



Water primrose (*Ludwigia* spp.)

Uprooting work on water primrose in the port of Biganos (Gironde department)

Arcachon Bay Board (SIBA)

- The board is active in ten townships on Arcachon Bay (those in the South Arcachon Urban Board and six towns along the northern edge of the bay).
- In parallel to its missions dealing with the quality of aquatic environments and the living conditions of residents (boating, water quality, management of rainwater and septage, etc.), SIBA has also been in charge of GEMAPI policy (management of aquatic environments and flood prevention) since 2018.
- Contact person for invasive alien plants:
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Intervention site

- The port of Biganos lies in the town of Biganos on the Leyre (or L'Eyre) River. It is one of two river ports for the Arcachon Bay and is used for recreational boating.
- Due to its proximity with the river delta, water and salinity levels vary depending on the tides.
- In July 2018, SIBA was contacted concerning beds of aquatic plants developing in the central section of the port. The National Botanical Conservatory for South-west France (CBNSA) was called in to identify the plants and reported that they consisted of two species of water primrose, *Ludwigia grandiflora* and *Ludwigia peploides*.
- The colonised area spanned a total of 1 200 square metres and consisted of ten beds, located primarily near the moorings, but spreading to the centre of the central section.

Disturbances and issues involved

- The water primrose hindered the free travel and manoeuvring of the boats.
- Due to the considerable production of biomass, the plants contributed to the silting of the port. They also modified the level of dissolved oxygen in the water and blocked the movement of aquatic fauna.



1. Map showing the site.
2. A bed of primrose in the port of Biganos.

Interventions

■ Preparation

- After reviewing the management reports for water primrose collected by the National Work Group on Biological Invasions in Aquatic Environments (IBMA¹), CBNSA made a number of recommendations:
 - identify and characterise the invaded areas, detect the possible sources of plants and cuttings;
 - uproot the beds (manually or mechanically) while taking care to avoid the dispersal of the plants downstream by setting up fine nets around the beds;
 - establish monitoring procedures and undertake any necessary uprooting work in subsequent years.
- Given the small surface areas requiring work and the technical constraints (earthen banks and a bridge to the central section incapable of supporting heavy machinery), the decision was made in favour of manual uprooting rather than the mechanical uprooting.

1. At the end of 2018, IBMA became the Scientific and technical network (REST) at the Resource Centre on invasive alien species (www.especies-exotiques-envahissantes.fr).

- The work took place on 24 and 25 September 2018. These dates were selected because low tide occurred in the middle of the day, meaning workers could access the central section on foot. Boat owners had been requested to remove their boats from the moorings to provide access to the beds.

- SIBA requested assistance from local entities, including the Landes de Gascogne Regional Nature Park, the technical department of the town of Biganos and the boaters from the Lou Batel'Eyre company who were hired to participate in the project.

■ Intervention steps

- A net (mosquito netting) was placed at the entry of the central section. It spanned the entire width of the section (ten metres) and also blocked off a bed of water primrose detected near the entry. Two small boats were positioned in the colonised area while the tide was dropping. They served to collect the uprooted plants that were far from the banks. The boats rested on the bottom until the tide came back in and they could be moved for unloading.

- The uprooting was done by hand, using rakes and garden forks. The plants were placed in oyster baskets or directly in the boats.

- In the middle of the first morning, the boats were already full and it turned out that the weight of the plants was so great that the tide could not lift the boats. A backhoe loader was then made available by the technical department of the town. The loader was positioned on the bank and the bucket was filled manually, then emptied into a dump truck or on a geotextile fabric laid out on the bank.

- Subsequently, the loader was used directly to remove the largest beds of plants, which also resulted in the removal of large quantities of sediment.

- The unloading zone for the water primrose was located near a parking lot, on land well above the high-tide mark. The uprooted plants were drained of water on the geotextile fabric and then transported to the town technical centre. After drying in a blocked off area of the technical centre, they were transported to composting units with other waste from the town.

Results and costs

■ Results

- A total of 5.74 tons of waste (water primrose and sediment) were removed.

- Young plants remained visible following a tide cycle and several new colonised areas were detected during the work. These areas will be treated in 2019.

- The use of the net to avoid dispersal was not satisfactory because the wind hindered its effectiveness. A system of floats and weights may be more effective and would adapt to the changing water level due to the tides.

■ Costs

- On average, six people were involved in the work. Five people uprooted the plants and one person managed the work from the bank.

- An employee from the town was also on hand to operate the dump truck and the backhoe loader.

- The cost of the work provided by the Lou Batel'Eyre company amounted to 1 800 euros.

- Most of the equipment used was made available by the various participants. The purchase cost of new equipment amounted to approximately 200 euros.



3. The net intended to prevent dispersal.
 4, 5. Manual uprooting of water primrose in the central section.
 6. The backhoe loader operating from the bank.
 7, 8. A bed of water primrose at low tide (7) and following the work (8).

Equipment supplied by the various participants.

Equipment	Supplied by
Two boats	Lou Batel'Eyre
Mosquito netting (0.8 mm mesh, 2.2 metres wide) + wooden stakes	Purchased
Geotextile fabric	Purchased
Garden forks, rakes	All participants
Oyster baskets	Lou Batel'Eyre
Buckets	All participants
Individual protection equipment (gloves, boots, waders)	All participants
Dump truck	Town technical department
Backhoe loader	Town technical department

Information on the project

- A poster providing information on water primrose and on the work was set up near the work site and a brochure on invasive alien plants, drafted by the Landes de Gascognes Regional Nature Park, was made available to the public in the port.
- The project was covered by the local press (*Val de l'Eyre*) and in television and radio programmes.
(France Bleu <https://www.francebleu.fr/infos/climat-environnement/biganos-operation-arrachage-des-plantessinvasives-sur-le-port-1537796209>, *Arcachon Bay television* <http://www.tvba.fr/vie-locale/biganos-arrachage-jussie-siba-ville-2018/>).

Outlook

- The technical means should be improved to provide better access to the middle of the central section and for the removal of the uprooted plants. Under the current conditions, participants occasionally found themselves up to the hips in mud, which made movement difficult and even dangerous.
- Visual monitoring of any regrowth of the beds will be carried out by people in addition to their regular activities on the site. Aerial photographs taken by a drone before the work and each subsequent year prior to uprooting work will be used to record the development of the beds.
- Annual uprooting work of sprouts and any new beds will be organised each September over the next five years.
- It is also recommended to maintain the vegetation on the banks because the shade provided can limit the growth of the water primrose.

Authors: Doriane Blottière, IUCN French committee, and Adelyne Rolland, SIBA, for the Resource Centre on invasive alien species. March 2019. Published by the French Biodiversity Agency.

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9. Storage and drying area for the uprooted plants.
10, 11, 12. A bed of water primrose at high tide (10), at low tide (11) and following the work (12).

For more information...

- Syndicat intercommunal du Bassin d'Arcachon. 2018. Bilan de l'intervention d'arrachage manuel de la jussie au port de Biganos. 14 pp.