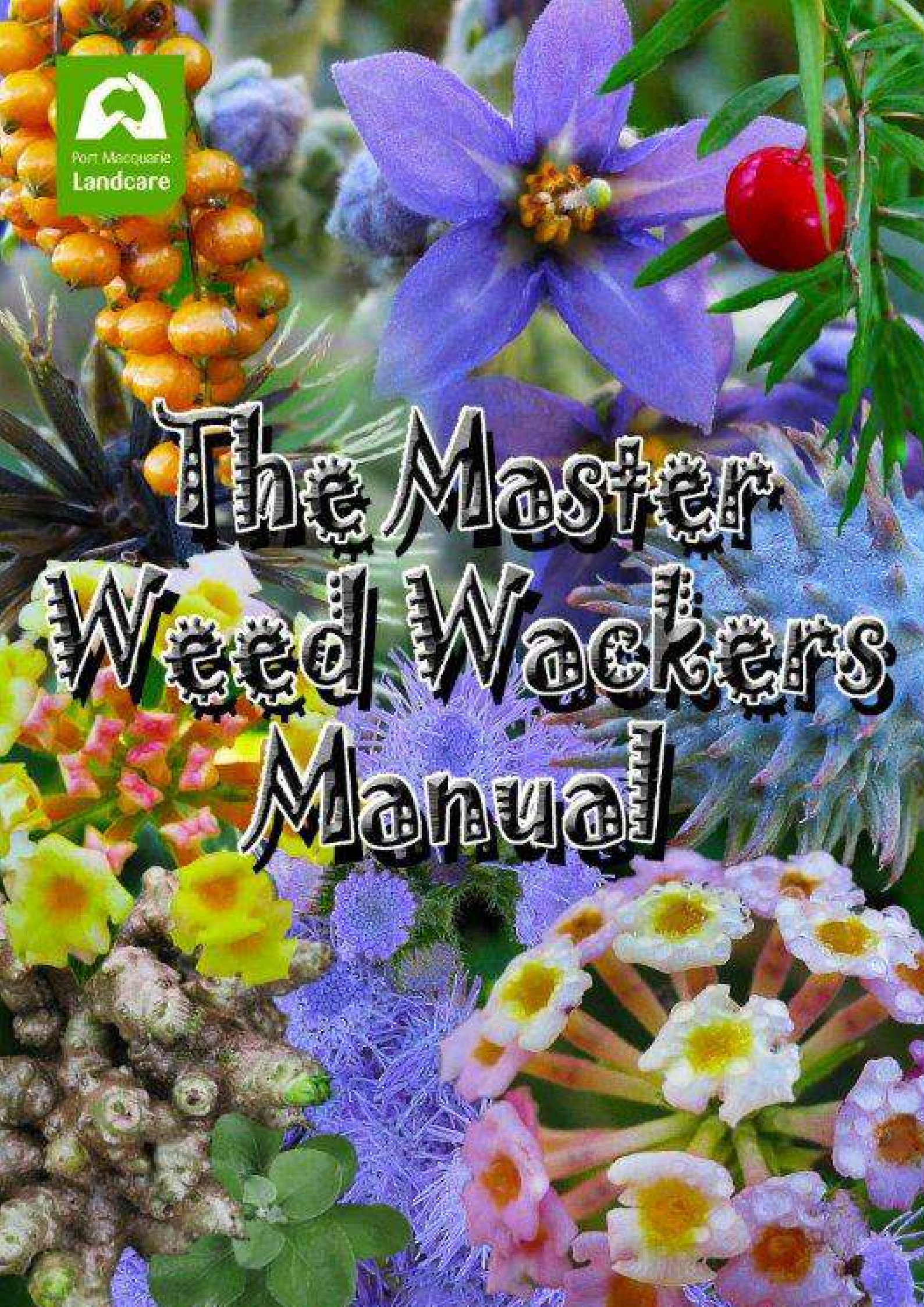
Port Macquarie
Landcare
The Master
Weed Wackers
Manual

A compilation

of the

most common weeds

found on

Port Macquarie Landcare sites.

Material sourced from various internet sites.

Edited by Peter Michael Bush Regeneration Supervisor.

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Native Seedlings of the Port Macquarie Area

Cabbage Tree Palm

Bangalow Palm

Native quince

Plum Pine

Lolly Bush

White Bolly Gum

Hairy Rosewood

Lilly Pilly

Tuckeroo

Kangaroo Vine

Striped Cucumber

Illawarra Flame Tree

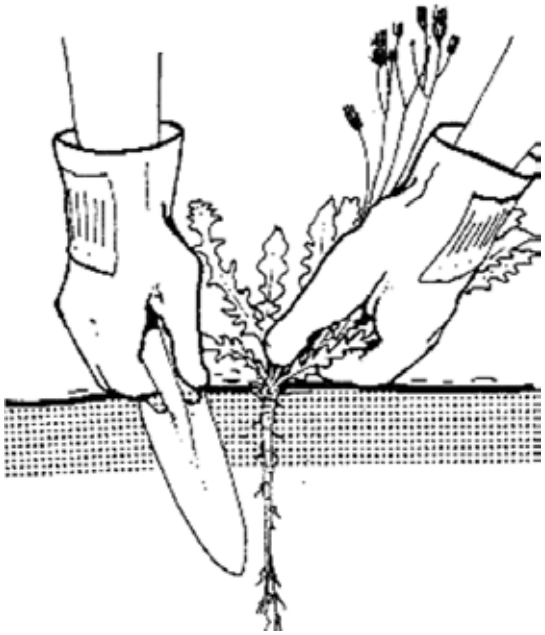
Cheese Tree

Sandpaper Fig

Manual Weed Control Techniques

Any part of the plant capable of reproducing (ie tubers, rhizomes, seeds, berries or other propagules or the entire plant) should be placed in a suitable bag and removed off site. Other debris material can be mulched on site.

Technique: Hand Pull / Dig



Consideration

The plant should be small enough to ensure the entire root will be removed, **or**
the plant should not be able to resprout from any remaining root system.

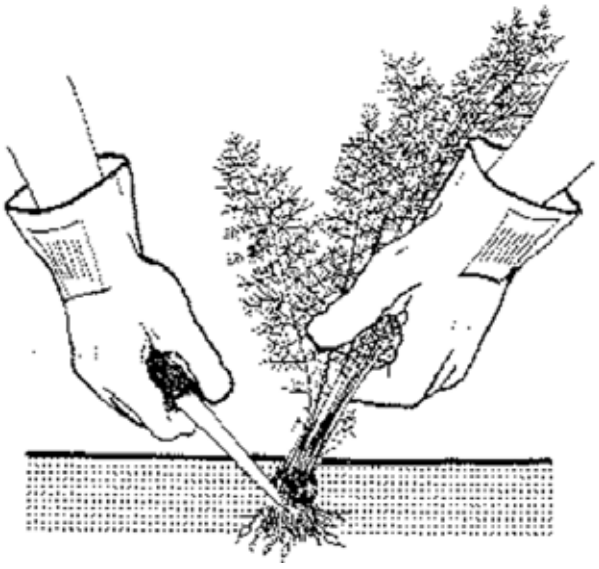
Tools and Equipment

Gloves, knife, hand trowel or similar. A wallboard saw has proved effective.

Procedure

- Rake back ground mulch
- Insert knife or similar tool and loosen the soil around the plant roots. Keep soil disturbance to a minimum
- Grasp the stems or leaves of the plant at ground level and pull while freeing the roots with the knife
- Remove the plant and shake off excess soil
- Replace disturbed soil and any ground mulch

Technique: Crown Cut



Consideration

The underground meristematic (growing heart) part of the plant only needs to be removed, or above ground in the case of palm species.
The plant should not be able to resprout from the remaining root system.

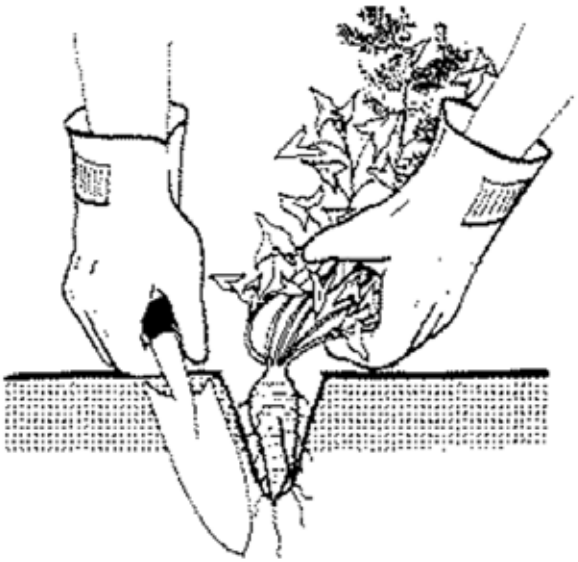
Tools and Equipment

Gloves, knife.

Procedure

- Rake back ground mulch
- Grasp the plant at ground level gathering the stems or leaves together
- Insert a knife so as to cut the root system below the crown or underground stems
- Remove the plant whilst cutting the lateral roots
- Ensure the knife is used for cutting rather than levering
- Replace the disturbed soil and ground mulch

Technique: Rhizome / Tuber Trace



Consideration

The plant has a root system of underground rhizomes, tubers or similar organs from which new plants can reproduce.

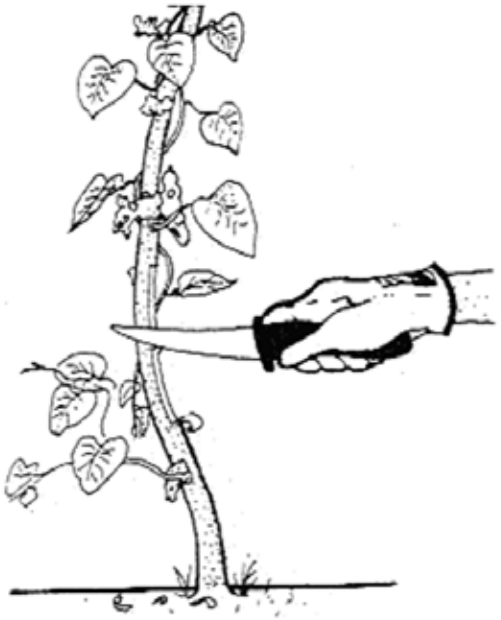
Tools and Equipment

Gloves, hand trowel, knife or similar.

Procedure

- Rake back ground mulch
- Grasp the plant at ground level gathering the stems or leaves together
- Insert a knife so as to cut the root system below the crown or underground stems. At ground level and using the appropriate tool, clear the soil from around the immediate root zone of the first rhizome or tuber
- Trace the underground lateral stems / roots and remove any secondary rhizomes or tubers
- Remove the roots, rhizomes, tubers and any attached soil
- Replace the disturbed soil and ground mulch

Technique: Stem Scrape



Consideration

The stem is too small to be frilled with a chisel, yet large enough to be scraped without cutting right through
The plant has aerial tubers which will drop and germinate if the plant is physically removed or the stem is cut through, **and**
The herbicide is mixed to the recommended ratio.

Tools and Equipment

Knife, herbicide and herbicide applicator, appropriate clothing and safety wear.

Procedure

- Scrape along the stem of the plant for approximately 150mm to expose the vascular tissue
- Apply herbicide to the exposed vascular tissue within 30 seconds after beginning the cut
- Do not take any further action or disturb the plant until it is completely dead
- Any dead material which may be a fire hazard (eg. vines) should be removed for a distance of at least 6 - 10m from a property boundary

Technique: Cut stump/Cut and Paint

Consideration

The plant should not have aerial tubers
The weed debris will not substantially increase the local fire hazard, **and**
The herbicide is mixed to the recommended ratio.

Tools and Equipment

Appropriate tools to cut stem (knife, secateurs, loppers, bush-saw or folding saw), herbicide and herbicide applicator, appropriate
clothing and safety wear.

