



Using Rainforest Research

Rainforest weeds and their ways: the need for vigilance

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Amidst the mosaic of colour and pattern that forms the tropical rainforest landscape, it can be difficult to discern which plants belong there, and which don't. Environmental weeds can establish self-sustaining populations in the Wet Tropics bioregion capable of causing great harm to the natural values for which the area is renowned. An audit undertaken by Garry Werren of the Centre for Tropical Freshwater Research found more than 500 environmental weeds species have become naturalised in the Wet Tropics bioregion. This represents about 11% of total plants in the region, with a further 29 exotic species under suspicion since the last official list was published by the Queensland Herbarium in 2000.

Eradication of environmental weeds often requires back-breaking work and demands on-going vigilance. When dealing with over 500 species, it is crucial that regular investigations of the types and numbers of weeds are undertaken to help determine which weeds pose the greatest threats, which parts of the rainforest are at most risk, how weeds are getting into the natural environment and how to stop them spreading.

The most threatening weeds

The adjacent box lists the twelve weeds, in order of severity, which the audit identified as posing the most serious threats to the environmental integrity of the Wet Tropics bioregion. Two of these species are considered to be *Weeds of National Significance*[#].



Left: A mature stand of Pond Apple (*Annona glabra*) which shows the extreme level of infestation this weed is capable of.

Above: Pond Apple fruit and seeds which are attractive to and easily dispersed by animals. (photographs: Peter van Haaren)

- Pond Apple[#] (*Annona glabra*)
- Leucaena (*Leucaena leucocephala*)
- Siam Weed (*Chromolaena odorata*)
- Singapore daisy (*Sphagneticola trilobata*)
- Hymenachne[#] (*Hymenachne amplexicaulis*)
- Miconia (*Miconia calvescens*)
- Guava (*Psidium guajava*)
- Laurel vines (*Thunbergia* spp.)
- Mile-a-minute (*Mikania micrantha*)
- Pará grass (*Brachiaria mutica*)
- Guinea grass (*Panicum maximum*)
- Cucumber tree (*Parmentiera aculeata*)

The most threatened ecosystems

The wet tropical environment is ideally suited to exploitation by invasive and opportunistic species of plants. The warm moist climate conditions are highly conducive to rapid growth which continues for most of the year, factors that greatly accelerate the invasion process.

The Wet Tropics bioregion contains a wide range of regional ecosystems that sustain a wealth of biodiversity across cool highland forests, wet sclerophyll zones, hot, dry tropical woodlands and very wet tropical lowland forests and communities. The environment, therefore, offers rich territories for the establishment of a wide array of alien plants. According to risk assessment figures quoted in the audit, 24 regional ecosystems within the Wet Tropics are endangered by weed invasion and a further 17 are of some concern.

Providing science for the conservation and management of Australia's World Heritage tropical rainforests.



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The Rainforest CRC is a research partnership involving the Commonwealth and Queensland State governments, the Wet Tropics Management Authority, the tourism industry, Aboriginal groups, CSIRO, James Cook University, Griffith University and The University of Queensland

How do weeds get into the forest and why do they succeed?

There are many ways weeds can turn up in natural ecosystems, although they are rarely considered pests in all Australian settings. *Leucaena*, Pará Grass and Guinea Grass were originally introduced as a stock fodder and continue to be cultivated and distributed and *Hymenachne* was promoted for use as a ponded pasture species until recent years. Ornamental and cultivated plants have also become weeds. These include the Mango (*Mangifera indica*), various passionfruits (*Passiflora* spp.), African Tulip (*Spathodea campanulata*) and Brazilian Nightshade (*Solanum seafortianum*).

Even in the natural rainforest environment, plants constantly compete with other plants and with animals. Many factors determine which species will triumph. Imported species often overcome natural species due to unnatural advantages, succeeding simply because their natural enemies are absent from the new environment or because of special growth forms that enable infiltration into new territory in different ways. Such strategies include replacing the natural herb or shrub layer, forming dense mats over native flora, or having fruit and seeds which are easily dispersed by wind, water or animals. A more insidious category of weeds known as *sleepers* reinforces the need for constant vigilance in the natural environment. Species like *Bauhinia* (*Bauhinia monandra*) for example, appear as minor weeds now, but can develop into a major pest in the future.



Left: The flowering head of Siam Weed (*Chromolaena odorata*), a weed which ranks 23rd on a list of the world's worst alien invaders.

Above: An infestation of *Hymenachne* (*Hymenachne amplexicaulis*) or ponded pasture grass, an aggressive weed with the ability to invade wetland ecosystems. (photographs: Peter van Haaren)

Stopping the spread

The audit identified several important factors in management of environmental weeds in the Wet Tropics region:

Prevention of Entry

As intentionally introduced weeds outnumber those that are unintentionally introduced, a combination of consultation with the nursery industry, wider public awareness campaigns and properly constituted quarantine exclusion systems are necessary to prevent any future incursions of potential weed species.

Early intervention

Efforts should be focused on identifying *sleeper* weeds before they become widespread and while eradication or control is still feasible.

To obtain a full list of weeds that have naturalised in the Wet Tropics:
<http://www.rainforest-crc.jcu.edu.au/downloads/WeedList.doc>

Integrated weed management

An improved understanding of the ecology and dispersal habits of weeds, how control methods may impact on other aspects of the environment, and coordination between various control agencies will ensure best results for least effort in the most appropriate locations.

Containment of existing weeds

Where weed species are so well established that eradication is no longer possible, efforts should be focused on critical areas of high conservation value which contain endangered regional ecosystems or species.

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