



Water primrose

(*Ludwigia* spp.)

Managing water primrose using mechanical uprooting and sediment dredging

Beuvron basin management board (SEBB)

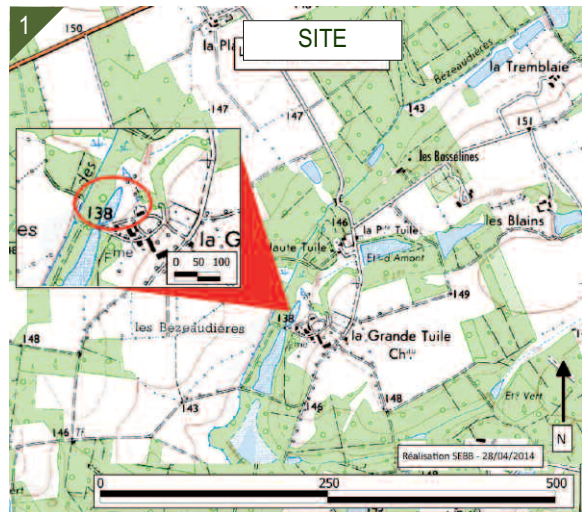
- The SEBB is a local government created in 1996.
- Its main missions are to manage the rivers in the Beuvron basin, including restoration and maintenance of the rivers, and to conduct the necessary studies on management of the rivers and of invasive alien species (both plant and animal).
- Workforce and territory. One policy officer for the basin contract, a river technician, four operators for river maintenance and a part-time secretary make up the SEBB personnel. The board represents 70 towns in the river basin, covering a total of 2 191 square kilometres.
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Fishing federation for the Loir-et-Cher department (FDP 41)

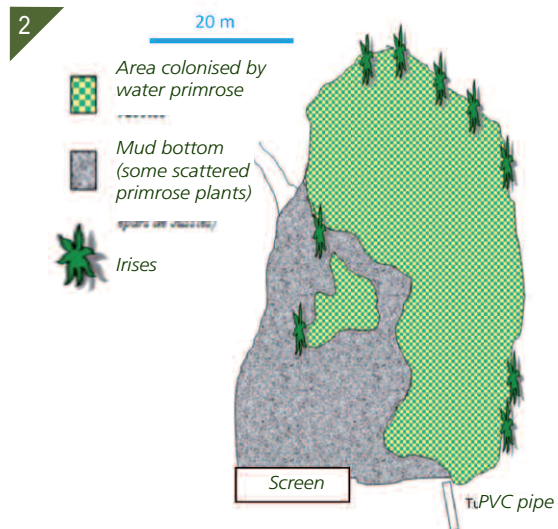
- A non-profit association certified for environmental protection, based in the city of Blois, grouping 40 certified associations for fishing and protection of aquatic environments (AAPPMA) and the certified departmental association of recreational fishermen using nets and traps, representing a total of approximately 11 000 members.
- Its main missions are to coordinate and organise the work of the AAPPMA, to gain knowledge and protect aquatic environments, to protect fish populations, develop recreational fishing and raise the awareness of members.
- Employees include a secretary-accountant, a policy officer in charge of coordination, an officer in charge of monitoring fish populations, two scientific officers and a maintenance operator.
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Site d'intervention

- Sologne is a "territory", covering approximately 5 000 square kilometres spread over three departments (Cher, Loir-et-Cher and Loiret).
- It is divided into two main parts:
 - Grande Sologne, including the ponds (between the Sauldre and Beuvron Rivers), the section near the city of Orléans (between the Beuvron and Cosson Rivers) and the section along the Cher River;
 - the wine-growing section in the western part of the river basin.



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1. Study site. The pond is located upstream of a string of three ponds.

2. Colonisation of the pond by water primrose, prior to the intervention.

- This area is home to a very large number of wetland plant and animal species and is an important ecological site in Europe.
- Large-flower water primrose (*Ludwigia grandiflora*) is present in Sologne in the rivers and in a number of ponds. In the rivers, it is located essentially in the lentic reaches (slow currents). Many ponds have also been colonised to different degrees by the plant.
- The existence of strings of ponds facilitates the spread of the plant from one pond to the next.

Disturbances and issues involved

- A high level of biodiversity exists in Sologne due to the many wetlands that, if colonised by water primrose, could no longer serve for the native plant and animal species that depend on wetland conditions.
- High densities of water primrose tend to “occupy” colonised sites due to the accumulation of organic matter resulting from the production of biomass by the plant. As a result, the volume of non-colonised water is reduced and the environment becomes less diverse because it no longer provides the habitats required by the native species that originally occupied the area. Water primrose is a highly competitive species with respect to the other aquatic species and particularly protected species.

Interventions

- Following an informational meeting in 2004 on issues surrounding water primrose in Sologne and an open-house in 2005, the Pays-de-Grande-Sologne board decided to test mechanical uprooting of water primrose in a local pond.
- The test took place in the town of Souvigny-en-Sologne thanks to a land owner who took interest in the project. Two ponds on the property were colonised by water primrose and it was decided to conduct the test on the smaller pond (1 850 square metres) located upstream of a string of three ponds.
- In 2007, when the project began, water primrose had colonised two-thirds of the total surface.
- The pond was drained before the work was undertaken.

■ Project steps

- Mechanical uprooting and soil stripping, followed by three inspections with manual uprooting:
 - the first inspection immediately following the work;
 - the second two months after the work;
 - the third eleven months after the work.
 - The work started in 2008.
- The site was then monitored annually from 2009 to 2013.

