



# Pest risk assessment

Amazon frogbit (*Hydrocharis laevigata*  
syn. *Limnobium laevigatum*)

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# Summary

*Hydrocharis laevigata* syn. *Limnobium laevigata* (Amazon frogbit) is a fast-growing, stoloniferous, floating, perennial aquatic plant native to Central and South America.

The first naturalised specimen in Queensland was detected in 2011 near Brisbane. However, the species was probably sold as an aquarium plant for some time prior. Infestations have since been recorded at multiple locations in Southeast Queensland and North Queensland.

The species is a noxious weed in California, where it occasionally forms dense mats in canals and other waterbodies. It has also naturalised in Africa.

This assessment suggests that *Hydrocharis laevigata* has the potential to become a troublesome free-floating aquatic (freshwater) weed in coastal Queensland, from the New South Wales border north to the wet tropics. Like most aquatic weeds, it will probably grow most prolifically in dams, lakes and creeks that have suffered from anthropogenic disturbance and nutrient input. It could form dense floating mats in drainage ditches and canals, as it has done in parts of California.

Based on the evidence collected to-date, *Hydrocharis laevigata* appears to be a “high risk” species. It is in its early stages of population development in Queensland. However, the fact that it has been traded as an aquarium plant for some time means that it is likely to have been dispersed over a substantial area.

\*Important note: This assessment is based on the best available literature at the time of writing. Please send any additional information, or advice on errors, to the authors.

## Identity and taxonomy

**Species:** *Hydrocharis laevigata* (Humb. & Bonpl. ex Willd.) Byng & Christenh.

**Synonyms:** *Limnobium laevigata*, *Limnobium stoloniferum*, *Hydromistria stoloniferum*, *Salvinia laevigata* Humb. & Bonpl. ex Willd. (basionym), *Hydromystria laevigata* (Humb. & Bonpl. ex Willd.) Hunz., *Limnobium spongia* subsp. *laevigatum* (Humb. & Bonpl. ex Willd.) Lowden

**Common names:** Amazon Frogbit, South American spongeplant, West Indian spongeplant, Smooth Frogbit

**Family:** Hydrocharitaceae

*Hydrocharis laevigata* was previously known as *Limnobium laevigatum*. It is one of five species in the genus:

- *Hydrocharis chevalieri* (De Wild.) Dandy
- *Hydrocharis dubia* (Blume) Backer
- *Hydrocharis laevigata* (Humb. & Bonpl. ex Willd.) Byng & Christenh.
- *Hydrocharis morsus-ranae* L.
- *Hydrocharis spongia* Bosc

## Description

*Hydrocharis laevigata* is a fast-growing, stoloniferous, floating, perennial aquatic plant (Figure 1). It has white flowers.



Figure 1. *Hydrocharis laevigata* (image by 'FrozenAvatar' under a Creative Commons license available at: [File:Amazon Frogbit.jpg - Wikimedia Commons](https://commons.wikimedia.org/wiki/File:Amazon_Frogbit.jpg))

Leaves are either floating or emergent and arranged in basal rosettes along stolons. Petioles are short or elongate. Leaf blades are orbicular-ovovate to reniform, venation palmate, inconspicuous; base cordate to rounded; margin entire; aerenchyma on abaxial surface distinct; basal sheath present. Flowers are unisexual (there are separate male and female flowers on the same plant), pedicels are short, spathes are comprised of 1 or 2 free bracts; female flowers 1 to 3, hypanthium absent; male flowers arranged in cymes of up to 11 flowers; sepals 3; petals 3, rudimentary or absent in female flowers. Pods contain 20 – 30 seeds each.

