

# Cabomba

## *Cabomba caroliniana*

HABIT	STEMS & BRANCHES	LEAVES	FLOWERS	REPRODUCTION
				
<p>Cabomba is a mostly submerged perennial plant, 2 - 10m long. Plant is usually rooted to the water body floor, but can survive unattached.</p>	<p>Stems are branched with white or reddish brown hairs growing on them.</p>	<p>There are two types of leaves. Below the water they have opposite fan shaped leaves that grow on a 3cm stem (right). Above the water they have 2cm elliptical leaves (left).</p>	<p>White/yellow flowers are 2cm wide and form on short stems just above the water's surface. Often a pink tinge on their tips. Flowers all year in the Northern Territory.</p>	<p>Cabomba reproduces and spreads by the movement of small plant pieces. In the NT it also reproduces by seed. Seeds are approximately 4mm long.</p>

**Cabomba is declared a Class A (to be eradicated) and Class C (not to be introduced) weed in the Northern Territory and is a Weed of National Significance in Australia.** Cabomba is a declared weed in accordance with the *Weeds Management Act*.

### The problem

Cabomba is a submerged aquatic plant native to the Americas, that was originally introduced to Australia as an aquarium plant. In Australia, cabomba is highly invasive and can rapidly infest waterways.

Cabomba can negatively impact water quality, by increasing turbidity and nutrient loading, reducing dissolved oxygen levels and decreasing flow. Cabomba can rapidly displace native plant species and form dense monocultures. This negatively affects fauna populations, including fish, mammals, monotremes (platypus) and reptiles.

Decreased ecosystem health and reduced water quality resulting from cabomba infestations can significantly impact social, cultural and industrial uses of affected water and waterways. In particular tourism, fishing, aquaculture and horticulture industries could be severely affected if cabomba was to spread further in the Northern Territory.

Cabomba infestations can also significantly reduce water storage capacity and taint drinking water supplies. Potential impacts on dam capacity and water quality are of particular concern as Darwin River Dam, which supplies 90% of Darwin's potable water, is located only 6 km upstream from the original cabomba infestation at Darwin River.

## **Habitat and distribution**

Cabomba was first recorded in Australia in 1967, probably as a result of being introduced through the aquarium industry trade. Cabomba has a wide potential range, as it can grow in humid, sub-humid and temperate regions. To date cabomba has spread into Queensland, New South Wales, Victoria and the Northern Territory.

Establishment and growth rates are optimal in areas which receive direct sunlight, have minimal water flow, are nutrient rich and are one to three metres deep. Cabomba is therefore well suited to establishment in the permanent freshwater bodies of the Top End of the Northern Territory, including floodplains and billabongs.

Cabomba was first recorded in the NT in 1996 at Marlow Lagoon, Palmerston. After multiple unsuccessful attempts at physical control, a single application of the herbicide, Agricrop Rubbervine Spray resulted in complete eradication. In 2004 another cabomba outbreak was identified in the Darwin River area. Subsequent surveys identified infestations at multiple locations along an 11 km stretch of the river. Physical and chemical control efforts have reduced this infestation to an estimated 1% of its initial size. The only remaining cabomba stands are now limited to Lok Landji Billabong in the lower Darwin River.

## **Cabomba control in the Northern Territory**

Given the currently limited extent of cabomba in the Northern Territory, the enormous potential range and the scope for extensive environmental, social and economic impacts, eradication has been established as a priority. The Cabomba Eradication Program, which is administered by the Northern Territory Government, aims to eradicate all known infestations of cabomba from the Northern Territory, and to prevent all future introductions of plants within the genus, to the Northern Territory.

## **Eradication**

Water level manipulation and physical removal have failed to eliminate major cabomba infestations in the Northern Territory or elsewhere in Australia. These control options were not considered suitable for the Darwin River site due to the size and location of the infestation. Chemical control was considered a necessary component of an integrated control program, which also incorporated the use of shading to reduce sunlight and floating booms to prevent the movement of floating fragments.

Agricrop Rubbervine Spray, which contains the active ingredient 2,4-D n-butyl ester, is a systemic herbicide used to control many types of weeds. It is used internationally in cultivated agriculture, rangeland applications and to control aquatic vegetation. Based on the successful eradication of cabomba in Marlow Lagoon using 2,4 D n-butyl ester it was, and still is, considered the most suitable management option for the Darwin River situation.

2,4-D-n-butyl ester is not registered for use in Australia. Its purchase and use can only be made with the successful application of an off-label permit through the Australian Pesticides and Veterinary Medicines Authority (APVMA), who are the national independent regulators of pesticides and veterinary chemicals. The Department successfully applied for a minor use permit from the APVMA to obtain and use this herbicide on cabomba. Only qualified departmental staff are allowed to use 2,4-D-n-butyl ester and all methods of use are governed by the permit.

## **Preventing spread**

Cabomba is a particularly easy plant to spread, as reproduction can occur from seed and very small sections of stem. Anything that moves through the water, including fishing lures, boats, trailers, outboard motors and animals, can break off plant segments, and then act as vectors for the movement of either plant fragments or seeds.

A quarantine order has been established under section 21 of the *Weeds Management Act*. The Quarantine Area comprises the section of Darwin River between Cox Peninsula and Leonino Roads. The order prohibits the movement of people or any object, including boats, vehicles and fishing equipment into or out of this section of river and the five metres of land adjacent to the water's edge, unless an appropriate permit has been obtained from the Department. Vehicles are not to pass over causeways at Old Bynoe Road or Reedbeds Road if the river is flowing over these causeways.

The quarantine order will remain in place until 9 November 2011, or until it is revoked or extended by the Minister for Environment and Natural Resources. The Weed Management Branch conducts regular patrols of the Quarantine Area, maintain quarantine signage at all public access sites to the river and maintain exclusion fencing.

### Monitoring and survey

The Weed Management Branch monitors all sites known to have previously been affected by cabomba on a bi-monthly basis in order to determine, and treat, the occurrence of any regrowth. The Branch also provides an extension and information service to landholders adjoining these areas in order to increase their ability to identify cabomba.

### Extension and education

The Northern Territory Government has developed an extension and education program which provides information on the:

- quarantine order and quarantine area
- legislated restrictions regarding the import, sale and transport of cabomba in the Northern Territory
- identification of cabomba and importance of reporting any sightings
- potential negative impacts of cabomba in the Northern Territory.

The program has included the development of a web page, a series of technical manuals that report on the progress of the Cabomba Eradication Program, television advertisements and the provision of printed extension material. Part of the program involves direct liaison with the aquarium trade industry for the purpose of educating industry members and the public about the risks associated with specific exotic aquatic plants.

### Further information

Weed Management Officers from the Weed Management Branch can provide advice on all aspects of weed management including control techniques, biological control, legislative responsibilities, policy advice, monitoring and reporting and regional planning.

For further information on weed management planning, integrated control, herbicide application techniques and monitoring please refer to the [NT Weed Management Handbook](#).

The Cabomba Weed Management Plan can be found at [www.nt.gov.au/environment/weeds/weed-management-planning](http://www.nt.gov.au/environment/weeds/weed-management-planning).

