Curly waterweed

(Lagarosiphon major)

Managing curly waterweed in the valley of the Vergnote River (Lot-et-Garonne department)

Centre for environmental initiatives (CPIE) for the Pays de Serres-Vallée du Lot area

- The centre is a non-profit environmental-protection organisation founded in 1983 and active in the Lot-et-Garonne department.
- Its main missions include:

- management of natural environments (studies, inventories, monitoring, upkeep, conservation);
- educational work on the environment and sustainable development (nature walks, conferences, film-debates, citizen-science programmes);
- support for projects (planting hedgerows, environmental issues) and management of a “Biodiversity info” system.

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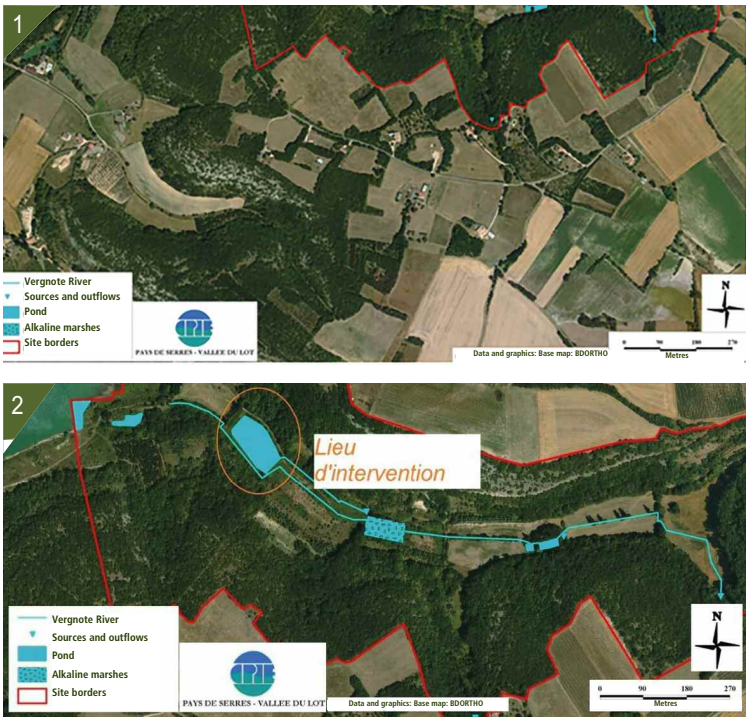
Intervention site

- The Vergnote is located in the town of Masquières, in the eastern section of the Lot-et-Garonne department, and has been listed as a ZNIEFF (high-value ecological zone) since 1989.
- It is also part of the Boudouyssou and Lascrozes Natura 2000 zone.
- The area, approximately 50 hectares in size, has been listed as a sensitive natural area since 2014. It has outstanding environment diversity and wonderful landscapes. The bottom of the valley is a succession of wet meadows, idle land and EU-listed wet woodlands called “Tufa marshes” and “Petrifying springs with tufa formation” (N2000 code 7220). Amphibians, insects, mammals, reptiles, birds and plants living together compose an emblematic habitat. Remarkable orchids grow on the dry swards covering the calcareous slopes, e.g. *Cephalanthera rubra, Neotinea ustulata, Ophrys simia* and *Gymnadenia conopsea.*
- The pond colonised by curly waterweed lies in the lower section of the Vergnote, which originates higher up in the valley and runs a total of 1.2 kilometres. The small size of the river does not mean that it does not flow year round. The source waters, derived from the karstic substrate of the surrounding calcareous plateaus, contain high levels of carbonates. Calcium carbonate formations (tufa) may be observed along the entire length of the river.



1. 2. Map showing the site.
3. 4. Curly waterweed prior to the work.

Disturbances and issues involved

- Curly waterweed was found in 2013 in one of the ponds in the valley, approximately 3 000 square metres in size, that was originally dug for recreational purposes (fishing).
- The plant rapidly colonised the pond.
- In 2014, it covered approximately 25% of the surface area and one year later had spread to virtually the entire pond (90%). It competed with other aquatic plants, reduced the quantity of light in the water and created difficulties for fish to move through its dense beds.

Interventions

- In 2013, at a time when the curly waterweed occupied only a small part of the pond, it was decided to eliminate the plant by manually uprooting it.
- The objective was to enable other plant species to recover a level of abundance comparable to the situation prior to the arrival of the curly waterweed.
- A monitoring committee was set up to select the management techniques best suited to the context and to supervise the work.
- It included both technical (Vallée du Lot board, fishing federations, ONCFS, Onema, etc.) and financial partners (Adour-Garonne water agency, Nouvelle Aquitaine region, Lot-et-Garonne department).

Manual uprooting

- In the fall of 2014, over a dozen volunteers gathered for a day of work in manually uprooting the plants once the pond had been partially drained.
- The site was regularly monitored following this initial work. The uprooting was not sufficient to halt the progression of the plant, which continued to colonise the pond in 2015.
- The dispersal of plant fragments may have contributed to the strong spread of the species in spite of the work done. Uprooting could not be carried out on the entire pond because the water in the middle of the pond was still too deep. However, the accessible plants were completely removed, including their roots.

Draining of the pond

- Given the results of the initial efforts, a total draining of the pond was deemed the most effective solution to eliminate the curly waterweed.
- Following discussions with the monitoring committee for the site and obtaining authorisation from the departmental territorial agency, two systems were used to drain the pond in February 2016 (syphoning and a motor pump on a tractor), a time of year outside the reproductive period for amphibians. The two systems were temporarily effective, but the pond continued to fill with rainwater and groundwater.
- A rescue fishing campaign was undertaken at the same time to transfer the fish to a nearby pond. A dozen volunteers from the Fumel APPMA were on hand in the beginning of March 2016 to assist the two CPIE employees. Care was taken not to transfer any curly waterweed to the other pond (the fish were washed by hand and the cleaning water was filtered).
- At the end of March, the dike was opened with an excavator to let the water flow out (the pond had filled since February with rainwater and groundwater). At each step in the work, care was taken to avoid any dispersal of curly waterweed to the ponds downstream using filters and screens that were cleaned once per week.

