

Petasites japonicus var. giganteus

Species description

Giant butterbur (*Petasites japonicus var. giganteus*) is a perennial riparian plant native to Asia. The species was introduced to Europe, including Belgium, though the horticultural trade as an ornamental plant for gardens. The first records of giant butterbur in the environment in Belgium date back to 1989. Disposal of garden waste and natural spread from cultivation are probably at the origin of its escape into the wild. Today, while emerging and uncommon in Belgium, the plant might become a problematic invasive species in the near future. It is therefore a species of the LIFE RIPARIAS alert list. Giant butterbur can easily be confused with native plant species such as *Petasites hybridus*. Its distribution on the Belgian territory is probably underestimated due to a lack of recorded observations, monitoring efforts and possible confusion with look-alike species.



Fig 1. *Petasites japonicus var. giganteus*. Photo : Dominicus Johannes Bergsma



Petasites japonicus var. *giganteus*

Giant butterbur is mostly found in moist habitats such as along ponds and streams, shady woodlands, ditches and wet meadows. The plant thrives in partially shaded areas. As an emerging invasive species in Belgium, the plant might soon cause diverse environmental, social and economic impacts. In some parts of its introduced range (northern Europe), the plant has already displayed some invasive tendencies. This invader has the capability to form dense stands, which can have detrimental effects on the ecosystem and biodiversity. It displaces native plant species, restricts light availability, and contributes to soil erosion. Economic effects involve management costs associated with controlling, eradicating and mitigating the spread of the plant.

Biological characteristics, reproduction and spread

Flowering of giant butterbur occurs in early spring, before the leaves emerge. The plant then dies back in late fall, leaving bare ground, and emerges from rhizomes the next growing season.

Giant butterbur is a dioecious species. Its reproduction in western Europe is exclusively vegetative via fragmentation of thick rhizomes. When the rhizome breaks into fragments, either naturally or because of human activity, those small fragments can form a new plant, and therefore a new population, away from the initial invaded area. In its native range, giant butterbur is also known to reproduce by seeds, although production of viable seed does not occur in Belgium as only male individuals have been observed so far. The spread of giant butterbur mainly occurs through the transportation of rhizome fragments by waterways, particularly during flooding events. The species' remarkable regenerative and dispersal abilities emphasise the importance of implementing effective management measures to control its spread and impact.

References

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Fig 2. Giant butterbur invasion in a private property forming dense stands. Photo: Marie Patinet

General considerations about management

Few management options have been implemented so far to control and eradicate the species. There is also a lack of available literature on this topic. Local eradication of giant butterbur is considered hardly achievable for well-established populations. The feasibility of eradicating populations 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. The harvested plant material must be safely disposed of far away from water systems and moist areas, and is either destroyed (incinerated) or placed in trash bags to be buried. Material that has been in contact with the plant (e.g. machines and equipment) 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 5 years after the implementation of the last treatment.

Tualatin Watershed Invasive Species Team. (2021) *Weed watchers guide invasive plant species of the Tualatin river watershed*. TWIST.

Verloove, F. (2011) *Manual of the alien plants of Belgium - Petasites japonicus*. <https://alienplantsbelgium.myspecies.info/content/petasites-japonicus> [Accessed: 30th November 2022].



Fig 3. Giant butterbur reproduces through fragmentation of thick rhizomes. Photo: Marie Patinet



Fig 4. Flowering of giant butterbur occurs before the leaves emerge. Photo: Jérémie Guyon

Manual removal

- ✓ Control and potential local eradication can be achieved
- ✓ Manual removal is highly selective and will have minimal impact on ecosystems and other organisms
- ✗ The method is only practical for small and early-detected populations
- ✗ 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 all parts of the plant are removed as the species will resprout from fragments of rhizome. Manual removal is repeated at regular intervals over multiple years to progressively remove regrowth from remaining rhizomes. It is implemented until no regrowth occurs.

Material

Management: Spades or little diggers, gloves

Transport: Bags

References

Municipalité de Saint-Anne-des-Lacs. (n.d) *Fiches informatives EIEE*.

Tualatin Watershed Invasive Species Team. (2021) *Weed watchers guide invasive plant species of the Tualatin river watershed*. TWIST.

Tualatin Watershed Invasive Species Team. (n.d) *Best management practices – Japanese butterbur – Petasites japonicus*. TWIST, Tualatin Soil and Water Conservation District.



