MARIE PATINET - ETIENNE BRANQUART - ARNAUD MONTY

Saururus cernuus

Species description

Lizard's tail (*Saururus cernuus*) is an aquatic and semi-aquatic perennial plant that has both a submerged and an emergent form. The species, native to North America, was introduced to Europe, including Belgium, through the horticultural trade as an ornamental plant for garden ponds. The first records of lizard's tail's presence in the environment in Belgium date back to 1977. Disposal of pond waste in water systems is probably at the origin of its escape into the wild. Today, while emerging and uncommon in Belgium, the plant might become a problematic aquatic invasive species in the near future. However, the species is not yet listed as an IAS of Union concern under the (EU) Regulation No 1143/2014. It is therefore a species of the LIFE RIPARIAS alert list. Although easily detectable, its distribution on the Belgian territory is probably underestimated due to a lack of recorded observations and monitoring efforts.

Fig 1. *Saururus cernuus*

Guide de gestion complet en version française

Volledige beheergids in Nederlandse versie

Photo: Etienne Branquart

Saururus cernuus

Lizard's tail thrives in stagnant or slow-moving waters such as marshes, pond, streams and along the banks of water systems. The species is highly tolerant to changes in water levels and resistant to frost. As an emerging invasive species, the plant has the potential to cause diverse environmental, social and economic impacts. For instance, this invader has the ability to form dense mats on the surface of the water, with subsequent detrimental impacts on the ecosystem and biodiversity through light restriction, habitat degradation or by competing with native plant communities. Social and economic effects include restriction of recreational activities (angling, boating) and management related costs.

Biological characteristics, reproduction and spread

The plant can develop a rather fragile submerged vegetative form on the bottom of shallow waters and a robust erected form reaching heights of 120 cm on water margins. In western Europe, flowering occurs in summer, from June to September. The plant, then, dies back during winter and emerges from rhizomes the next growing season.

In its introduced range, including Belgium, lizard's tail probably exclusively reproduces by rhizome extension (vegetative reproduction), with really long rhizomes that can reach up 5m long. Rhizome and stem fragments can form a new plant, and therefore a new population, away from the initial invaded area. The species is also known to reproduce by seeds, which are contained in fruits (1 to 4 seeds per fruit). Fruits are able to float for a short amount of time (usually a few hours) before sinking back to the bottom. However, in Belgium, seed germination does not seem to occur as seedlings have not been observed yet. Spread of this invasive species probably only occurs through fragmented rhizomes drift within water systems. The species' high regeneration and dispersal abilities highlight the importance of implementing effective management measures.

Fig 2. Important invasion of lizard's tail in a pond in Belgium. The plant has already colonised different parts of the water body. Photo : Etienne Branquart

References

Branquart, E. *et al.* (2021) *Belgian alert lists of alien aquatic plants and crayfish.* LIFE RIPARIAS project.

Centre de ressources espèces exotiques envahissantes. (2017) *Base d'informations* – Saururus cernuus. http://especes-exotiques-envahissantes.fr/espece/saururus-cernuus/#1458311762057-246ee81f-ef40 [Accessed: 17th November 2022].

Delaunay, G. (2003) Contribution à l'étude de la flore du Maine-et-Loire. Une nouvelle espèce naturalisée dans la dition: la Lézardelle penchée *Saururus cernuus* L. Sp. Pl. 341 (1753) – Saururacées. *Bulletin de la Société d'études scientifiques de l'Anjou*, 118, 29-38.

Delaunay, G. (2005) Contribution à l'étude de la flore du Maine-et-Loire : un exemple de gestion d'une xénophtye à caractères envahissant : cas de la lézardelle penchées (*Saururus cernuus* L- Saururaceae). *Symbioses*, 13, 29-31.

Delay, J. and Petit, D. (2006) *Houttuynia cordata* Thunberg et *Saururus cernuus* L. nouvelles espèces de notre environnement urbain. *Bulletin de la Société botanique de France*, 59(3), 3-14.

General considerations about management

Very few management options have been implemented to control and eradicate the species. Available literature on this topic remains highly limited. Local eradication of lizard's tail is considered achievable for small infestations. The eradication feasibility must, however, be assessed on a case by case basis, considering site specificities, and be thoroughly discussed within the management team.

