

# Recognising Water Weeds

PLANT IDENTIFICATION GUIDE



**WeedED** Resource

## **Recognising Water Weeds Plant Identification Guide**

### ***Aquatic Weeds Early Detection Project***

*Compiled by Jessica Grantley, Fiona McPherson and Andrew Petroeschevsky,*

*Edited by Matthew Stevens and Elissa van Oosterhout*

Enquiries: Industry & Investment NSW, Grafton Primary Industries Institute,  
PMB 2, Grafton, NSW 2460.

Weeds Hotline 1800 680 244 or  
weeds@dpi.nsw.gov.au

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# Emergent water plants





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Photo: Bruce Auld



Photo: NSW DPI



# Alligator weed

*Alternanthera philoxeroides*

## Description

Sprawling emergent perennial. Forms floating mats on water surface or grows rooted in soil at water's edge or in shallow water, extending many metres across the water surface. Also grows on land.

### Leaves:

- Opposite
- Glossy, spear-shaped, 2–7 cm long
- Smooth margin

### Flowers:

- Single, white, papery, ball-like, 1.2–1.4 cm diameter
- On short stalk in leaf axils (stem and leaf junction)

### Stem:

- Aquatic alligator weed: completely hollow
- Terrestrial alligator weed: reddish-brown

## Similar looking species

- #Water primrose (*Ludwigia peploides* ssp. *montevidensis*): yellow flowers, alternate glossy leaves
- #Smart weed (*Persicaria decipiens*): alternate hairy leaves, dark blotch in centre, small pink or white flowers on spike
- Senegal tea (*Gymnocoronis spilanthoides*): irregularly toothed leaf margins, ribbed stems that are hollow between the joints, half-sphere-shaped (pom-pom-like) white or pale purple flower heads in clusters
- Hygrophila (*Hygrophila costata*): stems four-angled, whorled flowers around stem and leaf junction

- *Alternanthera* spp: no flower stalks

## Background

Alligator weed is native to South America and was first discovered in Australia during the 1940s in the Hunter River, NSW. It is believed that plant fragments were accidentally introduced via ship's ballast water. Alligator weed is regarded as one of Australia's worst weeds due to its impact, invasiveness, capacity to spread and regenerate from fragments, and ability to tolerate a range of control treatments.

## Distribution

About 5000 hectares in the Greater Sydney and Hunter regions in NSW is infested with alligator weed. Smaller infestations are found in Vic, Qld, ACT and regional NSW.

## Means of spread

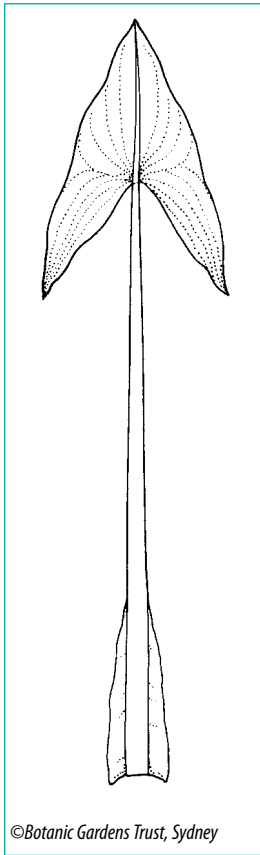
Alligator weed does not produce viable seed, and spreads by fragments. Earthmoving equipment, boating equipment and water movement have been responsible for much of the spread, and some infestations may have been deliberately planted.

## Declaration status

WoNS. Vic: S; NSW: C2(84)/C3(44); SA: 1@; WA: P1/2; Tas: D; Qld: C1; NT: A/C; ACT: C1/4

If found, report this weed to your local weed authority.

# Denotes Australian native species.



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Photo: Graham Prichard



Photo: Graham Prichard





# Arrowhead

*Sagittaria montevidensis*

## Description

Mainly emergent to 1 m tall.

### Leaves:

- Adult leaves: strongly arrow-shaped, to 25 cm long
- Submerged juvenile leaves: strap-like

### Flowers:

- 3 white petals, 2.5 cm diameter
- 2–12 whorls of flowers at apex of a leafless stem
- Whorls of male flowers situated above female flowers
- Summer

### Seeds:

- Laterally flattened, 0.15–0.3 cm long with wings

## Similar species

- *Sagittaria* (*Sagittaria graminea* ssp. *platyphylla*): spear-shaped leaves
- Juvenile leaves similar to *Vallisneria* spp., *Ottelia ovalifolia*, *Alisma plantago-aquatica*
- #Water plantain (*Alisma plantago-aquatica*): flowers on long stems and leaves rounder at base

## Background

Arrowhead is native to South America and is a common weed of rice in Australia. It grows in warm-temperate, shallow, stationary or slow-moving water and can obstruct drainage channels and compete with rice crops.

## Distribution

Primarily found in rice-growing areas of south-western NSW. Has also been found in a number of waterways in Vic.

## Means of spread

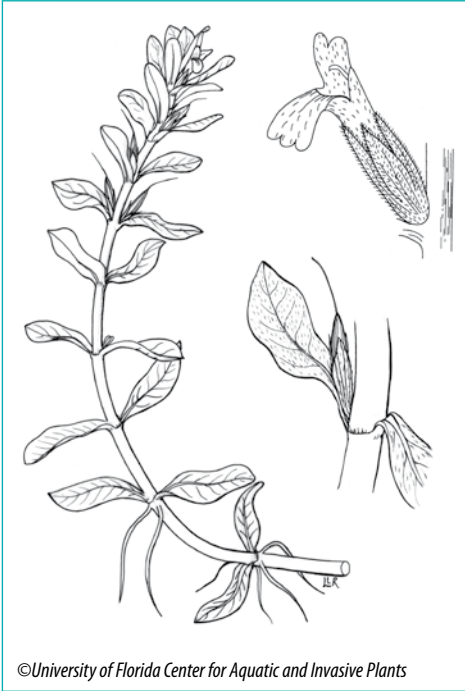
Arrowhead reproduces by seed, which is spread by water and attaches to the hooves and fur of animals.

## Declaration status

NSW: C5(S); SA: 1@; WA: P1/2; Tas: D

If found, report this weed to your local weed authority.

# Denotes Australian native species.





# East Indian hygrophila

*Hygrophila polysperma*

## Description

Submerged and emergent perennial to 50 cm tall.

### Leaves:

- Opposite
- Spear-shaped, 0.7–8 cm long, pointed tips
- Submerged leaves: longer with small leaf stalk
- Emergent leaves: slightly rounder with no leaf stalk
- Variable leaf colour: bright green to brown to reddish

### Flowers:

- Small, 0.5–0.6 cm long, bluish-white
- In emergent leaf axils (stem and leaf junction)

### Stems:

- Emergent: squarish in cross section and slightly hairy
- Submerged: round and can grow over 2 m long

### Fruit:

- Capsule 0.6–0.7 cm long, contains 15–25 seeds

### Seeds:

- Pale brown, round and flattened, 0.08 cm in diameter

## Similar looking species

- Alligator weed (*Alternanthera philoxeroides*): single white ball-like flower on stalk and hollow stem
- Hygrophila (*Hygrophila costata*): leaves up to 18 cm long

## Background

East Indian hygrophila is native to South-East Asia and is found in tropical regions of the world. It has been used in Australia as an aquarium plant. It is particularly difficult to control as it reproduces by stem fragmentation and from leaf nodes.

## Distribution

Widespread in south-eastern Qld and in several locations on the North Coast of NSW.

## Means of spread

East Indian hygrophila can reproduce by fragments and from leaf nodes, which are spread by water, and by attaching to boats and fishing equipment.

## Declaration status

NSW: C1(S); WA: Unass.

If found, report this weed to your local weed authority.

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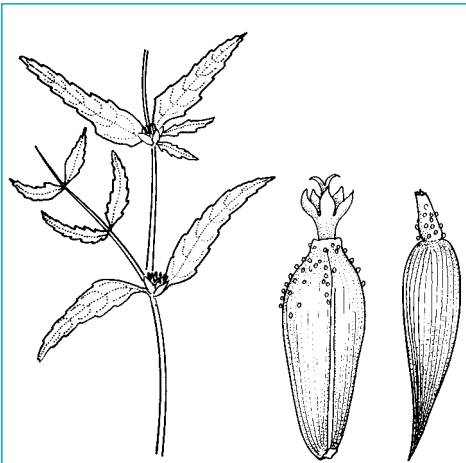
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Photo: Graham Prichard



Photo: Graham Prichard

# Enydra / buffalo spinach

*Enydra fluctuans*



## Description

Emergent perennial herb.

### Leaves:

- Opposite
- Spear-shaped, 2.5–8 cm long, 0.6–2 cm wide
- Serrated margin

### Flowers:

- Yellowish flowers in leaf axils (stem and leaf junction)
- Summer

## Similar looking species

- Alligator weed (*Alternanthera philoxeroides*): single white ball-like flower on stalk and hollow stem

## Background

Enydra is an Australian native aquatic plant that can be easily confused with alligator weed. It is not considered a weed, although it sometimes forms large floating mats of tangled stems that can be carried downstream during floods.

## Distribution

Enydra grows in swamps and aquatic areas in coastal regions of Qld and NSW north from Port Hacking. It is common around the Newcastle area, causing some minor problems in the Williams River and minor creeks.

## Means of spread

Enydra reproduces by seed.

## Declaration status

Not declared a weed in Australia.

Do not report this plant.