## Reproduction and dispersal

Dispersal is by seeds and stem-fragments. Floating rosettes produce runners (stolons), the ends of which grow into juvenile plants. Plants can produce multiple fruits, with up to 100 seeds per fruit (Calvert *et al.* 2016). Fruits remain on the plant until they reach maturity, when they split and the seeds mostly sink (FNQROC 2023). Seeds can remain dormant in the seed-bank for at least five years (Akers *et al.* 2010; NSW DPI 2023; FNQROC 2023). Newly emerged plants from seeds are small enough to be dispersed by water currents, waterbirds and in other floating aquatic plants (Calvert *et al.* 2016).

In North Queensland, fruits averaged 70 seeds each (range 21 –117) and 80-90% germination success (FNQROC 2023). It is not known how long it takes for the species to reach maturity.

## Preferred habitat and climate

Preferred habitats include still waters of dams, lakes and wetlands (freshwater). Preferred climate is tropical to subtropical.

## Native range and global distribution

Pest risk assessment: Amazon frogbit *Hydrocharis laevigata*

*Hydrocharis laevigata* grows wild in lakes, ponds and slow-flowing rivers throughout northern Venezuela, Central Mexico, Central America, West Indies and South America, except Chile (Hyde and Wurston 2011). The USDA (2011) listed its native range as:

- Mexico - Federal District, Mexico, Michoacan, Morelos
- Costa Rica; El Salvador; Guatemala; Mexico - Tabasco; Nicaragua; Panama
- Caribbean: Antigua and Barbuda - Antigua; Cuba; Dominican Republic; Guadeloupe; Martinique; Montserrat; Puerto Rico; St. Lucia; Trinidad and Tobago - Trinidad
- Northern South America: French Guiana; Guyana; Suriname; Venezuela [n.]
- Brazil: Brazil
- Western South America: Colombia; Ecuador; Peru
- Southern South America: Argentina - Buenos Aires, Chaco, Corrientes, Entre Rios, Formosa, Salta, Santa Fe, Tucuman; Chile; Paraguay; Uruguay



Figure 2. Distribution of *Hydrocharis laevigata* in the Americas (GBIF 2025).

In southern Brazil, *H. laevigata* co-exists with *Salvinia auriculata* and other free-floating macrophytes in rivers and wetlands (Milne *et al.* 2007).

## History as a weed elsewhere

*Hydrocharis laevigata* is a noxious weed in California, where it is subject to control activity. In some places, it forms dense mats that block the water surface completely (Figure 3).

## Management: Treatment works well if infestation is caught early



A canal in western Fresno county, before, during, and after treatment. Plants did not come back at this location.

In locations where the plants have had time to establish a seed bank, they quickly return.



Figure 3. Dense growth of *Hydrocharis laevigata* in California (Akers 2010).

Tidwell and O'Donnell (2010) commented that, in California, it has "potential to be as bad as water hyacinth (or possibly worse)". It has also naturalised and appears invasive in Zambia and Zimbabwe (Howard *et al.* 2016), South Africa (van Wilgen *et al.* 2020) and Japan (Kadono 2004). Hyde and Wurston (2011) commented that it is "abundant in some dams near Harare" (Zimbabwe) at an elevation of 1370 m. Dense floating mats of *H. laevigata* have been recorded in the Zambezi River (in Lower Zambezi National Park) in Zambia (Howard *et al.* 2016).

The plant has been recorded in Europe, but spread is limited due to low temperatures (Garcia-Murillo 2023). Elsewhere in Australia, it has naturalised in Western Australia, New South Wales and the Northern Territory.

## Use

*Hydrocharis laevigata* has a history of being sold as an aquarium plant, both overseas and in Queensland. It is used in ponds and for waterbody remediation due to high nutrient uptake.

## Current distribution and impact in Queensland

*Hydrocharis laevigata* was first recorded as 'naturalised' in Queensland in March 2011 (at Wellington Point, Redland City Council, southeast Queensland) (Figure 4). It is considered to be in its early stages of population development in Queensland, with the potential to become much more abundant and widespread in the future.