Due to the species' ability to reproduce vegetatively through fragmentation, precautionary measures must be implemented before management to prevent fragment spread within the managed area or to uninvaded areas. Managed areas are also isolated by physical barriers.

The harvested plant material and the sediments (in case of dredging) must be safely disposed of far away from the water and composted in dry zones. Checks of the composted zones must be done to ensure that no regrowth occurs. Material that has been in contact with the plant (e.g. machines, nets) should be checked, cleaned and dried before being taken to another site.

Managed and surrounding areas must remain under enhanced surveillance for a period of 3 to 5 years after the implementation of the last treatment.

Fig 3. Early detection of lizard's tail invasion. The site could be subject to rapid management responses. Photo : Dido Gosse

Dutartre, A. (2010) *Importance de la prévention et de la détection précoce.* Journée d'échanges sur les plantes aquatiques exotiques envahissantes dans le bassin de la Loire, Poitiers.

Hall, T.F. (1940) The biology of *Saururus Cernuus* L. *The American Midland Naturalis*t, 24(1), 253-260.

Sarat, E. *et al.* (2015) *Les espèces exotiques envahissantes dans les milieux aquatiques: connaissances pratiques et expériences de gestion - Expériences de gestion.* ONEMA, UICN, GT IBMA and Irstea. Report number: 3.

Thien, L.B. et al. (1994) Population structure and reproductive biology of *Saururus cernuus* L. (Saururaceae). *Plant Species Biology*, 9, 47-55.

Tiaki Tāmaki Makaurau Conservation Auckland. (2022) Saururus cernuus - Lizard's tail. https://www.tiakitamakimakaurau.nz/protect-and-restore-our-environment/pests-in-auckland/pest-search/saucer/ [Accessed: 17th November 2022].

Verloove, F. (2011) *Manual of the alien plants of Belgium* – Saururus cernuus. https://alienplantsbelgium.myspecies.info/content/saururus-cernuus [Accessed: 17th November 2022].

Manual removal

- v Control and potential local eradication can be achieved
- v Manual removal is highly selective and will have minimal impact on ecosystems and other organisms
- x The method is only practical for small and early-detected populations
- x Manual removal is time-consuming and labor intensive

Method description

The principle is to remove the whole plant from the ecosystem. Plants are dug out in a way that all plant material is removed from the soil, including roots and rhizomes. This management strategy, which can be carried out manually or with machinery, is conducted during the vegetative period. Operators must ensure that every part of the plant is removed as regrowth can occur from fragments of rhizome. Manual removal is repeated 3 times a year over multiple years to progressively eliminate regrowth from remaining rhizomes. It is implemented until no further regrowth is observed.

Material

Management: Spades or little diggers, gloves and waders

Transport: Bags and buckets

References

Delaunay, G. (2005) Contribution à l'étude de la flore du Maine-et-Loire : un exemple de gestion d'une xénophtye à caractères envahissant : cas de la lézardelle penchées (*Saururus cernuus* L- Sauruaceae). *Symbioses,* 13, 29-31.

Dutartre, A. (2010) *Importance de la prévention et de la détection précoce.* Journée d'échanges sur les plantes aquatiques exotiques envahissantes dans le bassin de la Loire, Poitiers.

Tiaki Tāmaki Makaurau Conservation Auckland. (2022) Saururus cernuus - Lizard's tail. https://www.tiakitamakimakaurau.nz/protect-and-restore-our-environment/pests-in-auckland/pest-search/saucer/ [Accessed: 17th November 2022].

Substrate removal: mechanical dredging

v Local eradication can be achieved

x The method is effective for small populations

x This method can only be implemented in sites where the whole area is accessible to the machines

x Dredging can create a large number of fragments which increases the risk to spread the species to uninvaded areas

x This method can have high negative impacts on aquatic living organisms

Method description

The principle is to remove the bottom sediments contaminated with all parts of the invasive plant such as roots, stems, seeds, etc. Excavators equipped with cleaning bucket thumb are used for excavation. Mechanical dredging is conducted in autumn (October/November) when the plant is more prostrate. The infested site must be dredged at depths of 1.5m to 2m is thisto ensure the removal of all root fragments. Operators must establish a 3m buffer zone surrounding the infested area. The contaminated area, including the buffer zone, must then be physically delimitated before dredging. Great care must be taken to prevent root fragments as much as possible. This action is immediately followed by manual removal of remaining fragments and plants that might have been overlooked. Any regrowth occurring during the following years is manually removed. Manual removal is implemented until no further regrowth is observed.

