



**Shoalhaven City Council Weed Management Plan – Salvinia**

**Common name:** Salvinia

**Botanic name:** *Salvinia molesta*

**South East Regional Priority Weed Objective – Recommended Regional Measure**

*Land managers should mitigate the risk of new weeds being introduced to their land. The plant should be eradicated from the land and the land kept free of the plant. Notify local control authority if found.*

**Mandatory measure: Prohibition on dealings.** *Must not be imported into the State or sold*

**Salvinia** has the potential to spread to much of Australia and is regarded as a serious threat to waterways and irrigation areas because it:

- disrupts aquatic ecosystems, seriously affecting native animals and plant life;
- decreases the quality of water by causing odours, accumulation of organic matter and stagnation of streams;
- degrades the aesthetic value of waterways;
- reduces or prevents the use of waterways for recreation and transport;
- interferes with the functioning of river control structures, especially during flooding.
- Even though it is prohibited from sale in New South Wales, occasionally, it is traded as an aquarium plant. The plant itself has to be physically transported as it cannot move from one aquatic system to another unaided. Animals and water birds are therefore a significant means of spreading the weed. Salvinia doesn't normally produce viable seed in Australia, but anecdotal evidence suggests that a small percentage of spores may be viable.
- Salvinia is capable of vegetative spread in two main ways:
  - by breaking into daughter plants;
  - by the separation of young growth through death or damage of the parent material connecting these sections.
- Daughter plants grow when an abscission layer (where the leaf stem joins the plant stem) develops at each node following stem branching. This process occurs very quickly in uncrowded, favourable growing conditions.

**What does Salvinia look like?**

**Leaves**

The leaves of this weed float on the water surface, are paired and round-to-oval in shape, with dense, waxy hairs on the upper surface. The shape and size of leaves vary with age and the degree of crowding. In open water during its primary growth stage, the plant has flat, well-shaped leaves. As the weed begins to increase in density, the leaves start to fold, with only the midrib touching the water surface. Folding of the leaves is very distinct when a mat of Salvinia forms.

**Stems**

Stems are submerged, green, branched, and covered with fine hairs. Their function is to join the paired, floating leaves and to support the roots which develop at each node. axillary buds are located at each node along the stem.

**Roots**

Thought to be a modified leaf, the roots form into trailing, hairy strands up to 25 cm long. Under crowded or mat conditions, up to 4 stalks develop among the roots, each bearing a chain of sterile sporocarps (the spore-producing part of the plant).

**General Biosecurity Duty**

*All plants are regulated with a **general biosecurity duty** to prevent, eliminate or minimise any biosecurity risk they may pose. Any person who deals with any plant, who knows (or ought to know) of any biosecurity risk, has a duty to ensure the risk is prevented, eliminated or minimised, so far as is reasonably practicable*

The **Biosecurity Act 2015** and the **Biosecurity Regulation 2017** set out a range of penalties for non-compliance with the provisions of the legislation. Penalties range from \$1,000.00 on the spot fines, through to court imposed penalties of up to a maximum of \$220,000 for individuals or \$440,000 for corporations for failing to discharge a biosecurity duty. If an offence is proven to have been committed negligently, the court may impose a penalty of a maximum of \$1,100,000 for an individual and \$2,200,000 for a corporation.

