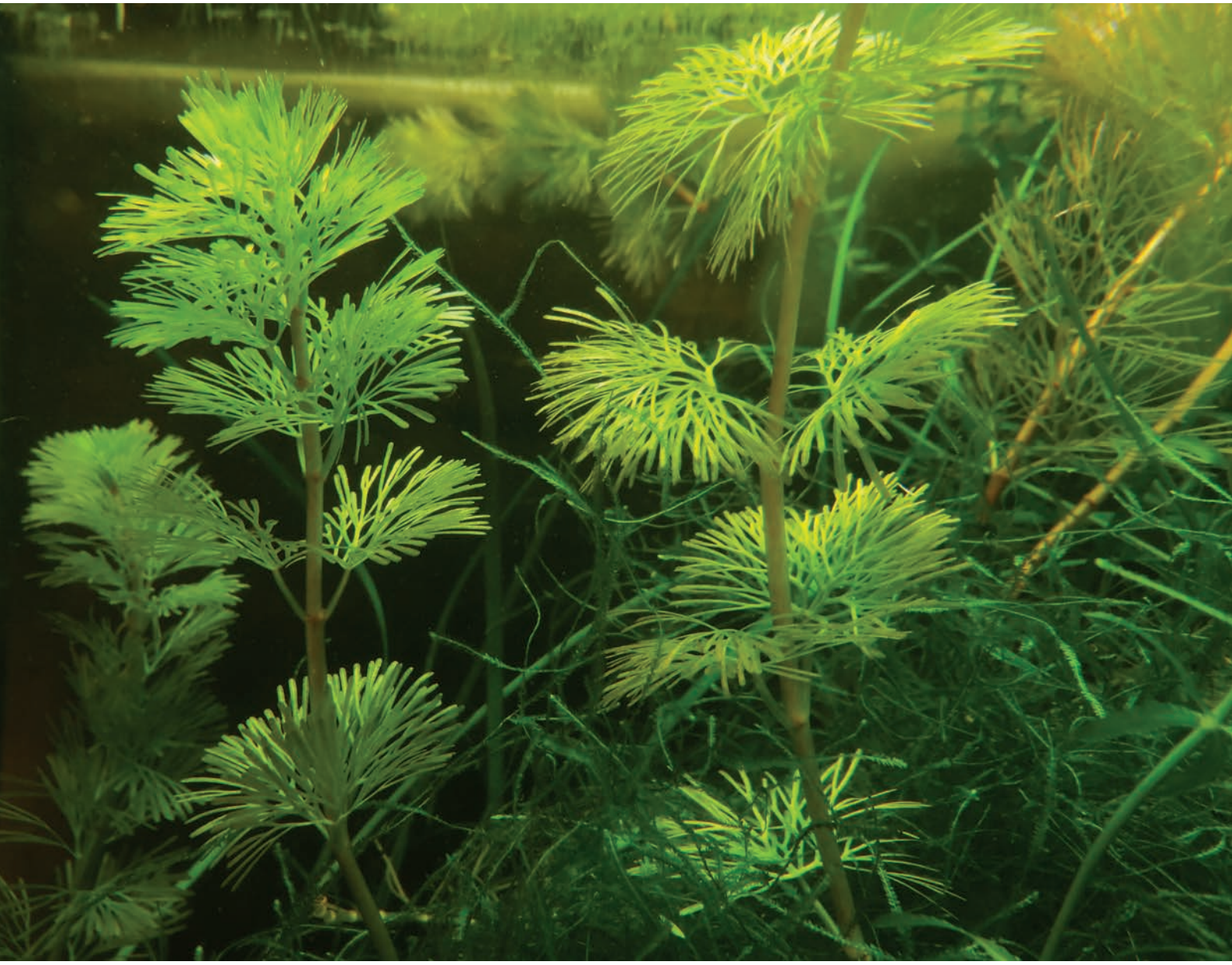
Cabomba

Cabomba species including Cabomba aquatica, Cabomba caroliniana, Cabomba furcata (Cabcomba piauhyensis), Cabomba haynesii and Cabomba palaeformis



Cabomba is a popular aquarium plant. However, released into natural waterways, its rapid growth allows it to dominate native vegetation and obstruct creeks and wetlands, lakes and dams. Cabomba quickly forms a dense monoculture that effectively blocks sunlight and thereby outcompetes native plants. Cabomba thickets interfere with swimming, boating and fishing resulting in high ongoing management costs.