Procedure

- With a flat cut, cut the stem/trunk as close to the ground as practicable, below any branching stems or side shoots
- Apply herbicide to the exposed vascular tissue within 30 seconds after beginning the cut
- Do not take any further action or disturb the plant until it is completely dead

Using Herbicide

When using herbicides, handling and cleaning procedures should be undertaken in accordance with the label and the herbicide's Material Safety Data Sheet. Material Safety Data Sheets are made available by the manufacturer.

Read the label before opening the container and follow the instructions exactly. Herbicides are poisons, and should be handled with the greatest respect. They can be absorbed very easily through the skin, by breathing the vapours, and by ingestion.

Wear protective clothing: long sleeves, long pants, sturdy shoes, gloves, eye protection. Always wear waterproof gloves. A respirator is advised when mixing or pouring the liquid.
Wash skin and equipment afterwards. Wash contaminated clothing separately.

Clean up any spills, includng on your skin, with large amounts of water, or by shovelling up contaminated soil and disposing of it at the tip. All herbicide application mentioned in these methods refer to the use of glyphosate360-based products only, unless otherwise stated.

African Olive *Olea europaea* subsp. *cuspidata*

European Olive *Olea europaea* subsp. *europa* vars
FAMILY: Oleaceae
ORIGIN: Mediterranean region of Europe, Portugal, South Africa
Noxious Weed Category: n/a

Description

Habit: much branched evergreen tree to 5-15m with drooping branchlets. Thin greyish bark covered by protruding lenticels. **Leaves**: narrow, lance-shaped to 5-10cm long and 2cm wide with prominent midrib and recurved tip, dark green on upper surface. African Olive leaves broader and yellowish-brown on lower surface c.f. European Olive leaves silvery-grey on lower surface. **Flowers**: small white to cream or greenish tubular flowers forming in racemes at branch tips in spring-summer. **Fruit**: green berries at first ripening to purplish-black in summer with African Olive's fruit: round 1-2cm in diameter c.f. European fruit: oval shaped 2-5cm long. **Roots**: substantial tap root that gives rise to many laterals. (will re-shoot from any root stock left in ground).

Ecology

One of the most significant threats to the last remnants of Cumberland Plain woodlands in the Sydney Basin; threatens further ecosystems in Sydney North. Forms dense mono-cultures beneath which no other vegetation remains.

Dispersal

Water, animals (foxes, rats & birds), humans, contaminated soil (earthmoving equipment, cars etc) and garden refuse dumping.

Control

HAND: dig/pull juvenile plants; bag and dispose of all berries.. **CHEMICAL**: cut or scrape and paint; foliar spray.

African Olive

European Olive

Native look-a-like Plum Pine *Podocarpus elatus*. Differs in pungent-pointed leaves, with conifer smell when crushed, and dark blue fruit that sits below the large seed.

Common name: Agapanthus *Latin name:* *Agapanthus praecox* ssp. *orientalis*
FAMILY: ALLIACEAE
ORIGIN: South Africa
Noxious Weed Category: n/a

Description
Habit:vigorous tufted perennial. **Leaves**: Large thick glossy-green, strap-like leaves to 50cm. **Flowers**: Large globular flower heads in blue, mauve or white flowering in summer. **Fruit**: each flower produces many small black hard coated seeds which are held in a three-sided capsule. **Roots**: robust fleshy.

Ecology
Drought and shade tolerant, but will live in full sun and full shade. Clumps spread vegetatively and outcompete native ground covers (including seedlings of canopy trees, shrubs and vines). A water-hogging weed capable of killing mature trees presumably through dehydration.

Dispersal
Seed spread by wind and water, and people transporting trailers with de-headed flowers to the tip. Vegetative once established often through garden dumping.

Control
HAND: only practical for small clumps of the plant. When digging ensure that all the root material is removed. Dispose of contaminated soil or monitor for regrowth. It is important to pull out **all** roots from beneath the soil. Alternatively, cut the flower heads off before seeding to help prevent spreading. Brush cutting or mowing must be done regularly. **SPRAY:** Cut leaves off, brush-cut or mow to stimulate new growth, then spray new growth with a registered herbicide. The area should be monitored for regeneration.

Photos: Ku-ring-gai Council

Common name: Alexandra Palm *Latin name Archontophoenix alexandrae*
FAMILY: Arecaceae
ORIGIN: Queensland Australia
Noxious Weed Category: n/a

Habit: This is a tall, solitary, handsome palm to about 25 metres (80 feet) tall with a spread of about 2 - 2.5 metres (10 - 15 feet) and a graceful appearance. **Leaves**: The leaves, up to about 2 metres(6-7 feet) long, are stiff pinnately compound feather-like fronds and have a tendency to rotate 90' to expose the whole leaf in profile (Figure 2). The leaflets are all in the same plane, bright green above with a silvery underside. (this distinguishes them from the Bangalow Palm)The base of the petioles forms a bright green crownshaft that the leaves rarely droop below. The trunk is smooth and ringed with noticeable leaf scars and the base can be noticeably swollen. It can get to about 1/3 metre (one foot) in diameter. **Flowers**: Flowers are formed below the crownshaft with the creamy flower stalks holding amythest purple flowers. **Fruit**: The round fruit, about 12 mm (1/2 inch) in diameter, turn bright red at maturity.

Ecology: Occurs in NEQ to as far south as Brisbane. Altitudinal range from near sea level to 1000 m. Grows in swampy areas and along drainage lines in rainforest, gallery forest along seasonally dry creeks, vine forest, Melaleuca forest and mixed Eucalypt forest.

Dispersal: Seed, usually spread by birds but also often as a contaminant of garden waste/mulch and to a lesser extent in flowing water of riparian systems.

Control
As for many woody weeds, control is best undertaken as early as possible while the plant is as small as possible. **HAND:** Seedlings can be hand-pulled, but young plants quickly develop a strong, fibrous root system making hand-pulling difficult. Juveniles can be chipped out. **CHEMICAL:** Juveniles can be cut close to ground level and immediately painted with undiluted glyphosate (eg Roundup Biactive). Larger palms can be treated by chiselling or drilling around the trunk close to the ground 100mm apart and filling with 2mm of undiluted glyphosate per hole.

Alexandra Palm

Bangalow Palm

Underside of fronds: Bangalow on left Alexandra on right

Common name: Asparagus Fern *Latin name: Asparagus aethiopicus*
FAMILY: Asparagaceae
ORIGIN: South Africa
Noxious Weed Category: Environmental Weed may soon be listed as Wons

Description
Habit: This is a spiny shrub with sprawling to pendent stems with fibrous and tuberous roots.**Leaves**: are bright green, fern-like, with almost needle-like leaflets of up to eight in a cluster.**Flowers**: are white to pinkish and small. **Fruit**: is a bright, round, shiny, red berry. Each fruit contains 1 to a few seeds.

Ecology: It germinates from a single-seeded fruit and is capable of flowering and fruiting after two to three years. It is shade tolerant and can invade relatively intact (undisturbed) forest systems. Once established, like other weedy Asparagus species, it competes aggressively for soil moisture and dense infestations can 'starve' nearby deeper-rooted vegetation of water and nutrients.

Dispersal: Seeds are spread by birds, water and dumping. Asparagus Fern can also reshoot from rhizome pieces left in the ground or dumped as garden waste.

Control
Manual: The numerous water tubers can be left in the ground as they contain no food and the plant cannot reproduce from them. Wear thick gloves, with secateurs cut off the stems about 20cm above soil level and bag. Don't cut too low or you may lose sight of the crown. Check where stems join crown and use a knife or mattock to cut around the crown to sever roots and water tubers. Lift out crown, checking that it is entire and bag or hang in trees after removing water tubers. Seedlings may sprout where you have removed mature plants, these can be sprayed with glyphosate and a penetrant

Balloon Vine *Cardiospermum grandiflorum*
FAMILY: SAPINDACEAE
ORIGIN: Tropical America, West Indies and Africa
Noxious Weed Category: being nominated as a WoNS

Description

Habit: herbaceous perennial climber with stems to more than 10m long. **Leaves**: leaves 6-16cm long, on a leaf stalk 2-10cm long, with 3 leaflets each further divided into 3; margins of leaflets irregularly toothed. **Flowers**: white, 4 petals. in clusters, stalk of the flower heads end in a pair of tendrils. Flowers for most of the year. **Fruit**: inflated membranous capsule, 6-ribbed, 4-8cm long, covered with short stiff hairs. each containing 3 blackish, round seeds, about 7mm wide. **Roots**: shallow and fibrous, fragments re-root readily.

Ecology Seedlings germinate most of the year on disturbed land. Plants spread over ground or climb trees and shrubs. Common in moist gullies along the warm temperate to tropical coast of Qld and NSW. The combined weights of many hundreds of vine stems also acts to collapse the existing edges of infested rainforest stands. All local rainforest remnants are small and any reduction of their edges exposes the vital core areas of the forest to greater risk of weed invasion, entry of feral animals, fire, erosion and a number of other threats.

Dispersal Water, animals (foxes, rats & birds), humans, contaminated soil (earthmoving equipment, cars etc) and garden refuse dumping.

Control

HAND: hand pull/Dig. **CHEMICAL**: scrape and Paint, skirting, foliar spraying using Roundup Biactive.

Balloon Vine in flower

Balloon Vine showing ripe fruit

Native look-a-like:
Slender Grape *Cayratia clematidea*

This Project is a Byron Shire Council Environmental Levy Initiative
Your Environmental Levy at Work

Bitou Bush

Chrysanthemoides monilifera subsp. rotundata

Family ASTERACEAE **Life Form** SHRUB

Origin
South Africa

Description
Sprawling or upright shrub to 1.5 m high, with thick, alternate leaves having a distinct mid vein. Yellow daisy-like flowers are clustered at the tips of the stems. Fruit are fleshy and purplish black. Stems can layer and form adventitious roots like Lantana.

Flowering time
Mainly April - June

Fruiting time
All year

Impacts
Competes with native coastal species, forms dense, exclusive thickets and also climbs up trees.

Habitat
Disturbed coastal sites

Reproduction/dispersal
Bird dispersed seeds
Water

Weed status
Noxious Class 4

Locality notes
Coastal

Similar Native Species
Myoporum boninerse subsp.
Australe stackhousia spathulata

CONTROL METHODS *for* BITOU BUSH

Methods
SMALL INFESTATIONS: carefully handpull (smaller rootlets easily snap & reshoot), or cut, scrape & paint stump with glyphosate & water at 1:1.5, or foliar spray.

LARGE INFESTATIONS: foliar spray with glyphosate & water at 1:200 (5ml/L) + sticker (in cooler, good growing conditions) or at 1:100 (10ml/L), (during warmer or less favourable growing conditions) or with metsulfuron methyl & water at 1gm/10L + surfactant (to avoid impacts to native grasses). Follow-up Bitou Bush seedling regeneration in a few months time and other weeds such as Glory Lily and Coastal Morning Glory that may occur in association with Bitou infestation. Repeated follow up treatments are necessary to reduce soil seed bank.

Best season
During cooler periods in good growing season for spray applications

Permit
Covered by off label permit 9907 for use in areas of native vegetation to control noxious and environmental weeds. Further detail available at http://permits.apvma.gov.au/PER9907.PDF

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Last updated January 2010

Bitou Bush Native look-a-likes

Headland Boobialla Myoporum boninense

Sea Daisy *Melanthera biflora*

Dune Fan-flower *Scaevola calendulacea*

Blue Billy Goat Weed *Ageratum houstonianum*
FAMILY: ASTERACEAE
ORIGIN: Native to tropical America
Noxious Weed Category: not applicable

Description

Habit: annual or short-lived perennial herb growing to 1m. **Leaves**: mostly opposite but sometimes (upper) alternate leaves almost triangular to egg-shaped (ovate) with bluntly toothed margins and either blunt or pointed tip. Stems and leaves are softly hairy. **Flowers**: flowers are light lavender-blue florets to 3 mm grouped into fluffy heads to 7 mm across, lacking petals (ray florets). Basal flower (involucral) bracts obviously hairy. Flowering occurs throughout most of the year. Flowers throughout the year. Often confused with another much less common, but very similar species *Ageratum conyzoides* (see below). **Fruit**: Blue Billy Goat Weed has a pappus that is shorter than the floret and glandular hairs on its involucral bracts. *Ageratum conyzoides* has a pappus which is longer than the floret and its involucral bracts are only sparsely hairy and never have glandular hairs.