Chemical control calendar											
January	February	March	April	May	June	July	August	September	October	November	December
<b>Glyphosate 360 g/L</b> (Only products registered for aquatic use) Rate: 1 L in 100 L of water. PERMIT <a href="#">14327</a> Expires 30/06/2022 Apply in warmer months for best result. Maximum 4 applications per year. Not to be applied within 500 m of potable (drinking) water uptake. NIL withholding period											
<b>Metsulfuron-methyl 600 g/kg</b> (Brush-off®) Rate: 10 g per 100 L (plus wetter at 200 mL per 100 L) PERMIT <a href="#">84767</a> Expires 31/05/2020. Apply in warmer months for best result. Comments: May only be applied in enclosed water bodies, and not within 400 m of potable (drinking) water supply uptakes. WARNING: very toxic to aquatic plants and algae. Apply a maximum of 3 applications per year at minimum intervals of 90 days. NIL withholding period however allow 7 days before and after application to allow chemical uptake in target plants											
<b>Diquat 200 g/L</b> (Reglone®) Rate: 400 mL per 100 L of water. Comments: Spot spray to wet all foliage thoroughly, add Agral 600. Observe withholding period. Withholding period: 1 day in pasture, 10 days in treated water.											
<b>Diquat 200 g/L</b> (Reglone®) Rate: 5.0–10.0 L/ha Comments: Boom spray to wet all foliage thoroughly, add Agral 600. Observe withholding period. Withholding period: 1 day in pasture, 10 days in treated water.											
<b>Herbicides are a safe and effective method of control</b> as part of an integrated Salvinia management plan. Use of herbicides does not stop the need to manage Salvinia infestations effectively. The aim of herbicide treatment is to minimise the spread of Salvinia. Always treat “outliers each season and work continuously on larger sections to reduce the density and abundance of Salvinia. <p style="text-align: center;"><b>ALWAYS READ THE LABEL AND USE CHEMICALS IN ACCORDANCE WITH MANUFACTURER’S RECOMMENDATIONS</b></p> <p style="text-align: center;">Refer to NSW DPI Weedwise website: <a href="http://weeds.dpi.nsw.gov.au/WeedBiosecurities?Areald=114">http://weeds.dpi.nsw.gov.au/WeedBiosecurities?Areald=114</a>            Salvinia page: <a href="http://weeds.dpi.nsw.gov.au/Weeds/Details/118">http://weeds.dpi.nsw.gov.au/Weeds/Details/118</a></p>											

<p><b>Control:</b> Successful management of Salvinia relies on early detection, action and implementation of an integrated control program. Varying infestations may require a different method or a combination of biological, mechanical and herbicide control techniques. With its high growth rate and ability to adapt to a wide range of environments, Salvinia represents a serious threat to Australian waterways. Before attempting a new control program, land managers should seek expert advice from either the local control authority or NSW Department of Primary Industries.</p>
<p><b>Mechanical control:</b> Floating booms or nets on waterways have been used to help contain Salvinia infestations and limit the spread of the plant to other areas or waterways. These barriers, however, give only short-term relief and are best used along with chemical control programs. Mechanical removal is an option for small infestations only (due to their high costs) and care needs to be taken to remove all plants to prevent rapid re-growth.</p>
<p><b>Chemical:</b> Controlling Salvinia with herbicides depends on having good access to the weeds in well-defined waterways. Reedy banks and swampy backwater areas, protect the plant and reduce the effectiveness of chemical control. Reinfestation of a waterway can occur rapidly from these sites. Due to this regenerative ability, infestations of Salvinia should be controlled early to prevent them getting out of control. Dense, mature infestations are also difficult to control with herbicides. In this situation, it is difficult to gain effective herbicide contact with the plant due to the densely-folded and compact nature of the weed.</p>
<p><b>Water Quality Management:</b> Vigorous growth rates of any water weed is usually an indication of high nutrient levels in the water. As part of a control program for Salvinia, nutrient run-off into an infestation should be minimised. Heavy nutrient loadings in water come from erosion of cultivated land, cattle yards, domestic and municipal sewerage outfalls and waste water discharges from factories. This nutrient inflow can be reduced by using conservation farming practices and by diverting effluent before it enters waterways.</p>

<p><b>Useful references:</b>            NSW Weedwise: <a href="http://weeds.dpi.nsw.gov.au/WeedBiosecurities?Areald=114">http://weeds.dpi.nsw.gov.au/WeedBiosecurities?Areald=114</a>            Biosecurity Act 2015: <a href="https://www.legislation.nsw.gov.au/acts/2015-24.pdf">https://www.legislation.nsw.gov.au/acts/2015-24.pdf</a>            Biosecurity Regulation 2017: <a href="https://www.legislation.nsw.gov.au/regulations/2017-232.pdf">https://www.legislation.nsw.gov.au/regulations/2017-232.pdf</a>            South East Regional Strategic Weed Management Plan: <a href="http://southeast.ils.nsw.gov.au/_data/assets/pdf_file/0006/722706/South-East-Regional-Weed-Mgmt-Plan.pdf">http://southeast.ils.nsw.gov.au/_data/assets/pdf_file/0006/722706/South-East-Regional-Weed-Mgmt-Plan.pdf</a></p>
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