New Zealand pigmyweed

(*Crassula helmsii*)

Managing New Zealand pigmyweed in the Netherlands

RINSE project

■ The European RINSE project (Reducing the impacts of non-native species in Europe) attempts to determine the best management strategies for IASs in the Two seas region (along the English Channel and the southern section of the North Sea).

■ The objective of the project is to develop cross-border instruments to improve assessment and targeting of IASs in order to ensure that management work effectively addresses the most worrisome species and sites. The project is concerned in particular with the species that grow in aquatic environments, e.g. New Zealand pigmyweed, water pennywort, Himalayan balsam, topmouth gudgeon, the Egyptian goose, American mink and muskrats. New management methods are experimented in the field to determine the best practices and issue recommendations to managers.

■ The three-year project was launched in 2011 and is funded by the EU in the framework of the Interreg IVA Two seas programme. A total of nine partners from France, the U.K., Belgium and the Netherlands are involved.

■ The total budget for the three years is 2.5 million euros.

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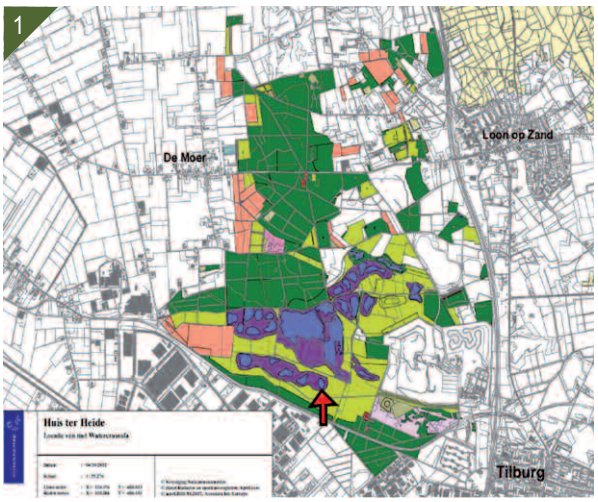

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1. 2. Study site.

Context and issues involved

■ New Zealand pigmyweed (NZP) was observed for the first time in the Netherlands in 1995, in a nature reserve near the town of Breda.

■ As long as the plants did not impact drainage systems, very little work was undertaken to manage it.

■ Subsequently, the species gradually began to cause problems (competition with native aquatic plants, reductions in wetlands used by birds) during restoration projects for important natural sites such as dunes.

■ Its increasing presence in pools and ponds also causes problems for the conservation of amphibians.

Interventions

■ In the framework of the RINSE project, an experiment was conducted in the town of Huis ter Heide (Netherlands), where NZP was spreading in a pond.

■ In June 2012, an initial visit to the site served to characterise the situation prior to any work:

- NZP was in the process of dispersing in the emergent riparian zones;
- the degree of colonisation varied depending on the dry period for the pools and ponds;
- the plants were massively present on the banks of the largest pond and were probably present below the water surface;
- all the colonised areas were in contact with the main pond during the wettest part of the year.

■ Following the initial visit, the objective of the management work was to limit the spread of NZP by:

- prohibiting grazing by animals that can disperse the plants unintentionally;
- emptying the main pond;
- removing the top 20 centimetres of soil;

- burying the contaminated soil nearby.

■ In parallel, population-monitoring work was launched on the site.

■ The work started in July 2012.

■ It took several weeks to empty the pond because 50 centimetres of water remained in the middle due to flows from the water table and rainfall.

■ Dry dredging of sediment and soil

■ The drained sections of the pond and the dry areas on the site were dry dredged to a depth of 20 centimetres.

■ The entire pond and the rest of the site were dredged in August 2012.

■ Approximately 3 400 cubic metres of sediment and soil were removed from the dry areas and the pond once the water level had dropped 50 centimetres (1 200 cubic metres of the remaining water were pumped).

■ The residual plants in the middle of the pond (section never completely emptied) remain a constant source of propagules.

■ Dyofix

■ The use of Dyofix (an antialgal, triarylmethane dye) was planned. This dye limits luminosity in the aquatic environment, thus hindering photosynthesis and plant growth.

■ In October 2012, the application for a waiver to use Dyofix was submitted.

■ Voluntary personnel monitored the ponds on the entire study site. NZP was detected on two new sites.

■ New management recommendations were implemented:

- the exposed banks of the pond were covered with opaque sheets of plastic (tarps);
- monitoring sites were established;
- newly colonised sites were reported and eliminated or isolated;
- monitoring was set up for NZP fragments that drift off and colonise neighbouring sites.

■ Tarps

■ Plastic tarps (4 metres wide and 1 500 metres long) were installed on the exposed banks of the pond in November 2012.