# Denotes Australian native species.

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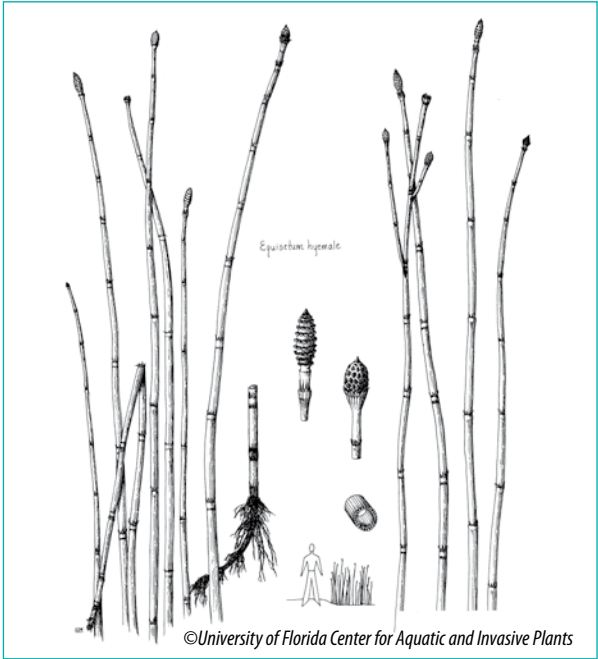


Photo: Jennifer Anderson



Photo: Larry Allain



# Horsetail

*Equisetum spp.*

## Description

Emergent, non-woody, non-flowering perennial herb.

### Leaves:

- Short, tooth-like; circle the stem in rings of 6–18

### Stems and shoots:

- Erect, segmented stems or shoots
- Break easily at joints
- Hard and rough owing to silica in the tissues

Two kinds of shoots:

- – green, branched, hollow shoots
- – pale brown, unbranched shoots bearing fruiting cones 1–4 cm long; die back each year

## Background

Horsetail is native to most areas of the Northern Hemisphere. It is a highly invasive plant that reduces crop yields and is toxic to livestock. Twelve of the 30 horsetail species are considered weeds. The common horsetail (*Equisetum arvense*) and scouring rush horsetail (*E. hyemale*) are of most concern in Australia.

## Distribution

Horsetail occurs in cold- to warm-temperate regions. It grows well in damp areas with disturbed soils and can tolerate low nutrient levels. Horsetail has spread to New Zealand, Madagascar and parts of South America. The common horsetail (*E. arvense*) is a weed in areas of Australia where annual rainfall is around 1400 mm.

## Means of spread

Horsetail spreads almost entirely by rhizomes. Small pieces of tuber or rhizome broken from the plant can grow into new plants. It also produces millions of tiny, dust-like spores that require moist conditions to successfully germinate. Some horsetail species have been found offered for sale.

## Declaration status

National Alert List plant. Vic: S; NSW: C1(S); SA: 1@; WA: P1/2; Tas: D; Qld: C1; NT: C; ACT: C1/4  
If found, report this weed to your local weed authority.

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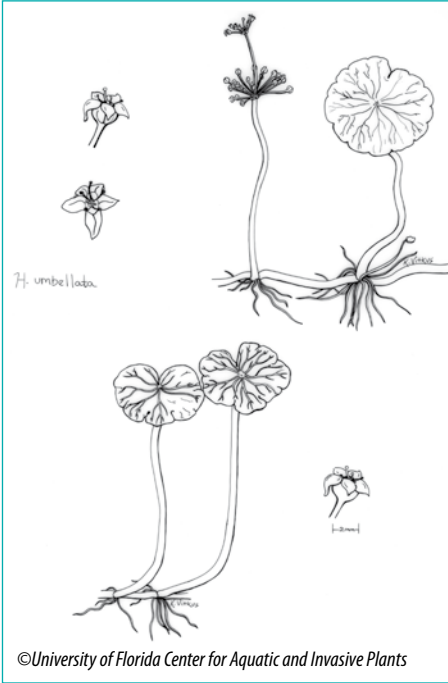
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# Hydrocotyl

*Hydrocotyle ranunculoides*

## Description

Emergent perennial.

### Leaves:

- Floating or emergent
- Round to kidney-shaped with 3–11 deep or shallow lobes
- To 10 cm wide

### Flowers:

- 0.3 cm diameter
- 5–10 on slender 2-cm stalk
- Spring to autumn

### Other:

- Almost circular fruit that breaks into segments

## Similar looking species

- Shield pennywort (*Hydrocotyle verticillata*): groups of 3 flowers on a slender stalk
- Kidney leaf / mud plantain (*Heteranthera reniformis*): rounded leaves

## Background

Hydrocotyl is native to North and South America and is a fast-growing plant that grows over water or land. It was first recorded in Australia in 1983 near Perth and quickly covered 7 km of the Canning River. It is occasionally used as an aquarium plant and is reported to have escaped from ornamental garden ponds.

## Distribution

Hydrocotyl is currently found in coastal freshwater streams and water storages near Perth.

## Means of spread

Spread occurs from stem fragments that produce roots at each node.

## Declaration status

SA: 1@; WA: P1/2

If found, report this weed to your local weed authority.

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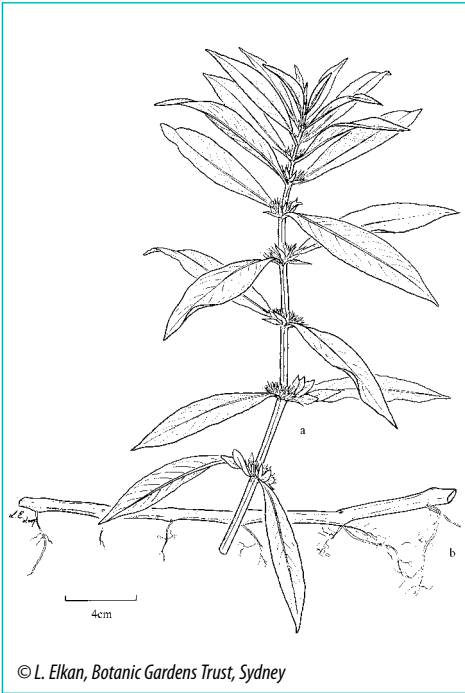


Photo: NSW DPI



Photo: NSW DPI



# Hygrophila

*Hygrophila costata*

## Description

Emergent to 1.5 m high.

### Leaves:

- Opposite leaves
- To 1.8 cm long, 0.3 cm wide
- Prominent midrib
- Generally hairy lower surface

### Flowers:

- Inconspicuous whitish flowers
- In whorls in leaf axils (stem and leaf junction)
- Year round

### Stems:

- Four-angled and generally hairy

## Similar looking species

- Alligator weed (*Alternanthera philoxeroides*): white flower on stalk, completely hollow stems
- East Indian hygrophila (*Hygrophila polysperma*): sprawling habit, smaller leaves (0.7–8 cm long), variable leaf colour, bright green to brown to reddish
- Senegal tea (*Gymnocoronis spilanthoides*): irregularly toothed leaf margins, ribbed stems that are hollow between the joints, half-sphere-shaped (pom-pom-like) white or pale purple flower heads in clusters

- #Smart weed (*Persicaria decipiens*): alternate hairy leaves
- #Water primrose (*Ludwigia peploides* ssp. *montevidensis*): yellow flowers, alternate glossy leaves

## Background

Hygrophila is native to the region from southern Mexico to Argentina. It is an aggressive aquatic or semi-aquatic plant that forms mats of dense growth around the margins of watercourses. It was sold as an aquarium plant and has been collected in Australia only since the 1990s, suggesting that it is a recent naturalisation.

## Distribution

Hygrophila has naturalised and became a weed in south-eastern Qld and north-eastern NSW.

## Means of spread

Spreads by fragments and by water-dispersed seed. The sticky seeds may also adhere to wildlife, machinery, watercraft and humans. Spreading stems sprout new roots from nodes when in contact with the soil.

## Declaration status

NSW: C2(55); WA: Unass; Qld: C1

If found, report this weed to your local weed authority.

# Denotes Australian native species.

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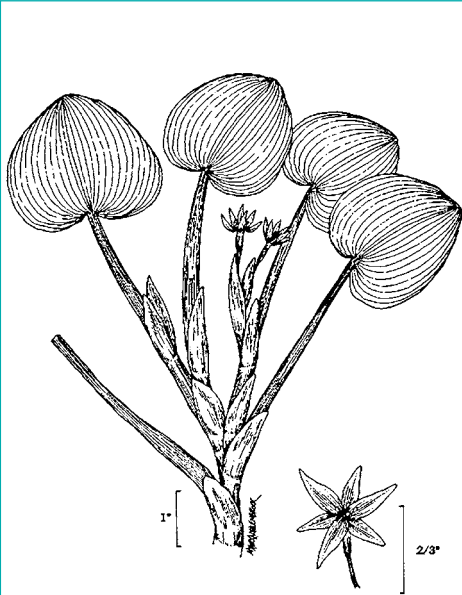
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USDA-NRCS PLANTS Database / USDA NRCS. Wetland flora: Field office illustrated guide to plant species. USDA Natural Resources Conservation Service.

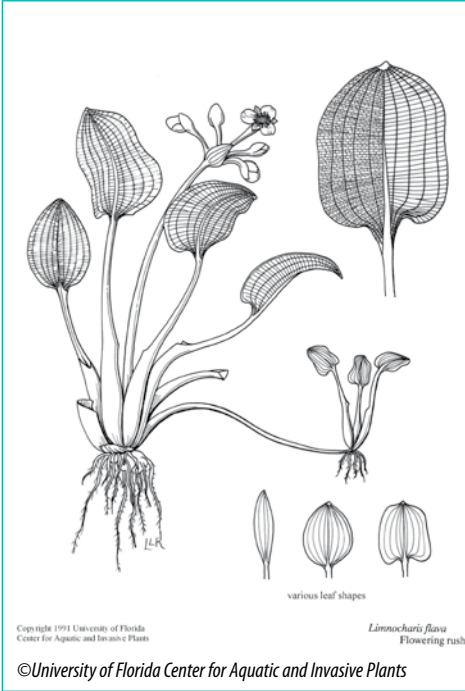


Photo: Ian Turnbull



Photo: Ian Turnbull





# Limnocharis / yellow burrhead

*Limnocharis flava*



## Description

Emergent to 1 m high. Grows in clumps.

