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Reducing the water weed risk How government and industry can contribute to a safer trade

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In 2004, Nursery & Garden Industry Australia (NGIA) joined the National Aquatic Weeds Management Group (NAWMG) to help implement a range of initiatives designed to tackle the issue of aquatic weeds. One such project is a weed risk assessment of water plants sold in aquariums and nurseries. This project aims to identify future water weed threats and remove such plants from sale.

This Nursery Paper explores the water weed issue in Australia. It provides an overview of the weed risk assessment process and explores its meaning and implications for the nursery and garden industry.



Reducing the water weed risk

How government and industry can contribute to a safer trade

Aquatic plants make a beautiful addition to fish ponds and water features but several species pose a major threat to Australia's waterways and water resources. In an era where management of our water resources is under rising scrutiny, the threat of water weeds receives ever increasing attention from Government, landholders and water management authorities. More Australian gardeners are putting water features in their gardens and more retail nurseries are selling water plants, pet supplies and pets - including fish.

Upon invitation in 2004, Nursery & Garden Industry Australia (NGIA) joined NAWMG to help implement a range of important initiatives. One such project is a weed risk assessment of water plants sold in aquariums and nurseries, which aims to identify future water weed threats and remove such plants from sale.

Water weeds - a serious issue

Water weeds pose serious environmental and economic risks to Australia's water resources. They form dense floating mats or underwater thickets that can block irrigation channels and equipment and reduce fish and plant life. They also impede water bodies, rendering them useless for recreational purposes.

It may seem ironic that in this current drought, described by some as the worst in 100 years, water weeds are arguably having their most noticeable impacts on waterways. In 2004, for instance, a serious outbreak of the noxious weed *Salvinia* (*Salvinia molesta*) occurred in the Hawkesbury River near Sydney. In a matter of months, isolated areas of scattered plants expanded to virtually complete coverage of over 80km of the river and tributaries. Reducing the size of this infestation has proven to be one of the most expensive water weed control operations in Australia, costing over \$3 million since 2004.



A major outbreak of *Salvinia* on the Hawkesbury River in 2004. A containment boom was placed across the river to prevent further spread and aid in the clean up.

The challenge of managing water weeds

A combination of factors makes water weeds one of the greatest challenges in invasive species management. Water weeds pose much greater challenges for control and eradication than their land-based cousins because aquatic environments are particularly complex. Access to weeds pose the biggest challenge to weed control authorities – particularly when the plants are submerged!

In addition, much weed control technology, herbicides and tools were developed for terrestrial crops, which means there are far fewer control options for aquatic situations.

Finally, use of herbicides in aquatic environments is strictly governed by legislation and there are often strong public concerns about their use in waterways. Herbicides have been known to cause death or have a severe impact on non-target plants and other aquatic species such as fish, frogs and insects.



A fishpond containing Water Hyacinth – a declared plant nation-wide.

Legislation governing the sale of water plants

A total of 30 water plants are declared in Australia under state and territory legislation. Of these, 10 species have national bans from sale. It is important to point out that legislation differs from state to state and sometimes even within states, which means some species can be legally traded in one state but not within another.

Ongoing illegal trade poses a significant threat. The Sunday markets, for instance, are the source of the most complaints for the trading of declared water plants, most noticeably Water Hyacinth and Salvinia.

See Table 1. on the following page

Disclaimer: Declarations are correct as of May 2007. This list may not contain all aquatic and semi aquatic plants banned from sale in your state/territory. Also, aquatic plants banned from sale may also be prohibited or denied entry in your state/territory. Weed legislation is regularly updated and other plant species may be prohibited from sale, so check with local or state weed control authority for the most up-to-date list.

Tracing the origins of water weeds

Studies have shown that around 75 percent of water weeds entered Australia through the ornamental plant trade. Both Water Hyacinth and Salvinia, Australia's most widespread water weeds, were both introduced as ornamental plants only to later spread to waterways.

Most water weed infestations are started by plant fragments entering our waterways through the either deliberate or accidental actions by people. One major culprit for water weed spread has been deliberate seeding by rogue water plant traders, who return later to harvest for commercial gain. Unfortunately, this practice still occurs on the NSW North Coast and South East Queensland.

Home and property owners who have introduced water plants into farm dams or fish ponds may accidentally start new infestations when floods wash these plants into nearby waterways. This remains a common occurrence and, given the large shift of populations to 'peri-urban' environments, further incursions originating this way are likely.

There are also occasions where boat and boat trailer owners unknowingly transport plant fragments from one site to another, but this is considered to be less of a threat than deliberate introductions.