Fig 5. Very large kidney-shaped and irregularly toothed leaves that can measure up to 150 cm in diameter. Photo: Marie Patinet

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.

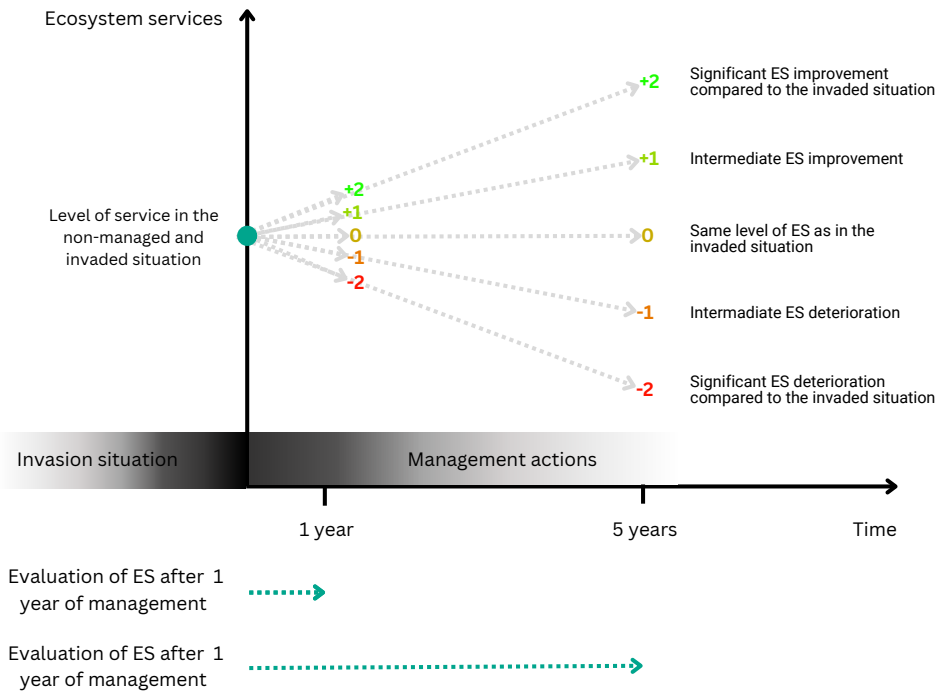


Fig 6. Representation of the survey process

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.