Roots: shallow and fibrous, fragments with stem sections attached re-root readily.

Ecology

It is a widespread weed of disturbed areas. A common weed but not a particularly damaging one

Dispersal

Wind, water, contaminated soil, dumping

Control

HAND: Seedlings/small infestations :Carefully crown out to hand remove, ensure to remove all rootletswhich can easily break and reshoot; or cut and paint stems with glyphosate & water at 1:1.5, or spot spray. In moist habitats place material off the ground to avoid re-shooting. **CHEMICAL**: Foliar spray plant with glyphosate & water at 1:75 (13.3ml/L) or 1:100 (10ml/L) during good growing season, or Metsulfuron methyl & water at 1.5g /10 L. In restoration sites undertake spray preparation by hand removing from around ferns and seedlings or pruning low leaves of non target species. To avoid impacts to native grasses or pasture during spray treatments use Metsulfuron methyl only.

Billy Goat Weed.

Bridal Creeper *Asparagus asparagoides (*syn. *Myrsiphyllum asparagoides)*
FAMILY:
ORIGIN: South Africa
Noxious Weed Category: Class 4 and a Weed of National Significance (WoNS)

Description
Habit:. Bridal Creeper is a wiry climber (stems only 1-2mm wide) and up to 3m long. Leaves reduced to scales.. **Leaves**: Its fern-like or leaf-like stems are small and lance-shaped to 3cm long. **Flowers**: Sprays of sweet smelling white to pink flowers. Each petal has a distinctive central green stripe. **Fruit**: Fruit is a small red to black berry. **Roots**: the root system is a complex of white starch and water-storing tubers attached to a horny flat crown. These robust fleshy masses crowd out all other roots down to a depth of 10-15cm.

Ecology
Drought and shade tolerant, but will live in full sun and full shade. Clumps spread vegetatively and outcompete native ground covers (including seedlings of canopy trees, shrubs and vines). A water-hogging weed capable of killing mature trees presumably through dehydration. Occupies both sands (hind-dunes) and clay soils in open forest to rainforest. Bridal Creeper is a massive problem in southern states of Australia, but recent biological controls have had a significant impact in high infestation zones.

Dispersal
Escaped from garden sites (through dumping). The attractive berries are widely dispersed by birds.

Control
HAND: this species is best removed manually by cutting away stems and carefully bag all berries. Crowning requires tracing to current growing tip of root mass which is lateral rather than upper (as in most other asparagus species).

Immature fruit (L), Mature fruit and yellowing leaves at end of growing season (R)
Photos: Ku-ring-gai Council

Native look-a-like:

Wombat Berry *Eustrephus latifolius*

Common name: Broad Leaf Paspalum *Latin name:*Paspalum mandiocanum (*Syn. *P. wettsteinii)*
FAMILY: POACEAE
ORIGIN:
Noxious Weed Category: not applicable

Description
Habit: tufted grass, which can root at nodes of tillers. **Leaves**: broad dark green **Flowers**: **Fruit**: typical paspalum type in an open head. Individual seeds not especially sticky, but will adhere to clothes, boots and vehicles especially when wet, dropping once the surface dries. **Roots**: shallow and fibrous

Ecology
Significant transforming environmental weed. Grows in full sun and partial shade. Often grows on edges of paths (major incursion route), roads etc. Can penetrate and destroy groundcovers in intact vegetation. Water can transport this weed through good bush and deliver it deep within a remnant. Often a weed succession component following woody weed control.

Dispersal
Spreads on contaminated soil, animals, people, vehicles, mowing spoil, dumping and water.

Control
Slow to spread vegetatively, but spreads rapidly by seed and 'flares up' after woody weed control. Early control prior to other weeding or immediately after will reduce spread onto your site.. So to hold an infestation until spraying or weeding can occur, de-head and remove seed from the site. **HAND:** Hand-pull or crown out (crown segments easily missed if carelessly hand-pulled), old crowns or stolons likewise break and need to be carefully traced in or beneath other plants, **CHEMICAL:** glyphosate.

Common name: Broad Leaved Privet *Latin name: Ligistrum lucidum (*synonym*)*
FAMILY: OLEACEAE
ORIGIN:
Noxious Weed Category: W5 (Environmental Weed)

Description
Habit: Evergreen tree to 10m, often growing as a dense stand along fence lines and water courses, but will form thickets in disturbed forest or neglected areas. Trunk whitish-grey and prominently covered in lenticels. **Leaves**: opposite, hairless, broad-lanceolate, dark-green above paler below **Flowers**: Fragrant, white flowers appear in Spring in large panicles **Fruit**: develops in Summer and is small, fleshy and purplish-black to 6mm **Roots**: Very large trees can form spur-type buttresses but roots are generally spreading and (sub)surface and capable of producing suckers.

Ecology: Serious transforming weed of a range of forest types including wet sclerophyll and rainforest, but also pasture boundaries and degraded infrastructure areas. It's aggressive surface roots are water-hogging and the upper limbs readily compete with nearby vegetation for space. It spreads predominantly by seed which animals – particularly birds – eat, but also via stem fragments which can be dispersed in riparian systems. The plant will coppice and root-sucker if damaged/grazed/incompletely killed.

Dispersal: Seed, predominantly by birds, but seed also spread in water and other gravity means as well as garden waste, mulch etc.

Control
The plant is generally shallowly rooted so seedlings and juveniles can be hand pulled under most circumstances. However, use caution on steep and friable ground where uprooting the plant will cause soil damage. Dense germinations of seedlings can be foliar sprayed. In large natural systems, control outlying individuals and small clumps before moving onto the core infestation.
HAND: Small plants to ~2 years of age. **CHEMICAL:** Foliar spray with 1g $10L^{-1}$ metsulfuron methyl (eg Brushoff); cut stump to 100mm with undiluted glyphosate; chisel or drill and inject larger trees with undiluted glyphosate with 2mL per cut/hole, holes 100mm apart and as close to the ground as possible (also treat any dominant surface roots).

Common name: Butterfly flower / **Clockweed** *Latin name: Gaura lindheirmeri, Gaura parviflora*
FAMILY: ONAGRACEAE
ORIGIN:
Noxious Weed Category: n/a

Description
Habit: Tufted, spreading shrub to 2m with arching stems and sprays of (mostly) white flowers. **Leaves**: Either basal (rosette-like) or alternate, often attenuate (tapered) at the base, and reducing in size up stem, from 5 to 90mm long. **Flowers**: Many-branched, each white flower with 4 prominent petals **Fruit**: a capsule 2-3mm wide, 9mm long **Roots**: Fibrous and tolerant of a range of sandy and clay soils.

Ecology: A common garden escapee which flourishes in ruderal, roadside and other degraded and unmanaged areas, particularly on low-nutrient soils. It is a perennial which spreads readily by its tiny seeds on machinery such as slashes and road-building plant. Dense stands of Gaura can outcompete native grasses and heath plants.

Dispersal: Seed, often as a contaminant of garden waste.

Control
The plant is generally shallowly rooted so seedlings and juveniles can be hand pulled or grubbed out under most circumstances. However, use caution on steep and friable ground where uprooting the plant will cause soil damage. Dense germinations of seedlings can be foliar sprayed. In large natural systems, control outlying individuals and small clumps before moving onto the core infestation.
HAND: Small plants. **CHEMICAL:** Foliar spray with 5mL $1L^{-1}$ fluroxypyr (eg Starane200).

Common name: Camphor Laurel *Latin name: Cinnamomum camphora*
FAMILY: LAURACEAE
ORIGIN:
Noxious Weed Category: W5 (Environmental Weed)

Description
Habit: Semi deciduous tree to 25m with rounded form in open-growing situations. **Leaves**: Simple, opposite, dark glossy above, paler below with dusty bloom, strong camphor smell when crushed, strongly 3-veined from the base. **Flowers**: Inconspicuous cream-green **Fruit**: a black, single-seeded berry to 6mm **Roots**: Deeply rooted with old trees having spur-buttress-type surface roots.

Ecology: A significant transforming weed of the eastern Australian seaboard, particularly in previously-cleared rainforest areas. The tree is considered a temporal substitute for native forest regeneration in the absence of substantial native alternatives. The camphor oil is moderately allelopathic (stops/limits the growth of competition within the dripline). Camphor laurel is a very long-lived tree and traditionally cultivated as a feature tree by municipalities and rural homesteads due to its stately appearance and longevity.

Dispersal: Seed, usually spread by birds but also often as a contaminant of garden waste/mulch and to a lesser extent in flowing water of riparian systems.

Control
As for many woody weeds, control is best undertaken as early as possible while the plant is as small as possible. If controlling isolated individuals or dense stands/monocultures, seek strategic advice on control to minimize disruption to local ecology. **HAND:** Small plants to 2 years old can be hand pulled but when older than this the lignotuber (underground swelling of dormant buds) develops and can make hand-pulling difficult. Use caution when hand pulling on steep or friable soils. **CHEMICAL:** Plants too large for hand pulling – but up to 100mm diameter - can be cut close to ground level and immediately painted with undiluted glyphosate (eg RoundUp Biactive). Chisel or drill and inject larger trees with undiluted glyphosate @ 2mL per cut/hole, holes 100mm apart and as close to the ground as possible (also treat any dominant surface roots).

White Bolly Gum or *Neolitsea dealbata,*

Native look a like.

Common name: Canary Island Date Palm *Latin name: Phoenix canariensis*
FAMILY: ARECAREAE
ORIGIN:
Noxious Weed Category: n/a

Description
Habit: Native to the Canary Islands and North Africa, the Canary Island Date Palm is a solitary palm with a strong trunk 10-40 metres tall. Its leaves are pinnate and are 4-6 metres long. The basal leaflets are compact sharp spines and the fruit is oval and orange in colour. **Leaves**: Compound, whorled to 3m with basal leaflets reduced to spines. **Flowers**: Large sprays of small creamy white flowers present within foliage **Fruit**: Orange-coloured and oval-shaped to 12mm **Roots**: Aggressively fibrously rooted.

Ecology: Well suited to the tropics and sub-tropics, it grows readily from seed which often originates from municipal and private amenity plantings. Large numbers of seedlings can germinate and self-thin to lead to an impenetrable thicket of palms. Like many palms, the seed does not seem to require passage through gut to become viable.

Dispersal: Seed, usually spread by birds but also often as a contaminant of garden waste/mulch and to a lesser extent in flowing water of riparian systems.

Control
Special note: Fronds have long sharp spines which can penetrate skin.
As for many woody weeds, control is best undertaken as early as possible while the plant is as small as possible. **HAND:** Seedlings can be hand-pulled, but young plants quickly develop a strong, fibrous root system making hand-pulling difficult. Juveniles can be chipped out. **CHEMICAL:** Juveniles can be cut close to ground level and immediately painted with undiluted glyphosate (eg RoundUp Biactive). For a larger palm: To gain access to fronds nearer the growing point, cut off most of the fronds with loppers or saw close to the trunk on one side. Cut off about 10 fronds at the growing point and, as above, immediately paint some glyphosate herbicide on the stump of each cut frond. Cover the whole surface of the cut with herbicide. NOTE: Do not cut off all fronds and then treat with herbicide. Remove large dead trunks with a chain saw. A ladder or cherry picker may be needed to gain access to taller trees. Reshoots after cutting and poisoning, and also suckers from its roots. If removing from waterways or very steep land, please contact your local control authority for advice.