Material

Managment: Excavators equipped with cleaning bucket thumb, rakes, pickets

Transport and stocking: Buckets or mesh bags, trucks and containers

Precautionary measures: Hand net, floating booms, containment nets

References

Centre de ressources espèces exotiques envahissantes. (2017) *Base d'informations* – Saururus cernuus. http://especes-exotiques-envahissantes.fr/espece/saururus-cernuus/#1458311762057-246ee81f-ef40 [Accessed: 17th November 2022].

Delaunay, G. (2003) Contribution à l'étude de la flore du Maine-et-Loire. Une nouvelle espèce naturalisée dans la dition: la Lézardelle penchée *Saururus cernuus* L. Sp. Pl. 341 (1753) – Saururacées. *Bulletin de la Société d'études scientifiques de l'Anjou*, 118, 29-38.

Delaunay, G. (2005) Contribution à l'étude de la flore du Maine-et-Loire : un exemple de gestion d'une xénophtye à caractères envahissant : cas de la lézardelle penchées (*Saururus cernuus* L- Saururaceae). *Symbioses*, 13, 29-31.

Dutartre, A. (2010) *Importance de la prévention et de la détection précoce.* Journée d'échanges sur les plantes aquatiques exotiques envahissantes dans le bassin de la Loire, Poitiers.

Sarat, E. et al. (2015) *Les espèces exotiques envahissantes dans les milieux aquatiques: connaissances pratiques et expériences de gestion - Expériences de gestion.* ONEMA, UICN, GT IBMA and Irstea. Report number: 3.

The impact of management actions on ecosystem services

While the adverse effects of IAS are well-known and provide strong incentives for implementing management actions, the impacts of these management actions on ecosystems and the services they provide are less considered. The matrices are the result of expert assessments of the evolution of relevant ecosystem services (ES) from a highly invaded situation towards a managed situation. ES evolution is considered over 2 given periods of time: 1 year and 5 years after the initiation of management.

