728	2	11	August and October	2 400
2012	469	3 to 12	5	July to September	1 500
2013	524	2 to 12	9	June to August + December	2 200
2014	310	3	6	September	2 000
2015	50	3	5	October	1 600
2016	28	2	2	October	450
TOTAL	16 958		111		26 980

Information on the project

- Little information was produced concerning the work on groundsel bushes because the work on water primrose was considered more important. However, the work on groundsel bushes was regularly mentioned in the various documents sent to the local management entities.
- The work was the topic of a presentation to the regional symposium on invasive plants in the Pays de la Loire region in May 2011, titled « Le baccharis du littoral aux marais de Brière, le point sur douze années de lutte » (Della Valle and Damien, 2011).

Outlook

- Systematic inspection visits are carried out on the formerly colonised sites and the surrounding areas, and the annual work to uproot the plants continues.

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This management report was drafted in June 2017 by the work group for biological invasions in aquatic environments, set up by the French biodiversity agency and IUCN France, in addition to those already presented in the second volume 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. (<http://www.onema.fr/sites/default/files/EN/EV/cat7a-EEE-vol2.html>).



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For more information

- Della Valle P. et Damien JP. 2011. Le Baccharis du littoral aux marais de Brière, le point sur douze années de lutte. Parc naturel régional de Brière. Presentation to the regional symposium on invasive plants in the Pays de la Loire region in May 2011. 22 pp.
- http://www.pays-de-la-loire.developpementdurable.gouv.fr/IMG/pdf/Gestion_du_Baccharis-Della_Valle_et_Damien.pdf
- Internet pages of the Brière regional nature park on invasive alien species: <http://www.parc-naturel-briere.com/le-sespeces-invasives-en-briere.html>