Livistona australis or Cabbage Tree Palm

Native look a like

Common name: Canna Lily *Latin name: Canna indica, Canna x generalis*
FAMILY: CANNANACEAE
ORIGIN:
Noxious Weed Category: n/a

Description
Habit: Erect, herbaceous perennial to 2m high with no true stems. Stems are a collection of tightly furled leaf bases. Roots extensive and a fleshy rhizome is formed underground. **Leaves**: Leaves Dark green to multi coloured and striped, large (60 x 25cm), arranged alternately on 'stems'. **Flowers**: Tubular flowers (yellows oranges, reds and pinks) formed in asymmetrical clusters. Spring-Autumn. **Fruit**: Black, globular seeds (5-7mm long) borne in capsule, and spread by birds. **Roots**: Aggressively fibrously rooted.

Ecology: Well suited to damp/boggy ground in full sun positions, but because it can spread by the aggressive, creeping rhizome, it can invade into semi-shade. When ripe, the fruit capsule is unremarkable in colour but the 5mm seeds are spread by birds and by contaminated and dumped green/waste.

Dispersal: Seed, usually spread by birds but also often as a contaminant of garden waste/mulch and to a lesser extent in flowing water of riparian systems.

Control
HAND: Hand pull/dig, bagging all plant parts and removing from site. **CHEMICAL:** Foliar spray with glyphosate (eg RoundUp Biactive) for initial knockdown of large infestations, but long-term hand removal required.

Common name: Cape Ivy *Latin name: Delairia odorata*
FAMILY: ASTERACEAE
ORIGIN:
Noxious Weed Category: W5 (Environmental Weed)

Description
Habit: Perennial, weakly-stemmed vine to 25m, but also ground-smothering. **Leaves**: Simple, alternate and lobed, palmately veined, fleshy and light green. **Flowers**: Conspicuous clusters of small, unpleasantly scented yellow, daisy-like flower heads. July - September. **Fruit**: An achene (hard-coated, no flesh) with a pappus (tuft of 'hairs'). **Roots**: Shallow-rooted and generally not adventitious (ie rooting at nodes).

Ecology: Tolerant of semi-shade to full sun, Capy Ivy is fast growing and quickly smothers other vegetation, often stunting and killing the 'host'. Once elevated to canopy height, the wind-dispersed fruit can travel over long distances (>1km) and start new infestations.

Dispersal: Seed which is readily spread by wind, water and as a soil contaminant. Is also capable of growing from stem fragments with a node.

Control
HAND: Hand pull/dig, bagging all plant parts and removing from site. Use caution not to damage host vegetation. **CHEMICAL:** Foliar spray with 1.5g $10L^{-1}$ metsulfuron methyl (eg Brushoff) is effective.

Common name: Castor Oil Plant *Latin name: Ricinus communis*
FAMILY: EUPHORBIACEAE
ORIGIN:
Noxious Weed Category: W5 (Environmental Weed)

Description
Habit: Perennial large shrub to small tree to 7m with open, spreading habit and smooth, grey trunk. **Leaves**: Simple, alternate and deeply lobed, palmately veined, soft and thin, dark green above, paler below. **Flowers**: Conspicuous terminal spikes of separate male and female flowers protruding beyond foliage (see photo). **Fruit**: Capsule containing numerous hard striped seeds to 7mm.

Ecology: A disturbance specialist which rapidly colonises after flood, fire or clearing of land or weedy vegetation from dormant seed bank. Castor Oil Plant does not like full shade, but takes advantage of high light and heat conditions. The plant can grow up to 5m in the first year and set viable fruit. Fruit estimated to have a viability of up to 120 years and a dense seed bank can develop quickly within infestations.

Dispersal: Seed which is readily spread by water and as a soil contaminant.

Control
Note: All parts of this plant should be considered poisonous and appropriate PPE used.
HAND: Small plants can be hand-pulled. **CHEMICAL:** Dense infestations of seedlings or small plants can be foliar sprayed with glyphosate @ 2.0% + a non-ionic penetrant (eg Pulse or Rygel) @ 0.1%. Large plants can be cut-stumped with undiluted glyphosate (eg Roundup Biactive).

Common name: Cats Ear *Latin name: Hypochaeris radicata*
FAMILY: ASTERACEAE
ORIGIN:
Noxious Weed Category: n/a

Description
Habit: Rosetted annual, herb, 8-50cm high, leaves rough, bristly; yellow flower heads up to 3 cm across. Common weed of lawns, horticultural areas, roadsides & bushland.
Leaves: A rosette of lanceolate, shallowly-lobed leaves with abundant rough hairs. **Flowers**: Conspicuous yellow flowers presented on occasionally-branched stems. **Fruit**: An achene (hard-coated, no flesh) with a pappus (tuft of 'hairs').

Ecology: Like many *Asteraceae* plants of this type, *Hypochaeris* thrives in disturbed, high light and heat situations eg. post-fire, scarification by machinery, trampling, over-stocking etc. It produces abundant seed that rapidly germinates and also can resprout from the tap-root.

Dispersal: Seed which is readily spread by wind and as a soil contaminant.

Control
HAND: Small plants can be hand-pulled, ensuring the tap-root is removed. **CHEMICAL:** Dense infestations of seedlings or small plants can be foliar sprayed with glyphosate @ 1.0% or 1g $10L^{-1}$ metsulfuron methyl (eg Brushoff) which will not kill surrounding grasses.

Common name: Chinese Celtis *Latin name: Celtis sinensis*
FAMILY: CANNABACEAE/ULMACEAE
ORIGIN:
Noxious Weed Category: W3

Description
Habit: Deciduous, small to medium tree to 15m with broad crown and greyish trunk and branches. **Leaves**: Simple, alternate, slightly toothed (except for basal 1/3), mildly rough to touch, dark dull-green upper, paler beneath, 3-veined from the base. **Flowers**: Inconspicuous cream-green. **Fruit**: A single-seeded berry which ripens from green to orange to black at maturity.

Ecology: A significant transforming environmental weed and agricultural weed, capable of forming dense impenetrable thickets. Chinese Celtis produces abundant fruit which readily germinates beneath the parent tree to form a dense stand where it outcompetes native vegetation.

Dispersal: Seed which is readily spread by birds and occasionally as a contaminant of dumped garden waste or mulch. Seeds do not seem to require passage through gut for viability and hence dispersal in riparian systems – unaided by animals – is common.

Control
HAND: Small plants can be hand-pulled, ensuring the tap-root is removed. **CHEMICAL:** Dense infestations of seedlings or small plants can be foliar sprayed with glyphosate @ 10mL L^{-1} + 1g $10L^{-1}$ metsulfuron methyl (eg Brushoff). Plants too large for hand pulling – but up to 100mm diameter - can be cut close to ground level and immediately painted with undiluted glyphosate (eg RoundUp Biactive). Chisel or drill and inject larger trees with undiluted glyphosate @ 2mL per cut/hole, holes 100mm apart and as close to the ground as possible (also treat any dominant surface roots).

Common name: Chinese Tallow *Latin name: Triadica sebifera (*Syn. *Sapium sebiferum)*
FAMILY: EUPHORBIACEAE
ORIGIN:
Noxious Weed Category: W5 (Environmental Weed)

Description
Habit: A deciduous tree usually to 8m, with a spectacular maroon autumn leaf colour. Tallow tree should not be confused with the bleeding heart tree (*Homalanthus populifolius*), a native rainforest tree in the same Family (Euphorbiaceae). **Leaves**: Leaves are dark green above, paler below and distinctively heart-shaped with a blade to 9cm long and to 7.5cm wide. The leaves are arranged alternately and the petiole is often longer than the blade. **Flowers**: Tallow tree produces slender spikes approximately 100mm in length of tiny yellowish green flowers in late spring to summer. Male and female flowers are on separate plants.
Fruit: The fruit is 1.2cm long and 1.4cm wide, initially green then black, three lobed and contains three white seeds covered in a chalky coating of tallow.

Ecology: A significant transforming environmental weed and agricultural weed, capable of forming dense impenetrable thickets. Over 130,000 seeds can be produced per tree per year. Germination success can be as high as 62% (Singh *et. al*. 1993). Tallow also spreads by suckering following cutting or burning. The tree is generally not tolerant of deep shade but is fast growing and capable of invading rainforest gaps and margins as well as partially shaded forests such as melaleuca swamps or wet sclerophyll.

Dispersal: Seeds are eaten by birds and float on water, and hence are easily spread by floods (Hosking, pers. comm.).

Control
HAND: Small plants can be hand-pulled, ensuring the tap-root is removed. **CHEMICAL:** Dense infestations of seedlings or small plants can be foliar sprayed with glyphosate @ 1.0% + 1g10L^{-1} metsulfuron methyl (eg Brushoff). Plants too large for hand pulling – but up to 100mm diameter - can be cut close to ground level and immediately painted with undiluted glyphosate (eg RoundUp Biactive). Chisel or drill and inject larger trees with undiluted glyphosate @ 2mL per cut/hole, holes 100mm apart and as close to the ground as possible (also treat any dominant surface roots).

Common name: Climbing Asparagus *Latin name: Asparagus plumosus*
FAMILY: ASPARAGACEAE
ORIGIN:
Noxious Weed Category: W5 (Environmental Weed)

Description
Habit: A perennial vine to 5m arising from an underground corm in the same fashion as edible asparagus *A. officinalis*. In some instances, however, a creeping rhizome can develop which may send up new stems. **Leaves**: Leaves are in fact fine cladodes (reduced stem segments) which encircle the branches at nodes giving the plant a 'ferny' appearance. The main lateral branches present in horizontal planes, as do the individual clusters of cladodes (*this is a key identifier with other climbing asparagus*). The base of each branchlet is often subtended by a thorn. **Flowers**: Small, inconspicuous and born singularly in branchlet axils. **Fruit**: The fruit is a spherical, single-seeded berry which ripens from green to black.

Ecology: *A. plumosus* germinates from a single-seeded fruit and is capable of flowering and fruiting after two to three years. It is shade tolerant and can invade relatively intact (undisturbed) forest systems. Once established, like other weedy Asparagus species, it competes aggressively for soil moisture and dense infestations can 'starve' nearby deeper-rooted vegetation of water and nutrients. The plant does not spread vegetatively from stems (apart from the growing crown or rhizome) and requires gravity or an animal vector to facilitate this.

Dispersal: Seeds are eaten by birds, can travel in water and are occasionally spread in contaminated garden waste.

Control
HAND: Seedlings quickly develop strong, clumping roots so even small plants may need crowning out. Plants only regrow from the crown or creeping rhizome so it is not essential to remove the entire root mass, but it is important to follow and remove all rhizomes. Larger plants can still be rogued out but may require the use of a mattock or similar. In all cases, either remove the crown. **CHEMICAL:** Dense infestations of seedlings or small plants can be foliar sprayed with 1.5g10L^{-1} metsulfuron methyl (eg Brushoff).

Common name: Climbing Nightshade *Latin name: Solanum seaforthianum*
FAMILY: SOLANACEAE
ORIGIN:
Noxious Weed Category: W5 (Environmental Weed)

Description
Habit: A perennial vine to 6m with a tough stem and deeply lobed leaves, common in coastal environs. **Leaves**: Simple, alternate and deeply lobed (pinnatafid), dull green above, paler beneath. **Flowers**: clusters of mauve to lilac flowers with 5 fused petals (like many other Solanaceae) and yellow stamens. **Fruit**: is a red berry with many seeds to 7mm in diameter.

Ecology: Climbing nightshade flourishes in forested coastal environments, including dry and wet sclerophyll and Littoral rainforest, although it has limited potential to invade undisturbed systems. It can, however, flourish in rainforest gaps (internal and external (ie edges)) where it is a quick grower and capable of rapidly spreading. At maturity it can smother other vegetation, competing with it for light (and moisture) and it also aggressively competes with native vines of similar niche (eg Stephania, Cayratia, Cynanchum, Marsdenia, Hardenbergia).