### Leaves:

- Triangular fleshy leaf stalks 5–75 cm long
- Broad and oval-shaped, 5–30 cm long and 4–25 cm wide

### Flowers:

- Small, yellow, 3 petals
- Clusters of up to 15 at the end of a stalk
- All year round

### Other:

- Fruit: 2 cm wide, made up of many crescent-shaped segments
- A single fruit can produce about 1000 seeds
- Dark brown, horseshoe-shaped, ridged seeds, about 0.15 cm long

## Background

Yellow burrhead is a native of Central America and the Caribbean islands. It has the potential to become a major weed of waterways in semi-tropical and tropical areas of Australia. It thrives in nutrient-enriched water and multiplies rapidly. In Asia it has been used as a food source, but severe infestations have forced farmers to abandon rice paddies.

## Distribution

Several small naturalised populations and individual plants in garden ponds were discovered in the Cairns and Townsville districts in 2001–2002. An eradication campaign is currently under way to remove isolated populations in northern Qld.

## Means of spread

Yellow burrhead reproduces by both seed and fragments. It behaves as a perennial in areas that have year-round wet conditions and as an annual in areas that endure dry seasons. The flower stalk bends towards the water and releases the fruit onto the surface, where it splits into segments. These segments float to new locations and break down to release seeds. Each plant is capable of producing 1 million seeds per year.

## Declaration status

NSW: C1(S); WA: Prohib; Qld: C1; NT: C

If found, report this weed to your local weed authority.

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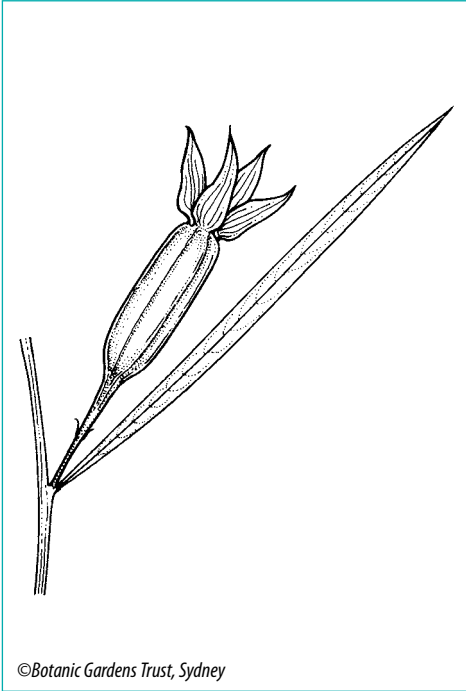
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Photo: Graham Prichard



Photo: Graham Prichard





# Longleaf primrose willow

*Ludwigia longifolia*

## Description

Erect habit; shrub up to 2.5 m high.

### Leaves:

- Alternate
- To 15 cm long and 2.5 cm wide, reducing in size up the stem
- Leaves and stems hairless

### Flowers:

- Solitary, in upper leaf axils (stem and leaf junction)
- Pale yellow, 4–5 petals, 0.2–0.25 cm long
- Open for 1 day
- Summer to winter

### Stems:

- Red, narrow, four-angled, usually branched towards the apex

### Fruit:

- Oblong to narrow, 0.1–0.35 cm long and 0.4–0.8 cm wide
- Numerous tiny seeds in several chambers

## Similar looking species

- *Ludwigia* spp.
- #Water primrose (*Ludwigia peploides* ssp. *montevidensis*): hairless leaves, creeping or floating hairless stems to 4 m long
- Peruvian primrose (*Ludwigia peruviana*): erect habit, rounded hairy stems, hairy leaves, four-angled fruit

## Background

Longleaf primrose willow is native to South America, occurring from Brazil to Argentina. It is considered a major weed in its native range. It was introduced to Australia as an ornamental plant and was first recorded as naturalised near Sydney in 1991.

## Distribution

Longleaf primrose willow has a very limited distribution in Australia. Recent infestations have occurred around Port Stephens and Gosford on the Central Coast of NSW.

## Means of spread

Longleaf primrose willow reproduces by seed and fragments. Seeds are extremely small (<1 mm long) and are dispersed by water, wind and human activity.

## Declaration status

NSW: C3(36); SA: 1@; WA: Prohib; Qld: C1

If found, report this weed to your local weed authority.

# Denotes Australian native species.

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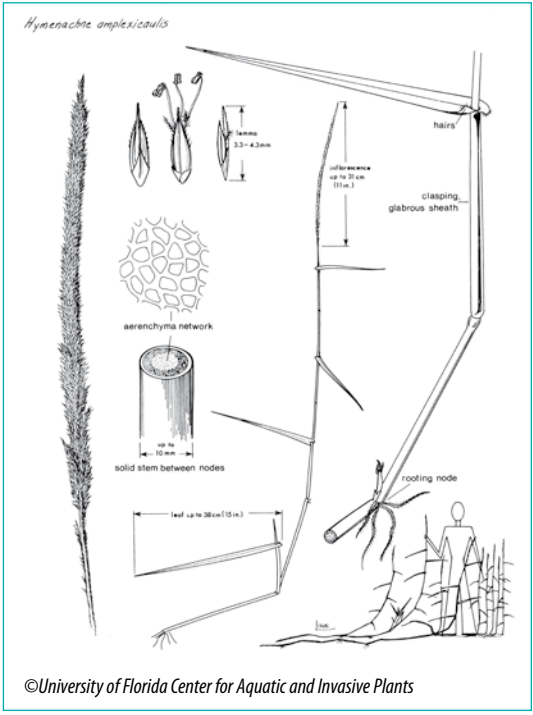
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# Olive hymenachne

*Hymenachne amplexicaulis*

## Description

Emergent semi-aquatic grass, 1–2.5 m tall.

### Leaves:

- To 50 cm long and 3 cm wide
- Base clasps around stem

### Flowers:

- On a cylindrical spike to 40 cm long
- Summer and autumn

### Stems:

- To 1.6 m tall
- White pith

## Similar looking species

- #Native hymenachne (*Hymenachne acutigluma*): no hairy stem-clasping leaf bases present

## Background

Olive hymenachne is a native of the tropics of South and Central America. It was introduced into Qld and NT as a ponded pasture species. It has invaded freshwater wetlands, floodplains and crops and is considered one of Australia's worst weeds. It forms dense infestations, displaces

native plant species, reduces biodiversity and threatens native wetland habitat.

## Distribution

Infestations have been found in tropical Qld and NT. Smaller infestations have also been found on the North Coast of NSW. This species has the potential to become a major weed of wetlands and waterways in northern NSW.

## Means of spread

Olive hymenachne reproduces by seed, fragments and stolons. A large number of seeds are produced and require contact with moist soil for at least 48 hours before germination can occur. Germination can occur all year round. Stolons run along the ground and produce roots at each node, forming new plants. Broken plant fragments can be easily transported by floodwater and will take root in moist soil.

## Declaration status

WoNS. Vic: R; NSW: C1(S); SA: 11+; WA: P1/2; Tas: S; Qld: C2; NT: B/C; ACT: C4

If found, report this weed to your local weed authority.

# Denotes Australian native species.

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Graham Prichard



Graham Prichard



# Peruvian primrose

*Ludwigia peruviana*

## Description

Terrestrial or partially submerged erect shrub to 4 m.

### Leaves:

- Alternate
- 4–12 cm long, 0.6–1 cm wide
- Hairy lower surface
- Winter deciduous in Sydney area

### Flowers:

- Erect, showy yellow flowers
- 4 (rarely 5) petals, 4 sepals
- Last 1 day
- Mid-summer

### Stems and branches

- Hairy

### Fruit:

- Four-angled capsule, 1–2.5 cm long
- 1000–3000 tiny pepper-like seeds in each capsule

## Similar looking species

- Longleaf ludwigia (*Ludwigia longifolia*): erect habit; red, narrow, four-angled stem; hairless stem and leaves
- #Water primrose (*Ludwigia peploides* ssp. *montevideensis*): hairless leaves; creeping or floating hairless stems to 4 m long

## Background

Peruvian primrose is native to South America and was introduced and grown at the Royal Botanic Gardens Sydney in 1907. It was first recorded as naturalised in Australia in the Botany Wetlands in 1970 and recognised as a potential weed in 1971. It forms dense stands on watercourses, obstructs flow and limits access.

## Distribution

Peruvian primrose grows in stationary or slow-moving water and drying-mud creek banks in coastal regions of NSW. In the Botany Wetlands, near Sydney, it has become the dominant species and has replaced much of the former vegetation in these shallow urban swamps.

## Means of spread

Peruvian primrose reproduces by seed. In some areas the number of seeds found below a dense thicket can number over 200 000 per square metre. The seeds are easily spread by birds. It will also spread by fragments, and new plants may form floating islands.

## Declaration status

NSW: C3(36); SA: 1@; WA: Prohib; Qld: C1

If found, report this weed to your local weed authority.

# Denotes Australian native species.

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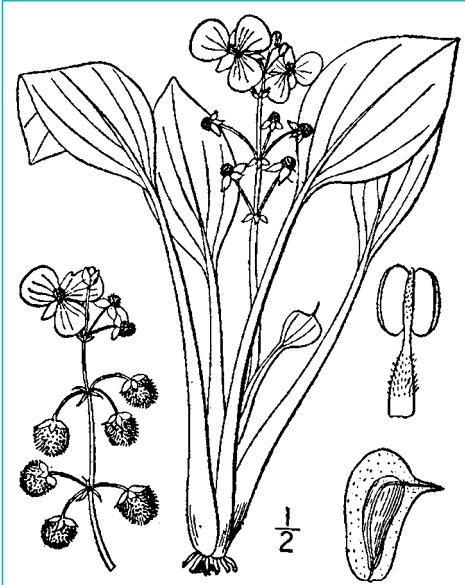
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USDA-NRCS PLANTS Database / Britton, N.L., and A. Brown. 1913. *An illustrated flora of the northern United States, Canada and the British Possessions. Vol. 1: 103.*



Photo: Graham Prichard



Photo: Graham Prichard



# Sagittaria

*Sagittaria graminea ssp. platyphylla*

## Description

Emergent to 1.2 m tall.

