



## Aquatic weeds and their control

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### Introduction

Water features are a beautiful addition to any garden and having attractive pond plants adds to their value. However, some aquatic plants used in garden ponds are highly invasive and have become serious weeds in natural waterways. These weeds often out-compete local species and seriously affect the local ecology. Not only do they affect native wildlife but can also impact on recreational activities such as swimming, boating and fishing and can ruin the aesthetic appeal of the water body.

Originally these weeds were introduced as ornamental plants for ponds because of their attractive flowers or foliage, or their ability to grow quickly. The intentional and unintentional dumping of pond plants, water and unwanted fish has led to the infestation of natural waterways. The spread of these weeds has also occurred through sharing of cuttings or division of existing plants by friends and family. Birds often transport plant material and boats can also spread the weeds by moving between different waterways.

Many of these aquatic weeds are now banned from sale in nurseries however they continue to be mistakenly sold at weekend markets and backyard sales and purchased by people unaware of the invasive nature of the plant. This Gardennote provides information on the most common garden aquatic plants which have become serious weeds in our waterways, and details ways in which you can help to reduce their spread.

### Types of Aquatic Weeds

Aquatic weeds are typically categorised into four main groups depending on their growth habit. These are: emergent, free floating, floating leaf and submerged weeds.

Emergent weeds have both the stems and leaves above the waterline and are often growing on the fringes of ponds and waterways. Free floating weeds are not attached to the soil in any way but can still have root systems. Floating leaf weeds are rooted into the soil with long stems that stretch to the water surface where the leaves float. Submerged weeds are rooted into the soil and all parts of the plant are completely submerged under the water.

### Arum lily (*Zantedeschia aethiopica*)

Arum lilies originated from South Africa and were introduced as garden plants due to their highly ornamental white flowers and lush green foliage.

They are an emergent aquatic weed which can grow both along the fringes of ponds and waterways and on land. It is a robust clump-forming, perennial herb to 1.5 m high, with tuberous underground stems (rhizomes) and fleshy white roots. The dark shiny green leaves are arrow shaped 15–50 cm long and 8–25 cm wide. The showy flowers consist of a large white funnel shaped spathe that surrounds the spike of small yellow flowers. The fruit that forms is green or yellow, and contains small yellow-orange coloured seed.

This weed has become prolific along creek and river banks due to people dumping garden waste containing rhizomes and seeds which readily grow to form new plants. Arum lilies are toxic to animals and humans alike and therefore pose significant risk if spread into areas where livestock freely roam. Arum lily is listed as a declared weed in Western Australia.



*Arum lily infesting wetlands*

### Leafy Elodea or dense waterweed (*Egeria densa*)

Leafy Elodea is native to South America and is a perennial submerged aquatic plant that was introduced originally as an aquarium and pond plant. Unfortunately, it has escaped into natural waterways and causes problems including restricting water flow, increasing

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siltation, reducing aquatic plant and animal biodiversity and interfering with recreational activities such as swimming, boating and fishing.

Elodea has cylindrical stems that grow up to 1.5 m long. Stems take root at the lower nodes but float for most of their length. The leaves are oval to oblong-shaped and occur in whorls of 4-5 leaves at each node. Little white flowers with yellow anthers appear on the surface of the water and often occur in the warmer months of summer



Leafy Elodea or dense waterweed

and autumn. New plants can form when pieces of the main plant break off therefore large infestations are easily established. Leafy elodea is a declared weed in Western Australia and plants must be eradicated if found.

#### **Hydrocotyl (*Hydrocotyle ranunculoides*)**

Hydrocotyl, or shield pennywort is native to South America and was introduced as a pond plant due to its attractive foliage. It is an emergent stoloniferous perennial herb that roots prolifically at the nodes and has the potential to cover large bodies of water. The leaves are circular with a deep radial split and shallowly lobed. The flowers are white and insignificant (usually located under the leaves in summer), and are formed in an umbel on a slender stalk.

In waterways, hydrocotyl overruns native plants, and creates an unfavourable habitat for aquatic fauna, it obstructs water flow and causes eutrophication of water when it decays. The floating mats of hydrocotyl can be a hazard to humans and animals who try to walk on them and fall through into deep water. *Hydrocotyle ranunculoides* is a declared weed in Western Australia and all plants need to be eradicated if found.



Hydrocotyl infesting waterways

There are other species of hydrocotyl which are not declared weeds. It is recommended that if you are unsure of the species, you can send a sample to the Department of Agriculture and Food for identification.

#### **Parrots feather (*Myriophyllum aquaticum*)**

Parrots feather was originally introduced from South America as a pond and aquarium plant due to its attractive bright green feathery foliage. It is a submerged and emergent perennial herb which forms dense, vigorously growing tangled mats from 2-5m long. The leaves are toothed and feathery and occur in whorls around the stems. It has small insignificant flowers



Parrots feather established in drain

although no seed is produced as only female plants are present in Australia. New plants form when pieces break off and establish elsewhere. Parrots feather is a declared weed in Western Australia and all plants must be eradicated if found.

#### **Salvinia (*Salvinia molesta*)**

Salvinia is regarded as one of the worst aquatic weeds due to its invasiveness and its impact on the environment. It is a free floating perennial fern that originated from South America and was initially introduced as a pond plant. It has since escaped into our natural waterways where it produces dense mats on the surface of the water. It can be dangerous to humans and animals as it is often mistaken for solid ground. It also provides the perfect haven for disease carrying mosquitoes.