Dispersal: Seeds are eaten and spread by birds.

Control
HAND: Seedlings and small plants can be hand-pulled, taken care to remove as much of the root mass as possible. If practicable, remove and fruit off-site too. Large plants may require the use of a mattock or similar. **CHEMICAL:** Dense infestations of seedlings or small plants can be foliar sprayed with 1.5g10L^{-1} metsulfuron methyl (eg Brushoff). Large plants can be cut-paste with undiluted glyphosate (eg RoundUp Biactive).

Common name: Cocos Palm *Latin name: Syagrus romanzoffiana*
FAMILY: ARACACEAE
ORIGIN:
Noxious Weed Category: W5 (Environmental Weed)

Description
Habit: Tree to 15m with single, straight trunk, frequently planted in municipal areas and private yards. **Leaves**: Large (to 3m), whorled and compound with many long leaflets. Seedlings do not have divided cotyledons as in Bangalow Palm (*Archontophoenix cunninghamiana*). **Flowers**: Cream to white in large, showy panicles. **Fruit**: is an orange, fleshy drupe (ie single seeded) 10mm in diameter.

Ecology: Similar to that of Canary Island Date Palm (Phoenix canariensis). Well suited to the tropics and sub-tropics, it grows readily from seed which often originates from municipal and private amenity plantings. Large numbers of seedlings usually germinate beneath parent trees and particularly where seed has 'rafted' into piles along stream banks. Dense stands are uncommon, but large numbers can establish in forest types usually inhabited by other endemic palms such as Bangalow and Cabbage Palm (*Livistona australis*).

Dispersal: Seeds are eaten and spread by birds, flying foxes, possums etc.

Control
As for many woody weeds, control is best undertaken as early as possible while the plant is as small as possible. **HAND:** Seedlings can be hand-pulled, but young plants quickly develop a strong, fibrous root system making hand-pulling difficult. Juveniles can be chipped out. **CHEMICAL:** Juveniles can be cut close to ground level and immediately painted with undiluted glyphosate (eg RoundUp Biactive). Larger palms can be treated by chiselling or drilling around the trunk close to the ground 100mm apart and filling with 2mm of undiluted glyphosate per hole.

Livistona australis or Cabbage Tree Palm,
Native look a like

Common name: Coffee *Latin name: Coffea arabica*
FAMILY: RUBIACEAE
ORIGIN:
Noxious Weed Category: n/a

Description
Habit: Shrub to 4m with dense, dark, glossy foliage to ground level. Usually a single trunk then branching from 300mm upward. **Leaves**: Simple, opposite to 120mm, oblanceolate and drawn out to a 'drip tip', wavy margin. Adult leaves have several domatia in the axis' of the mid-vein and several lateral veins. **Flowers**: Clustered, small white flowers in leaf axis', fragrant. **Fruit**: A red, fleshy, ovoid (olive-shaped) drupe (ie single seeded) to 15mm.

Ecology: Coffea Arabica is an emerging weed on the mid-north coast, but well established in northern New South Wales where it has escaped cultivation from households and plantations into adjacent forests. It is particularly well suited to high-rainfall, frost-free, red-soil environs where it readily invades in-tact rainforests in deep shade conditions. The highly visible and palatable fruit are dispersed by birds and the plant is capable of rapid spread across a wide range. The tree is capable of setting viable fruit after 3 years.

Dispersal: Seeds are eaten and spread by birds. People readily plant it as a feature tree or for its edible fruit.

Control
As for many woody weeds, control is best undertaken as early as possible while the plant is as small as possible. **HAND:** Seedlings and juveniles can be hand-pulled, but young plants quickly develop a strong tap root. **CHEMICAL:** Juveniles can be cut close to ground level and immediately painted with undiluted glyphosate (eg RoundUp Biactive) or sprayed with 1.5g10L^{-1} metsulfuron methyl (eg Brushoff) and/or 20mL L^{-1} of glyphosate. Larger plants can be treated by chiselling or drilling around the trunk close to the ground 100mm apart and filling with 2mm of undiluted glyphosate per hole.

Common name: Coral Berry *Latin name: Ardisia crenata*
FAMILY: MYRSINACEAE
ORIGIN:
Noxious Weed Category: n/a

Description
Habit: Shrub to single trunk to 2m with glossy foliage with red clusters of fruit presented within or below the foliage. Usually a single trunk then branching from 300mm upward. **Leaves**: Simple, pseudo-whorled, to 100mm, lanceolate with strongly crenate margins (see photo). **Flowers**: Small, white and clustered. **Fruit**: Red, fleshy, rounded drupe (ie single seeded) to 8mm.

Ecology: *Ardisia* is an established weed on the mid-north coast but - for the most part - still in comparatively low infestation levels. It is hardy and capable of tolerating frost and deep shade conditions where it readily invades in-tact forest. The highly visible and palatable fruit are dispersed by birds and the plant is capable of rapid spread across a wide range.

Dispersal: Seeds are eaten and spread by birds. People readily plant it as a feature tree or for its edible fruit.

Control
As for many woody weeds, control is best undertaken as early as possible while the plant is as small as possible. **HAND:** Seedlings and juveniles can be hand-pulled, but young plants quickly develop a strong root system. Care should be taken when hand-weeding on steep or friable soils. **CHEMICAL:** Juveniles can be cut close to ground level and immediately painted with undiluted glyphosate (eg RoundUp Biactive) or sprayed with 1.5g10L^{-1} metsulfuron methyl (eg Brushoff) and/or 20mL L^{-1} of glyphosate. Larger plants can be treated by cut and paste with undiluted glyphosate.

Common name: Coral Tree *Latin name: Erythrina x sykesii*
FAMILY: FABACEAE
ORIGIN:
Noxious Weed Category: W5 (Environmental Weed)

Description
Habit: Fast-growing, deciduous tree to 25m; broad spreading crown; all parts of the tree are covered in short thorns; aggressive layering when felled. **Leaves**: Alternate to pseudo-whorled, compound with 3 deltoid (triangular) leaflets, the middle on a long petiolule (leaf stalks); leaflets thin and dark green above – paler below **Flowers**: Showy clusters of red flowers appear in Spring when the tree is leafless **Fruit**: A pod, but this hybrid does not yet set viable seed.

Ecology: A cultivated hybrid which has been (and is) widely planted as a stately feature tree on farms, suburban gardens and in municipal areas, the main vector of spread is humans and flowing water of riparian systems where rafted debris of trunk and branch parts readily strike roots and develop new infestations. The wood is pithy and the tree is vulnerable to stem-injection techniques of control. However, limbs which drop to the ground during necrosis can still have viable epicormic buds and begin to grow again. Similarly for the collapsed trunk of a treated tree. For this reason, retreatment is often required.

Dispersal: Does not yet produce viable seed. Main means of dispersal is by humans through cultivated plantings and water movement of riparian systems. To a lesser degree in dumped garden waste and as a contaminant in soil ('clean fill') on farms and civil construction.

Control
Note: Exercise caution and use appropriate PPE when handling this plant as all parts have sharp thorns.
As for many woody weeds, control is best undertaken as early as possible while the plant is as small as possible. **HAND:** Seedlings and juveniles can be hand-pulled. Care should be taken when hand-weeding on steep or friable soils. **CHEMICAL:** Juveniles can be cut close to ground level and immediately painted with undiluted glyphosate (eg RoundUp Biactive) or sprayed with 1.5g10L^{-1} metsulfuron methyl (eg Brushoff). Larger plants can be treated by cut and paste with undiluted glyphosate. Chisel or drill and inject larger trees with undiluted glyphosate @ 2mL per cut/hole, holes 100mm apart and as close to the ground as possible (also treat any dominant surface roots). If branches of the tree have made contact with the soil, it is likely that they will have struck roots, so treat these by the above methods.
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Common name: Coreopsis *Latin name: Coreopsis lanceolata*
FAMILY: ASTERACEAE
ORIGIN:
Noxious Weed Category: n/a

Description
Habit: A short lived perennial from the American prairies, Coreopsis is a bright yellow daisy carpeting rural roadsides in spring and early summer. Long lanceolate leaves in basal clusters. **Leaves**: Lanceolate, basal rosette developing into a tuft, green above, whitish beneath. **Flowers**: Yellow, compound 'daisy'-like, singularly on peduncle (flower stalk) to 60cm, ray florets (outer petals of flower head) are toothed on the ends. **Fruit**: An achene (hard-coated) with 2 papery 'wings', small (1-2mm).

Ecology: A short lived perennial herb which produces abundant seed that germinates readily under high light and heat conditions; well suited to road-sides, burned heath, dunes, compacted turf or recreation areas, overstocked/degraded pasture on poor soils. Coreopsis is now a widespread environmental weed on poor soils and in open grassland and woodland. It is spread rapidly by wind and forms interconnected root mats.

Dispersal: Its tiny seeds are spread rapidly by wind along roads and railway lines. Also spreads vegetatively via underground rhizomes. To a lesser degree in dumped garden waste and as a contaminant in soil ('clean fill') on farms and civil construction.

Control: Hand weeding is time consuming but successful. Each sister plant must be traced and removed. Seeds are long lived, so new seedlings will need to be weeded out every year. Spraying with a glysophate at 10mL L^{-1} flowering is successful.
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Common name: Corky Passion Flower *Latin name: Passiflora suberosa*
FAMILY: PASSIFLORACEAE
ORIGIN:
Noxious Weed Category: n/a

Description
Habit: Annual scrambler/vine to 5m, straggling habit which can ground-cover as well as smother low vegetation, particularly on forest edges and in other gaps. Older stems are white and particularly corky/pithy. **Leaves**: Simple, alternate and lobed. Three lobes, each drawn to a blunt point. **Flowers**: White, singular and showy – typical of other Passifloraceae. **Fruit**: A black berry with multiple seeds.

Ecology: It is usually most successful in the sub-canopy, where it smothers small trees, shrubs and even the ground cover species. It germinates readily in partial shade to full sun and can also spread by layering along older sections of the stem where it contacts the ground. The fruit is palatable to animals, particularly birds and this helps the plant spread quickly over a wide range.

Dispersal: Fruit are eaten and spread by birds, but also likely by terrestrial vertebrates such as rats. Less common is the active spread by humans as the plant is valued by some as an ornamental.

Control:
HAND: Hand weeding is time consuming but successful. It is important to remove as much of the root mass as possible, particularly where the stem has layered. **CHEMICAL:** Dense infestations can be foliar sprayed with glyphosate (eg RoundUp Biactive) at 10mL L^{-1}. Large plants can be treated by cut-scrape-paint with undiluted glyphosate.
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Common name: Cotoneaster *Latin name: Cotoneaster glaucophyllus*
FAMILY: ROSACEAE/MALACEAE
ORIGIN:
Noxious Weed Category: n/a

Description
Habit: Shrub to 4m, often multiple trunks arising from the base which take on an arching habit. The tree has a dull green appearance punctuated with clusters of bright red berries when in fruit. **Leaves**: Simple, alternate, discolourous (upper and lower surfaces distinctly different in colour), the lower surface with a wooly covering of hairs, leaves up to 10cm long. **Flowers**: In white clusters. Each flower about 8 mm wide, 5-petalled. Flower stalk densely hairy. Flowers spring and summer. **Fruit**: A red berry to 10mm with multiple yellow seeds, presented in clusters.

Ecology: Common ornamental. Widely naturalised on the fringes of urban bushland and roadsides near plantings. At least nine species of *Cotoneaster* have naturalised in Australia. The fruit is palatable to animals, particularly birds and this helps the plant spread quickly over a wide range. It is aggressive in the mid and understory of some forest types, although not well suited to the deep shade of rainforest. It invades heathland and heathy woodland, lowland grassland and grassy woodland, dry sclerophyll forest and woodland, damp sclerophyll forest, wet sclerophyll forest, riparian vegetation, freshwater wetland (seasonal), and rock outcrop vegetation (Carr *et al* 1992). It's aggressive habit and ability to form dense thickets enables it to outcompete desirable vegetation.