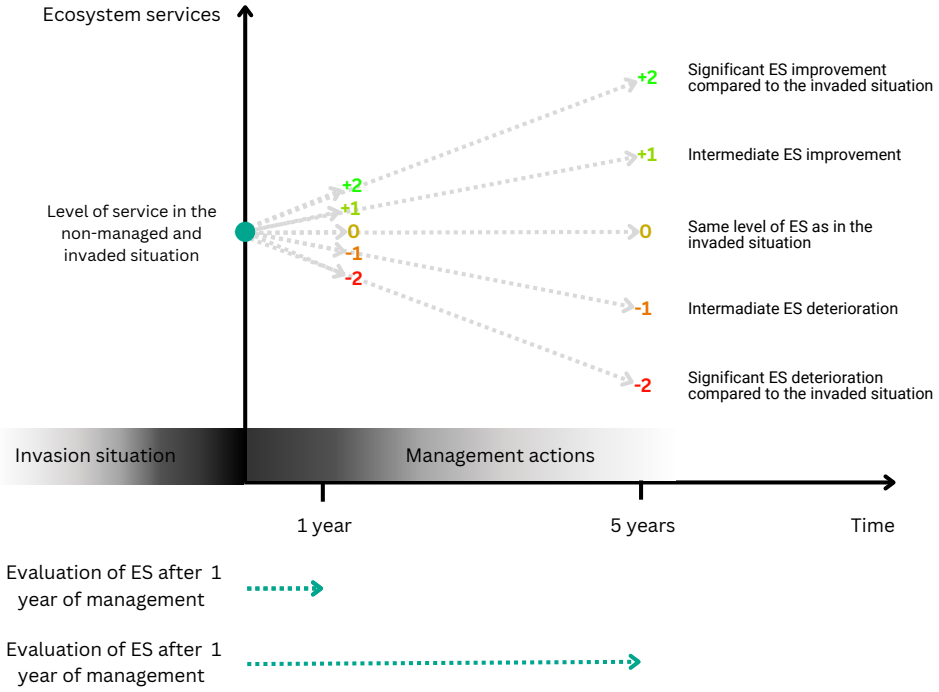

Fig 4. Representation of the survey process

Each matrix displays the average impact scores of management methods on ecosystem services. These scores have been associated to colours to facilitate the visualization of the impacts of every method on every relevant ecosystem service. Green indicates a significant improvement in the ecosystem services (ES) due to management, orange represents no or minimal effect, and red signifies a negative impact of the method on the ES.

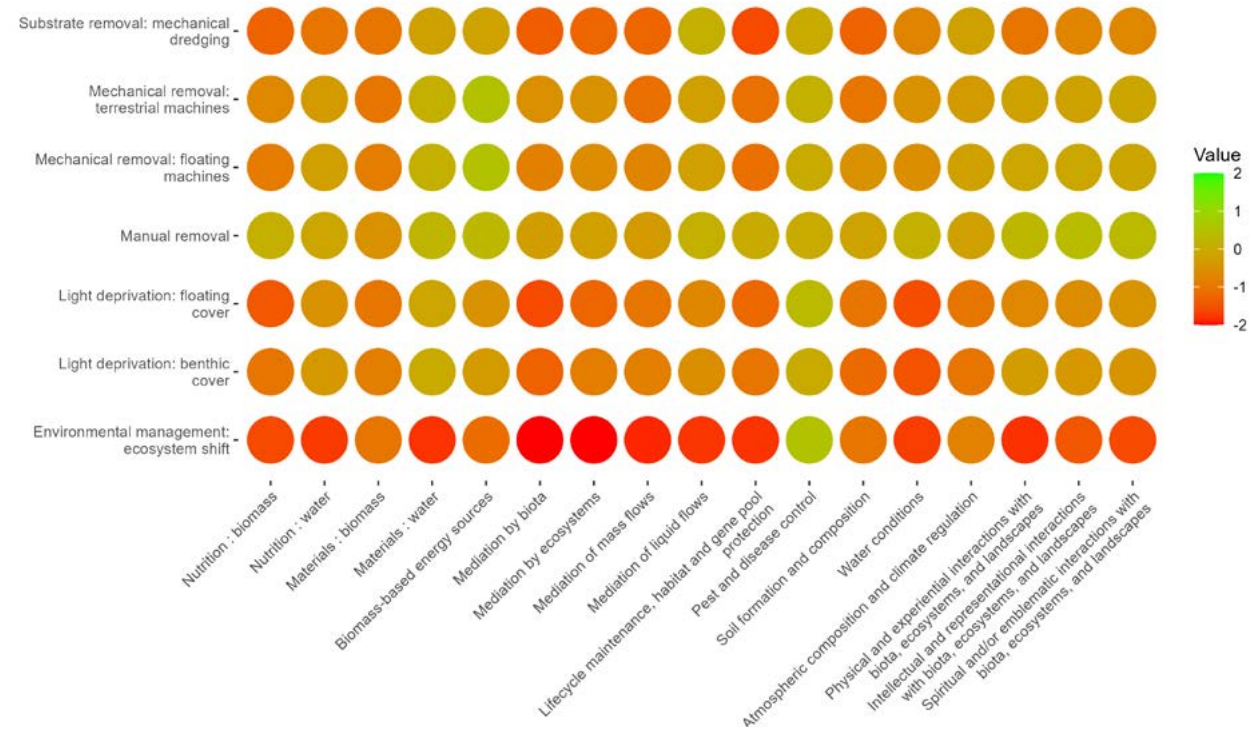

Fig 5. Matrix displaying the impact of management methods for aquatic plant species on ecosystem services after 1 year