■ Mechanical uprooting and soil stripping (2008)

- The plants were uprooted and removed using a tracked excavator, a tractor and a trailer.
- For the test, it was decided to remove the water primrose, the plant litter and 40 centimetres of sediment (on average) in order to limit regrowth by cuttings and seeds (removal of all roots and seeds).

■ Manual uprooting

- Manual uprooting was included in the project for several reasons:
 - uprooting was undertaken around the emergent native riparian vegetation to help it develop and compete with the water primrose;
 - following the mechanical uprooting, it was required to remove the new shoots that generally appear after a few days. This occurs because the excavator bucket tends to leave many rhizomes in the soil during uprooting. It was therefore essential to include manual uprooting in order to reduce recolonisation by the plants. This work was made easier due to the very small volumes involved.



3. The drained pond.

4. Work to uproot the plants and strip the top layer of sediment.

5. Removal of the plants and sediment.

■ Waste management

- The plants and sediment were transported by tractor and trailer to a meadow. Every effort was made to limit the passage of the excavator in the beds of primrose to avoid dissemination of the plants.
- The waste was spread in a nearby meadow. It was planned not to create mounds, but a layer approximately 10 centimetres thick.
- The waste was spread only in the top section of the meadow in order not to cover typical wetland plants present in the lower section.

Results and assessment

■ Results

- The volume of waste (plants and sediment) removed from the pond amounted to 1 200 cubic metres.
- The entire amount was spread in the nearby meadow. In the end, the waste was spread over a surface area of 3 500 square metres in a layer approximately 30 to 40 centimetres thick.
- Manual uprooting took place in 2008.

Date	Number of people	Time spent (hours per person)	Volume removed (litres)
28 July	3	8	240
9 September	2	3	160
22 September	1	2,5	54
30 September	2	3,5	160

■ Subsequent monitoring (2009, 2010, 2013)

- The owner was trained to identify water primrose so that she could carry out manual uprooting herself.
- * Monitoring of the meadow where the waste was spread:
 - the drying time was longer than planned given the thickness of the spread material;
 - in 2009, the very hot summer resulted in the disappearance of the stands of reeds in the meadow and the appearance of grasses;
 - in 2010, wetland plant species such as reeds and hemp-agrimony (*Eupatorium cannabinum*) reappeared, signalling that the soil on the site still contained a high degree of humidity;
 - in 2013, the plant community in the meadow comprised grasses and shrubs (*Genisteae* (brooms) and blackthorn), similar to the situation before the work. The species observed in 2010 were no longer present.

■ Monitoring of the pond

- 2009. Sporadic, but regular regrowth of water primrose was observed in the pond and along the banks (probably due to plant litter buried during the work).
- 2010. Following the manual uprooting carried out in 2009, the sections of the pond under water were free of water primrose. However, the species was still present at the foot of the banks.



6. 7. The meadow prior to the work (2008) and in 2013.

- 2011. A few plants persisted at the foot of the banks in the sections no longer covered with water, which made them more difficult to uproot.
- In 2010 and 2011, the work to uproot the plants was done by a private firm. The volumes removed and the time spent are not known.
- 2012. A few plants were present on the dewatered bank at the foot of the pond, mixed with marsh seedbox (*Ludwigia palustris*). No regrowth was observed in the pond. A volume of 10 litres was removed by two people in 30 minutes.
- 2013. Three small areas were noted (less than 1 square metre each) and uprooted (40 litres). This work occupied one person for an hour.

■ Financial aspects

- The mechanical uprooting and stripping was funded by the land owner (50%) and by EU LEADER+ funds (50%) managed by the Pays-de-Grande-Sologne board. The overall cost was 5 800 euros including VAT.
- In 2010 and 2011, the land owner brought in a specialised firm for manual uprooting that cost 500 euros each year, i.e. a total of 1 000 euros including VAT.

Year	Volume removed (litres)	Time spent (hours)	Price (in euros incl. VAT)
2008	614	39.5	5 800
2010	Not available	Not available	500
2011	Not available	Not available	500
2012	10	0.5	-
2013	40	1	-
TOTAL	At least 670 litres	At least 41 hours	6 800 € incl. VAT

Outlook

- Site monitoring was conducted for a year in conjunction with the land owner. During that time, she learned to identify water primrose (a similar native plant, marsh seedbox, was also present) and how to uproot the plants. Today, the owner regularly monitors the pond and if necessary calls a firm specialised in this type of work.

Information on the project

- Management of water primrose calls for greater communication and notably of information on how to handle it rapidly following its establishment on a new site.
- With that in mind, a brochure on the best manual uprooting technique for water primrose was recently drafted so that anyone confronted with the start of a colonisation can take effective action. Intended for the general public, the brochure is available in town halls and can be viewed on the SEBB site.

Authors: Emmanuelle Sarat, IUCN French committee, and Dominique Béguin, Beuvron basin management board.



8. The pond just before the work (2008).

9. The pond in 2012.

For more information

- www.bassin-du-beuvron.com
- www.fedepêche41.com
- Béguin D. et Parot I. 2013. Compte-rendu de l'opération test d'arrachage mécanique de jussies, Petit Étang, la Thuile, Sauvigny-en-Sologne, Loir-et-Cher. Syndicat d'entretien du bassin du Beuvron et Fédération de pêche et de protection du milieu aquatique du Loiret-Cher. 20 pp.
- Syndicat d'entretien du bassin du Beuvron et Syndicat intercommunal du Bas Cosson. 2013. La jussie, plante exotique envahissante : méthodologie d'arrachage manuel. 2 pp.