Dispersal: Fruit are eaten and spread by birds, but also likely by terrestrial vertebrates such as rats. Seeds can be transported in flowing water of riparian systems. Also spread by humans as the plant is valued by some as an ornamental.

Control:
HAND: Cotoneaster can be dug out, and seedlings and small plants hand pulled. **CHEMICAL:** Seedlings can be spot sprayed with glyphosate & water at 10mL L^{-1} + surfactant (eg Pulse or Rygel). The plant suckers readily so large plants can be treated by cut, scrape and paint stump, or stem inject with undiluted glyphosate.

Common name: Cotton Bush / **Swan Plant** *Latin name: Gomphocarpus fruiticosus*
FAMILY: APOCYNACEAE/ASCLEPEDIACEAE
ORIGIN:
Noxious Weed Category: n/a

Description
Habit: Erect, short-lived perennial shrub to 2m. Stems densely covered with apressed (laying flat) short weak soft hairs when young, becoming hairless with age. Leaves 4–12.5 cm long, 0.5–1.5 cm wide, upper and lower surfaces with scattered hairs; hairs on leaf stalk to 1 cm long. **Flowers**: White to 15mm in clusters. **Fruit**: A green inflated pod, turning brown with age, covered with soft spines to 1 cm long, splitting to release seeds; pod with inner wall separated from outer wall by an air space and seeds within inner chamber; pod stalk S-shaped. Seeds numerous, ovoid, flat, about 0.6 cm long and ending in a tuft of white silky hairs (pappus) about 3 cm long.

Ecology: Grows well in areas of disturbance such as grazed pasture or degraded farmland, but also readily colonises areas of ephemeral inundation, creek banks etc. Prefers full sun. Inflated fruit releases windblown seeds, but spread also facilitated by contaminated soil, garden waste and on vehicles and machinery. Dense stands of Cotton Bush compete with desirable vegetation.

Dispersal: Inflated fruit releases windblown seeds, but spread also facilitated by contaminated soil, garden waste and on vehicles and machinery.

Control:
Note: Plants contain milky sap which may be irritable to some so PPE should be worn.
HAND: Recommended for small infestations only. **CHEMICAL:** Dense or large and diffuse infestations can be foliar sprayed with 10ml L^{-1} glyphosate (eg RoundUp Biactive).

Common name: Crimson Fountain Grass *Latin name: Pennisetum setaceum* and *P. alopecuroides*
FAMILY: POACEAE
ORIGIN:
Noxious Weed Category:

Description
Habit: Tufted or clump-forming perennial grass to 1m. **Flowers**: Flowers Inflorescence spike-like and feathery, purplish, at the end of long canes; flowers Summer-Winter. *P. setaceum* – seed heads to 30cm long, *P. alopecuroides* – seed heads to 8cm long. **Fruit**: Small (<1-2mm); both species strongly self-seed. Some new varieties are claimed to have low seed viability.

Ecology: Outside its native range *P. setaceum* is a weed of pastures and alongside railway lines and roads (Johnson) and can grow in rock crevices and pavement cracks (CDFA). It grows in tropical to semi arid areas and prefers exposed, dry habitats, particularly rocky areas but can also grow in sandy soils such as coastal grasslands and coastal sage scrub (Johnson; CDFA; Clayton, 1970).

Dispersal: Can reproduce asexually and reproduce by seeds following pollination (Simpson and Bashaw, 1969) by either fertilized or unfertilized seeds (Simpson and Bashaw, 1969). The species can be propagated from seed and it will self sow in warm climates. Most cultivars do not produce seeds; they are propagated by dividing the root clumps (Floridata). Primarily wind dispersed (NPCI). Mainly spread by humans and wind, also animals and water (Poulin *et al* 2007). It is readily dispersed by vehicles, humans, wind, water and possibly birds (Tunison, 1992). The propagules are spread by wind, water and possibly animals and also humans.

Control:
HAND: Dig out and remove off site. **CHEMICAL:** Dense or large and diffuse infestations can be foliar sprayed with 10ml L^{-1} glyphosate (eg RoundUp Biactive).

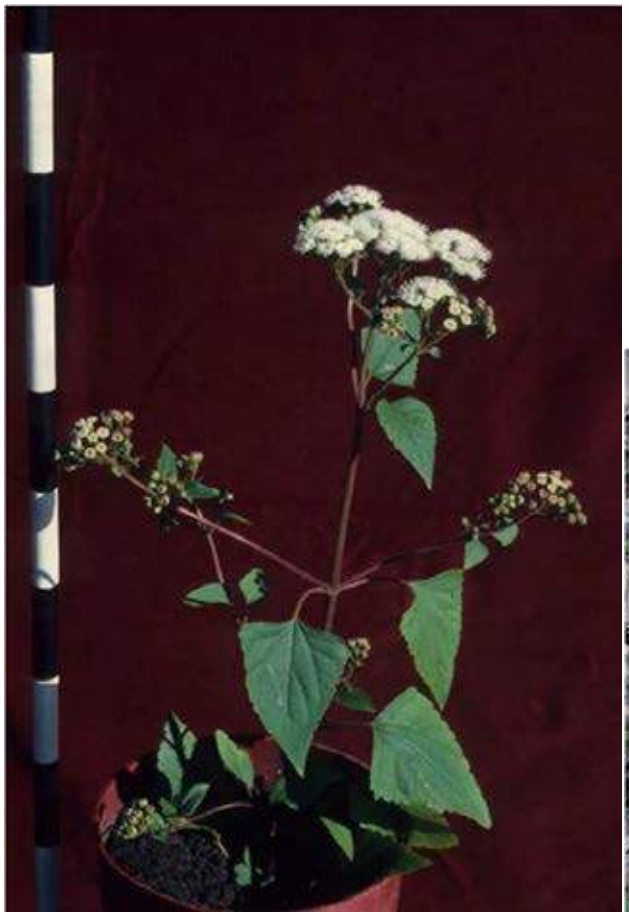
Common name: Crofton Weed *Latin name: Ageratina adenophora*
FAMILY: ASTERACEAE
ORIGIN:
Noxious Weed Category: W4

Description
Habit: A large branched herb up to2 m high with triangular to diamond-shaped dark green leaves, sometimes slightly hairy with obvious veins. **Flowers**: Flowers are small, white and daisy-like, clustered in heads. **Fruit**: A small achene (hard-coated seed) with a bristly 'tail'.

Ecology: Spreads rapidly; mature Crofton weed plants can produce between 10 000 and 100 000 seeds per year. Seeds are very light (25 000 seeds/g) and are windborne over long distances to invade previously non-infested areas.The seeds require light to stimulate germination so that invasion commonly takes place on bare, disturbed sites and only rarely on heavily vegetated areas. Places where Crofton weed is commonly found include: land cleared but not revegetated with pasture, roadsides and waste areas, State forests. Once established, seedlings tolerate shade and grow rapidly. In this way, small infestations of Crofton weed rapidly increase in size unless controlled. Crofton weed reduces the ecological value of bush land, lowers crop yields and reduces the carrying capacity of grazing land.

Dispersal: Windborne over short-long distances, but also as a contaminant of soil, machinery, animals and people.

Control:
HAND: Dig out and remove off site. **CHEMICAL:** Dense or large and diffuse infestations can be foliar sprayed with metsulfuron methyl (eg Brushoff) 1.5g $10L^{-1}$.



Clerodendrum tomentosa or Lolly Bush
Native look a like

Common name: Duranta ('Sheena's Gold') *Latin name: Duranta repens* and *D. erecta*.
FAMILY: VERBENACEAE
ORIGIN:
Noxious Weed Category: n/a

Description
Habit: A large shrub with many trunks up to 6m with arching branches covered in straight spines. It has a golden-green appearance and – when in fruit – is often festooned in large racemes of orange berries. **Flowers**: Lilac to 15mm in long racemes from Spring to Autumn. **Fruit**: An orange berry to 8mm with multiple seeds.

Ecology: Common ornamental but only and emerging weed in the Hastings region where it is occasionally naturalised on the fringes of urban bushland and roadsides near plantings. The fruit is palatable to animals, particularly birds and this helps the plant spread quickly over a wide range. It is aggressive in the mid and understory of some forest types, and although not well suited to the deep shade of rainforest it can flourish on edges and in gaps.

Dispersal: The fruit is palatable to animals, particularly birds and can spread quickly over a wide range. It is still widely planted and as such humans are a primary dispersal vector.

Control:
Note: Plants are covered in sharp spines and caution should be exercised when working with this plant, including the use of appropriate PPE.
HAND: Duranta can be dug out, and seedlings and small plants hand pulled. Caution should be exercised when hand removing on loose, steep or friable ground. **CHEMICAL:** Large plants can be treated by cut-paint with undiluted glyphosate or by chiselling or drilling around the trunk close to the ground 100mm apart and filling with 2mm of undiluted glyphosate + metsulfuron methyl at 1g L^{-1} per hole. Dense infestations should be slashed and the regrowth treated as above.

Common name: Dwarf Umbrella Tree *Latin name: Schefflera arboricola*.
FAMILY: ARALIACEAE
ORIGIN:
Noxious Weed Category: n/a

Description
Habit: Shrub to about 2 m high but occasionally larger; often multiple trunks; fan-like foliage presents facing outward. **Flowers**: Terminal panicles bearing small clusters or umbels, greenish to white. **Leaves**: Compound, palmate with about 7-11 glossy green leaflets, each to 11 cm long. **Fruit**: Fruit a purple berry when ripe.

Ecology: Widely planted as a garden ornamental, it is often in ready proximity to bushland areas where it is readily dispersed by animals, particularly birds. The seeds can germinate in shaded rainforest environments, but is better suited to more open light conditions such as wet sclerophyll, heathy forest as well as ruderal and unmanaged areas (easements, rural infrastructure etc). The plant competes with desirable vegetation and whilst thickets are uncommon, it is a threat to forest biodiversity.

Dispersal: The fruit is palatable to animals, particularly birds and can spread quickly over a wide range. It is still widely planted and as such humans are a primary dispersal vector.

Control:
HAND: Seedlings and small plants can be hand pulled. Caution should be exercised when hand removing on loose, steep or friable ground. **CHEMICAL:** Large plants can be treated by cut-paint with undiluted glyphosate or by chiselling or drilling around the trunk close to the ground 100mm apart and filling with 2mm of undiluted glyphosate (eg RoundUp Biactive) per hole.

Dwarf Umbrella Tree and Umbrella Tree Seedlings

Common name: Elderberry *Latin name: Sambuccus nigra*.
FAMILY: ADOXACEAE/CAPRIFOLIACEAE
ORIGIN:
Noxious Weed Category: n/a

Description
Habit: Freely coppicing shrub to 3m **Flowers**: Upturned umbels of showy, white flowers at canopy. **Leaves**: Compound, pinnate with about 7-11 toothed leaflets, each to 5 cm long. **Fruit**: Fruit a purplish black berry to 5mm.

Ecology: Widely planted as a garden ornamental, it is often in ready proximity to bushland areas where it is readily dispersed by animals, particularly birds. It is better suited to more open light conditions such as wet sclerophyll, heathy forest as well as ruderal and unmanaged areas (easements, rural infrastructure etc). The plant competes with desirable vegetation and whilst thickets are uncommon, it coppices readily from the lower trunk.

Dispersal: The fruit is palatable to animals, particularly birds and can spread quickly over a wide range. It is still widely planted and as such humans are a primary dispersal vector.

Control:
HAND: Seedlings and small plants can be hand pulled. Caution should be exercised when hand removing on loose, steep or friable ground. **CHEMICAL:** Large plants can be treated by cut-paint with undiluted glyphosate or by chiselling or drilling around the trunk close to the ground 100mm apart and filling with 2mm of undiluted glyphosate (eg RoundUp Biactive) per hole. Dense infestations can be slashed and treated as above.

