Declared Plant Policy
under the Natural Resources Management Act 2004

sagittaria (*Sagittaria platyphylla*)

Sagittaria is an emergent aquatic plant that is rare in South Australia. In the eastern States it is a problem weed that obstructs drains and irrigation channels. It resembles giant arrowhead, *Sagittaria montevidensis*, which is not known in South Australia, but is established in NSW and Victoria, and is the subject of a separate policy.

**Management Plan for Sagittaria**

**Outcomes**

- Maintain waterways free of blockages by water weeds.
- Maintain wetlands free of major weed threats.

**Objectives**

- Eradicate current infestations on the Murray and in dams in the Mount Lofty ranges
- Prevent further introduction of sagittaria to waterways and wetlands.

**Implementation**

- Any infestations of sagittaria discovered to be treated as incursions and destroyed.
- To prevent introduction or spread, any sale and movement to be prohibited.
- NRM authorities to inspect waterways, wetlands and drainage channels for the presence of water weeds.

**Regional Implementation**

Refer to regional management plans for further details.

<table>
<thead>
<tr>
<th>NRM Region</th>
<th>Actions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adelaide and Mount Lofty Ranges</td>
<td>prevent entry or sale; destroy infestations</td>
</tr>
<tr>
<td>Aliny tjara Wilurara</td>
<td>Limited action</td>
</tr>
<tr>
<td>Eyre Peninsula</td>
<td>prevent entry or sale; destroy if detected</td>
</tr>
<tr>
<td>Kangaroo Island</td>
<td>prevent entry or sale; destroy if detected</td>
</tr>
<tr>
<td>Northern and Yorke</td>
<td>prevent entry or sale; destroy if detected</td>
</tr>
<tr>
<td>South Australian Arid Lands</td>
<td>Limited action</td>
</tr>
<tr>
<td>South Australian Murray Darling Basin</td>
<td>Contain spread</td>
</tr>
<tr>
<td>South East</td>
<td>prevent entry or sale; destroy if detected</td>
</tr>
</tbody>
</table>

**Declaration**

To implement this policy, sagittaria is declared under the *Natural Resources Management Act, 2004* throughout the whole of the State of South Australia so that cultivation, sale and
movement of plants can be prevented. The movement or transport of the plant on a public road by itself or as a contaminant, its entry to the State, or the sale by itself or as a contaminant are prohibited. In all NRM regions, land owners are required to destroy sagittaria plants growing on their land. Notification of the presence of plants is necessary to ensure any incursions are promptly destroyed.

Sagittaria is declared in category 1 under the Act, for the purpose of setting maximum penalties and for other purposes. Any permit to allow its movement or sale can only be issued by the Chief Officer pursuant to section 188.

The following sections of the Act apply to sagittaria throughout each of the NRM regions noted below:

<table>
<thead>
<tr>
<th>Sections of Act</th>
<th>AMLR</th>
<th>AV</th>
<th>EP</th>
<th>Ki</th>
<th>NY</th>
<th>SAAL</th>
<th>SAMDB</th>
<th>SE</th>
</tr>
</thead>
<tbody>
<tr>
<td>175(1) Prohibiting entry to area</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>175(2) Prohibiting movement on public roads</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>177(1) Prohibiting sale of the plant</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>177(2) Prohibiting sale of contaminated goods</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>180 Requiring notification of infestations</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>182(1) Landowners to destroy the plant on their properties</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>182(2) Landowners to control the plant on their properties</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>185 Recovery of control costs on adjoining road reserves</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>

Review

This policy is to be reviewed by 2020 or in the event of a change in one or more regional management plans for sagittaria.

Weed Risk

Invasiveness

Sagittaria spreads by seeds and rhizome fragments which may be carried in flood waters, on birds or by machinery used in dredging or excavation. The seeds have small hooks and are produced in large numbers; these characteristics, and their capacity to float, aid their dispersal.