The leaves of salvinia occur at each node on the stem and consist of two oval shaped hairy fronds and one brown frond that trails under the water and acts like a root. The upper fronds are covered with egg beater shaped waxy hairs that aid in floatation. Reproduction and spread is via vegetative means, forming daughter plants at stem nodes. As these break away they can then be introduced into new areas. Salvinia is a declared weed in Western Australia and all plants must be eradicated if found.



Senegal tea

**Senegal tea (*Gymnocoronis spilanthoides*)**

Senegal tea originated from South America and was introduced as a pond plant. It can grow as a bush up to 1 m tall but is found more commonly as a sprawling dense floating mat, extending from the edges of waterways.

Stems are hollow between the nodes and can grow up to 1.5 m in length. Leaves are dark green and arranged in opposite pairs along the stem. The plants have numerous white ball shaped flowers occurring at the end of the stems and start appearing in late spring to late autumn. Senegal tea produces seed which will germinate in the following spring leading to the formation of new plants. It can also reproduce quickly through vegetative means, forming new plants as parts of the stem break away and float into new areas. Senegal tea is a declared weed in Western Australia and plants must be eradicated if found.



Taro

Taro is not a declared weed in Western Australia and can be grown in home gardens. Care must be taken to ensure the weed is not dumped or translocated into our natural waterways where it quickly spreads.

**Water hyacinth (*Eichhornia crassipes*)**

Water hyacinth originated from South America and is a free floating perennial aquatic weed that has become one of the world's worst aquatic weeds. It was introduced as a pond and aquarium plant due to its striking mauve flowers that are held above the foliage in dense spikes and lush green foliage.



Salivina

**Taro (*Alocasia esculenta*)**

Taro was introduced as an attractive perennial aquatic herb with its large heart shaped leaves. It is grown widely as a food plant as its tubers are edible (needing special preparation as they are poisonous when raw). Taro has escaped into our natural waterways where its rapid growth out-competes native species. Roots often trap organic matter fouling the water and when disturbed can often release toxins that can be harmful to wildlife.



Flowering water hyacinth

The plant has dense fibrous roots and large infestations clog waterways making it impossible to penetrate, severely restricting recreational activities. The mats also out-compete other native species and create low oxygen levels in the water. They can also be breeding grounds for mosquitoes. Water hyacinth rapidly spreads across water bodies due to its ability to reproduce both vegetatively and by the large amounts of seed it produces. It flowers in late spring and summer. Water hyacinth is a declared weed in Western Australia and plants must be eradicated if found.

### **Water lettuce (*Pistia stratiotes*)**

Water lettuce is a perennial free floating weed that often resembles a small open head of lettuce. It was introduced into Australia from Asia as an aquarium and pond plant where it has since escaped into our natural waterways where it rapidly forms dense spongy mats.

It consists of a rosette of fan shaped pale green leaves, which are covered in hair. It has a large number of small inconspicuous green flowers found at the centre of the rosettes which produce many seeds. Like most other aquatic weeds, water lettuce causes interference with recreational activities such as boating, fishing and swimming as well as harbouring mosquitoes, lowering oxygen levels in the water and out competing other native plant species and wildlife. Water lettuce is a declared plant in Western Australia and must be eradicated if found.



*Water lettuce is a declared plant*

### **Control**

Controlling aquatic weed infestations poses major challenges. Waterways are environmentally sensitive systems and attention is needed in regard to using chemicals as a means for control. Consideration for the ecology of the infested area such as wildlife and fish living in and around the water and other native plant life will all have an effect on what chemicals you can use. Emergent weeds are often controlled with the use of glyphosate at the stated label rates. When treating emergent water weeds consider your application

method as a way to target the weed species and reduce the potential for chemical to enter the water. Application by “painting” the herbicide directly onto the target weed with a brush or herbicide blanket will ensure that the chemical is applied directly to the target weed to reduce the potential for spray droplets to enter the water.

For larger infestations of free floating and floating leaf aquatic weeds, a range of chemicals can be used such as diquat, 2, 4-D and glyphosate when the plant is actively growing. Submerged weeds are perhaps the hardest to control where sufficient concentrations of the chemical are needed to be maintained long enough for it to kill the aquatic weed. Therefore the volume of water needs to be calculated accurately and chemicals applied uniformly to achieve the desired outcome. If the infestation is particularly large then consideration needs to be given to temporarily removing the water by drainage or pumping then drying the water body to allow access to the water weeds where effective treatment to be undertaken. After treatment, the water can be returned and the waterway restored to its pre-weed status. In a home garden situation the best control available is to manually remove all parts of the plant from the pond or aquarium and burn or allow them to dry out completely before wrapping the weeds in black plastic and disposing them.

### **What you can do?**

- Do not buy aquatic weeds for your garden pond or aquariums. Always ask for non-invasive or native pond species which will also encourage frogs.
- Avoid buying aquatic weeds from markets where invasive species are possibly being sold. Buy only from reputable nurseries.
- Do not accept any invasive or declared plants from friends or family, as this will spread weeds further.
- Never dump aquatic plants, water or fish from your pond or aquarium down drains or into waterways.
- Control any weed infestations before they spread and become a major problem.
- Report banned species to the nearest office of the Department of Agriculture and Food, or call 1800 084 881.

When sending or delivering samples, the following information is required:

- Collector's name, location (where the specimen was found), full address, description of the damage, and date collected.

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