Cabomba adversely affects water quality by imparting colour and taints. This increases the cost of treating potable water and impairs the sustainable use of drinking water storages. Broken cabomba stems can interfere with water infrastructure by blocking water intake pipes.

Queensland Government

Legal requirements

Cabomba caroliniana 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.

All other cabomba species are a prohibited invasive plant under the *Biosecurity Act 2014*. The Act requires that all sightings must be reported to Biosecurity Queensland within 24 hours.

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 cabomba. Some of these actions may be required under local laws. Contact your local government for more information.

Description

Five species are currently recognised: *Cabomba aquatica, Cabomba. caroliniana, Cabomba furcata (Cabomba piauhyensis), Cabomba. haynesii* and *Cabomba palaeformis*. All are perennial, aquatic herbs growing below the water surface.

Cabomba caroliniana may have stems up to 10 m long. The submerged leaves and stems have a thin gelatinous coating, with the leaves being opposite and repeatedly divided to form feathery, fan-shaped structures.

Flowers are produced above the surface and colour is dependent on species and sub-species. Flowers of *Cabomba caroliniana* and *Cabomba palaeformis* tend to be white, while *Cabomba aquatica* flowers are yellow and those of *Cabomba furcata*, purple.

Only *Cabomba caroliniana* is established in Queensland. The foliage ranges in colour from brownish to bright green and can have a purple tinge. The stems can be whitish, green or purple. The colour of foliage and stems is predominantly affected by environmental factors such as shading and nutrients in the water.

If unsure of whether or not the plant is cabomba, take samples to your local government or Biosecurity Queensland office.

Cabomba can be confused with a range of native water plants, including hornwort (*Ceratophyllum demersum*), milfoils (*Myriophyllum* species) and marshweeds (*Limnophila* species). All these species have whorled leaves around the centre stem where cabomba has distinct fan shaped leaves attached to the stem by a leaf stalk (petiole). Hornwort is rough to touch and wiry while cabomba is soft and sometimes slimy.

Life cycle

Cabomba flowers and has its maximum growth period in summer. It predominantly reproduces and disperses through stem fragments but also produces seeds for long term survival.

Methods of spread

Seeds could potentially be dispersed by water birds and fragments are moved by water currents and floods. However, intentional and unintentional transport of cabomba fragments by humans is the most common source of new infestations. Mostly by people using the plant in aquaria and disposing unwanted material into local waterways or by people not washing down watercraft after recreational activities in water bodies that have cabomba infestations before moving to another location.

Cabomba is also frequently transported in fishing gear (e.g. eel traps). It can survive considerable time out of the water, therefore good weed hygiene is crucial to prevent further spread.

Habitat and distribution

Cabomba grows in ponds, lakes and quiet streams. It is generally rooted in water 1–3 m deep (down to 6 m deep water clarity permitting) but can continue to grow free-floating if uprooted. It does well in both cool and warm waters but does not tolerate overly warm water (above 30°C). Cabomba prefers slightly acidic to neutral water (pH 6–7) and alkaline waters (pH >8) are not conducive to its growth. Cabomba needs fine substrates that provide sufficient nutrients for healthy growth.

Cabomba caroliniana is the only species known to be naturalised in Queensland. It occurs in several locations in the wet tropics, most notably, Leslie Creek on the Atherton Tablelands. South East Queensland has a large number of cabomba infestations in drinking water reservoirs, creeks and urban lakes. Lake MacDonald near Noosa has the largest cabomba infestation in Australia.

Control

Managing cabomba

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

Prevention and early detection

The major concern at present is to stop further introduction of cabomba into natural waterways and dams.

The threat to Queensland waters by cabomba should be made known throughout the community. Cabomba from aquariums should be disposed through general waste or composting to avoid its spread.

