Alligator weed poses an extreme threat to Queensland’s waterways, wetlands and irrigated crops. It establishes from small plant pieces in water and soil. The only limiting factor is the availability of water or rainfall. Under favourable conditions, the plant grows out from banks to form floating mats of dense interwoven stems. These can be dislodged by water movement (especially during floods) and these floating mats can restrict water flow in creeks, channels and drains; impede recreational water sports and boating access and damage pumping and irrigation equipment and other structural features.

On land, alligator weed is capable of out-competing all but the most robust plant species, including wetland natives and crops.

**Legal requirements**

Alligator weed is a category 3 restricted invasive plant under the *Biosecurity Act 2014*. It must not be given away, sold, or released into the environment. The Act requires everyone to take all reasonable and practical steps to minimise the risks associated with invasive plants under their control. This is called a general biosecurity obligation (GBO). This fact sheet gives examples of how you can meet your GBO.
At a local level, each local government must have a biosecurity plan that covers invasive plants in its area. This plan may include actions to be taken on certain species. Some of these actions may be required under local laws. Contact your local government for more information.

Description

Alligator weed is a perennial plant that grows on land in damp soil, or in water.

The stems are hollow when mature and can be single or branched. Stems can lie flat or upright. The flat stems can be light green, yellow or brown to red. Upright stems are dark green, can be up to 80 cm or longer. Stems have pairs of leaves at each node.

Leaves with no leaf stalk (petiole), they are spear-shaped in opposite pairs along the stems. They are generally dark green waxy, glossy, and range in size from 2–12 cm in length and 0.5–4 cm wide with an acute tip. Flowers are white, paper-like, ball-shaped that appear around mid-summer and are carried on short (2–7 cm) stalks growing from the leaf stem joint.

On land, it produces underground stems (rhizomes) that may extend to a depth of 1 m in soil. Rhizomes are less obvious in semi-aquatic habitats, while aquatic plants only develop roots from nodes on the stem. In aquatic situations, stems build up into large, interwoven, floating mats. These mats can reach a thickness of up to 1 m.

Alligator weed is often confused with two other plants that grow over the water surface from the banks. They are:

- water primrose, which has bright-yellow flowers
- smartweed, which has alternate, wavy-edged leaves, often with a dark blotch on the leaf surface and with small, pink flowers on long flower spikes.

Life cycle

Alligator weed forms new shoots in spring from nodes on existing stems or rhizomes. It flowers from mid-summer to March, but does not produce viable seed. Severe frosts kill stems, but regrowth occurs quickly from stems or underground rhizomes buried in soil when favourable conditions return. In aquatic situations, stems break and float away to form new mats or take root in shore sediments.

Methods of spread

The aquatic form is spread by fragments breaking off and floating downstream. In terrestrial spread is by being very aggressive and taking over and by people planting it.

Habitat and distribution

Native to South American, alligator weed grows under a wide range of conditions on land and water. Optimum growth occurs in fresh water with a high nutrient level. It can tolerate brackish water and, once established on land, will survive extreme dry periods.

Considering its vigorous growth and ability to re-establish from stem fragments, alligator weed has the potential to establish in all Queensland coastal areas and inland agricultural and urban areas (where water is not a limiting factor).

El stands for Ecoclimatic Index and represents the areas where alligator weed could potentially occur, given the existing climatic conditions of an area and the climatic conditions preferred by alligator weed. The higher the index, the more suitable are the local climatic conditions to support alligator weed.

Control

Managing alligator weed

The GBO requires a person to take reasonable and practical steps to minimise the risks posed by alligator weed. This fact sheet provides information and some options for controlling alligator weed.

A number of control methods are available for alligator weed. It is important that nothing is planted in the area being treated until it is certain the infestation is controlled. Landholders should contact Biosecurity Queensland to discuss the most appropriate method for control in each situation.

Prevention and early detection

Prevention and early detection is the only way of limiting alligator weed. Look for unfamiliar plants, particularly in aquatic areas. Do not allow invasive plants to establish and always treat any small infestations before they can spread.

Any suspected infestations of alligator weed should be reported immediately to the nearest Biosecurity Queensland office.

Mechanical control

Successful mechanical control of this plant is extremely difficult since the plant is able to re-establish from very small pieces.

Spread to other areas is likely to occur by two methods if care is not taken. These are:

1. re-establishment from stem fragments that are left behind
2. loss of spillage at the dump site or in transit.

