New Zealand pigmyweed

(Crassula helmsii)

Detection and removal (scraping) of New Zealand pigmyweed in the Acheneau and Tenu marshes (Loire-Atlantique department)

Sud-Loire Hydraulic Board (SAH Sud-Loire)

- The area managed by SAH Sud-Loire covers parts of the Loire-Atlantique and Vendée departments, from the Loire estuary to north of the Breton Marshes and from the outlet of the Grand-Lieu Lake to the ocean.
- Since 2010, the board has implemented a policy to improve the quality of water and aquatic environments in the Tenu basin (a sub-basin in the Loire Estuary SBMP) including management of invasive aquatic plants.
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Intervention site

- In the Loire-Atlantique department, New Zealand pigmyweed (NZP) was first reported in 2010 in Guérande and has since spread considerably throughout the department.
- In August 2017, it was observed by the volunteer network of the Brest National Botanical Conservatory (CBNB) at the confluence of the Acheneau and Tenu Rivers, in the town of Saint-Mars-de-Coutais.
- That was the first observation of the species in the area at the point of junction between two Natura 2000 sites, the Loire Estuary site (FR5200621) and the Grand-Lieu Lake site (FR3600048).
- To assess the degree of colonisation and determine, if possible, the site of introduction, the main hydraulic network, i.e. 40 km of river, was inspected by boat using binoculars by members of the Loire Nature Conservatory (CEN PDL), the CBNB, the Fishing Federation of the Loire-Atlantique department, the National Association for the Protection of Nature (SNPN) for Grand Lieu and the SAH.
- It was determined that the plants most probably spread via water channels, from a moat in a marsh receiving water from a catchment comprising private properties in the town of Port-Saint-Père.
- The flow direction of this hydraulic network changes depending on the season, due to the very slight slope (1 cm per kilometre) and to the effects of summer draw-offs of Loire water via locks (that collect fresh water from the estuary pushed upstream by high tides) and upstream pumping stations that reverse the flow direction.
- This unusual hydraulic system that flows in both directions offers NZP a chance to colonise all favourable environments in the marshes down to the Loire, i.e. a potential area of approximately 1 800 hectares. The risk of propagation via hydraulic channels to the Grand-Lieu Lake is slight, however the risk of future colonisation due to the movement of fauna and humans is great.

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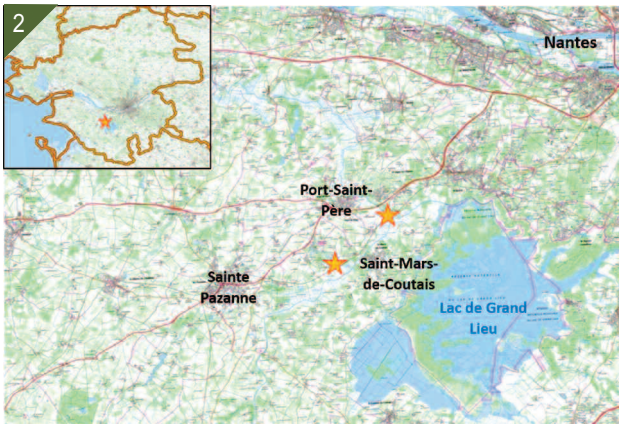

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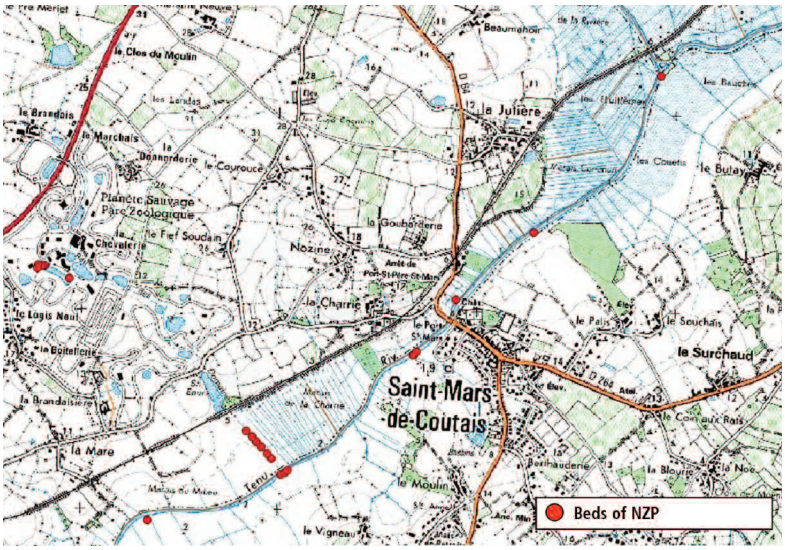
1. Area managed by SAH Sud-Loire.
2. Intervention sites.