It is illegal to possess or sell any species or variety of cabomba anywhere in the Queensland. Early detection of cabomba infestations is essential, as eradication of larger infestations become costly and unfeasible.

Mechanical control

Mechanical removal of small infestations can be accomplished by pulling (in deeper areas scuba gear may be required), taking care to remove all of the plant to prevent re-infestation. The removed plants must be properly disposed of or destroyed. Great care must be taken not to create new fragments during mechanical control as this would only increase the spread of the plant.

Cabomba is a true aquatic and is therefore susceptible to dehydration. Removing the water (called 'drawdown') and exposing the stems and leaves for several months can be effective as long as cabomba material is allowed to completely dry out. This can be hard to achieve during the wet season, therefore drawdown is most effective in areas that have dry hot summers. Cabomba stems can survive in moist mud for extended periods of time, so repeated drawdowns might be necessary for complete control.

Herbicide control

Before using any herbicide always read the label carefully. All herbicides must be applied strictly in accordance with the directions on the label.

More information

More information is available from your local government or visit biosecurity.qld.gov.au.

Table 1. Herbicides for the control of cabomba (*Cabamba caroliniana*)

Situation	Herbicide	Rate	Comments
Control of submerged plants in enclosed water bodies and margins of larger open aquatic systems, including natural water bodies	Flumioxazin 15 g effervescent tablet (Clipper aquatic herbicide)	**Direct tablet application** **High concentration** Apply one tablet for every 37.5 m^3 of water to achieve active 400 parts per billion **Low concentration** Apply 1 tablet for every 75 m^3 of water to achieve active 200 parts per billion	Refer to general instructions and application on the product label to determine the appropriate application type based on application area and water depth Correct estimate of water volume is critical to achieve correct dosage for efficacious control and prevent non-target damage. Spread out the tablets evenly to get even distribution of herbicide in the water collumn Application rate will depend on the pH of the water and the amount of vegetation. For most situations the low rate should be sufficient for efficient cabomba control as the plant is very sensitive to flumioxazin Preferably apply early in the day to avoid high pH later in the day which will cause rapid breakdown of the active Check withholding periods on label. Withholding periods for drinking water is 10 days. No restrictions for reentering water or stock watering. DO NOT use unless accredited by the Supplier (accreditation through clipperaquatic.com.au) DO NOT apply during the months June to August (NT, QLD and WA north of 28th S latitude)
Non-flowing water bodies	Carfentrazone-Ethyl 240 g/L (Shark Aquatic Herbicide)	830 mL Shark Aquatic Herbicide per 100 000 L water [2 ppm (2 mg/L) Carfentrazone-ethyl]	To control cabomba, apply Shark Aquatic Herbicide onto the surface or below the surface of the water where cabomba is growing. The intention is to achieve a concentration of 2 ppm (2 mg/L) carfentrazone-ethyl in the water where cabomba is growing. This requires application of the product over/into the water where cabomba is growing. The application should be spread evenly over the cabomba infestation regardless of the type of application used DO NOT treat water where cabomba is not growing DO NOT apply where desirable species are present In areas where subsurface injection is not practical, ensure that low drift application methods and equipment are used. Apply by drip or handheld boom sprayer, using a minimum of 50 L water. To minimise drift when applying Shark Aquatic Herbicide to the water surface use a high-flow, minimal-drift nozzle. Use nozzles that are designed to produce spray droplets with **very coarse** to **extremely coarse** droplet sizes (›300 µm). Use nozzle types such as Air Induction, low pressure fans, flooding flat fan nozzles and other nozzle types commonly used for 'flood' applications to soils. Always follow the nozzle manufacturer's recommendations for spray pressure, spacing and height above the water surface DO NOT use an adjustable handheld spray nozzle in order to avoid deoxygenation of the water DO NOT apply to more than 50% in volume of the waterbody in a single application DO NOT apply subsequent applications to the waterbody within 3 months NOTE: Algae and non-target plants may also be affected by this application Very toxic to aquatic life Other aquatic species may be susceptible to this product

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