



# Sagittaria: the new threat to southern waterways

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## IN A NUTSHELL

- ▶ Sagittaria blocks waterways and reduces the effectiveness of water distribution systems, and potentially alters the ecology and undermines the biodiversity of creeks and wetlands
- ▶ More than \$250,000 is spent annually to manage this weed in irrigation channels on both sides of the Murray River, where it has a significant impact on the provision of water for irrigation
- ▶ There is a clear need for all land and water managers to recognise the growing impact this weed is having or potentially could have if left to its own devices

***Sagittaria graminea var. platyphylla, or sagittaria as it is commonly known in New South Wales, is a plant that is creating havoc in irrigation areas of southern NSW and northern Victoria. It is of increasing concern as it is spreading at an alarming rate.***

A Sagittaria Forum was held in Barooga in March 2005 bringing together scientists and decision-makers throughout the Murray-Darling Basin. A bus tour of the Murray Valley, Broken Creek and River Murray revealed the seriousness of the weed problem and prompted the group to call for the development of a tri-state action plan to tackle the problem.

## Growing menace

Quoting the words of three forum participants says it all.

"One is always hearing about potentially 'bad' weeds, but this workshop and tour left me stunned with the seriousness of this weed in our waterways." – Alex Arbuthnot, member of the Victorian Catchment Management Council.

"To say I was gob-smacked is an understatement. The weed is almost completely choking sections of the Broken Creek and is increasingly infesting areas along the Murray River. My conclusion is that unless sagittaria is taken seriously, all the work being done on The Living Murray and the Icon Sites will be for very little gain." – Pat Feehan, Manager Environment and Natural Resources, Goulburn-Murray Water.

"The spread of sagittaria is at crisis point in the Barmah Forest, with urgent action required immediately. Sagittaria has the potential to alter the ecology within the forest by competing with other species and altering the flow of water in the forest by trapping silt and debris." – John Kneebone of Parks Victoria in Nathalia.

## Why is it a problem?

Sagittaria generally grows in water of depths less than one metre. It grows along river and creek banks, lagoons, irrigation channels and drains, and in dams and wetlands. It is an aggressive competitor and can dominate vegetation. It blocks waterways reducing the effectiveness of water distribution systems and has the potential to alter the ecology and undermine biodiversity of creeks and wetlands.

There are limited effective means to manage this weed. Chemicals registered for use in waterways do not kill the rhizomes of the plant and mechanical methods of control are not feasible in many situations such as creeks and rivers.

## Background

Sagittaria is native to the southern states of North America. The exact time of its introduction into Australia is not known however it is likely to have been brought in as an ornamental aquatic species and is still available for sale for this purpose in some states, including NSW and Victoria. Sagittaria was identified in Victoria in 1962 in the Nine Mile Creek at Wunghnu, north of Shepparton.

Sagittaria is well established in the Murray irrigation areas and districts in NSW and the Shepparton irrigation region. The impact of sagittaria on irrigators in these regions is well known. Both Goulburn-Murray Water and Murray Irrigation Ltd already spend more than \$250,000 annually to manage the weed in channels where it has a significant impact on the provision of water for irrigation. These core infestations are the major source of seed that is carried into natural waterways and wetlands, spreading the problem. The Murray, Goulburn, Edward and Loddon rivers have infestations. Over the last few years control programs have been carried out in the Murray River aimed at trying to decrease the spread downstream. As far as is known it has



not spread extensively below the Torrumbarry Weir on the Murray River and has limited distribution in the Murrumbidgee and other irrigation districts in southern NSW and Victoria. Throughout Australia its distribution is scattered with some infestations in coastal areas of NSW, Queensland, South Australia and Western Australia.

In Victoria, sagittaria is commonly referred to as arrowhead, due to the shape of the leaves. However, this plant is not to be confused with *Sagittaria montevidensis*, which is called arrowhead in NSW and commonly found in rice crops throughout the Murrumbidgee Valley. The NSW arrowhead species has a much broader leaf.