Common name: Elephant's Ears/Purple Taro *Latin name: Colocasia esculenta/Xanthosoma violaceum*
FAMILY: ARACEAE
ORIGIN:
Noxious Weed Category: Class 4 (Locally Controlled) (*Colocasia* spp.)

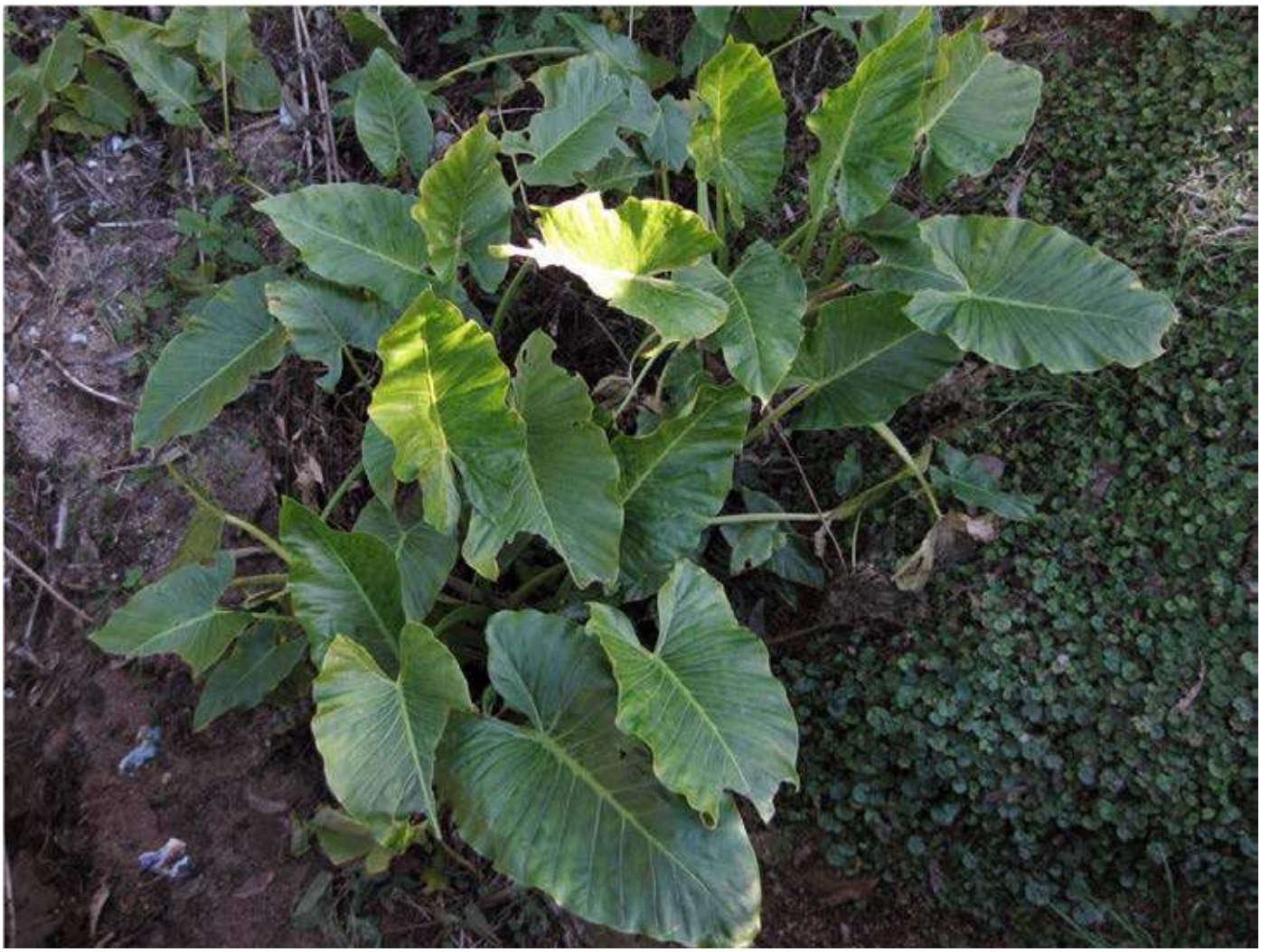
Description
Habit: A variable species of perennial herb 1-2 m tall; large "elephants ears" leaves grow from the base, upper surface glossy green to bluish-black. Occurs in many variants. **Flowers**: Flowers appear on a fleshy stalk enveloped by a long yellow bract (spathe). **Leaves**: Leaves are usually very large, arrowhead shaped, dark green and velvety. **Fruit**: Fruit a small berry, in clusters on the fleshy stalk.

Ecology: In some parts of the world this fast growing wild taro (*C. esculenta*) is harvested for its potato-like tubers and it can be easily grown by re-sowing sections of the same. It spreads rapidly by vegetative means (rhizomes as well as tuber parts) and this is further enabled by its preference for boggy and waterlogged conditions. On occasion it sets viable seed, but this is not considered a primary means of spread.

Dispersal: It is still widely planted and, as such, humans are a primary dispersal vector. Tubers can be distributed in the flower water of riparian systems, particularly during flood disturbance.

Control:
Note: Care should be taken when handling all plant parts, as the tissue contains needle-shaped raphides in un-cooked plant cells — severe gastrointestinal distress can occur. The initial affect on the mouth is an immediate painful irritation, burning and swelling of the lips, tongue and other mouth parts with a subsequent feeling of local anaesthesia. It is also toxic to handle, care needs to be taken with removal. Wear gloves and avoid coming into contact with plant parts.
HAND: For individual plants or small infestations, dig up rhizome and dry out. Larger infestations :dig up and remove, though this can cause a large amount of soil disturbance. **CHEMICAL:** The plants can be sliced across near the base with a cane knife and neat glyphosate dabbed on the stem, if possible mostly on the green part of the new leaf which takes up the poison best. This will kill the tuber and possibly new plants that are growing by sprouting from the roots nearby. Trial foliar spray with glyphosate and water at 1:50 (20ml/L) &/or metsulfuron methyl (e.g. Associate®) at 1.5g/10 L + non ionic surfactant (repeated treatments needed); or trial cut, scrape and paint or drill & inject of rhizome with glyphosate and water 1:1.5 &/or metsulfuron methyl at 10g/1L. Trial wiping of leaves with metsulfuron methyl mix. Only use metsulfuron methyl in terrestrial areas. To control dense patches of the plant near waterways, trial glyphosate 1:9 (via a splatter gun) or 1:20 with a wickwiper. Use only formulas that are registered for use near waterways. Usually some material will be left and new plants will continue to emerge, which have to be treated gradually. Others will appear after having drifted downstream, and yet others will come up from seed.

Elephants Ears Native Look a Like: Alocasia brisbanensis or Cunjevoi



Common name: Farmer's Friends/Cobbler's Pegs *Latin name: Bidens pillosa*
FAMILY: ASTERACEAE
ORIGIN:
Noxious Weed Category: n/a

Description
Habit: An erect annual or perennial herb with branching habit to about 1m high. **Flowers**: Individual flowers are yellow but are tiny and held in dense terminal clusters in a widely branching flowering head. Each flower cluster has four or five short, broad, white "petals" but these do not persist for very long. **Leaves**: Leaves are deeply divided into three toothed lobes, with the terminal lobe larger than the other two. **Fruit**: The seeds are black, about 1cm long, with 2 or 3 barbed awns at the tip. These adhere to clothing.

Ecology: Generally found growing in full sun or partial shade on grazing land, roadsides or waste ground, but it also invades remnant grassy vegetation in farming areas. It will tolerate dry infertile soils and often is most prolific on warm north-facing rocky slopes. Burrs are a nuisance on sheep and other fleece-producing livestock, and to people.

Dispersal: Fruit adhere to hair/fur/clothing and are a contaminant of soil and garden waste. They also are capable of floating on water.

Control:
HAND: Chip or hand pull prior to the burrs forming, or spot spray. Take care to avoid walking through seeding plants and spreading the seed. If removing seeding plants, bag them for burning or deep burial, to avoid spreading the seed. It is successful to pile them in full shade to stop germination. Aim to shade out areas of infestation. **CHEMICAL:** Foliar spray of 10mL L^{-1} glyphosate (eg RoundUp Biactive) is effective, but non-selective. 1.8mL L^{-1} 2,4-D amine (eg Amicide625) will not kill grasses.

Common name: Fishbone Fern *Latin name: Nephrolepis cordifolia (*Syn. *N. auriculatata)*
FAMILY: DAVALLIACEAE
ORIGIN:
Noxious Weed Category: n/a

Description
Habit: Fern with underground stem densely covered with pale brown scales; the above ground stems slender and wiry. Has rounded tubers just below surface. **Flowers**: n/a. **Leaves**: Fronds erect or hanging downwards, the leaves are dull lime green and narrow, often with a row of pale dots on the upper surface near the leaf margin. **Fruit**: n/a.

Ecology: A common weed of different bushland types as it is often dumped as refuse. Because of its rapid and aggressive vegetative spread, it readily moves into bushland from neighbouring suburban/periurban land when left unmanaged. It can outcompete and overwhelm native groundcovers and prevent the regeneration of desirable seedlings. It can reproduce by wind and water-borne spores all year round, making long range dispersal and spread possible.

Dispersal: Creeping underground rhizomes, wind, water and soil-borne spores, dumped garden waste, propagation by division by humans.

Control:
HAND: Use hand weeding on small infestations; or as a means to prepare an infestation for spraying to avoid off-target damage; or as follow-up in large infestations once knock-down has been effective.
CHEMICAL: Foliar spray of glyphosate (eg RoundUp Biactive) at 20mL L^{-1} + metsulfuron methyl (eg Brushoff) 1.5g $10L^{-1}$ + non ionic surfactant (e.g. Agral®, Pulse or Rygel) at 1mL L^{-1}.

Fishbone Fern Look a Likes

Doodia aspera or Prickly Rasp Fern

Pellaea falcate or Sickle Fern

Common name: Five Leaved Morning Glory/Mile-a-minute *Latin name: Ipomoea cairica*
FAMILY: CONVOLVULACEAE
ORIGIN:
Noxious Weed Category: n/a

Description
Habit: A fast-growing, perennial vine to 30m with trailing and twining stems, rooting at the nodes; stems with milky sap when cut/broken. **Flowers**: Funnel-shaped and hairless, violet to purplish violet with a darker throat, rarely white. **Leaves**: Leaves alternate, palmate, divided almost to the base with 5-7 lobes drawn to a blunt tip. **Fruit**: A dry capsule to 15mm with 4-5 hard brown seeds.

Ecology: An aggressive bushland invader and significant transforming weed across a range of vegetation types. It is a fast grower and – although not a comparatively prolific seeder – capable of spreading and (re)infecting over long ranges by spread of floating seed in flowing fresh water, coastal and estuarine salt water and more generally as a contaminant of soil and garden refuse. On roadsides it rapidly spreads by grading and slashing machinery as well as short-range vegetative spread when the ground-running stems root adventitiously.

Dispersal: Although widely recognised as an environmental weed, Morning Glory is still valued by some for its showy flowers and quick-growing hardy habit, but it is seldom propagated. However, as a transforming weed, non-management of this weed provides opportunities for continued spread. It is capable of spreading and (re)infecting over long ranges by spread of floating seed in flowing fresh water, coastal and estuarine salt water and more generally as a contaminant of soil and garden refuse. On roadsides it rapidly spreads by grading and slashing machinery as well as short-range vegetative spread when the ground-running stems root adventitiously.

