



## Water primrose

(*Ludwigia* spp.)

### Testing a method to eradicate water primrose from two ponds in Acigné (Ille-et-Vilaine department)

#### Ecological-engineering professional federation (UPGE)

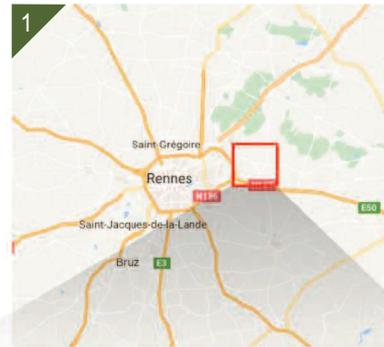
- The federation was founded in 2008 to bring together firms active in or linked to the field of ecological engineering.
- Its mission is to structure the ecological-engineering sector and to develop the market, notably by stimulating innovation and encouraging contacts between the various participants.
- The test was carried out in the framework of the compensatory measures for the high-speed train line to the Bretagne and Pays-de-la-Loire regions, constructed by Eiffage Rail Express.
- Contact: Thomas Redoulez - t.redoulez@genie-ecologique.fr

#### Dervenn Compensation écologique

- This firm is a subsidiary of the Dervenn company (ecological-engineering consulting, research and work), founded in 2002.
- The firm participates in projects to define the technical conditions for and implement compensatory measures, e.g. the creation of wetlands or the restoration of rivers.
- Contact: Vincent Guillemot, Head of the research department - v.guillemot@dervenn.com

#### Intervention site

- The work was done on two ponds colonised by large-flower water primrose (*Ludwigia grandiflora*), located in the town of Acigné, to the east of Rennes:
  - a buffer pond (Acigné 01), 6 000 square metres, supplied by alluvial groundwater and by a ditch from the north draining runoff water from a housing development site. A regulation system sends excess water to the Joval Stream, located approximately 25 metres to the south-east of the pond. The Joval Stream drains a 2.6 square kilometre catchment and flows into the Vilaine River approximately 400 metres downstream of the pond;
  - a pond for recreational purposes (Acigné 02), 12 500 m<sup>2</sup>, intended primarily for walkers, supplied by alluvial



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1. Maps showing the two ponds in the town of Acigné.
2. Aerial view of the buffer pond (Acigné 01).
3. Aerial view of the second pond (Acigné 02).

groundwater from the Chevré River, located just to the north, and by the river itself via a flap weir used to fill the pond.

■ The town of Acigné proposed these two ponds as compensatory work sites for the high-speed train line to the Bretagne and Pays-de-la-Loire regions, constructed by Eiffage Rail Express.

## Disturbances and issues involved

■ The two ponds were heavily colonised by water primrose (70% in Acigné 01 and 90% for Acigné 02), a situation that limited the development of the fauna and flora on the sites.

■ Water primrose is not a major problem for human activities, even though the two ponds, particularly Acigné 02, are often used as recreational areas in the town.

## Intervention

### ■ Meetings

■ The objective of the project was to eradicate the water primrose on the two sites.

■ An organisational meeting was held in March 2016 by the Centre to coordinate the experimentation and implementation of ecological engineering (CCEAGE) to decide on the work methods. All concerned stakeholders were present, including Eiffage Rail Express, the Eiffage sustainable-development department, the town of Acigné, the Development agency for the Vilaine River basin, Agrocampus Ouest, DDTM 35, the city of Rennes, companies (Dervenn, Ouest Aménagement, CARDIN TP) and Louis Diard, botanist, editor of *Flore d'Ille-et-Vilaine*.

### ■ Work procedure

■ The work was done in May and June 2016.

■ The plan foresaw six steps on each site, namely mechanical uprooting, emptying of the pond, surface removal, burial of the uprooted water primrose, filling in and planting of the site.

■ Removal (scraping the surface to remove the plants with their roots) of the accessible water primrose was done using excavators from the banks.

■ The uprooted plants were stored temporarily on the banks.

■ The ponds were then emptied in two steps:

- simple draining;

- pumping with an in-series filtering system comprising a straw filter + geotextile fabric and a ditch with a grid + geotextile fabric.

■ A bulldozer was used to dig out 30 centimetres of biomass and mud from the centre of each pond.