Assessing weed risk in the purpose built competition trials facility at the NSW Department of Primary Industries research station in Grafton

Table 1.
Status of declared plants in Australia

Name	Must not be sold	Must be controlled or eradicated
Alligator Weed (<i>Alternanthera philoxeroides</i>)	All states and territories	All states and territories
Anchored Water Hyacinth (<i>Eichhornia azurea</i>)*	NSW, QLD,	NSW, QLD
Arrowhead (<i>Sagittaria graminea</i> subsp. <i>platyphylla</i>)	NSW, SA, TAS, WA	SA, WA, Parts of NSW
Arrowhead (<i>Sagittaria montevidensis</i>)	NSW, SA, TAS, WA	SA, TAS, WA
Cabomba (<i>Cabomba caroliniana</i>)	All	ACT, NT, QLD, , TAS, WA
Canadian Pond Weed (<i>Eloдея canadensis</i>)	NT, SA, TAS, WA	SA, TAS, WA
Eurasian Water Milfoil (<i>Myriophyllum spicatum</i>)*	NSW, QLD, SA,	NSW, QLD, SA
Hornwort (<i>Ceratophyllum demersum</i>)	TAS	TAS
Horsetails (<i>Equisetum</i> spp)	All states and territories	All states and territories
Hydrilla (<i>Hydrilla verticillata</i>)	TAS	TAS
Hydrocotyle (<i>Hydrocotyle ranunculoides</i>)	SA, WA	SA, WA
Hygrophila (<i>Hygrophila costata</i>)	NSW, QLD	NSW, QLD
Hygrophila (<i>Hygrophila polysperma</i>)	NSW	NSW
Hymenachne (<i>Hymenachne amplexicaulis</i>)*	All states and territories	QLD, NSW
Lagarosiphon (<i>Lagarosiphon major</i>)	All states and territories	All states and territories
Leafy Elodea (<i>Egeria densa</i>)	NSW, NT, SA, TAS, WA	SA, TAS, WA
Limnocharis (<i>Limnocharis flava</i>)*	NSW, QLD	NSW, QLD
Mimosa Pigra (<i>Mimosa pigra</i>)	All states and territories	NT, QLD
Parrot's Feather (<i>Myriophyllum aquaticum</i>)	ACT, TAS, WA	ACT, TAS, WA
Peruvian Primrose (<i>Ludwigia peruviana</i>)	QLD, SA, NSW	QLD, SA
Pond Apple (<i>Annona glabra</i>)	All states and territories	NSW, QLD, WA
Salvinia (<i>Salvinia molesta</i>)	All states and territories	All states and territories
Salvinia's (<i>Salvinia</i> spp. <i>not molesta</i>)*	QLD	QLD
Senegal Tea (<i>Gymnocoronis spilanthoides</i>)	ACT, NSW, NT, QLD, SA, TAS, WA	ACT, NSW, QLD, SA, TAS, WA
Shield Pennywort (<i>Hydrocotyle verticillata</i>)	WA	WA
Water Caltrop (<i>Trapa</i> spp)	NSW, QLD, SA (T. natans), TAS	NSW, QLD, SA (T. natans), TAS, WA
Water Hyacinth (<i>Eichhornia crassipes</i>)	All states and territories	NSW, NT, QLD, SA, TAS, VIC, WA
Water Lettuce (<i>Pistia stratiotes</i>)	ACT, NSW, NT, QLD, WA	ACT, NSW, NT, QLD, WA
Water Soldiers (<i>Stratiotes aloides</i>)	NSW, QLD, SA,	NSW, QLD, SA
Willow (<i>Salix</i> spp other than <i>babylonica</i>) <i>calodendron</i> and <i>reichardtii</i>)	All states and territories, (excluding <i>S. calodendron</i> , and <i>S. reichardtii</i> in SA)	ACT, QLD, (excluding <i>S. calodendron</i> , and <i>S. reichardtii</i>), Tas

Weed risk assessment – a joint approach to tackling water weeds

In late 2006, NAWMG initiated a Weed Risk Assessment (WRA) of water plants in the ornamental plant trade. Funded by the Australian Government's 'Defeating the Weeds Menace' program, the project aims to identify water plants in the trade that pose a significant weed risk to waterways and remove these species from sale nation-wide.

The WRA ranks each species (on a score of 0-100) on the following biological traits contributing to weed potential:

- Invasiveness (versatility and competitive ability against other species)
- Impact (economic, environmental, social)
- Dispersal (ease of spread)
- Potential range in Australia
- Difficulty of control.

The higher the score, the higher the weed risk to agriculture or the environment a species is likely to pose.

To further validate the results, some species are undergoing competition trials in a purpose built facility. These trials will assess their ability to compete with both natives and other known species at varying temperatures.