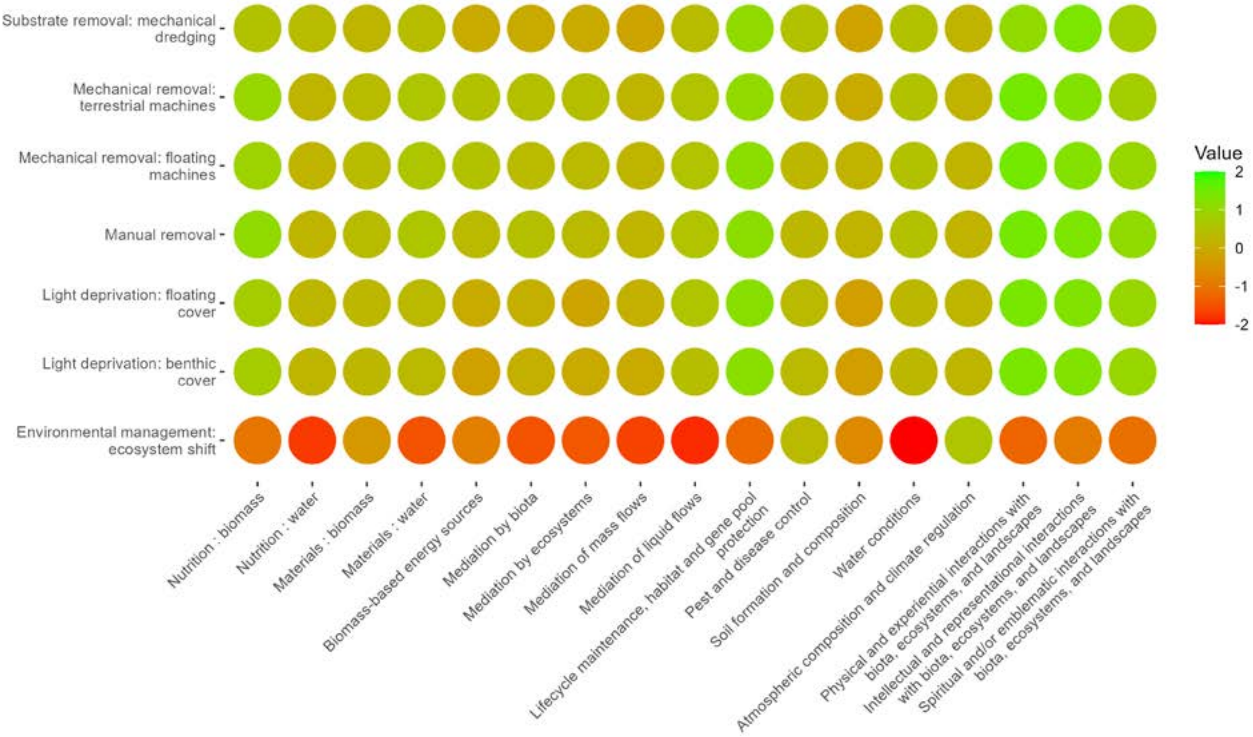

Fig 6. Matrix displaying the impact of management methods for aquatic plant species on ecosystem services after 5 years

LIFE RIPARIAS

Reaching Integrated and Prompt Action in Response to Invasive Alien Species

Citation

Patinet, M., Branquart, E. and Monty, A. (2024). Management fact sheet - *Saururus cernuus*. LIFE RIPARIAS project, 9p.

www.riparias.be

This project is co-funded by the European Union. Views and opinions expressed are however those of the authors only and do not necessarily reflect those of the European Union or CINEA. Neither the European Union nor the granting authority can be held responsible for them.

RIPARIAS

Reaching Integrated and Prompt Action in Response to Invasive Alien Species

bruxelles environnement leefmilieu brussel .brussels

NATURA 2000

Life

Co-funded by the European Union

VLAAMSE MILIEUMAATSCHAPPIJ

INSTITUUT NATUUR- EN BOSONDERZOEK

Vlaanderen is wetenschap

AGENTSCHAP NATUUR & BOS

.be

Biodiversity.be

Wallonie service public SPW

LIÈGE université Gembloux Agro-Bio Tech

Dendre

Contrat de rivière

CONTRAT DE RIVIERE SENNE

GETTE

DYLE

CONTRAT RIVIERE