■ In January 2013, the water level rose, covering the tarped areas and resulting in dispersal of the stalk fragments. In response, voluntary personnel collected the fragments on a weekly basis.

■ Following official approval, Dyofix was used for the first time in January 2013 when 16 kilogrammes were spread.

Subsequently, the dye was used twice again, in March 2013 (14 kg) and in August 2013 (30 kg).

3. 4. The colonised pond, prior to the work.
5. Dredging work.
6. Site following the work.

Results and costs

■ The results in the emergent areas of the site were very encouraging. No regrowth has been noted to date following the removal of 20 centimetres of topsoil and the installation of the tarps.

■ On the other hand, the results in the pond were mixed:

- there was no significant reduction in NZP after the initial use of the dye, even though the recommended dosage (100 µg.l-1) was exceeded each time;
- the reduction in the luminosity achieved by the dye was insufficient, except in the deepest part of the pond and for very short periods.

■ Higher concentrations of the dye would be necessary to compensate the luminosity problem, the significant fluctuations in the water level and the colonisation/growth potential of NZP.

■ The above difficulties severely limited the potential of this technique in the given context and in similar situations.

■ The meagre results are also due to the delayed use of Dyofix:

- the water level rose regularly following empting of the pond in August 2012 due to inputs from the water table and rainfall;
- this situation enabled the NZP to take root once again between the dredging work and the first use of Dyofix in January 2013 (the maximum water level was reached in December 2012 and January 2013, when the water covered the tarps).

■ Below is an assessment of the management costs.

Details on management costs.

Work	Cost in euros
Mechanical dredging	55 000
Plastic tarp (4 m x 1 500 m)	5 500
Fence (750 m)	1 500
Dyofix (60 kg)	1 200
Hours worked in 2012 by Natuurmonumenten (877 hours)	21 000
Hours worked in 2013 by Natuurmonumenten (95 hours)	Not quantified
Hours worked in 2013 by volunteers (482 hours)	Not quantified
Inventories (INBO)	Not quantified
Project monitoring (NVWA)	Not quantified
TOTAL	**84 200**

Outlook

■ Establishment of sites to monitor the effects of the Dyofix.
■ Maintain the concentration of Dyofix in the water.
■ Remove cuttings, fragments and sand landing on the tarps.
■ Monitor newly colonised areas in order to rapidly eliminate the plants.
■ Mechanical mowing carried out at the end of 2013.

7. 8. Laying of the plastic tarps.
9. Creation of the monitoring sites.
10. NZP fragments following the use of Dyofix.
11. Spreading Dyofix in the water.

Information on the project

■ Presentations of management work during NZP conferences in the framework of the RINCE project:

- St. Ives, Grande-Bretagne 7 - 8 mars 2013. *The 45th Robson Meeting. The on-going Crassula battle at Huis ter Heide.*

- Brockenhurst, Grande-Bretagne, 20 mars 2013. Conférence : New Zealand pygmyweed : tackling the challenge : *« Crassula helmsii in The Netherlands and Flanders: rules, regulations, management options and environmental impact »* ;

- Norwich, Grande-Bretagne, 17-18 octobre 2013 : Best practice workshop : *Managing invasive aquatic plants : « Physical and mechanical control of Crassula helmsii and Ludwigia peploides : is it a realistic option? ».*

■ A good-practices guide for NZP management is currently being drafted. http://www.bosschap.nl/cmsAdmin/uploads/praktijkadvies-watercrassula_25-11-2013_002.pdf

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■ RINSE internet site: http://www.rinse-europe.eu/

■ Natuurmonumenten : https://www.natuurmonumenten.nl/watercrassula

■ Van Valkenburg J., de Hoop E. 2013. *The on-going Crassula battle at Huis ter Heide. In: Newman J.(ed.) The 45th Robson Meeting 7-8 March 2013. Proceedings, Waterland Management Ltd, CaneEnd,* p. 10.

■ Van Valkenburg J. et al.,2013. *Crassula helmsii in The Netherlands and Flanders: rules, regulations, management options and environmental impact. RINSE Conference : New Zealand pygmyweed : tackling the challenge. Brockenhurst,* Grande-Bretagne, 20 March 2013.

■ Van Valkenburg J. 2013. *Physical and mechanical control of Crassula helmsii and Ludwigia peploides : is it a realistic option? RINSE Best practice workshop : Managing invasive aquatic plants.* 17-18 October 2013, Norwich, Great Britain.

■ Denys L., Van Valkenburg J., Packet J., Scheers K., De Hoop E. et T. *Adriaens 2014b. Attempts to control aquatic Crassula helmsii at Huis ter Heide (Tilburg, The Netherlands), with special reference to dye treatment.* In: Boets P. *et al.* (eds) Science for the new regulation. Abstract book BENELUX conference on invasive species, Ghent, p. 51.