



Water fern

(*Azolla filiculoides*)

Manual uprooting to eradicate water fern from the Coste pond (Côtes d'Armor department)

Saint-Brieuc Armor Urban Area (SBAA)

- SBAA federates 32 towns in the department and includes rural, coastal and urban areas.
- Within the local government, the Catchments unit in the Water and Sanitation service is active in numerous fields dealing with the water cycle and wetlands, including management of the bocage landscape, wetlands, rivers and ponds, water quality, information, technical assistance for farmers, towns, individuals and companies, etc. It is in this capacity that it also works on invasive alien species observed in the area.
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Intervention site

- The Coste pond is located in the town of Saint-Julien, just to the south of Saint-Brieuc. It covers a total surface area of 8 000 square metres, has a maximum depth of four metres and is situated 500 metres downstream of the source that supplies it with water. Downstream of the pond, a stream flows into the Gouët, a small river that flows 1.2 km further downstream into an 80 hectare reservoir used for drinking water.
- The Coste is a private pond managed by a hunting society that signed an agreement with the owner.
- The presence of the water fern was first noted by the Saint-Julien hunting society during the summer of 2015, by which time the pond had been almost completely colonised. An initial management effort was undertaken and the plants were partially uprooted using pitch forks from the banks or from boats, however the species reappeared in the pond in the spring of 2016, at which point the hunting society contacted SBAA.
- The water fern had grown very densely and covered the entire pond, with in addition a significant layer of dead stems under the water surface.



1. The Coste pond (red circle) and the reservoir behind the Saint-Barthélemy dam (blue circle).
2. The pond entirely covered by water fern.

Disturbances and issues involved

■ Ecological impacts

- A thick blanket of fern covering the entire pond reduces the light in the water and results in anoxic conditions that are lethal to many species of fish (pike, roach, perch, rainbow trout), molluscs and plants.

■ Impacts on various uses

- Access to the pond was blocked off to prevent any risk of drowning given that the water was not visible under the layer of plants.
- The fishing competitions and all fishing activities were halted by the hunting society.

Interventions

■ In March 2016, a partnership was launched between the local stakeholders, including the pond owner and the hunting society, the Departmental Territorial and Maritime Directorate (DDTM), Departmental Council, Town of Saint-Julien and Saint-Brieuc Quintin Binic Certified Association for Fishing and Protection of Aquatic Environments (AAPPMA). A day of manual collection of the plants was organised on 2 July 2016, using the available means provided by the various stakeholders.

■ The objective was to control the growth of the plants in the pond and, if possible, to eradicate the species.

■ Prior to the work and to avoid any risk of dispersal downstream, a siphon was installed at the outlet of the pond, with a floating barrier of the type used to contain hydrocarbon pollutants in water.

■ Using dip nets and nets with a one-centimetre mesh, the beds of water fern were gathered and pulled to the banks. Boats were used to access the centre of the pond.

■ Any fish caught were extracted from the nets before they were pulled up on the bank and immediately put back into the water.

■ The collected water fern was laid out in swaths near the pond to drain and then transported to a disposal centre at the end of the summer and folded into a compost-production line (in the “green algae” circuit where it is first dried before being mixed with standard green waste).

■ A monitoring programme was set up for the pond to detect any regrowth of forgotten fragments and stems. Water fern fragments are very small and in spite of the precautions taken, it is difficult to remove all fragments from a site. SBAA personnel inspected the site every two weeks for two months following the work, then once per month thereafter. They also maintained regular contact with the local hunters and with the game warden in charge of the site, who was trained to recognise the plant.

■ In the beginning of August 2016, approximately one month after the work, the technician in charge of inspecting the site found some water fern growing on about 2.2 square metres of wetland (saturated soil comprising mud and sand) to the north of the pond, just a few metres from the water. With the help of the president of the hunting society and using a shovel, the technician carefully scrapped up the plants, starting from the outside and working in to avoid missing or dispersing any fragments. This additional work took approximately one hour. The removed water fern was transported in a plastic garbage bag and added to the swath of water fern collected in July.

Results and costs

■ Results

■ In July 2016, the work covered the entire pond and approximately 50 cubic metres of water fern were removed from the water, drained, dried and transported. With the exception of the small, isolated section to the north of the pond discovered in August 2016, no further discoveries of water fern were reported during the inspections.

■ Two and a half years after the work, no water fern has been observed on the site.