■ Ditches 1.5 metres deep were dug in the middle and along the ponds. The extracted plants, sediment and soil were buried in the ditches and covered with the soil removed while digging the ditches.

■ Pond Acigné 01 was partially filled with 80 cm of mineral soil and 20 cm of top soil. The banks were reworked and a channel dug to lead the water to the overflow system. The pond refilled naturally and very rapidly with 40 cm of water due to the alluvial groundwater flowing in from the bottom of the pond.



4, 5. Acigné 02 pond, prior to the work.  
6. Mechanical uprooting in Acigné 02.  
7. Filtering system during pumping of Acigné 02.  
8, 9. Removing the surface soil in Acigné 02.

- Pond Acigné 02 was filled in without raising the initial topographic level in order to maintain the site as a wetland, but not a pond. The fill consisted of 50 to 70 cm of mineral soil, followed by 20 cm of top soil.

- Reed beds were planted around the two ponds and meadow grasses were also sown around pond Acigné 02. Near pond Acigné 02, the plan was to preserve the reed bed to the south-east and to remove manually the water primrose growing there, but the colonisation turned out to be too extensive and the reed bed was finally removed.

- During the work on pond Acigné 02, a severe storm occurred when 80% of the surface area had been cleared of the water primrose. The storm dispersed plant fragments and roots that were still in the areas just cleared. Some of the fragments subsequently developed into the terrestrial form of the plants. These sprouts were systematically removed manually using hand tools (garden forks).

## Results and costs

### Results

Table presenting project results.

	Surface area treated (square metres)	Extracted biomass (cubic metres)
Acigné 01	6 000	50
Acigné 02	12 500	150

- Monitoring in May 2017 revealed that in pond 01, no regrowth of water primrose was found. In pond 02, a dozen sprouts were observed.

- They were uprooted manually.

### Costs

- The project was funded 100% by Eiffage Rail Express in the framework of the compensatory measures. Equipment and materials represented 80% of the costs, payroll costs represented the other 20%.

- Cost of the work:

- Acigné 01: 48 000 euros not including VAT.

- Acigné 02: 77 500 euros not including VAT.

- The job was done by three people working full time for one month.

- Details on the planting and monitoring costs were not available.

## Information on the project

- Before the work, a sign was set up on each site, explaining the context and the work, with instructive drawings. A second sign was installed following the work. These efforts served to provide residents with information and avoid negative reactions to the work.

- Articles appeared in the local press.

- Information was made available on the internet site and in the UPGE bulletin.



10. Reed bed in pond Acigné 02 (after the work).

11. Pond Acigné 02 after replanting.

## Outlook

- To avoid recolonisation by a patch of water primrose upstream, it is advised to work on the catchment of the Chevré River as a whole.
- The town had planned to create pools in conjunction with the natural refilling via the alluvial groundwater, however it is necessary to postpone these developments to ensure that buried fragments of water primrose are not brought to the surface. The town has agreed to wait several years and to launch the work progressively in order to avoid any regrowth of the water primrose.
- The sites will be monitored by Dervenn for two years with a visit every 15 days during the first year to manually uproot any plants and then once per month during the second year. After the second year, the town will monitor the sites, following training of the technical personnel by Dervenn.
- A citizen-science project, organised by the town in an effort to raise awareness on the part of local residents, is also planned in order to detect as early as possible any regrowth.

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12. Informational sign on the Acigné 02 site.

### For more information

- Water-primrose work group - UPGE.  
[www.genie-ecologique.fr/cceage-groupe-de-travail-sur-la-jussie](http://www.genie-ecologique.fr/cceage-groupe-de-travail-sur-la-jussie)
- Efforts against water primrose - UPGE.  
[www.genie-ecologique.fr/le-cceage-lutte-contre-la-jussie](http://www.genie-ecologique.fr/le-cceage-lutte-contre-la-jussie)
- Techniques against water primrose – Environnement magazine.  
[www.environnement-magazine.fr/article/48089-les-grands-moyens-contre-la-jussie](http://www.environnement-magazine.fr/article/48089-les-grands-moyens-contre-la-jussie)

*This management report was drafted in January 2018 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/IEV/cat7a-EEE-vol2.html>).*



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