Equipment, vehicles and clothing (especially soles of shoes) should be inspected before leaving the affected area. Drying and burning or deep burial of the desiccated weed material is essential. Follow-up inspections of both the removal and disposal areas are essential to check for regrowth. In New South Wales coastal areas, excavation equipment (especially those with tracks) have been the main cause of alligator weed spread.

Biological control

Three biological control agents from South America have been introduced into Australia for the control of alligator weed. Two of these insects are established and contribute to control of alligator weed growing in the aquatic habitat, but not when it grows on land.
Flea beetle (*Agasicles hygrophila*)

Both the adults and larvae feed on the underside of leaves and aerial parts of alligator weed. The insect causes a reduction in photosynthesis (energy production), which weakens the plant.

If insect numbers are high, the beetles also feed on the stems, which become prone to infection from pathogens or desiccation. Pupation occurs inside the hollow stems and newly emerged adults cut a hole and exit the stems. The stems are then prone to waterlogging and secondary rotting as water enters the emergence hole, contributing to the demise of the weed.

Stem boring moth (*Vogtia malloi*)

Larvae bore into the internode and down the hollow stem causing it to collapse. One insect can destroy between five and nine stems of alligator weed.

Biological control has proven to be very effective on aquatic infestations of alligator weed. However, terrestrial plants have proven to be far less susceptible to insect attack.

### Table 1. Herbicides for the control of alligator weed

<table>
<thead>
<tr>
<th>Situation</th>
<th>Herbicide</th>
<th>Rate</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Terrestrial plants</td>
<td>Metsulfuron-methyl (e.g. Brush-off&lt;sup&gt;®&lt;/sup&gt;, Ken-Met 600&lt;sup&gt;®&lt;/sup&gt;)</td>
<td>80 g/ha + 1 mL/L non-ionic wetter or 10 g/100 L water + 1 mL/L non-ionic wetter</td>
<td>Apply in terrestrial situations only&lt;br&gt;Follow-up applications over several seasons are essential for complete control&lt;br&gt;A ‘two-hit’ strategy (with second application one to two weeks after the initial treatment only to any plants missed in the initial treatment) in January, March and May is recommended&lt;br&gt;Allow maximum regrowth before re-treatment and time the final treatment as close to the start of winter to ensure maximum movement of the herbicide to the rhizomes&lt;br&gt;Ensure all plants and regrowth receive at least three double treatments during the season. Boom spray large infestations and (if necessary) use pneumatic sprays or brushes to apply in garden-type settings or where uptake by neighbouring plants may be a problem. Follow-up with spot treatment if necessary and inspect the area for regrowth in the next growth season</td>
</tr>
<tr>
<td>Terrestrial plants</td>
<td>Aminopyralid 375 g/kg plus Metsulfuron-methyl 300 g/kg (e.g. Stinger&lt;sup&gt;®&lt;/sup&gt;)</td>
<td>20 g/100 L water plus wetting agent (consult label)</td>
<td>Apply in terrestrial situations only&lt;br&gt;Follow-up applications over at least two seasons are essential for complete control</td>
</tr>
<tr>
<td>Free-floating plants</td>
<td>Glyphosate 360 g/L registered for use in aquatic situations (e.g. Roundup Biactive&lt;sup&gt;®&lt;/sup&gt;)</td>
<td>10 mL/L</td>
<td>Apply any time when actively growing, from summer through winter (floating form only)</td>
</tr>
<tr>
<td>Non-potable waterways</td>
<td>Metsulfuron-methyl (e.g. Brush-off&lt;sup&gt;®&lt;/sup&gt;, Ken-Met 600&lt;sup&gt;®&lt;/sup&gt;) + 1 mL/L non-ionic wetter</td>
<td>10 g of product per 100 L water</td>
<td>PERMIT 10221 (expires 31/12/2022)&lt;br&gt;Restricted to certain users (see permit)&lt;br&gt;Maximum rate of 600 L/ha of weed surface&lt;br&gt;ONLY apply as a spot spray using calibrated knapsack or hand-gun equipment</td>
</tr>
</tbody>
</table>

Multiple formulations of glyphosate are available, but not all are suitable. Use only formulations registered for aquatic situations that include alligator weed on the label.

Read the label carefully before use. Always use the herbicide in accordance with the directions on the label.