3. Stream feeding into the pond.

4. Net full of water fern, pulled up on the bank.

5. Barrier used to avoid the dispersal of water fern.

6. Swath of water fern for draining and drying prior to transport.

7. The pond the day after the work.

Costs

- The operation as a whole required the equivalent of ten man-days from SBAA personnel (management, meetings, work site, press contacts) and two man-days by the Departmental Council (meetings). The personnel who took part in the manual gathering of the plants did so on a volunteer basis.
- A total of 35 volunteers participated in the work on the pond.
- The town of Saint-Julien paid for the meal during the work day (200 euros).
- The Departmental Council funded the work to create the siphon at the pond outlet (approximately 100 euros).
- The nets and boats were supplied by AAPPMA.

Volunteers for the work on 2 July 2016.

Origin	Number
SBAA personnel	2
Departmental personnel	2
Town personnel	2
AAPPMA members	10
Hunters	10
Residents and elected officials from Saint-Julien	9

Information on the project

- An article was published in the municipal bulletin of Saint-Julien on the preparations for the day of work.
- The colonisation of the pond by water fern was a topic in the national media (TF1, Canal+ and France 2 TV stations and on radios), however, only the local press followed and informed on the management operations.

Outlook

- The site continues to be monitored annually by an SBAA technician and contacts are maintained with the hunters to monitor any observations of the species.
- Water fern was detected around the same time in a small, private pond (5 x 10 metres) in the town of Plaintel, five kilometres in a straight line from the pond in Saint-Julien. Water birds are suspected to have transported fragments of water fern. The owner of the second pond was informed of the technique implemented for the Coste pond and used the same technique, with identical success.
- No other invasive alien species have been detected to date in the Coste pond.

Authors: David Etienne, SBAA, and Doriane Blottière, IUCN French committee, for the Resource Centre on invasive alien species. July 2019. Published by the French Biodiversity Agency.

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. (https://professionnels.ofb.fr/index.php/en/node/416)



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Étang rouge à Saint-Julien. Mobilisation citoyenne ?

Diminué Bouchon-Bazile

Une « mobilisation citoyenne » pour nettoyer l'étang rouge de Saint-Julien. C'est la solution envisagée par le maire de la commune, pour régler le sort de la fougère invasive qui a donné ses belles couleurs au point d'eau.

À Saint-Julien, l'étang rouge est devenu, au temps, une véritable cascade locale.

Les curistes sont moins nombreux au bord du petit étang du château de la Coste, à Saint-Julien, en cette fin de mois de mai. Le plan d'eau, lui, est toujours couvert de cette fougère invasive qui avait fait, bien malgré lui, sa renommée. Un végétal exotique aux qualités ornementales remarquables, mais dévastateur pour l'environnement. Faune aquatique, risque de contamination aux plans d'eau voisins. Le phénomène avait même poussé les autorités locales, d'autant que la situation sanitaire de l'étang (il est sur un terrain qui avait subi auparavant la contamination de la fougère, la semaine dernière, Claude Blanchard, le maire de Saint-Julien, a réuni autour de la table les services de l'état, du département, de l'agglomération bretonne, les chasseurs, et aussi le propriétaire du site. Objectif : engager les solutions.

C'est exorbitant

« On s'est mis d'accord, déjà, pour mener des analyses, rechercher la présence de « symbiotes », explique le maire. Pour le reste, ce n'est pas simple. Il faudrait nettoyer mais les outils techniques seraient exorbitants. Et de toute façon, c'est un étang privé. »

En fait, « personne n'a les moyens » de se lancer dans une opération scolaire. « On pense plutôt à une journée de nettoyage, où l'on ferait appel aux bonnes volontés. Une journée citoyenne, cela me semble la moins mauvaise solution. »

Les fougères seraient ensuite compostées. L'étang vient régulièrement car « on n'a aucune garantie que ça ne reprenne pas ». Pas d'analyse sur les causes de l'invasion : « Il y a forcément un argument qui a été validé quelque part, et un étang qui est passé par là ». Selon certains : « Il y a pas de risque avéré pour les usages d'eau proches. » La fougère ne colonise que les zones stagnantes, il ne faut pas de courant, ou de végétation. Elle a profité à Saint-Julien de conditions favorables, des eaux mortes, et notamment un hiver doux. »

- 8. The small group of water-fern plants found to the north of the pond in August 2016.
- 9. The pond four months after the work.
- 10. An article published in the Télégramme newspaper on 24 March 2016.

