



Northern Rivers Catchment Management Authority Fellowship

Jill Garsden, 2011

A study of the impact of some opportunistic alien species on native fauna and ecological communities within the Mt Warning Caldera

I chose my topic as a result of my awareness of the major problems created by weeds and pests in our region. I want to raise public awareness and motivation to address these problems. Discovering that relatively little information was readily accessible about how these alien species affect our unique wildlife, I thought that many people would be better motivated if they had some visual indication of how weeds and pests affect our furry and feathery friends. My primary objective then became to illustrate relevant relationships between alien species and native fauna rather than to showcase my artistic capacity.

The key points that I hope to convey are:

- **The introduction of alien species (weeds and pests) is the greatest threat to native biodiversity – that is, a greater threat than land clearing.**
- **A focus on biodiversity in weed and pest management strategies is needed because alien species have become so entrenched in our environment. Whilst many native species are declining as a result of them, others have become dependent on them. We also need to develop a ‘big picture’ focus, looking not only at the direct impact of the alien species on native species, but also at the indirect effects, those of the native species’ decline or proliferation on other native species.**

Thank you for your interest in these paintings. A booklet accompanies and complements the paintings in this exhibition, and I have included in it far more detailed information than the panels next to each painting allow. Should you wish to obtain a copy, please email quillian6@gmail.com.

I, Currawong

(Privet)



Three species of privet are noxious weeds in NSW. Two of them, the **Broad-leaf or Tree Privet** (*Ligustrum lucidum*) and the **Small-leaf or Chinese Privet** (*Ligustrum sinense*), are major problems in the Caldera, out-competing native vegetation. Privet produces prolific white flowers in spring which turn to purple-black berries in autumn and winter, and some native birds have thrived on them.

One **Pied Currawong** (*Strepera graculina*), a large native bird, was found to have over 60 privet seeds in just one regurgitated pellet. This is indicative of Currawongs' opportunistic nature and adaptability. Once largely inhabiting mountainous areas and migrating to warmer, lower regions in the cooler months, they have become sedentary and far more populous around the Caldera since discovering that introduced weeds like privet, and human settlement in general, provide many opportunities for a satisfying diet.

Sadly, Currawongs also prey on small birds, whose population is declining as a result of habitat loss. A pair of Pied Currawongs may kill about 40 broods of small birds to raise one brood of its own. The extent to which Currawongs contribute to the decline in the small bird population is disputed; however, control of the Currawong population in some areas has led to increased populations of vulnerable species and decreased nest predation rates. But it would be better, rather than cull Currawongs, to eliminate the Privet and other weedy food supplies which contribute to their disproportionately high numbers.

Bitousweet

(Bitou Bush)



A native of southern Africa, deliberately planted to stabilize sand dunes, **Bitou Bush** (*Chrysanthemoides monilifera* ssp. *rotundata*) now infests 80% of the NSW coast and extends inland up to 10 km in some places. It has a devastating impact on coastal grasslands, heaths, woodlands and littoral rainforests, as well as headlands, wetlands and riparian areas along tidal rivers, forming dense monocultures that out-compete native species by chemically suppressing their germination.

Amongst the native species impacted by Bitou Bush are the **Beach Stone-curlew** (*Esacus neglectus*), which, with less than 15 nesting pairs in the whole state in 2010, is critically endangered in NSW, and the endangered **Little Tern** (*Sterna albifrons*). The dense Bitou monoculture eliminates their preferred nesting sites.

However, some native species, such as the **Superb Fairy Wren** (*Malurus cyaneus*), find in Bitou Bush shelter that is vital to them because of the destruction of their natural habitat. Small birds like wrens are presently experiencing an alarming decline in their numbers because loss of habitat reduces the availability of their food supply and renders them more vulnerable to predation.

Therefore, it is important that Bitou Bush, and similarly dense shrubby weeds, when removed from the landscape, are replaced with native shrubs if our beautiful small birds are to survive.

Space Invader

(*Lantana*)



Indigenous to Central and South America, **Lantana** (*Lantana camara*) out-competes native vegetation, threatening fauna such as the **Richmond Birdwing Butterfly** (*Ornithoptera richmondia*) which depend on the displaced flora. With its fruits eaten by possums and many birds, including the tiny **Silvereye** (*Zosterops lateralis*), Lantana is easily spread, and it now threatens more than 1400 native species and over 100 ecosystems.

Here, Lantana impacts on tussock grass at the forest margin. This is the habitat of the critically endangered **Eastern Bristlebird** (*Dasyornis brachypterus*) and the vulnerable **Eastern Grass Owl** (*Tyto longimembris*, formerly classed as *Tyto capensis*), both of which are ground-nesting birds. In northern NSW, fewer than 50 Bristlebirds remain in the local population. They are usually found in areas which have been burned five to ten years previously. Lantana interferes with the tendency of the native vegetation to burn at the specific intervals required to maintain the tussock grass. **Bell Miners** (*Manoria melanophrys*), find ideal nesting habitat in Lantana, which thus contributes to their increased numbers and implicates them in the spread of a fatal forest disease known as *dieback*.

Ironically, Lantana also provides food and refuge for many native creatures whose natural habitat has largely been destroyed. The complete elimination of Lantana could be a pyrrhic victory, likely to contribute to the extinction of these species, so its removal must be tackled with sensitivity and care.

Mobbed

(*Common Mynas*)



Originating in tropical southern Asia, the **Common Myna** (*Acridotheres tristis*), is a member of the starling family, unrelated to the grey native Noisy Miner (*Manorina melanocephala*), despite the fact that it has a similar patch of yellow skin behind the eye and a name that sounds similar. In the Caldera, invading Common Mynas were first noticed around the year 2000; now it is hardly possible to drive through the countryside without observing them.