### Leaves:

- Emergent: blade-like, to 28 cm long, 10 cm wide; long stalk with one main vein
- Submerged: translucent, strap-like, to 50 cm long

### Flowers:

- 3 white petals and 3 sepals
- 3 cm diameter
- In whorls on a leafless stalk
- Always below leaf height
- Mainly spring to autumn

### Fruit

- A cluster consisting of flattened and winged segments, 0.15–0.3 cm long, 1 seed in each

## Similar looking species

- Arrowhead (*Sagittaria montevidensis*): adult leaves strongly arrow-shaped
- #Water plantain (*Alisma plantago-aquatica*): flowers on long stems and leaves rounder at base

## Background

Sagittaria is native to the USA and Central America. It was introduced into and cultivated in Australia as an ornamental garden plant. It forms dense infestations, competes with native species and obstructs water flow. It grows well in enriched conditions and is becoming increasingly common in irrigation supply channels, drains, shallow creeks and wetlands.

## Distribution

Sagittaria is widespread and common in northern Vic, south-east Qld, south-west NSW and around Sydney and Newcastle.

## Means of spread

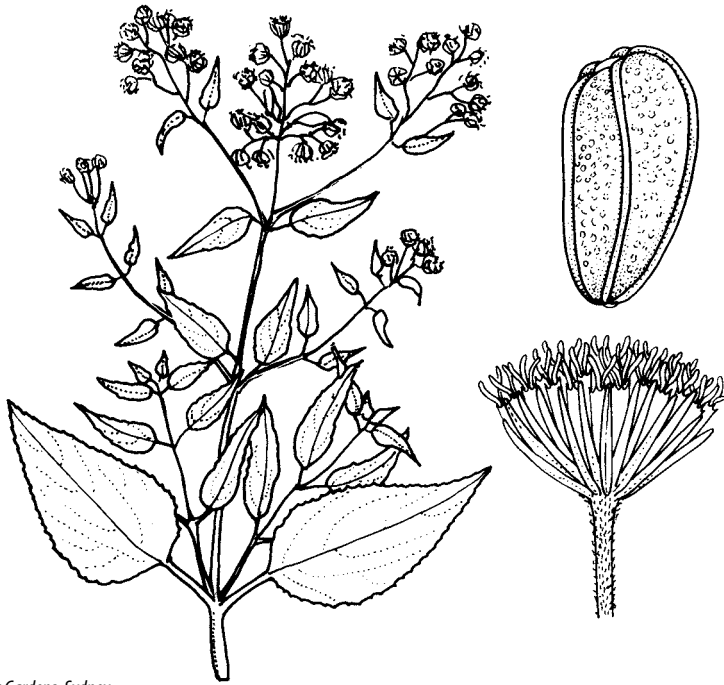
Spread by seed, rhizomes, tubers and floating entire plants.

If found, report this weed to your local weed authority.

## Declaration status

NSW: C4(18)/C5(S); SA: 1@; WA: P1/2; Tas: D

# Denotes Australian native species.



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Photo: Qld DPI & F



Photo: Qld DPI & F





# Senegal tea

*Gymnocoronis spilanthoides*

## Description

Emergent, erect or sprawling, to 1.5 m tall.

### Leaves:

- Opposite
- Oval to spear-shaped, 0.5–20 cm long
- Dark green
- Irregularly toothed margin

### Flowers:

- Half-sphere-shaped, pom-pom-like flowers 1.5–2 cm diameter
- White or pale purple flower heads in clusters near top of stem
- Late spring to early autumn
- Fragrant; attract insects, especially butterflies

### Stems:

- Ribbed stems, hollow between the joints

## Similar looking species

- Hygrophila (*Hygrophila costata*): whorled flowers near stem and leaf junction, angular stem
- Alligator weed (*Alternanthera philoxeroides*): white flower on stalk, completely hollow stems
- #Water primrose (*Ludwigia peploides* ssp. *montevicensis*): yellow flowers, alternate glossy leaves
- #Smart weed (*Persicaria decipiens*): alternate

hairy leaves

## Background

Senegal tea is native to tropical and subtropical America, from Mexico to Argentina. It was introduced into Australia and grown as an aquarium plant. It was first recorded as growing in the Manning River near Taree, NSW, in 1980. It grows rapidly in shallow water, forming dense stands and tangled mats, and is difficult to control.

## Distribution

There are several infestations in the Sydney and Hunter regions in NSW, and infestations in Tas, Vic, Brisbane and Perth.

## Means of spread

Senegal tea can spread by fragments and seed, although studies have shown that seed production is low. Stem fragments develop thin, fibrous roots at any node that is in contact with moist soil or immersed in water. These fragments can be spread by water, by animals or on equipment such as boats, trailers and lawn mowers.

## Declaration status

National Alert List plant. NSW: C1(S); SA: 1@; WA: P1/2; Tas: D; Qld: C1; ACT: C1/4

If found, report this weed to your local weed authority.

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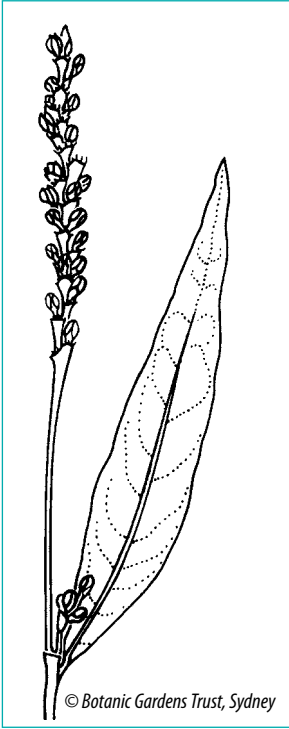
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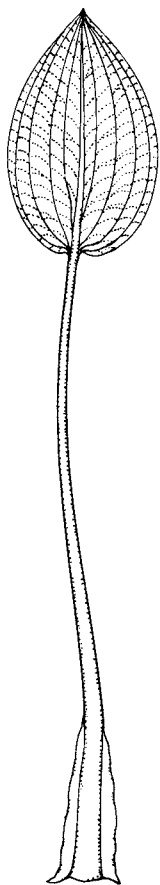


Photo: Fiona McPherson



Photo: Qld DPI & F





©Botanic Gardens Trust, Sydney

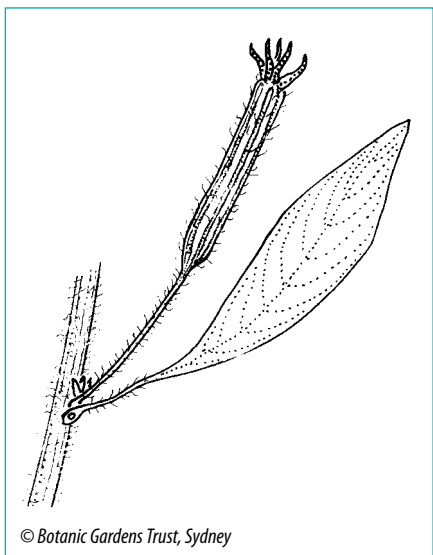


Photo: Graham Prichard



Photo: Graham Prichard





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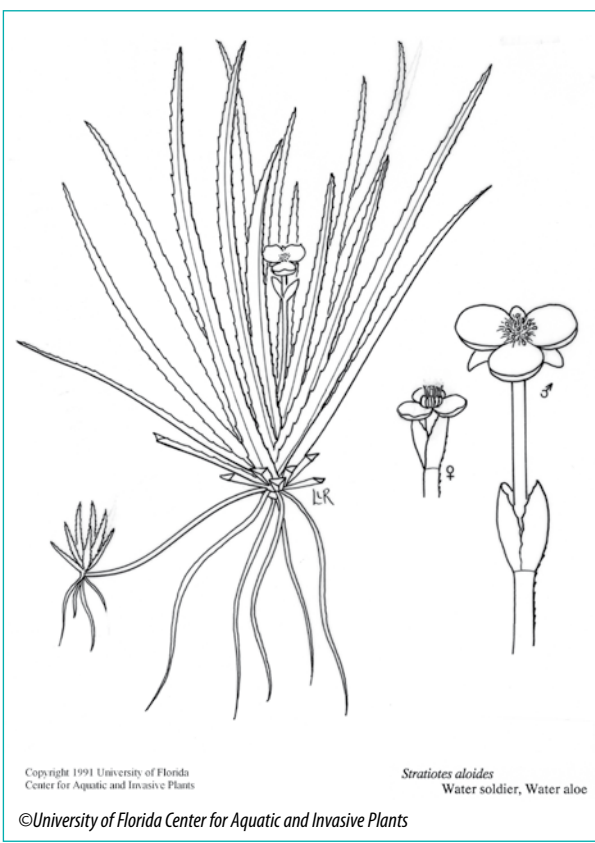


Photo: Suzanne Hayward



Photo: Bruce Auld





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*Stratiotes aloides*  
Water soldier, Water aloe

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Photo: NSW DPI



Photo: NSW DPI



Photo: NSW DPI





# Comparison table of similar emergent water plants

Name	Leaf arrangement	Leaf description	Leaf margin	Leaf size	Flower	Distinguishing feature
Alligator weed ( <i>Alternanthera philoxeroides</i> )	opposite	glossy spear-shaped	smooth	2–7 cm long	ball-like on stalk; white	completely hollow stem; terrestrial form has reddish-brown roots
Enydra / buffalo spinach ( <i>Enydra fluctans</i> )	opposite	spear-shaped	serrated	2.5–8 cm long, 2 cm wide	yellowish; in leaf axils	hollow stem; flower head in leaf axils
Hydrophila ( <i>Hydrophila costata</i> )	opposite	prominent midrib; hairy undersurface	finely toothed	1.8 cm long 0.3 cm wide	inconspicuous, whitish	four-angled stem
Senegal tea ( <i>Gymnocoronis spilanthoides</i> )	opposite	dark green	irregularly toothed	0.5–20 cm long	half-sphere pomp-pomp-like; white to pale purple	ribbed stem, hollow between joints
Smart weed ( <i>Pectisaria decipiens</i> )	alternate	dark blotch in centre	smooth	15 cm long	on elongated spike; pinkish (rarely white)	flower on elongated spike; dark blotch on leaf
Water primrose ( <i>Ludwigia peploides</i> ssp. <i>montevideensis</i> )	alternate	hairless	smooth	6 cm long, 3 cm wide	5 petals; primrose-like yellow	floating stems to 4 m, rounded