5. 6. Volunteers manually uprooting the plants.

■ During the summer of 2016, the pond dried partially and most of the curly waterweed died, but the incoming groundwater maintained the humidity in a few small spots where the species survived. In these areas, the very thick mud made it impossible to uproot any further plants.

■ The plants dried and then decomposed on site. Consequently, it was decided not to transport the plants to a composting unit as originally planned. The volume of curly waterweed remaining in the pond was not calculated.

■ The plan for the remainder of the project is to leave the pond drained for at least one full year in view of eliminating the curly waterweed. Discussions with the various partners will determine whether to refill the pond or to let it evolve naturally to a wetland, which would probably be better from an ecological standpoint. Better in the sense that the curly waterweed would probably be able to persist in the areas watered by the groundwater, but would find itself in competition with the native helophytes that would likely return. Consequently, the curly waterweed would probably not proliferate.

Results and costs

■ Results

■ Manual uprooting in 2014. A precise evaluation of the extracted biomass was not done (the beds occupied approximately one-third of the pond surface to a depth of about one metre).

■ Capture and transfer of the fish populations. A total of 557 fish were transferred (six species: Crucian/Prussian carp, goldfish, roach, rudd, carp, stone loach).

■ In November 2016, following the virtually total draining of the pond, most of the curly waterweed decomposed. However, there remains a large “puddle” (30 to 50 square metres) where the species subsists in five centimetres of water.

■ Human and financial aspects

■ 2014

- Pumping prior to the uprooting work: 2 000 € (1 day);
- Manual uprooting: 1 200 € (3 days x 350 € + 150 € of hand tools).

■ 2015

- Discussions with partners, preparation of request for authorisation from the departmental territorial agency (assessment of site, impact on Natura 2000 site): 2 800 € (8 days x 350 €)

■ 2016

- Pumping: 2 830 € (5 days x 350 = 1 750 € + pump rental = 1 080 €);
- Excavator to open the dike and digging the ditch (shovel and pickaxe): 2 950 € (8 days x 350 € = 2800 € + excavator rental = 150 €);
- Capture and transfer of fish populations: 700 € (2 days x 350 €).

■ Total approximately 13 500 € over three years.

■ Funding in the framework of the management programme for the natural site by the regional council (Aquitaine Nature contract), the departmental council (SNA funding) and the Adour-Garonne water agency.

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Lot-et-Garonne : invasion d'une plante exotique

Publié le 12/03/2016 . Mis à jour le 14/03/2016 à 15h29 par Julien Pellouer

S'ABONNER À PARTIR DE 1€ | 1 COMMENTAIRE

▲ Pauline Lefort et Arnoul Mateo au bord du lac presque vide, envahi de cette plante d'aquarium. © PHOTOS J. P.

ARTICLE ABONNÉS **Le lac du Vallon de la Vergnote, classé Espace naturel sensible, a dû être vidé afin de tenter d'éradiquer une plante venue d'ailleurs.**

Et si un ou deux inoffensifs poissons rouges étaient les responsables ? Ou plutôt leurs anciens propriétaires qui auraient eu la mauvaise idée, sans forcément en mesurer les conséquences, de se débarrasser d'eux en vidant le contenu de leur bocal dans les eaux translucides du lac du Vallon de la Vergnote, à Masquières.

Râteau en main et waders aux pieds, les membres du Centre permanent d'initiatives pour l'environnement (CPIE 47) se gardent de l'affirmer. Même si tout l'indique. L'association, en 2010, a signé une convention de gestion avec la municipalité, propriétaire du site et de huit hectares alentours, classés Espace naturel sensible.

Depuis quelques jours, Pauline Lefort et Arnoul Mateo sont entrés dans une nouvelle phase de lutte contre l'élodée crépue. Objectif : son éradication. Cette plante

7. The pond and waterweed in November 2016.
8. Press article published in the Sud-Ouest newspaper in March 2016.

Table listing costs since 2014

	2014	2015	2016
Pumping operation prior to uprooting	2 000		
Manual uprooting	1 200		
Coordination		2 800	
Draining of the pond			2 830
Opening of the dike			2 950
Capture and transfer of fish			700
TOTAL (€)	4200	2 800	6 480
Days of work	4	8	15

9. Fact sheet on curly waterweed.

Information on the project

- The work in November 2014 was done by volunteers. Information bulletins were published to call for volunteers and inform on the work, articles appeared in the press.
- A short report was drafted on curly waterweed and the work done in 2016.
- In March 2016, a two-page article on the rescue fishing campaign was published in the Sud-Ouest newspaper.
http://www.sudouest.fr/2016/03/12/maree-verte-et-p-oissons-rouges-2298823-3757.php

Outlook

- The curly-waterweed colony and the draining of the pond are monitored.
- If the decision is taken not to fill the pond, the wetland will be monitored.

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More information

- Information sheet on curly waterweed (2016): www.biodiversite47.fr
- Remark. The fact sheet will be updated in 2017 to include the monitoring results.

PAYS DE SERRES-VALLÉE DU LOT

This management report was drafted in January 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 Onema.(http://www.onema.fr/sites/default/files/EN/EV/cat7a-EEE-vol2.html).

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