A biosecurity plan has been developed by Far North Queensland Regional Organisation of Councils (2023) to manage infestations in the Wet Tropics region. The weed has become a serious concern for the Barron Gorge Hydroelectric Power Station as it threatens to disrupt operations and electricity generation (FNQROC 2023). Scattered populations exist elsewhere in Queensland, such as at Granite Creek, west of Cairns (Figure 5).



Figure 4. *Hydrocharis laevigata* at Wellington Point, southeast Queensland (photo: D. Crawford, Redland City Council, used with permission).



Figure 5. *Hydrocharis laevigata* at Granite Creek, west of Cairns, north Queensland (photo: Barbara Waterhouse).

## Potential distribution and impact in Queensland

Climate-matching software called 'CLIMATCH' (BRS 2009) was applied to predict areas of Queensland where climate is similar to that experienced across the native range of *Hydrocharis laevigata*. Substantial areas of eastern coastal Queensland have climates that are considered favourable for this species, as indicated by the red and orange area in Figure 6.

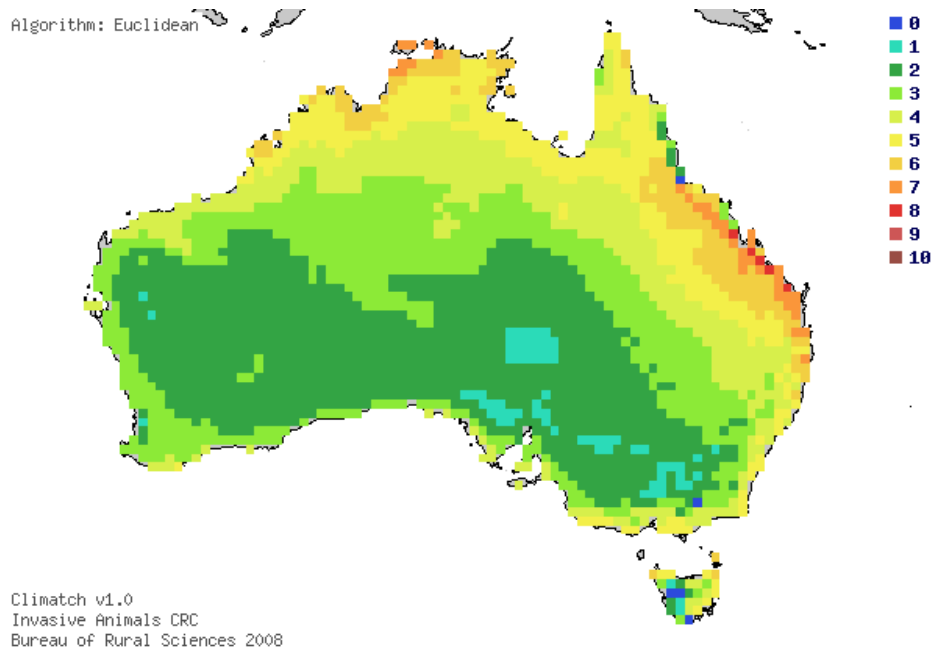


Figure 6. Area of Australia where climate appears suitable for survival of *Hydrocharis laevigata* (the red and orange indicate areas where climate is highly suitable, yellow indicates area where climate is marginally suitable. Green and blue indicate areas where climate is considered unsuitable for this species. The species' naturalised distribution in California was not included in this model).

This assessment suggests that *Hydrocharis laevigata* has the potential to become a troublesome free-floating aquatic (freshwater) weed in coastal Queensland, from the New South Wales border north to the wet tropics. Like most aquatic weeds, it will probably grow most prolifically in dams, lakes and creeks that have suffered from anthropogenic disturbance and nutrient input. It could form dense floating mats in drainage ditches and canals, as it has done in parts of California.

Whether it becomes more of a problem than a range of existing floating water weeds long-established in Queensland is difficult to predict. A study by Perryman (2013) compared the competitiveness of water hyacinth and a native pennywort with *H. laevigata*. Water hyacinth was found to be most competitive, followed by *H. laevigata* and pennywort. In addition, within its native range, *H. laevigata*, is reported to be far less abundant than water hyacinth, suggesting water hyacinth outcompetes it (Murphy *et al.* 2003).