Photo: Bruce Auld

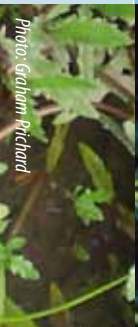


Photo: Graham Pritchard



Photo: NSW DPI



Photo: Qld DPI & E



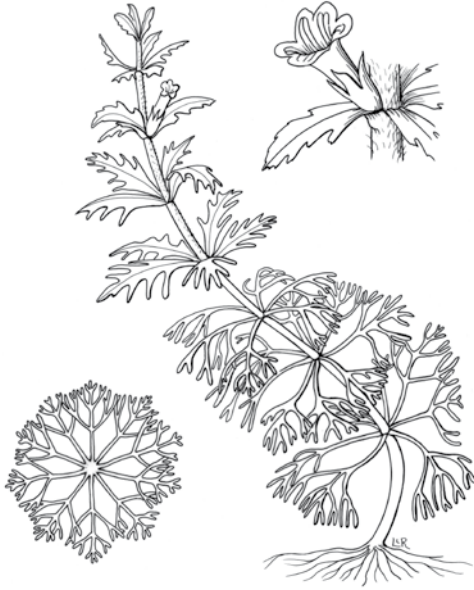
Photo: Fiona Michelson



Photo: Bruce Auld

# Feathery submerged water plants





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Center for Aquatic and Invasive Plants

*Limnophila sessiliflora*  
Ambulia

©University of Florida Center for Aquatic and Invasive Plants

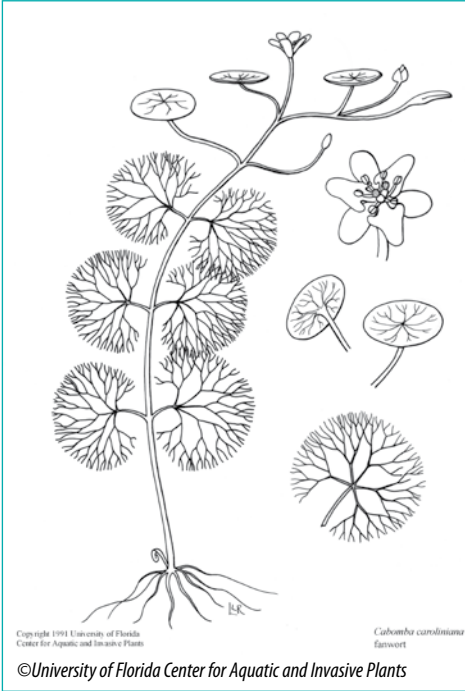


Photo: Andrew Petroshevsky



Photo: Andrew Petroshevsky







# Cabomba

*Cabomba caroliniana*

## Description

Submerged at depths to 3 m.

### Leaves:

- Opposite
- Submerged: fanlike and feathery
- Emergent: elongated diamond shape

### Flowers:

- Emergent
- White
- 6 petals
- 2 cm diameter
- Solitary

### Other:

- Seasonally purple stem to 10 m long
- Free-floating fragments continue to grow

## Similar looking species

- #Hornwort (*Ceratophyllum demersum*): free-floating; whorled leaves
- *Ambulia* (*Limnophila* spp.): whorled leaves
- *Myriophyllum* spp: whorled leaves

## Background

Cabomba is a native of South America and was introduced into Australia during the 1930s for

use as an aquarium plant. It has since become one of Australia's worst weeds. It forms dense underwater thickets which choke waterways.

## Distribution

Infestations are found in NT, Vic and various locations on the east coast of Australia between Cairns and Sydney. Owing to its submerged habit, weed managers are concerned that other infestations may exist that are yet to be discovered. Cabomba has the potential to invade waterways in all states and territories.

## Means of spread

Spreads by fragments. In one infestation in Australia it is reproducing by seed (Darwin River, NT). Plant fragments can be easily transported accidentally by boats and boat trailers. It is believed that many cabomba infestations are the result of deliberate plantings by aquatic plant enthusiasts.

## Declaration status

WoNS. Vic: R; NSW: C5(S); SA: 11+; WA: P1/2; Tas: D; Qld: C2; NT: A/C; ACT: C1/4 (Cabomba spp. WA: Unass; Qld: C2; NT: A/C)

If found, report this weed to your local weed authority.

# Denotes Australian native species.



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*Myriophyllum spicatum*  
Eurasian watermilfoil

©University of Florida Center for Aquatic and Invasive Plants



Photo: John Somerville



Photo: Ian Dodkins



Photo: Alison Fox





# Eurasian water milfoil

*Myriophyllum spicatum*

## Description

Submerged.

### Leaves:

- Whorled

### Flowers:

- On emergent flower stem
- Whorls of 4
- Male above (pink petals), female below (no petals)

## Similar looking species

- #Hornwort (*Ceratophyllum demersum*): free-floating; whorled leaves
- Ambulia (*Limnophila* spp.): whorled leaves
- *Myriophyllum* spp: whorled leaves
- Cabomba (*Cabomba caroliniana*): submerged opposite leaves

## Background

Native to Europe, Asia and northern Africa.

## Distribution

Eurasian water milfoil has not been reported in Australia.

## Means of spread

Spread mainly by fragments, although it can reproduce by seed.

## Declaration status

NSW: C1(S); SA: 1@; WA: Prohib; Qld: C1; NT: C

If found, report this weed to your local weed authority.

# Denotes Australian native species.

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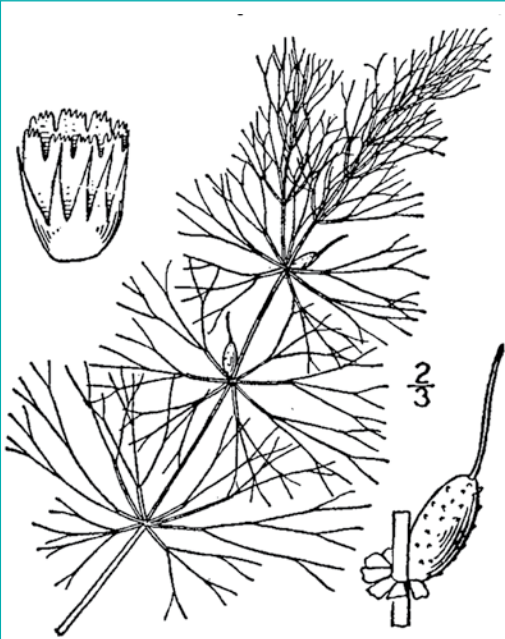
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USDA-NRCS PLANTS Database / Britton, N.L., and A. Brown. 1913. *An illustrated flora of the northern United States, Canada and the British Possessions*. Vol. 2: 75.



Photo: Graham Prichard



Photo: Graham Prichard



# Hornwort

*Ceratophyllum demersum*

## Description

Submerged and unattached (rarely loosely attached).

### Leaves:

- Whorled and forked
- 1.4 cm long with small teeth

### Flowers:

- Inconspicuous
- In leaf axils (stem and leaf junction)

### Other:

- No true roots
- Fruit black with 3 spines

## Similar looking species

- Cabomba (*Cabomba caroliniana*): submerged opposite leaves, white flowers
- Parrot's feather (*Myriophyllum aquaticum*): whorled leaves

## Background

Hornwort is a native Australia water plant which is a food source for waterfowl and provides shelter for small fish and other aquatic organisms. It sometimes forms dense mats in nutrient-rich water and can restrict fishing, boating and swimming. Hornwort is problematic in New Zealand, where it blocks dam intake equipment in hydroelectric lakes.

## Distribution

Widespread throughout NSW, Qld, WA and NT, in water to 10 m deep.

## Means of spread

Spread mainly by fragments, but can reproduce by seed.

## Declaration status

- WA: Prohib; Tas: D
  - WA and Tas: Report this plant.
- # Denotes Australian native species.

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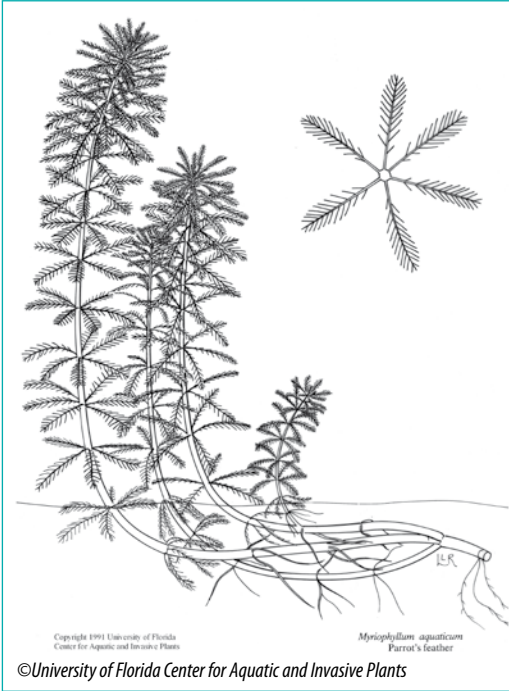
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# Parrot's feather

*Myriophyllum aquaticum*



## Description

Submerged to emergent perennial herb.

### Leaves:

- Whorled
- Feather-like
- Submerged: blade up to 4 cm long
- Emergent: blue-green, toothed, 2.5–3.5 cm long, 0.5–0.8 cm wide, crowded at tip

### Flowers:

- On emergent stem
- Inconspicuous
- In leaf axils (stem and leaf junction)

### Stems:

- Spreading, erect and hairless

## Similar looking species

- *Ambulia* (*Limnophila* spp.)
- *Cabomba* (*Cabomba caroliniana*): submerged opposite leaves
- *Myriophyllum* spp.

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## Background

Native to South America and widespread around the world. It grows very well in nutrient-enriched water and forms dense stands that impede water flow.

## Distribution

Common in coastal waterways along the east coast of Australia from Brisbane to Sydney.

## Means of spread

In Australia, parrot's feather spreads by fragments. Male and female flowers are produced on separate plants. Only female plants have been found in Australia, and seed is not produced here. If male plants are introduced into Australia this species may become more of a problem.