To ensure a fair and accountable process, NAWMG have established a working group consisting of state government and industry representatives. The Pet Industry Association of Australia, PISCES enterprises (the largest aquatic plant wholesaler) and Austral Water Gardens represent the industry. The industry contribution has most notably seen a correction factor that lowers the rank of species with a long history of trade (30 years or greater) in Australia.

Progress to date has identified 401 water plants in the aquarium and nursery trade, with around 80 posing some degree of weed risk. The challenge for the working group is to gather accurate information to ensure these 80 species receive a fair assessment and industry needs are considered throughout the remainder of the process.

This project is due for completion in April 2008 and a recommended list of species for sales bans will be forwarded to the Australian Weeds Committee for consideration.

Implications of weed risk assessment for the nursery industry

While the obvious downside of the WRA process for the nursery industry will be national sales bans of several water plant species, there are also significant upsides to consider.

Firstly, species ranked as high risk are normally the easiest to grow in our waterways. Removing them from sale is likely to remove the 'bread and butter' species from rogue plant traders who deliberately seed waterways. The winners, therefore, are responsible plant traders who grow their water plants in purpose built facilities.

The nursery industry will also benefit from a more uniform set of water weed declarations in Australia, which will remove much of the confusion regarding differing legal status in each state and territory.

Finally, businesses will still have a wide range of water plants available to trade, safe with the knowledge they pose little weed risk to waterways.

This declared aquatic weeds poster was a joint initiative of the National Aquatic Weeds Management Group, Pet Industry Association of Australia and Nursery & Garden Industry Australia.

NAME	MUST NOT BE SOLD IN	NAME	MUST NOT BE SOLD IN	NAME	MUST NOT BE SOLD IN
Alligator weed (Alternanthera versicolor)	All states and territories	Hyacinth (Shield) periwinkle (Hydrocotyle renouardii; H. verticillata)	SA, WA, NT, WA only	Sagittaria arrowhead (Sagittaria arifolia; S. polyphylla) (var. S. pruriens) (var. pruriens)	NSW, SA, TAS, WA
Cobomba (Cobomba caroliniana)	All states and territories	Hypophylla (Hypophylla carinata & H. polyperna)	ACT, NSW, QLD, NT, WA only	Scheuchzeria (Scheuchzeria palustris)	All states and territories
Canadian pond weed (Elodea canadensis)	NT, SA, TAS, WA	Lagarosiphon (Lagarosiphon major)	All states and territories, NT, Lagarosiphon spp. in WA	Seagull tea (Spermatococcus splachnoides)	ACT, NSW, QLD, SA, TAS, WA
European water milfoil (Myriophyllum spicatum)	NSW, QLD, SA	Leafy elodea (Elodea densa)	NT, SA, TAS, WA	Water caltrop (Ruppia spp.)	NSW, QLD, SA (T. melvillei, TAS)
Hornwort (Ceratophyllum demersum)	TAS	Limnorchis (Limnorchis flava)	NSW, QLD	Water hyacinth (Eichhornia crassipes & E. azurea)	All states and territories (NSW, QLD only)
Hydrilla (Hydrilla verticillata)	ACT, NSW, QLD, SA, TAS, NT, WA, ACT, NSW, SA, TAS, NT and WA	Parrot's feather (Myriophyllum aquaticum)	ACT, TAS, WA	Water lettuce (Pistia stratiotes)	ACT, NSW, NT, QLD, WA
		Posidonia pruriens (Posidonia pruriens)	QLD, SA (Parts of NSW)	Water soldier (Scheuchzeria palustris)	NSW, QLD, SA

How nursery owners and staff can help

The Nursery & Garden Industry in Australia is committed to reducing the impact of invasive plants on the Australian environment. Both the aquarium and nursery industries can play an important role in preventing further water weed incursions in Australia. Here is how you can help:

1. Familiarisation and identification

Know the declared water weeds in your state or territory and learn how to identify them. Your local weeds officer will be able to give you advice. If you discover that you are inadvertently selling a declared water weed, remove it from sale and display, and then dispose of all specimens.

2. Source your water plants from a reputable dealer

Obtain your water plants from dealers who grow their plants in an environmentally responsible manner, using specially constructed 'in house' ponds. Traders who deliberately seed streams with potentially hazardous plants or declared weeds run a great risk of introducing many more water weeds into Australia.

3. Advise your customers about water weeds

Tell customers that you are a responsible retailer who does not sell weeds. It's good marketing! Advise customers about the hazards of planting water plants and the need for safe disposal once they become unwanted.

4. Read the Nursery & Garden Industry Invasive Plants Policy Position

Copies are available to download for free from the Publications & Resources section of the NGI website: www.ngia.com.au/publication_resources/overview.asp.

Acknowledgements

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