Suspended sediment and nutrient pollution into our waterways, whether from agricultural runoff or urban sources, can play a key role in the proliferation of invasive aquatic plants, particularly when nitrogen (nitrate) is added to the system. Campos-Cuellar and Aponte (2020) found that growth of *H. laevigata* increased in response to increasing amounts of NO<sub>3</sub>. Heavy infestations of aquatic introduced plant species are often symptomatic of underlying nutrient inputs, rather than being true invasions of natural ecosystems. Whether this can be said for *H. laevigata* is open to speculation.

*H. laevigata* has significant impacts on concentrations of key minerals including lead, zinc, and nitrogen in aqueous systems and antimicrobial properties (Xing, Teryna & Teo, Swee 2024) (Arán, D. S 2017). *H. laevigata* presence in a waterbody can disrupt microbial activity and impact water quality and ecosystem dynamics.

Based on the evidence collected in this assessment *Hydrocharis laevigata* appears to be a "high risk" species that is in its early stages of population development in Queensland.

## Other invasive *Hydrocharis* species

In addition to *H. laevigata*, there is evidence of *H. dubia* and *H. morsus-ranae* behaving as weeds (Yang *et al.* 2023). *Hydrocharis dubia* has naturalised in Queensland in the Darling Downs, Moreton, and North Kennedy local government areas (Queensland Herbarium 2025). While the species has previously been considered native to Australia, further investigation by Bean (2011) revealed it is not. In Australia, *H. dubia* has been used as an ornamental plant where it has escaped into the

environment and formed mats over waterbodies (Bean 2011). In Vietnam, *H. dubia* is considered an emerging invasive species that has quickly occupied waterbodies in U Minh Thoug National Park (Tran *et al.* 2024). The species is largely suppressed by *Pistia stratiotes* (water lettuce) (Tran *et al.* 2024). *H. dubia* is recorded as introduced in Iran (Abdi & Afsharzadeh 2021). The species was possibly introduced to Iran as a cultivation escapee from the ornamental plant trade or by migratory waterfowl carrying seed or seedlings (Abdi & Afsharzadeh 2021).

*Hydrocharis morsus-ranae* was introduced to North American through the plant trade and was quickly reported as an escapee (Zhu *et al.* 2018). It is considered invasive throughout Canada and the USA where it forms dense mats in a range of freshwater waterbodies including small ponds, large rivers, and large lakes (Zhu *et al.* 2018). The negative impacts of *H. morsus-ranae* include preventing light penetration, shading out native vegetation, decreasing water flow, decreasing native plant diversity, limiting the amount of nutrients and dissolved gases and reducing dissolved oxygen concentrations (Zhu *et al.* 2018). These impacts can affect native animals and ecosystem function. In Oneida Lake, New York, the density of *H. morsus-ranae* was 512 plantlets/m<sup>2</sup> and the dissolved oxygen concentration underneath was as low as 1.9mg/L (Zhu *et al.* 2008).

*H. spongia* is considered invasive in California and has naturalised at multiple sites along the San Joaquin River and the Sacramento-San Joaquin delta (California Invasive Plant Council 2025). The species forms thick mats which can block light and interfere with boats, fishing and water infrastructure (California Invasive Plant Council 2025). It is unclear whether *H. spongia* is synonymous with *H. laevigatum* as references seem to use both names interchangeably.

Yang *et al.* (2023) argued that, on a global scale, *H. dubia*, *H. morsus-ranae* and *H. laevigata* have a high invasion risk and measures should be taken to prevent their introduction. Additionally, the authors noted that while *H. chevalieri* and *H. spongia* have a lower invasion risk, they still pose a potential threat and may have adverse environmental effects where introduced.

Given the invasiveness of multiple *Hydrocharis* species, a precautionary approach is justified and it appears that all species in the genus have weed risk.

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