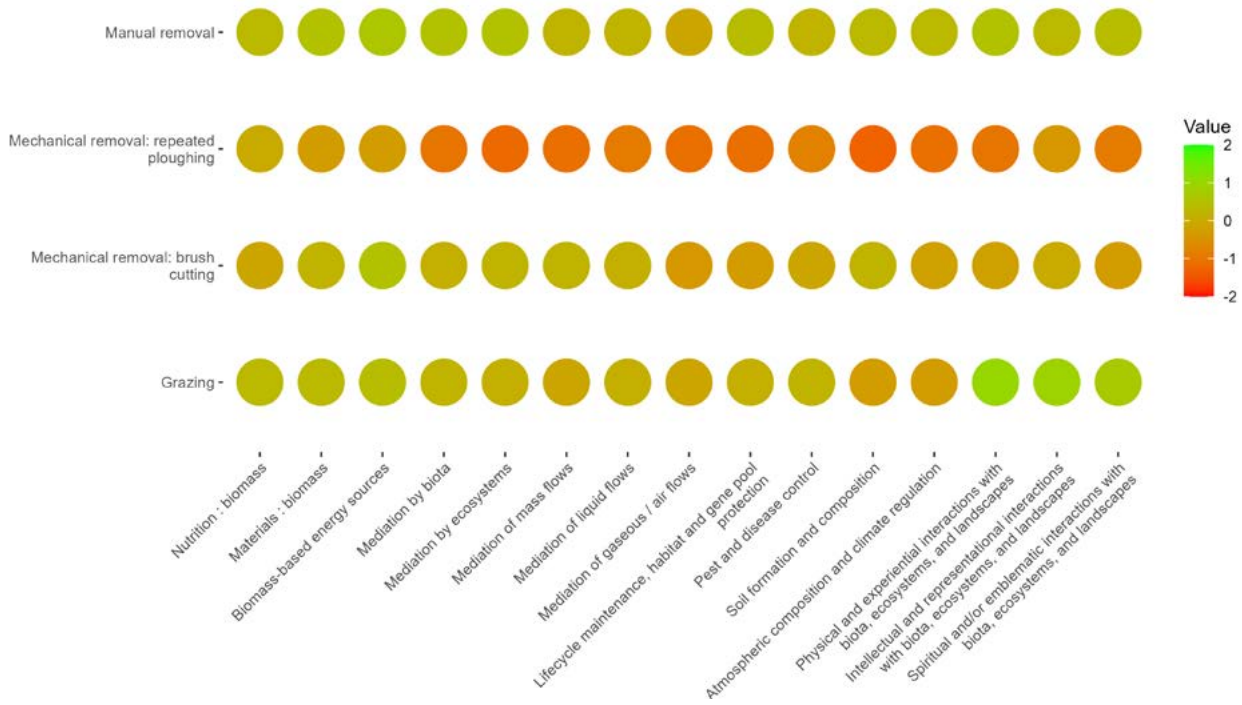


Fig 7. Matrix displaying the impact of management methods for riparian plant species on ecosystem services after 1 year

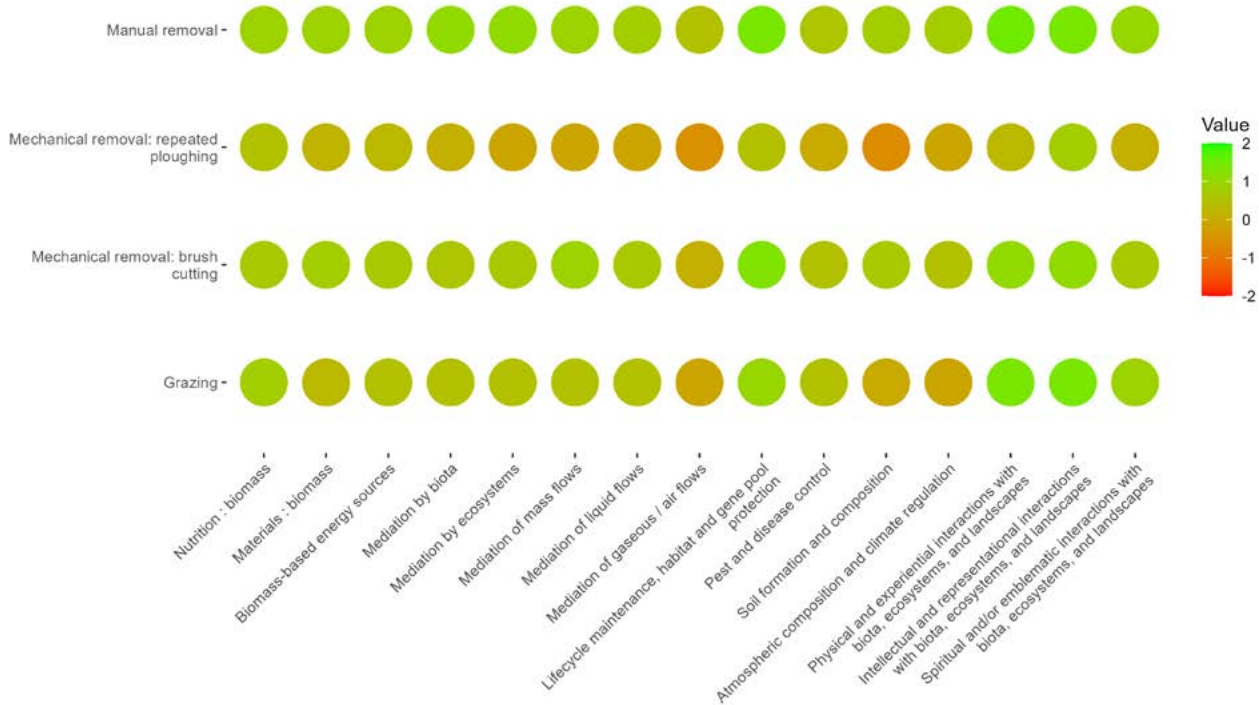


Fig 8. Matrix displaying the impact of management methods for riparian plant species on ecosystem services after 5 years

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Reaching Integrated and Prompt Action in Response to Invasive Alien Species

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