## Declaration status

WA: P1/2; Tas: D; ACT: C1/4

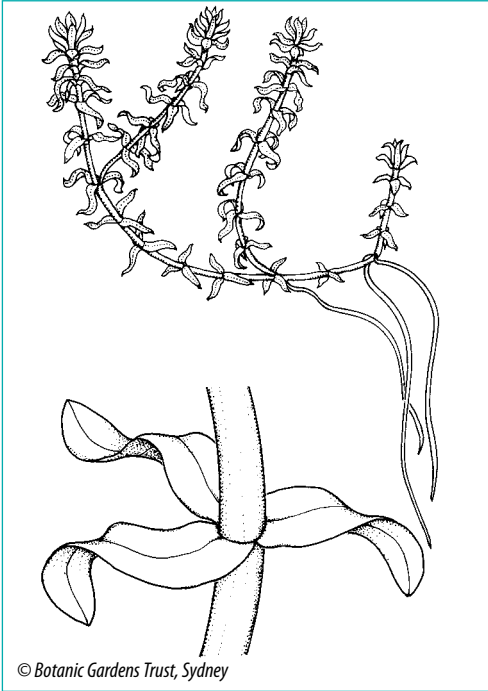
If found, report this weed to your local weed authority

# Comparison table of feathery submerged water plants

Name	Leaf arrangement	Leaf description	Flower	Distinguishing features	Image
<b>Cabomba</b> <i>Cabomba caroliniana</i>	opposite	fanlike	white	submerged leaves, emergent flowers	 <p><i>Photo: Courtesy of the Department of Natural Resources, Environment and the Arts, NT</i></p>
<b>Ambulia</b> <i>Limnophila</i> spp.	whorled	emergent: broad; submerged: finely divided	blue, white, pink, or lavender	submerged or emergent leaves	 <p><i>Photo: Andrew Petroschensky</i></p>
<b>Parrot's feather</b> <i>Myriophyllum aquaticum</i>	whorled	toothed margin	inconspicuous	submerged or emergent leaves	 <p><i>Photo: Suzanne Hayward</i></p>
<b>Hornwort</b> <i>Ceratophyllum demersum</i>	whorled	toothed margin	inconspicuous	free-floating	 <p><i>Photo: Graham Pritchard</i></p>

# Non-feathery submerged water plants





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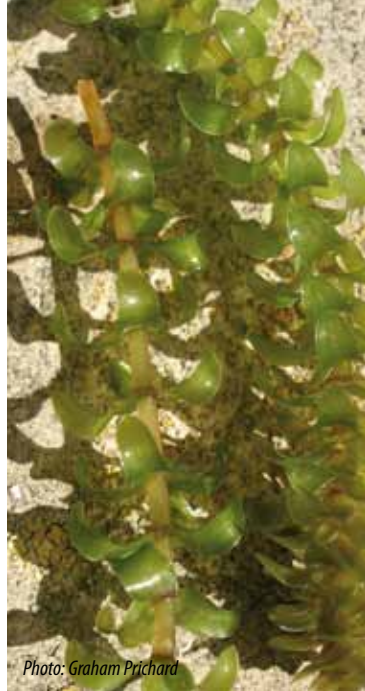


Photo: Graham Pritchard



Photo: Graham Pritchard





# Elodea

*Elodea canadensis*

## Description

Submerged.

### Leaves:

- 0.5–1.5 cm long, 0.2–0.5 cm wide
- Whorls of 3 (rarely 4)
- Bend down slightly
- Bright green

### Flowers:

- On white thread-like stem
- Inconspicuous
- 3 petals
- Only male flowers in Australia

## Similar looking species

- *Egeria (Egeria densa)*: leaves in whorls of 4–5, crowded; larger flowers (2 cm wide) and leaves (4 cm long)
- #Hydrilla (*Hydrilla verticillata*): leaves in whorls of 3–8; larger leaves (up to 4 cm long), almost straight, serrated, dull green
- Lagarosiphon (*Lagarosiphon major*): leaves in alternate spirals; curve downwards

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## Background

*Elodea* is native to North America. It thrives in temperate zones, can withstand freezing and grows rapidly when temperatures exceed 15 °C. *Elodea* does not thrive in iron-deprived water and has a high light requirement for optimum growth.

## Distribution

*Elodea* is found in slow-moving and stationary water bodies, coastal rivers and creeks, especially in colder areas in NSW, Vic and Tas. It has been a major problem in constructed waterways of northern Vic and south-western NSW.

## Means of spread

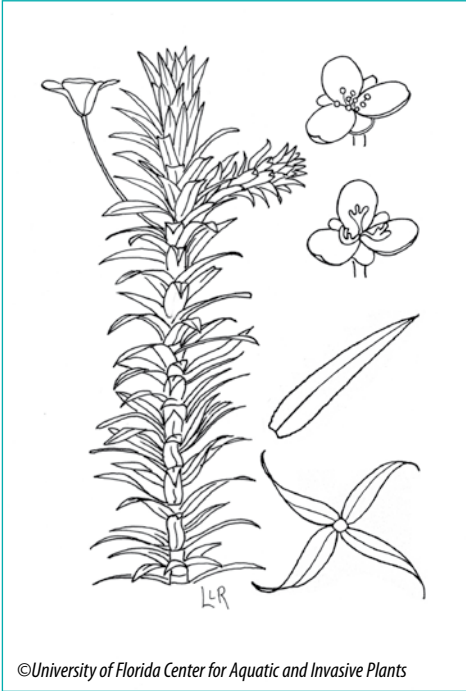
Spreads by fragments. Only male flowers are found in Australia. Stems readily break into pieces which are easily transported.

## Declaration status

SA: 1@; WA: P1/2; Tas: D; NT: C

If found, report this weed to your local weed authority.

# Denotes Australian native species.





# Egeria/leafy elodea/ dense water weed

*Egeria densa*

## Description

Submerged, up to 1.5 m long.

### Leaves:

- Whorls of 4–5 (rarely 3–8)
- 4 cm long
- Minutely serrated margins
- Densely clustered

### Flowers:

- White, 2 cm diameter
- Emergent
- 3 petals
- Only male flowers recorded in NSW

## Similar looking species

- Elodea (*Elodea canadensis*): leaves in whorls of 3; smaller flowers (5 mm long) and leaves (5–15 mm long)
- #Hydrilla (*Hydrilla verticillata*): leaves in whorls of 3–8; almost straight leaves, visibly serrated margin; smaller flowers (3 mm long)
- Lagarosiphon (*Lagarosiphon major*): leaves in alternate spirals, curve downwards

## Background

Egeria is native to South America and was introduced into Australia as a popular plant for aquariums and garden ponds. It forms dense masses and can restrict water flow, reduce aquatic biodiversity and interfere with recreational activities.

## Distribution

Found in shallow lakes, ponds and slow-flowing streams in NSW, Qld and Vic.

## Means of spread

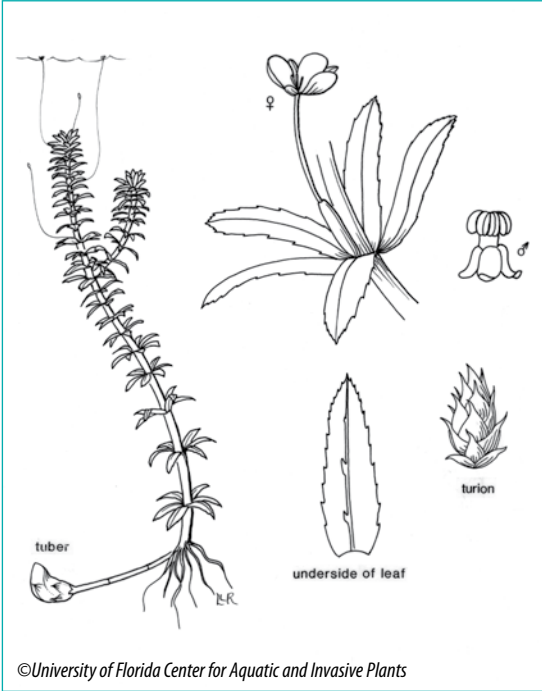
Spreads by fragments, which are easily attached to boating equipment. Only male flowers have been recorded in Australia.

## Declaration status

NSW: 5; SA: 1@; WA: P1/2; Tas: D; NT: C

If found, report this weed to your local weed authority.

# Denotes Australian native species.



# Hydrilla

*Hydrilla verticillata*



## Description

Submerged, to 2 m long.

### Leaves:

- Toothed margins
- Whorls of 3–8 (on same stem)
- Almost straight leaves
- Lower surface: very fine hairs visible under magnification

### Flowers:

- Summer
- Male and female flowers on different plants
- Female: translucent white, thread-like stem, 0.3 cm; 3 petals; floats to surface in an air bubble and opens
- Male: bud-like, reddish, in upper leaf axils; floats to surface in an air bubble and opens to release pollen

## Similar looking species

- Elodea (*Elodea canadensis*): leaves in whorls of 3, bent down slightly, bright green, 0.5–1.5 cm long
- Egeria (*Egeria densa*): crowded, minutely serrated leaves; larger flower (2 cm diameter)
- Lagarosiphon (*Lagarosiphon major*): leaves curl down in alternate spirals

## Background

Hydrilla is native to Australia and usually grows as part of a balanced community, improving water quality and fish production. It is sometimes regarded as a weed in Australia and is considered to be one of the most problematic water weeds in the USA.

## Distribution

Hydrilla grows in slow-moving and stationary water bodies, coastal rivers and creeks, especially in warmer areas in all mainland states of Australia.

## Means of spread

Spreads by fragments, rhizomes and stolons. Large numbers of tubers are produced, and it can form turions (overwintering vegetative buds) in leaf axils in winter, which break off, sink to the bottom and grow in spring and summer.

## Declaration status

WA: Prohib; Tas: D

If found in Tas, report this weed to your local weed authority.

