

## Emerging aquatic weeds

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### Introduction

There are four emerging weeds that are currently threatening Goulburn-Murray Water's (G-MW) waterways. All of these plants are introduced and most have been present for over ten years. They are arrowhead (*Sagittaria graminea*), alligator weed (*Alternanthera philoxeroides*), yellow waterlily (*Nymphaea mexicana*) and fanwort (*Cabomba caroliniana*). Control of all of these weeds is being undertaken but it is only with the help of the community that these weeds can be eradicated. G-MW exercises extreme caution and control when using herbicides in or near waterways.

### Yellow waterlily

Yellow waterlily has floating leaves, attached to the ground by a stem up to 2 m long. Its beautiful, bright yellow flower is the reason why it was introduced into Australia. Yellow waterlily has rhizomes which are stems that are capable of starting a new root system (and so a new plant). In slow moving waters, such as lakes and backwaters, yellow waterlily can rapidly infest large areas. Yellow waterlily is controlled by spraying with the herbicide glyphosate, commercially known as Roundup® Biactive™.

### Arrowhead

Arrowhead is an emergent plant that grows in slow moving waters, up to 1

metre deep. Its leaves are a distinctive bright green and lanceolate in shape. Germination of arrowhead occurs from November to April, resulting in a continuous show of flowers. The flowers are white, with three petals and are found in clusters at the end of a stem.

Arrowhead may be confused with the tuberous native water plantain (*Alisma plantago-aquatica*). Water plantain also has arrow-shaped leaves but unlike arrowhead, its white flowers are on a panicle extending above the leaves. Arrowhead is spread by rhizomes and seed, which leads to the rapid development of infestations. The herbicide 2,4-D amine (low volatile formulation) is used to control arrowhead. If arrowhead is treated with 2,4-D amine, the leaves become very narrow. G-MW is currently researching timing and rates of 2,4-D amine applications, for more effective control.

### Alligator weed

Alligator weed is a rhizomatous, perennial herb from South America that is being grown as a vegetable by the Asian community. It is legally registered as a noxious weed in all states and territories of Australia. Currently the Victorian Department of Natural Resources and Environment (DNRE) is responsible for the eradication of alligator weed in Victoria.

Alligator weed is different to other aquatic weeds in that, it has the ability to infest terrestrial situations as well. It has stalkless dark green leaves arranged oppositely. Its leaves are 2–12 cm long and 0.5–4 cm wide. White flowers (1.2–1.4 cm) appear during January–March on the end of a stalk.

It can be confused with another leafy vegetable plant, Mukunu-wenna (*Alternanthera sessilis*) although this herb has smaller flowers (less than 5 mm) which are found at the leaf joints (not on the end of a stalk). If you suspect alligator weed is growing near you, please contact the DNRE.

### Fanwort

Fanwort is a submerged plant that is more often found in aquariums. It has dark leaves that are branched to form a bottle brush appearance. Its branched leaves start from a single stalk connected to the main stem. Fanwort often clears the water by taking up the nutrients and settling the soil particles. However, its rapid spread and ability to take over large areas leads to its weed status. Fanwort can be confused with the native hornwort (*Ceratophyllum demersum*) which can be distinguished from fanwort by its leaves that are whorled directly around the main stem.

Control of submerged weeds in Australia is difficult with herbicides as there are no publicly available herbicides registered for this use. Herbicides in Australia that may control submerged weeds usually persist for long periods or may even kill aquatic life. Safer, alternative herbicides that are used overseas are being investigated.

whether the plants are causing a problem, before considering them as weeds.

In irrigation systems, two main control methods are considered; mechanical control (excavation, weed cutting, etc.) and chemical control (herbicides).

### Mechanical control

In irrigation channels and drains, mechanical control methods are generally not used, as they can:

- Provide a short-term fix only.
- Change the hydraulic effectiveness of the waterway by altering the shape of the banks, beds etc.
- Spread the weed downstream.
- Be ineffective.

### Chemical control

Correctly applied herbicides are often the most effective control method for aquatic weeds. Glyphosate, 2,4-D amine, amitrole and acrolein are the only herbicides used in irrigation waters. They are selected because they do not persist for long periods

## Aquatic weed control in irrigation

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Goulburn-Murray Water (G-MW) is one of Australia's largest irrigation areas, covering over 68 000 square kilometres. It is located in northern Victoria, in an area bounded by The Great Divide to the Murray River and from Tallangatta to Swan Hill.

Goulburn-Murray Water has:

- Approximately 10 000 km of irrigation channels, drains and pipelines.
- Fourteen major storages (including Eildon, Dartmouth, Eppalock and Waranga Basin).
- Ten rivers (including the Murray, Goulburn, Campaspe and Loddon Rivers).

Aquatic Plant Services (APS) is a business unit of G-MW that offers specialist advice for controlling weeds within the irrigation area. Weeds can block water flows, infest large areas, destroy natural habitats, damage irrigation structures or contaminate agricultural production. However, not all plant growth in these waterways is detrimental to the environment or to the delivery of water to irrigators. Plants can play an important part in:

- Reducing nutrients in the water.
- Providing food and shelter for fish and wildlife.
- Reducing bank erosion.

Therefore, it is important to determine