### Plant identification

Sagittaria is an emergent perennial plant that grows up to one metre when mature. It grows in various forms but in all cases the stems are triangular in cross-section.

- The most recognisable form has lance-shaped or arrow-shaped leaves which are a distinctive green colour.
- The next most prominent form has long narrow strap-like leaves. These are often more yellow in colour and can grow adjacent to or separate from the lance-shaped plants.
- The least prominent form grows under water. Its leaves are also strap-like but much shorter and grow in a rosette arrangement up to 50 cm long and almost flat against the soil.

The flowers of sagittaria plants are white, 30 mm in diameter and are always found below leaf height. Due to its many forms of reproduction sagittaria can spread rapidly. It is a prolific seeder, produces underground rhizomes (horizontal stems that put out both roots and shoots). The rhizomes can establish a new plant when they become detached. The plant also has bulbs which remain viable in the soil for many years.

### Similar species

Sagittaria can be confused with other similar looking species

such as the NSW arrowhead (*Sagittaria montevidensis*), water plantain (*Alisma plantago-aquatica*) and alisma (*Alisma lanceolatum*). Distinguishing characteristics are detailed as follows.

- Sagittaria (*Sagittaria graminea* var. *platyphylla*) has leaves with triangular stalks (petioles) and lance-shaped (lanceolate) or narrowly egg-shaped (narrowly ovate) leaf blades. Its relatively large flowers (up to 30 mm across) are white (sometimes pinkish) in colour and borne in threes on unbranched inflorescences.
- Arrowhead (*Sagittaria montevidensis*) has leaves with round stalks (petioles) and leaf blades with two pointed lobes at the base, giving them the appearance of an 'arrow-head'. Its relatively large flowers (about 25 mm across) are predominantly white in colour and borne in threes on unbranched or few-branched inflorescences.
- Water plantain (*Alisma plantago-aquatica*) is a native perennial, closely related to alisma (*Alisma lanceolatum*). It has leaf blades which are usually 10–25 cm long and 7–10 cm wide, which is wider than for alisma. The fully mature leaves are much broader than alisma with their length approximately twice their width. Its relatively small flowers (about 10 mm across) are pale pink in colour and borne in large much-branched inflorescences.
- Alisma (*Alisma lanceolatum*) is an erect perennial that can grow 1 m tall. The fully developed leaves are narrow, flattened, ovate to lanceolate in shape and carried on a long fleshy petiole. The inflorescence is an open panicle, 50 cm long and 30 cm wide, held above the leaves. It has dense clusters of mauve to cream coloured flowers.

### What is happening to manage sagittaria?

A tri-state working group and the Sagittaria Taskforce have been meeting for a couple of years and collaborating in their efforts to manage this growing problem. Together with Goulburn-Murray Water these groups organised the Sagittaria Forum held in Barooga. The forum was held as the seriousness of the problem was recognised to go beyond the resources of the groups, even though members are



**Figure 1** Sagittaria is well established in the Murray irrigation areas and districts in NSW, and the Shepparton irrigation region



**Figure 2** Sagittaria grows in various forms, and is similar to several other species, but in all cases sagittaria is characterised by stems that are triangular in cross-section



doing their utmost to address the problem. It is hoped that the decision-makers who attended the forum and the resulting tri-state action plan will help increase the profile of this serious weed problem.

There is a clear need for all land and water managers to recognise the growing impact this weed is having or potentially could have if left to its own devices.

**For readers who are not familiar with sagittaria, we urge you to become familiar with its identification and act quickly to treat any new infestations.** 🌱

#### Further information

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*Goulburn-Murray Water (2005), pers. comm. Carl Walters, Roger Baker, Mark Finlay, <http://www.g-mwater.com.au/>*

*Jim Wilding (2005), pers. comm. Wild Water Solutions*



**Figure 3** *Sagittaria (Sagittaria graminea var. platyphylla) has lance-shaped or narrowly egg-shaped (narrowly ovate) leaf blades*



**Figure 4** *The flowers of Sagittaria are relatively large (up to 30 mm across), white or pinkish in colour, and borne in threes on an unbranched inflorescence*