# Denotes Australian native species.

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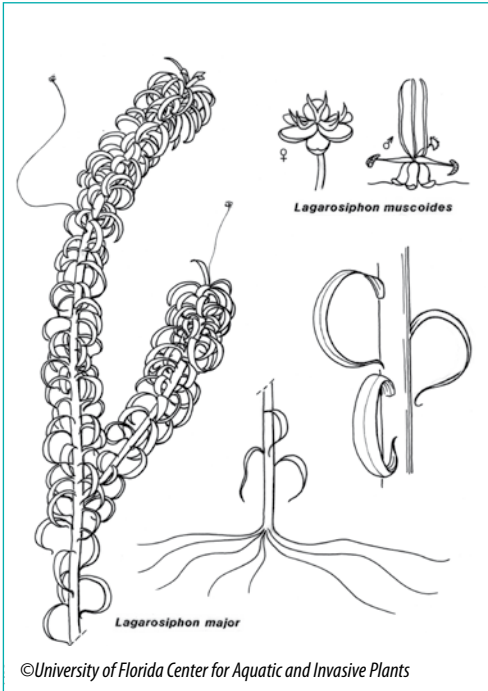
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# Lagarosiphon

*Lagarosiphon major*

## Description:

Submerged in depths to 6.5 m.

## Leaves:

- Alternate spirals along the stem
- 0.5–2 cm long, 0.2–0.3 cm wide
- Tapered tips curve downwards towards the stem (except in highly alkaline water)

## Flowers:

- Very small
- Female flower, 3 petals
- Clear to white
- Floats

## Stems:

- Curved at base (J-shaped)

## Similar looking species

- *Egeria (Egeria densa)*: whorled leaves to 4 cm long; flowers 2 cm diameter
- *Elodea (Elodea canadensis)*: whorled leaves
- *Hydrilla (Hydrilla verticillata)*: whorled, serrated, almost straight leaves

# Denotes Australian native species.

## Background

Lagarosiphon is native to South Africa and was introduced into Australia for the aquarium industry. Small infestations were discovered and eradicated in several locations in Australia in the late 1970s, and today it is not known to be present in Australia. However, it is a major weed in temperate zones of the world, including New Zealand and Europe. It can form dense underwater thickets in lakes, dams and ponded waterways up to depths of 6 metres.

## Distribution

There are currently no naturalised infestations of *Lagarosiphon* in Australia.

## Means of spread





Spreads by fragments, which attach to boats and boat trailers. Many infestations are often first recorded at boat ramps.

## Declaration status

National Alert List plant. Vic: S; NSW: C1(S); SA: 1@; WA: P1/2; Tas: D; Qld: C1; NT: C; ACT: C1/4

If found, report this weed to your local weed authority.

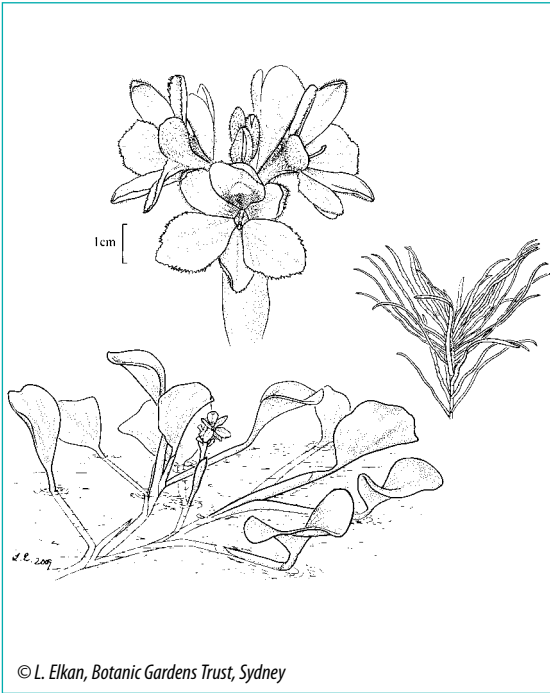
# Comparison table of similar non-feathery submerged water plants

Name	Leaf arrangement	Leaf description	Leaf margin	Leaf size	Flower	Distinguishing features	Image
<b>Hydrilla</b> ( <i>Hydrilla verticillata</i> )	whorls of 3–8	almost straight	serrated	4 cm long, 5 mm wide	3 petals, 3 mm wide	serrated leaf margin	 Photo: Graham Pritchard
<b>Elodea</b> ( <i>Elodea canadensis</i> )	whorls of 3 (rarely 4)	curve down slightly; bright green	minutely serrated	5–15 mm long, 2–5 mm wide	3 petals, 5 mm wide	leaves in whorls of 3	 Photo: Graham Pritchard
<b>Egeria</b> ( <i>Egeria densa</i> )	whorls of 4–5 (rarely 3–8)	densely clustered	minutely serrated	4 cm long, 2–5 mm wide	3 petals, 2 cm wide	large leaves and large flowers	 Photo: NSW DPI
<b>Lagarosiphon</b> ( <i>Lagarosiphon major</i> )	alternate spirals	curve down	minutely serrated	0.5–2 cm long, 2–3 mm wide	3 petals, 2 mm wide	leaves curve down	 Photo: Graham Pritchard



# Floating water plants







# Anchored water hyacinth

*Eichhornia azurea*

## Description

Usually rooted in substrate to depth of 10–15 m.  
Can be free floating.

### Leaves:

- Leaf stalks (petioles) are smooth; not inflated
- Emergent: generally very broad ovate, 5–16 cm long, 2–16 cm wide
- Submerged or in heavy shade: strap-like, 6–20 cm long, 1 cm wide

### Flowers:

- White to lavender-blue
- Uppermost petal has distinct yellow spot
- Several on erect hairy stem, 8–12 cm above water
- 6 toothed petals, 1–3 cm long
- Summer and autumn
- Open for 1 day

### Other:

- Submerged stems smooth and branched
- Small seeds, 0.1–0.2 cm long

## Similar looking species

Water hyacinth (*Eichhornia crassipes*): free-floating, erect leaves; bulbous leaf stalks; light purple flowers with dark purple to blue centre with yellow spot; black fibrous roots

## Background

Anchored water hyacinth is native to tropical South America. It is closely related to one of the world's worst aquatic weeds, water hyacinth (*Eichhornia crassipes*). Anchored water hyacinth can grow quickly and smother the surface of creeks, lakes and other water bodies.

## Distribution

If introduced and allowed to spread, anchored water hyacinth has the potential to become a major pest in waterways in all states and territories.

## Means of spread

Reproduces by fragments and seed. Seeds can be carried by water, in mud, on vehicles and by birds. Coverage spreads when part of the plant breaks away and moves downstream and starts a new infestation.

## Declaration status

NSW: C1(S); WA: Prohib; Qld: C1

If found, report this weed to your local weed authority.

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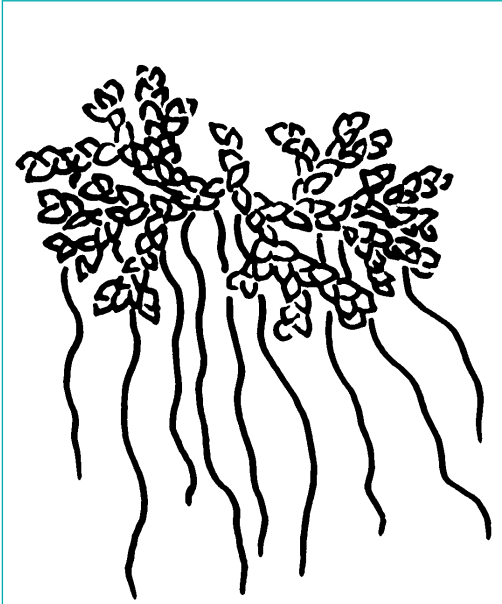
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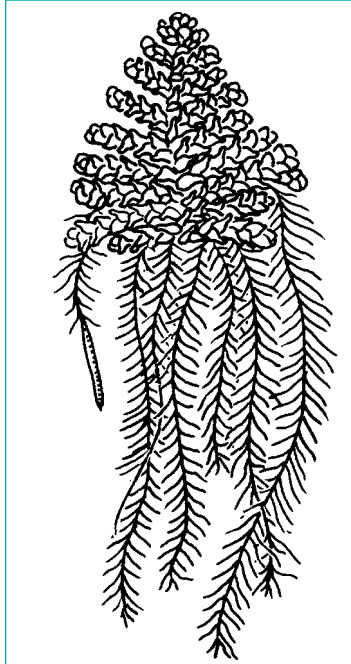
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Photo: NSW DPI



Photo: NSW DPI



# Azolla

*Azolla* spp.

## Description

Free-floating fern, 1–2.5 cm diameter.

### Leaves:

- Tiny, scale-like, 2-lobed
- Lobes 0.2 cm long
- Older leaves can be red in sunlight, green in shade

### Stem

- Main stem with pinnate branches
- Branches longer towards base, giving plant triangular shape
- *A. filiculoides*: fine rootlets absent
- *A. pinnata*: fine rootlets present

## Similar looking species

- Salvinia (*Salvinia molesta*): primary growth stage
- #Duckweed (*Lemna* spp. and *Spirodela* spp.)

## Background

Azolla is an Australian native fern that is common in many waterways and is commonly used as a decorative feature in garden ponds. It supports a nitrogen-fixing cyanobacterium in the fronds. This nitrogen is released when the plants decay. Azolla is often grown in paddy fields in Asia as a fertiliser. It can quickly spread to cover open areas of water and may build up in stationary water bodies, particularly if nutrients levels are adequate.

## Distribution

Azolla is found in slow moving and stationary waterways, and at least one species is found in each state and territory.

## Means of spread

Azolla produces spores and can spread by fragments.

## Declaration status

Not declared a weed in Australia.

Do not report this plant.

