



Water primrose

(*Ludwigia* spp.)

Managing water primrose in the Vistre basin

Public river-basin territorial agency for the Vistre basin

- The public entity was founded in 1998 and federates towns and groups of towns.
- On 1 August 2011, it was acknowledged by prefectural order as a public river-basin territorial agency (EPTB) in the area covered by the Vistre, Vistrenque and Costières SBMP:
- The Vistre EPTB provides overall water management, including:
 - maintenance of the river beds and banks, removal of jamming debris and management of landings (multi-annual management plan for river environments);
 - reduction of risks and vulnerability caused by river flooding and rural runoff;
 - participation in protecting water bodies, hydro-morphological restoration work and revitalisation of rivers.
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Intervention site

- The EPTB manages an area of approximately 790 square kilometres and 185 kilometres of river.
- The Vistre River originates in the town of Bezouze, to the north-east of Nîmes, and flows into the Rhône canal at Sète, to the north of Aigues-Mortes.
- In 2009 and 2010, management of water primrose was conducted primarily on sections of the Vistre, in nearby wetlands and on two tributaries, the Buffalon and the Tavernolle.
- Starting in 2011, in an effort to optimise management operations, the work was more focussed, targeting heavily colonised wetlands and the areas around the work sites of the previous years, in the towns of Bouillargues and Nîmes.

Disturbances and issues involved

- The presence of water primrose in the Vistre basin became troublesome starting in 2007. The plants developed primarily in the Buffalon and in the Vistre from the confluence with the Buffalon to the Bastide site (Nîmes).



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1. Territory managed by the Vistre EPTB.

Impacts on ecosystems

- High level of biomass produced, contributing to sedimentation and filling of stagnant biotopes.
- The beds of plants trap silt and suspended matter in the water.
- Hydraulic circulation in rivers is disturbed.
- Competition with native species.

Interventions

- At the request of the Rhône-Méditerranée-Corse water agency, the Vistre EPTB has since 2008 organised uprooting of water primrose in the upper sections of the Vistre basin to avoid colonisation of the downstream sections.

Manual uprooting

- A boat and a winch are used.

Mechanical uprooting

- Mechanical uprooting was used in areas where manual uprooting was not feasible (excessive depth or large surface areas).
- The work was done by a private firm (the Marquis company).
- An excavator with a 10-metre arm and a screening bucket was used.

■ Drying the uprooted plants

- The plants were deposited at the top of the banks.
- They remained spread on the banks for 7 days.
- They degraded naturally on site.

■ Tarping

- Tarps were spread on the banks for 10 to 15 days.
- They were used on non-flooded strips of ground colonised by water primrose, along the wetlands.
- After removing the tarps, the plants could be rapidly uprooted.
- In 2011, tests were conducted with two types of tarps, opaque black and translucent green.

Year	Work periods	Work sectors	Techniques
2008	26 June to 29 July	16 reaches (Vistre, Tavernolle, Buffalon)	Manual and mechanical uprooting
2009	30 June to 7 August	27 reaches (Vistre, Tavernolle, Buffalon)	Manual uprooting
2010	10 August to 6 September, 18 October (mechanical uprooting)	27 reaches (Vistre, Tavernolle, Buffalon)	Manual and mechanical uprooting + tarping
2011	27 June (spreading of tarps) 12 July to 20 September	12 reaches (Vistre, Buffalon)	Manual uprooting + tarping
2012	28 June (spreading of tarps) 14 August to 21 September	12 reaches (Vistre, Buffalon)	Manual uprooting + tarping

Results and assessment

■ Results of uprooting since 2008

- No increase in the area colonised by water primrose along the managed reaches.
- Decrease in the areas covered by water primrose along heavily shaded and rapidly running river reaches.

Year	Linear distance (metres)	Full-time equivalent days	Weight of removed plants (kg wet matter)	
			Manual uprooting	Mechanical uprooting
2008	5 049	71	5 098	2 365
2009	10 788	84	9 082	-
2010	7 846	76	10 100	4 706
2011	1 606	59	3 158	-
2012	1 376	33	3 478	-

■ Results of tarping

- Tarping reduced the volume of stalks to be uprooted.
- Observations after removing the tarps:
 - in November 2011, the plants under the translucent green tarps had started to regrow whereas there was no regrowth under the opaque black tarps;
 - identical observations in 2012.
- Manual uprooting was easier in the tarped areas.
- Tarping is not selective, i.e. it impacts the native species as well as the water primrose.

- In April 2013, natural recolonisation by native plants (Iris, Carex, *Veronica beccabunga*) was observed in the tarped areas.

Outlook

- Continue management work on water primrose in the Vistre basin.
- Monitor colonisation in the tarped areas, after uprooting.
- Encourage colonisation of native species by planting or seeding, in the absence of natural colonisation.
- Continue management work on the riparian vegetation of the banks to increase the shade along rivers.
- Operations started in 2006 include planting, brushcutting, clearing of jamming material in rivers, severe cutting back of willow trees.

Information on the project

- Annual publication of a report titled *The work to uproot water primrose in the upstream sections of the Vistre basin*.
- Partnership with a class from the Rodilhan agricultural school for a half-day of uprooting in 2010, 2011 and 2012.
- Project to publish a brochure and fact sheets on the work done.

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For more information

- Annual report titled *The work to uproot water primrose in the upstream sections of the Vistre basin*, from 2008 to 2012, S.M.B.V.V.- E.P.T.B.
- Presentation of the board for the Vistre basin.
- Presentation of the Vistre EPTB.
- Pézeril C., Serre Jouve S., Arce E., Archaimbault V., Chauvin C., Dumont B., Dutarte A., Foulquier A., Morin S., Montuelle B. 2010. Revitalisation écologique du cours du Vistre (Gard) : modalités techniques et évaluation des gains écologiques. Actes des 4èmes Journées Atelier de REVER, 6-7 novembre 2012, Lyon.
- Pézeril C., Dutarte A. 2013. Gestion de la Jussie (*Ludwigia peploides*) dans la rivière du Vistre (Sud-Est de la France). Poster présenté au Colloque Macrophytes, 28-30 mai 2013, Bordeaux.



2. Uprooting water primrose with a school class in 2011.
3. Tarp covering an area colonised by water primrose.
4. Situation after 7 days of being covered by a tarp.
5. Situation after tarping and manual uprooting.
6. Site tarped in 2012 and naturally recolonised by native species in April 2013.