Their impact on native fauna can be deadly. They compete aggressively with native species for nesting hollows, already in short supply in many areas because of land clearing. Attacking with claws and beaks, they will not only evict hollow-nesting birds – the **Eastern Rosella** (*Platycercus eximius*) taking off in fright in this painting is just one of them – but also kill the chicks of such birds, or build their own nests on top and smother them. So aggressive are they that they will attack large birds such as Kookaburras, and even small mammals like Gliders and Possums.

Here, a family of the vulnerable **Squirrel Glider** (*Petaurus norfolcensis*) flees its nesting hollow as Mynas mob it. Squirrel Gliders, a vulnerable species, spend at least 50% of their lives inside tree hollows, where they nest and seek refuge. Their need for hollows is extended by the fact that individuals occupy many different trees within their home range and engage in denswapping behaviour, possibly to minimize the chances of predation and infestation by parasites. It follows that Squirrel Gliders are likely to become even more threatened as Common Mynas gain territory in their habitat.

To the Victor, the Spoils...

(Cane Toads)



The **Cane Toad** (*Bufo marinus*), native to South America, is well-established in the Caldera, and continues to invade other regions. Able to survive the loss of up to 50% of its body water, cope with temperatures ranging from 5°C to 40°C, and tolerate salinity of up to 15%, it is evolving additional adaptations to suit its new environments. Cane Toads compete with native animals not only for food, but also for shelter and breeding sites. This is thought to be an important factor in the decline of many native animals, particularly the decline in number of some native frogs. But worse is the fact that the Cane Toad is toxic to most predators at all stages of its life cycle.

Amongst mammals, the endangered **Spotted Tailed Quoll** (*Dasyurus maculatus*) is probably the most highly threatened by the toad. Also known as **Tiger Cats**, Quolls are solitary creatures with a home range of up to 4000 hectares, their numbers quickly declining as their habitat becomes degraded and fragmented. Quolls are opportunistic predators and scavengers of anything of animal origin, and thus particularly likely to prey on Cane Toads. They can die within minutes of mouthing them. Unfortunately, there is no evidence that Quoll numbers are able to recover after their territory is invaded by Cane Toads, unlike some other species, such as Goannas, which evidently learn to avoid Cane Toads if they survive earlier encounters with them.

The **Keelback** or **Freshwater Snake** (*Tropidonophis mairii*), a small, non-venomous, semi-aquatic snake distinguishable by its large eye, is one local species which may exact some revenge on the toads, dining on smaller ones with impunity!

Fatal Attraction

(Aquatic Weeds)



Water Hyacinth (*Eichhornia crassipes*), was an intentional ornamental introduction because of its attractive purple-blue flowers. Uncontrolled, it infests tracts of still and slow-flowing water with dense impenetrable mats, fragments of which break away to invade other areas. Under favourable conditions, it doubles its mass every 5 days, forming new plants on the ends of stolons. It also grows from seed which can remain viable for 20 years or longer. Shown in the foreground of the painting is a secondary infestation of **Alligator Weed** (*Althernanthera philoxeroides*), identifiable by its papery, white, clover-like flowers. Its consequences are potentially devastating as a result of the fact that it impacts on both aquatic and terrestrial environments. It not only survives on damp soil, but rapidly dominates huge areas of pasture, swamp, and dry country, and can quickly become impossible to control. In the Northern Rivers, it was first discovered near Bangalow in 1998, and many infestations have been found since.

On water, these species, both native to South America, can blanket the entire surface, causing oxygen depletion, changing the temperature and pH levels of the water, increasing water loss through transpiration and destroying the under-surface ecosystem. At the top of the aquatic food-chain, fish and aquatic mammals, such as our iconic platypus, are impacted, and of course the bird species who share this habitat. Particularly vulnerable amongst bird species is the **Blue-billed Duck** (*Oxyura australis*). Infrequently seen in the Caldera, it is largely sedentary and almost entirely aquatic. Even non-aquatic mammals such as Kangaroos are affected, since their ability to access fresh water is impeded.

The Creeping Menace

(Vine Weeds)



The unmitigated spread of introduced vines and creepers is disastrous for our forests. In this painting, the **Koala** (*Phascolarctos cinereus*), looking rather forlornly for fresh leaves and trees unimpeded by vines, is really symbolic of the whole ecological community that loses its home to vine weeds. The Koala, listed as vulnerable in NSW, is highly selective as to its diet of eucalypt leaves. Because it must move between suitable trees for forage and shelter, it is especially vulnerable to the difficulties imposed by weeds, traffic, domestic dogs and introduced predators, and fire. Stressed by these factors, koalas are prone to anaemia, the highly infectious and potentially fatal Clamydia (which usually manifests as wet bottom and conjunctivitis), and retroviral disease.

Two of the worst vine weeds in the Caldera are here shown blanketing the forest; both are native to South America and are escaped garden ornamentals. **Madeira Vine** (*Andredera cordifolia*), also known as **Potato Vine** (because of its underground and aerial tubers) and **Lambs' tails** (because of its long white flowers) is notoriously difficult to eradicate because it reproduces vegetatively (ie. any part of the leaves, stem, roots or tubers can grow). **Cat's Claw Creeper** (*Macfadyena unguis-cati*), named for the claw-like hooks it produces to facilitate its ability to climb, thrives in full sun or partial shade and in a wide variety of soils, and also produces stolons and root tubers, which grow vigorously and produce dense mats on the forest floor.

Both these weeds climb over standing trees in vine scrubs, gallery forests, rainforests, closed forests and open forests. Trees can be crushed by the weight of vines, allowing further light to enter the forest and promoting invasion by more light-demanding species and weeds, thus altering whole ecosystems.