# Denotes Australian native species.

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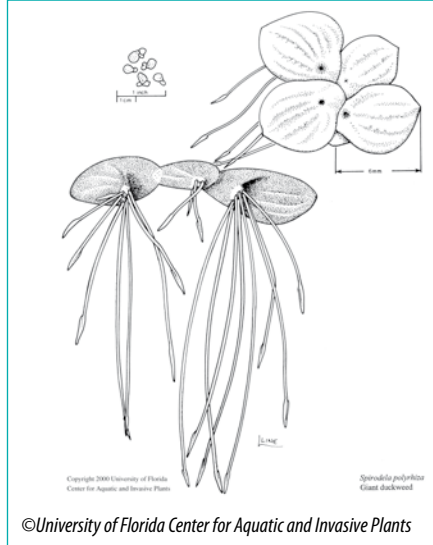
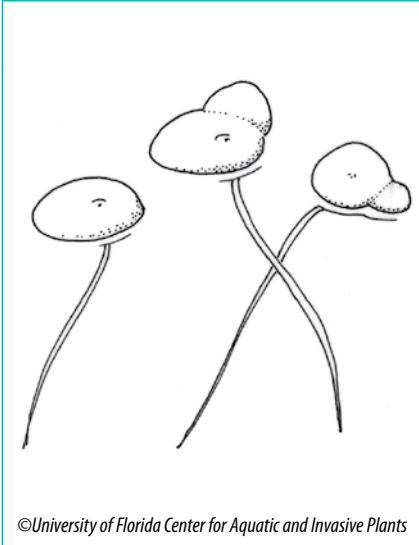
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# Duckweed

*Lemna spp., Wolffia spp., Spirodela spp.*

## Description

Tiny, free-floating plants. Dense growth appears as green mat on surface.

### Flowers:

- Tiny, white, barely visible
- *Wolffia* spp: < 0.1 cm
- *Spirodela* spp: to 1 cm

## Similar looking species

- *Salvinia* (*Salvinia molesta*): primary growth stage
- #Azolla (*A. filiculoides* and *A. pinnata*): stem and branches

## Background

Duckweeds are native to Australia and other countries and include the smallest flowering plants on Earth. They can form a dense green mat on the water surface in nutrient-rich conditions. They are an important food source for birds and aquatic animals.

## Distribution

Slow-moving and stationary waterways, with a few species found in each state and territory.

## Means of spread

Duckweeds spread mainly by fragments.

## Declaration status

Not declared a weed in Australia.

Do not report this plant.

*# Denotes Australian native species.*

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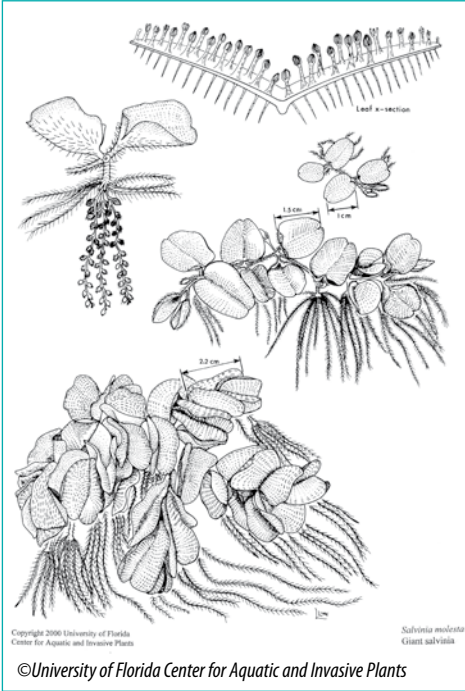
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# Salvinia

*Salvinia molesta*

## Description

Free-floating fern.

### Leaves:

- Opposite
- Light green; oval
- Hairy surface (repels water and aids buoyancy)
- Eggbeater-shaped hairs on upper 'leaf' surface

### 3 growth stages:

- Primary: isolated plants; small, flat, oval leaves
- Secondary: leaves start to fold at midrib
- Tertiary: crowded plants; leaves folded at midrib

## Similar looking species

The primary growth stage of salvinia may be confused with:

- #Azolla (*Azolla* spp.) alternate leaves
- #Duckweed (*Lemna* spp., *Spirodela* spp.)

## Background

Salvinia is native to South America and it is believed to have been introduced into Australia during the 1950s as an ornamental plant for garden ponds. It can grow rapidly, and with high temperatures and nutrients can double its size in less than a week.

## Distribution

Salvinia is found along much of Australia's east coast from Cape York to Bega, NSW. Other infestations are found in NT and WA. It has the potential to spread to still and slow-moving waterways in all states and territories.

## Means of spread

Spreads by fragments. New plants form when rhizomes break through decay or damage. Salvinia spreads mostly through human activities, on boating and fishing equipment, and through deliberate use as an ornamental plant in farm dams or by aquatic plant enthusiasts.

## Declaration status

WoNS. Vic: S; NSW: C2(106)/C3(22); SA: 1@; WA: P1/2; Tas: D; Qld: C2; NT: B/C; ACT: C1/4

If found, report this weed to your local weed authority.

# Denotes Australian native species.

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Center for Aquatic and Invasive Plants

*Trapa natans*  
water chestnut

©University of Florida Center for Aquatic and Invasive Plants



Photo: NSW DPI



Water chestnut  
*Trapa natans*  
Photo by Vic Ramey  
Copyright 2002 Univ. Florida



# Water caltrop

*Trapa spp.*

Two species of the genus *Trapa* are referred to as water caltrop: *T. natans* and *T. bicornis*.

## Description

Floating rosette with a stem attached to substrate.

### Leaves:

- Submerged: finely divided, feather-like
- Floating: triangular shape, 2–3 cm long, toothed margins, glossy upper surface, fine short hairs on lower surface; form rosette shape

### Flowers:

- Emergent
- White; 4 petals, 0.8 cm long
- Early summer

### Stems:

- Unbranched to 3.6–4.5 m long

### Fruit:

- Woody, 3 cm wide, 4 spines (1 cm long) (*T. bicornis* has 2 spines)
- Contains a single seed

### Roots:

- Feather-like to 8 cm

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## Background

Water caltrop is a native of warm-temperate parts of Eurasia and Africa. The seeds are cooked and eaten in China. It forms impenetrable mats across wide areas of water. The sharp spines of the fruit are hazardous to humans and animals.

## Distribution

Not yet recorded within Australia.

## Means of spread

Reproduces by seed. Each seed can result in 10–15 plant rosettes, and each rosette produces 15–20 seeds. The seeds remain viable for up to 12 years. Water caltrop can spread by the rosettes breaking away, and by fruits detaching and floating away or being transported by birds or other animals.

## Declaration status

NSW: C1(S); WA: Prohib; Tas: D; Qld: C1; NT: C; (SA: 1@ *T. natans*)

If found, report this weed to your local weed authority.





# Water hyacinth

*Eichhornia crassipes*

## Description

Erect, free-floating, 10 cm to 1 m tall.

### Leaves:

- Dark green
- Thick, waxy and glossy
- Ovate to circular, to 5 cm diameter

### Flowers:

- Light purple with dark purple to blue centre with yellow spot
- Cluster on spike above the plant

### Other:

- Leaf stems (petioles) bulbous and spongy
- Black fibrous root system

## Similar looking species

- Anchored water hyacinth (*Eichhornia azurea*): generally rooted in mud, yellow spot on flower, no bulbous leaf stem, strap-like submerged leaves

## Background

Water hyacinth is a native of South America and is a major weed of waterways throughout

the world. It was first noticed in Australia in Brisbane, Sydney and Grafton in the 1890s and was most likely imported as an ornamental plant. In waterways an infestation can double in size in a few weeks, altering aquatic habitats, providing shelter for mosquitoes and resulting in large quantities of floating biomass. This weight moving along a waterway can threaten infrastructures, including fences and bridges.

## Distribution

Found in slow-moving and stationary waterways in all mainland states of Australia.

## Means of spread

Spreads by fragments and produces vast quantities of seed. Seeds can germinate in a few days or remain dormant for up to 15 years. Its popularity as an attractive garden pond plant has increased its spread around the country.

## Declaration status

Vic: S; NSW: C2(101)/C3(17)/C4(9); SA: 1@; WA: P1/2; Tas: D; Qld: C2; NT: A/C; ACT: C4

If found, report this weed to your local weed authority.

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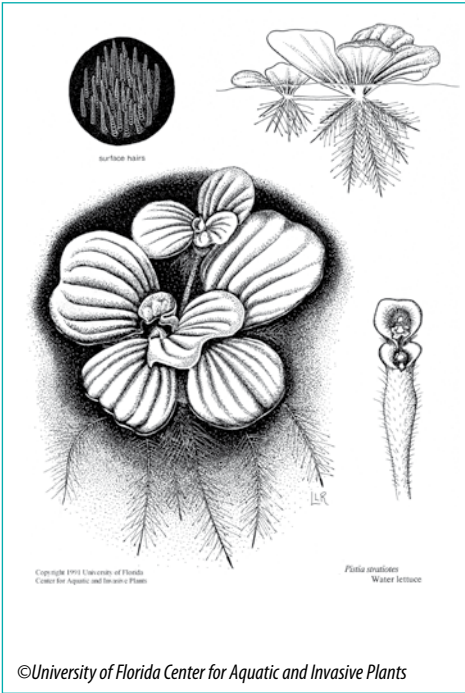
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# Water lettuce

*Pistia stratiotes*

## Description

Free-floating, to 15 cm tall and 30 cm wide.

### Leaves:

- Overlap like a lettuce
- Thick; covered with short hairs

### Flowers:

- Inconspicuous, on small stalk hidden amongst leaves

## Similar looking species

Floating mats of water lettuce can resemble:

- Salvinia (*Salvinia molesta*)
- Water hyacinth (*Eichhornia crassipes*)

## Background

Water lettuce is thought to be native to the NT, but is introduced in Qld and NSW. It can grow rapidly under tropical conditions and adequate nutrient levels to form large mats on the water surface. It is frost sensitive and does not thrive in cool waters.

## Distribution

Found in slow-moving waterways throughout the NT, Qld and northern NSW.

## Means of spread

Reproduces by fragments and seed. Plants produce stolons, which each produce a new plant at the end. It has been a popular ornamental plant and is sometimes found for sale.

## Declaration status

NSW: C1(S); WA: P1/2; Qld: C2; NT: B/C; ACT: C1/4

If found, report this weed to your local weed authority.

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