It spreads locally by stolons which develop from the base of the plant during the growing season, extending up to 30 cm before forming either a dormant corm or additional stem and leaf growth. Sprouting of corms is determined by the temperature of the surrounding water and mud. Seed germinates in very moist mud when temperatures rise in spring.

Impacts

Sagittaria competes with native aquatic vegetation and also interferes with flood irrigation and channel drainage schemes. It normally grows as an emergent with leaf blades above the water surface, but can also survive as a fully submerged plant in clear water. Its rate of spread, difficulty of control and the potential to completely dominate an environment makes it a greater problem for irrigation that many other aquatics. Sagittaria also has the ability to invade wetlands and permanently alter their biology.
Sagittaria leaf and stem material is readily grazed by cattle and sheep with no ill effects but makes an unknown contribution to their nutrition.

**Potential distribution**

Sagittaria may invade wetlands, header, lateral and drainage channels on the flood irrigated areas adjoining the Murray River, as well as dam spillways, ponds and water courses throughout the State. The drainage systems of the Upper South East are at risk if sagittaria is introduced to that region. It tolerates a high level of salinity, for example growing on the sea coast in the Mississippi Delta within its native range.

**Feasibility of Containment**

**Control costs**

Control is difficult as infestations would occur in water or areas of deep mud. This restricts access with herbicide application equipment. Herbicide use would also be complicated by the close proximity of infestations to water resources used for irrigation, human and livestock consumption and to plants susceptible to off-target damage.

Sagittaria is not controlled by a single application of any available herbicide. Physical removal of plants and corms has been effective in some areas, but is expensive.

**Persistence**

The rhizomes of sagittaria enable it to persist invisibly under water or in temporarily dried-out wetlands. It is only noticeable when in active growth or flowering.

**Current distribution**

Sagittaria has been found in several dams and ponds in the southern Mount Lofty Ranges and Fleurieu Peninsula where it was planted, and is also likely to persist in some ornamental garden ponds in urban areas. It has now disappeared from most sites on the Murray River but may still persist in places where it is almost permanently submerged.

**State Level Risk Assessment**

Assessment using the Biosecurity SA Weed Risk Management System gave the following comparative weed risk and feasibility of containment scores by land use:

<table>
<thead>
<tr>
<th>Land use</th>
<th>Weed Risk</th>
<th>Feasibility of control</th>
<th>Response at State Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aquatic</td>
<td>medium</td>
<td>very high</td>
<td>contain spread</td>
</tr>
<tr>
<td></td>
<td>84</td>
<td>3</td>
<td></td>
</tr>
</tbody>
</table>

**Considerations**

Sagittaria was first recorded in South Australia in 1964 from the Torrens Gorge, and in 1966 on the River Murray between Mannum and Walker Flat. A survey of the river in 1983 found a total of 20 hectares of sagittaria along the main channel and backwaters, upstream of Mannum and in the Wall Flat Irrigation Area. With the abandonment of flood irrigation in favour of piped
irrigation, sagittaria has now disappeared from most sites and any remnant infestations on the Murray are hard to locate.

Risk assessment indicates containment as the management action at State level; this is implemented by destroying infestations as found in the regions where sagittaria can grow.

Sagittaria has been recognised as a Weed of National Significance and is the subject of a national control strategy.

A form of Sagittaria platyphylla has formerly been sold in Australia as ‘chain sagittaria’ or Sagittaria teres. Other Sagittaria species are sold as the vegetable ‘duck potatoes’ under various names including S. sagittifolia, S. sinensis and S. trifolia. As these names are loosely applied, it is possible that some of this material is really S. platyphylla.

**Synonymy**


Nomenclatural synonym:

*Sagittaria graminea* Michaux, Flor. Bor. Am. 2:396 (1803)

Taxonomic synonyms:


*Sagittaria teres* S.Watson, Manual ed. 6: 555 (1890).

Other common names include arrowhead, elliptic-leaved arrowhead, chi gou and nar gou.