■ The low population densities and the currently limited ranges would indicate a recent arrival in the area and enable interventions to reduce the risks of NZP dispersal and avoid a widespread invasion.



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Sectors colonised by New Zealand pigmyweed.

Disturbances and issues involved

■ The plants colonise easily and can establish single-species populations, in direct competition with native species.

■ NZP can also block canals and ditches, creating problems for the flow of water.

Interventions

■ For the field work, SAH and the CEN formed a partnership and were supported by the CBNB for the detection campaigns, on the work sites and for monitoring. The towns of Port-Saint-Père and Saint-Mars-de-Coutais took part in the work to uproot the most densely colonised areas by providing equipment and a storage area, informing on the work and by determining the perimeter of a colonised site.

■ In September and October 2017, manual interventions (scraping of plants and roots) took place on all NZP sites, except on private land upstream of the marshes.

■ The banks of the Tenu River were inspected by boat. Small NZP sites were detected using binoculars and directly eliminated using trowels and shovels to remove the substratum in order to avoid fragmentation of the fragile plants (the roots do not go deep).

■ The waste was transported in large recipients and rolled into an agricultural tarp, in a dry area. Particular care was taken during travel to and from sites by personnel to avoid any dispersal caused by trampling on the plants and transporting segments under boots. When landing, the CBNB systematically marked out the colonised area before the uprooting work was started.

3. New Zealand pigmyweed mixed in with native vegetation.
4. Scraping spots colonised by NZP on the banks of the Tenu River.
5, 6. Identification of the colonised area and removal of the root system.

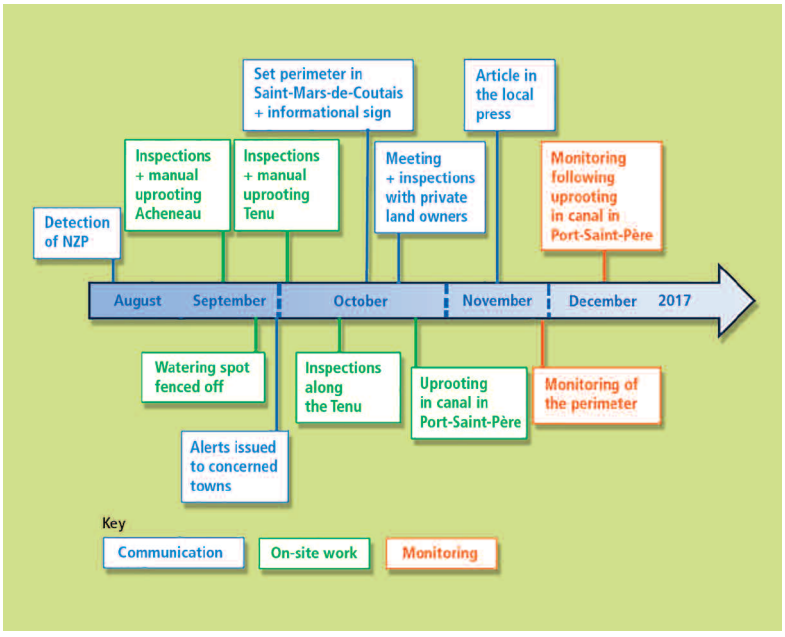
■ The 350 metres of moat in Port-Saint-Père represented a full day of manual intervention by eight people (6 from SAH, 1 from CBNB and 1 from CEN). The work took place in a number of steps:

- the two banks were first inspected on foot and the NZP sites were marked with paint, then all the marked areas were scraped manually;
- the workers entered the water to collect any floating cuttings and eliminate any plants not visible from the bank (overhangs);
- an initial inspection run was undertaken to check the work and remove any plants that had been missed;
- finally, after letting the sediment settle, a second inspection run was carried out.

■ The harvested NZP was transported using a tractor made available by the town.

■ Even though great care was taken in uprooting and transporting the plants, some NZP may still remain in the treated areas. To avoid any risk of propagation, two areas were fenced off to avoid passage that could disperse the plants. The first was a break in the river bank, approximately ten metres long, in a pasture. It was used by cows to access the river to drink. Informed by SAH, the farmer accepted to fence off the zone. The second was located on the right bank in the port of Saint-Mars-de-Coutais, where access to approximately 50 metres of the bank, used by anglers, was prohibited by prefectoral order.

■ The green waste was transported and stored under a tarp in a town depot, far from any circulation of people or vehicles. The soil removed during uprooting of the plants was placed in a tarp that was sealed to avoid contact with the air and the underlying ground. The contents of the tarp will be monitored to detect any regrowth of the plants and to determine their resistance to confinement (dryness and obscurity).



