



Asian knotweed

(*Reynoutria* spp.)

Managing Bohemian knotweed in the Garaye River

Operational committee for the Rance River (COEUR Émeraude)

- This association, founded in 1994, is the organisational entity for the future Rance-Côte d'Émeraude regional nature park.
- The main missions include:
 - managing the project to create the park and informing the public on the project;
 - assisting local governments in their projects to protect and develop their natural heritage and to implement sustainable-development policies (inventories, urbanism, Natura 2000, impact studies, walking trails);
 - setting up sustainable management of sediment in the Rance estuary;
 - assisting farmers in their efforts to reconcile agriculture and the environment;
 - preserving and restoring the bocage landscape (in the framework of the Breizh Bocage programme);
 - ensuring the protection of the marine and littoral environments, and of the maritime heritage;
 - contributing to the sustainable development of economic and recreational activities;
 - protecting aquatic environments and water resources.
- Management work on knotweed is conducted in favour of biodiversity in the framework of the policy on knowledge, mapping and control of invasive species. The work presented here is also part of the mission to protect aquatic environments.
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Intervention site

- Management work on *Reynoutria x bohemica* was done in the Côtes-d'Armor department, on the left bank of the Garaye River, a tributary to the Rance.
- The Rance springs from the Monts du Mené and flows to the English Channel at its mouth between Dinard and Saint-Malo.
- The work site was located in the town of Taden.



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1. The town where the work took place.

Disturbances and issues involved

- On the site in June 2013, *Reynoutria x bohemica* was present along 125 metres of river bank, representing a total surface area of over 2 000 square metres. The knotweed was planted in the 1980 to mask an old dump and a storage area for construction equipment.
- **Impacts on the ecosystem**
 - Competition with native riparian species.
 - Weakening of the river banks.
 - Increased shade on the colonised reach of river.
- **Impacts on human activities**
 - The more difficult access to the banks can make fishing impossible.
 - The intervention was designed to avoid any propagation of *Reynoutria x bohemica* cuttings by the river to the Rance estuary Natura 2000 zone and make possible normal use of the site.

Interventions

■ Starting in 2004, a method combining uprooting and tarping of the knotweed was implemented, followed by the planting of willows. The objective of this method was to help the native riparian species in the competition for space and light. Monitoring was ensured by a COEUR Émeraude policy officer and a team from a social reintegration association based in Dinan.

■ Manual uprooting

- This work was done on the entire colonised area.
- The first year of work was 2004:
 - the work took place from February to March;
 - the “dry” stalks of *Reynoutria x bohémica* from the previous year were uprooted;
 - the rhizomes were removed using pitchforks and garden forks.
- Over the following years, until 2013, the work consisted of:
 - interventions from April to September;
 - 3 or 4 interventions per month;
 - the harvested plants were burnt on site.

■ Manual uprooting and tarping

- The work was done on 900 square metres of colonised river banks. Due to the insufficient level of available funding, this area was treated sector by sector from 2005 to 2013. The treated surface area varied from year to year, depending on the funding. The work consisted of several phases:
 - manual uprooting from April to May of the area to be tarped, plus a 50 cm border;
 - smoothing of the soil using the municipal backhoe (30 minutes);
 - installation of bundled willow wood (fascines) along the banks to stabilise them;
 - installation of the tarp made of a biodegradable geotextile fabric (18-month service life) immediately after the uprooting work in May (before any regrowth). The fabric, made of 70% burlap and 30% hemp, was between 8 and 10 millimetres thick;
 - maintenance of the tarped area. Every two weeks until the planting of the willows, the tarp was walked on and compressed (two times using a lawn roller) to keep it firmly pressed to the ground;
 - planting of willow cuttings (*Salix fragilis* and *S. aurita*) collected on the opposite bank of the river from October to November. Five or six trees, approximately 1 metre high and 1 to 3 cm in diameter, were planted per square metre in holes cut into the tarp.

■ Maintenance following tarping

- This work was done during the months of March to September, from 2006 to 2013 (30 minutes per month) in the areas tarped the previous years.
- New willow cuttings were planted to replace the cuttings that did not grow.
- Any shoots of *Reynoutria x bohémica* growing around or through the tarps were manually uprooted as they appeared.

Results and assessment

■ Results

- As early as 2007, the river bank was recolonised by approximately 20 native species commonly found on river banks.
- The method employed was effective in recreating competitive conditions for native species, but could not completely eradicate the knotweed.



2. 3. The work site at different stages of colonisation and work.

4. The site following manual uprooting.

5. Installation of bundled willow wood (fascines) along the banks.

6. Tarped area.

7. Tarped area with planted willow cuttings.



Assessment

- Significant human resources were required during the 3 years of work.

Type of worker	Time worked in man-days	
	2004	Following years (average)
Social reintegration association	63	25
COEUR policy officer	13	5
Total	76	30

- It is worthwhile to initially weaken *Reynoutria x bohémica* by uprooting the plants as early as possible.
- It is necessary to ensure regular maintenance of the tarped areas over several months to assist the regrowth and sustainability of the native species.
- The control method employed can be reused on other sites with adaptations for the local conditions (economic, social and environmental).
- Given the significant human resources required, the method should probably be limited to high-value sites.

Outlook

- The maintenance work will be halted in 2014 to see whether the restored riparian vegetation can sustain the current equilibrium without any further intervention.
- The same method will be used on dunes, on a site colonised by *Reynoutria x bohémica* in the town of Saint-Lunaire (Côtes-d'Armor department), but by planting elderberry and/or privet to compete with the invasive species.
- An objective is to identify competitive native species suited to different types of environments colonised by *Reynoutria x bohémica* and to various site uses (notably along roadsides due to the importance of visibility).
- A further goal is to federate local stakeholders on the topic, notably by informing the general public and creating a participatory observatory (project under way).

Information on the project

- Ten highschool students participated in manually uprooting *Reynoutria x bohémica*.
- A two-page report was published on the work in the feedback document on projects to manage natural areas titled *Management of invasive species in the Bretagne region*, prepared by the Bretagne Vivante non-profit, a regional association for environmental protection.
- The work was also presented during the national symposium on Asian knotweed held on 23 and 24 October 2012 in the city of Saint-Étienne.
- Internet pages were created on the COEUR Émeraude site presenting IAS management and the work done by the regional nature park and the towns, as well as data and recommendations for plant management intended for the general public.

http://www.coeur.asso.fr/Actions_aquatiques_p4.html (pages en construction).

Remarks

- Bohemian knotweed (*Reynoutria x bohémica*) is a hybrid produced by cross breeding of Japanese knotweed (*Reynoutria japonica*) and giant knotweed (*Reynoutria sachalinensis*).

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8. Tarped area during regrowth of native species.
9. Tarped area after regrowth of native species.

For more information

- COEUR Émeraude internet site: <http://www.coeur.asso.fr/>
- Quemmerais-Amice G. et Magnier M. 2012. La Renouée de Bohème à Taden, p 44 – 45. Dans La gestion d'espèces invasives en Bretagne, recueil d'expériences menées sur des espaces naturels. Bretagne Vivante, Brest, 72 pp. http://www.bretagnevivante.org/images/stories/Reserves/Forum_gestionnaires/recueil%20esp%C3%A8ces%20invasives_2012.pdf