Chronology of the interventions.

7. Transport and elimination of the waste.
8. Second intervention in the moat.
9. Third intervention in the moat.
10. Prohibited area in the port of Saint-Mars-de-Coutais.

Results and costs

Results

On 20 December 2017, SAH and CEN inspected the main uprooted sites to check for any new sprouts. In spite of favourable weather conditions for the plants (relatively warm fall and winter, limited rainfall, i.e. low water level), only a small number of new-growth plants were detected and uprooted. These results bear witness to the meticulous work done.

Costs

The work done by SAH was financed directly by the board.

The operational assistance for the project managers provided by CEN and CBNB was financed in the framework of the Pays-de-la-Loire IAS network, funded by the Loire-Bretagne Water Agency (60% for CEN and 30% for CBNB) and the Pays-de-la-Loire Regional Environmental Directorate (35% for CEN, 45% for CBNB). The remainder was funded directly by the two organisations. The personnel costs per person and per day were estimated at 450 € for CEN and 467 € for CBNB.

11. Depot for green waste, protected by a tarp.

Work dates and sites.

Date	Place	On-site work	Participants	Number of persons	Time (hours)	Cost (€)
25 Sept. 2017	Canal (outlet of Grand-Lieu Lake)	Inspection + removal of plants	SNPN + CEN	3	4	422*
25 Sept. 2017	Acheneau (Port-St-Père to Rouans)	Inspection	Fishing Federation 44	NA	4	30*
25 Sept. 2017	Tenu (St-Mars-de-Coutais to Ste-Pazanne)	Inspection + removal of plants	CBNB + SNPN	3	8	833*
26 Sept. 2017	Thérèse Island (confluence)	Watering spot fenced off	SAH	1	2	42*
02 Oct. 2017	Site in St-Mars (Le Vigneau)	Uprooting in lower section	CBNB + SAH	4	6	641*
17 Oct. 2017	Tenu (Ste-Pazanne to Machecoul)	Inspection	CEN+CBNB+SAH	3	4	571*
19 Oct. 2017	Port of St-Mars-de-Coutais	Fencing off + sign	SAH	1	3	63
19 Oct. 2017	Port-Saint-Père (private property)	Inspection + information	SAH + CEN	2	4	308
26 Oct. 2017	Canal Port-Saint-Père	Uprooting	SAH + CEN + CBNB + Town	8	7	1860
17 Nov. 2017	Port of St-Mars-de-Coutais	Press article	SAH	1	2	42
20 Nov. 2017	Canal + Port of St-Mars-de-Coutais	Monitoring of sprouts	SAH + CEN	2	4	308
					Total	5120

Personnel costs were estimated on the basis of an hourly cost of 21 euros per person for personnel from SAH, SNPN and the town. Use of the motorboat is indicated by an asterisk and the cost was estimated at 30 euros per day. NA: Not available.

Information on the project

■ An article informing the population concerning the presence of the species in the area was published in the *Courrier du Pays de Retz* (the local weekly) on 17 November 2017.

■ An informational sign was put up on 17 October 2017 next to the fenced off area in the port of Saint-Mars-de-Coutais.

■ SAH also alerted the towns to the situation by sending an image of the sign via email. The relevant boards, the Buzay Canal managers and the steering committees for the two Natura 2000 sites, Grand Lieu and Estuaire de la Loire, were all informed of the situation in their respective meetings.

Outlook

■ Monitoring of the entire hydrographic network has been planned for the spring of 2018, as soon as the water levels have subsided. SNPN will also inspect the water courses in the Grand Lieu catchment in the vicinity of those already colonised.

■ CEN and SAH will work with private property owners to jointly manage the source areas and to reduce the dispersal risks of the species, as well as strengthen the resilience of the environment, for example by protecting river banks with fences to assist the development of helophytes capable of competing with the NZP.

Authors: Pierre Guinaudeau, SAH Sud-Loire, Emmanuel Leheurteux, CEN Pays-de-la-Loire, Doriane Blottière, IUCN French committee and Fabien Dortel, CBNB, for the Resource Centre on invasive alien species. July 2018. Published by the French Biodiversity Agency.

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12. An informational sign set up next to an NZP site.
13. Article published in the Courrier du Pays de Retz *newspaper.*

For more information...

■ Dortel, F. et Dutartre, A. 2017. La Crassule de Helms (*Crassula helmsii* Cockayne, 1907) : Fiche d'alerte détaillée, première analyse des risques, possibilités de régulation et mesures de bio-sécurité. CBNB et GT IBMA. 23 p.

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)