Control:
HAND: Seedlings and small plants can be hand pulled. Cut vertical stems at a height that ensures no re-rooting with the ground can be made. Trace back the stem and where it roots adventitiously, grub out, including – if possible – the main root system. This is likely to be time-consuming, but will ensure a good initial knockdown. **CHEMICAL:** Do as for above hand weeding, but cut-scrape-paint adventitious and main stem/roots with undiluted glyphosate. For dense, smothering infestations within foliar spray height, use 1.8mL L^{-1} 2,4-D amine (eg Amicide 625) **or** 5mL L^{-1} 2,4-Dichlorprop (Lantana600) **or** glyphosate (eg RoundUp Biactive) at 10mL L^{-1} +/- metsulfuron methyl (eg Brushoff) at 1.0g L^{-1}.

Common name: Fleabane *Latin name: Conyza spp.*
FAMILY: ASTERACEAE
ORIGIN:
Noxious Weed Category: n/a

Description
Habit: Erect, fast-growing, annual herb to 1.5m, usually single stemmed, but occasionally 2 or more. Dull green appearance and topped with large, dense, fluffy cream/off-white seed head. **Flowers**: Small, clustered, upturned and typical of 'Daisy' family with constricting sepals (ie it does not present 'open' as in *Coreopsis* sp. or *Gazania* sp.) (see photo). **Leaves**: Forms a basal rosette; stem leaves simple, alternate, lanceolate to 15cm, hairy and irregularly, deeply crenate ('toothed' but teeth rounded, not pointed). **Fruit**: An achene (hard-coated) with a tuft of hairs (pappus).

Ecology: A disturbance specialist, particularly on bare ground or after ripping, cultivating, scarifying or flood events where water can expose bare ground on creek banks or open inter-tussock spaces between clumping grasses. Each plant can produce up to 110 000 viable seeds that can lay dormant in the seed bank for many years waiting for disturbance to break dormancy. Although usually associated with dryland cropping areas, because of both the long-range dispersal by wind and long dormancy, fleabane can appear unexpectedly in rainforest gaps or on revegetation sites after pasture conversion.

Dispersal: The pappus of hairs enables the seed to be carried over very long distances on wind, but it also spreads readily on vehicles, clothing, machinery or even wildlife, to which the seeds can adhere.

Control:
Note: The most effective control for fleabane is direct competition from other vegetation which provides the shade and coolness to prevent fleabane germination.
HAND: Individual plants can be chipped or hand pulled, but this disturbance often triggers mass germination of dormant seed in the disturbed soil. If practical, bag off any seed heads**. CHEMICAL:** For spot-spraying or dense infestations use glyphosate (eg RoundUp Biactive) at 10mL L^{-1}. Note: off-target plants also killed or browned off may provide a short term opportunity for more fleabane seeds to germinate, so be prepared for follow-up.

Common name: Formosan (or Taiwan) Lily *Latin name: Lilium formosanum.*
FAMILY: LILIACEAE
ORIGIN:
Noxious Weed Category: n/a

Description
Habit: Deciduous perennial herb with annual flowering stalks 1-2m long. **Flowers**: Large trumpet shaped highly fragrant flowers, pure white on the inside, pink or purple/brown stripes on the outside bearing prominent yellow anthers. Summer flowering. **Leaves**: Mid to dark green, elongated, linear, sessile leaves (no leaf stalk "petiole") are arranged spirally or whirled along the stems. **Fruit**: Copious papery winged seeds borne in a large capsule.

Ecology: Bulb lays dormant for much of the year then emerges to quickly flower and seed, hence is unaffected by frosts and to a large degree, fire.

Dispersal: Seeds, bulbs and bulb scales spread by water, wind, humans, contaminated soil (earthmoving equipment, car tyres etc) and garden refuse dumping.

Control:
HAND: Infestations can be dug out, but the bulb and any small bulbils forming around the old bulb must also be removed and disposed of safely (by burning or deep burial). Removing the flowers as soon as they have finished, before seed production can occur, can buy a bit more time for full removal of the plant.
CHEMICAL: For spot-spraying or dense infestations use glyphosate (eg RoundUp Biactive) at 10mL L^{-1}, although follow-up hand-weeding will be essential.

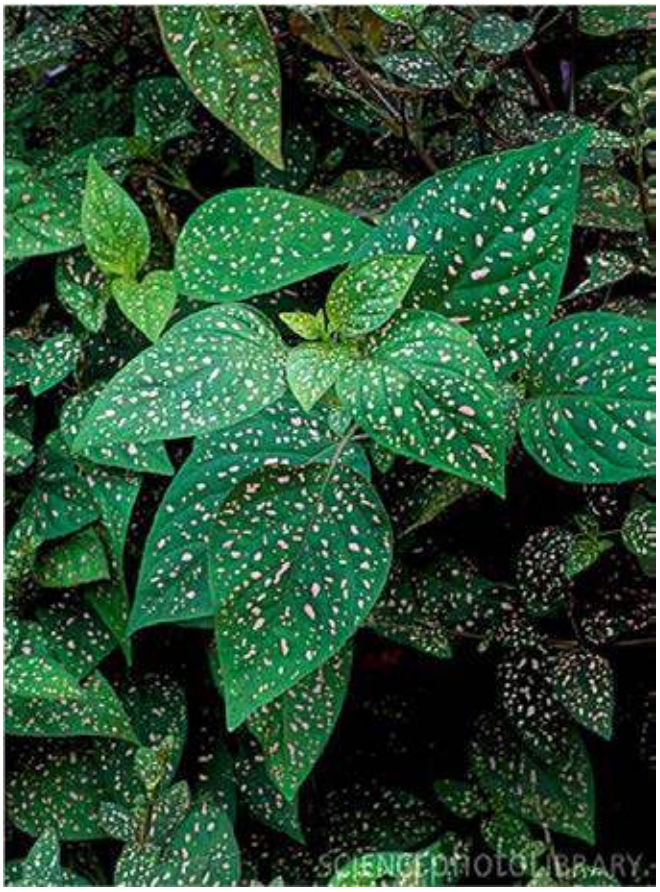
Common name: Freckle Face *Latin name: Hypoestes phyllostachya.*
FAMILY: ACANTHACEAE
ORIGIN:
Noxious Weed Category: n/a

Description
Habit: Erect, perennial herb/small shrub often grown in gardens for its attractive leaves marked with pink dots. **Flowers**: Magenta, lavendar or blue flowers sometimes with white inside during summer. **Leaves**: Simple, alternate, variegated, ovate, dark green to 10cm. Foliage coloration is often more pronounced in a shaded location. **Fruit**: An elongated capsule to 15mm containing numerous flattened seeds. Seeds often released explosively over a short distance.

Ecology: A significant, transforming weed of rainforests, which is capable of invading undisturbed areas. Forms dense monocultures, excluding desirable species. Fast-growing with a persistent seedbank.

Dispersal: Seeds, bulbs and bulb scales spread by water, wind, humans, contaminated soil (earthmoving equipment, car tyres etc) and garden refuse dumping.

Control:
HAND: Small infestations can be hand-pulled. Use caution on steep or friable soils. **CHEMICAL:** For spot-spraying or dense infestations use glyphosate (eg RoundUp Biactive) at 10mL L^{-1} + metsulfuron methyl at 1.5g L^{-1}.



Common name: Gazania *Latin name: Gazania linearis.*
FAMILY: ASTERACEAE
ORIGIN:
Noxious Weed Category: n/a

Description
Habit: Tough, low-growing perennial herb with lance-shaped leaves and brightly coloured daisy-like flowers. **Flowers**: Compound 'daisy' head with prominent ray florets; bronze, yellow and orange tones. **Leaves**: Simple, lanceolate, discolourous (upper and lower leaf surfaces different colours) to 15cm. Basal leaves form a rosette then – with age – a tufted clump. **Fruit**: An achene (hard coated seed) with a small tuft of hairs attached (pappus).

Ecology: As for many daisies, it thrives in high light and heat conditions, particularly roadsides, dunes and abandoned areas of industry with poor soils. In natural systems it is a significant transforming weed and acts by forming dense monocultures, excluding desirable species. Fast-growing with a persistent seedbank.

Dispersal: Seeds, spread by water, wind, humans, contaminated soil (earthmoving equipment, car tyres etc) and garden refuse dumping. Still highly valued as an ornamental and landscape plant. 'Sterile' hybrids are being bred, but are as–yet unproven over the long term.

Control:
HAND: Young plants can be hand-pulled, but older plants with tap-roots may need deeper digging. Use caution on steep or friable soils. **CHEMICAL:** For spot-spraying or dense infestations use metsulfuron methyl at 1.5g L^{-1} + a non-ionic surfactant (eg Pulse or Rygel) at 1mL L^{-1}.

Common name: German Ivy *Latin name: Senecio macroglossus.*
FAMILY: ASTERACEAE
ORIGIN:
Noxious Weed Category: n/a

Description
Habit: Perennial vine to 5m with twining habit, fleshy 3 or 5-lobed leaves. **Flowers**: Compound 'daisy' head with prominent ray florets; cream to off-white. **Leaves**: Simple, 3 or 5-lobed, fleshy to 6cm. **Fruit**: An achene (hard coated seed) with a small tuft of hairs attached (pappus).

Ecology: A popular ornamental, German Ivy has escaped cultivation and found its way into shaded areas on the verges of rainforests. It can scramble through the understory or smother low-growing vegetation where it competes and interferes with the regeneration of desirable species. The seeds can fall and germinate locally or be spread over long distances by wind or water. Even if – in the course of weed control – vertical stems are severed, the fleshy stems can continue to keep flowers metabolising and go on to produce viable seed.

Dispersal: Seeds, spread by water, wind, humans, contaminated soil (earthmoving equipment, car tyres etc) and garden refuse dumping. Still valued as an ornamental and landscape plant.

Control:
HAND: Plants are shallow-rooted and can be hand-pulled. If possible, remove as much of the vertical vine and flowers as possible without damaging the host plant. Use caution on steep or friable soils. **CHEMICAL:** For spot-spraying or dense infestations use metsulfuron methyl at 1.5g L^{-1} + a non-ionic surfactant (eg Pulse or Rygel) at 1mL L^{-1}.

Common name: Giant White Bird of Paradise *Latin name: Strelitzia nicolai*
FAMILY: STRELITZIACEAE
ORIGIN:
Noxious Weed Category: n/a

Description
Habit: Banana-like plants with erect woody stems reaching a height of 6 m (20 ft) and the clumps formed can spread as far as 3.5 m (12 ft). **Flowers**: A dark blue bract, white sepals and a bluish-purple "tongue". The entire flower can be as much as 18 cm high by 45 cm long and is typically held just above the point where the leaf fan emerges from the stem. **Leaves**: Up to 1.8 m long, grey-green and arranged like a fan at the top of the stems. **Fruit**: A large, triangular, woody pod with orange fleshy seeds.

Ecology: A fast-growing, but late-flowering, plant with an aggressive form and habit. Can spread by gravity and animal dispersed seed, but humans are the primary vector of spread.

Dispersal: Seeds spread occasionally by animals, humans (planting) and garden refuse dumping. Still highly valued as an ornamental and landscape plant.

Control:
HAND: Small plants are shallow-rooted and can be hand-pulled. Use caution on steep or friable soils.
CHEMICAL: Cut close to the ground and paint with undiluted glyphosate (eg RoundUp Biactive).

Common name: Ginger Lily/Gardner's Ginger/Kahili Ginger *Latin name: Hedychium gardnerianum*
FAMILY: ZINGIBERACEAE
ORIGIN:
Noxious Weed Category: Class 4 (Locally Controlled)

Description
Habit: A showy garden ginger native to India, it forms dense colonies, choking understory and creek banks. **Flowers**: Inflorescence (a group of flowers) is spike-like and erect. Flowers are bright yellow, fragrant and appear in Summer to Autumn. **Leaves**: Leaves are entire (having smooth edges) or are very shallowly lobed, and hairless. The leaf sheaths are also hairless. Ligule (appendage between the leaf and stem) is a broad and smooth membrane, up to 2.5 cm long and 2 cm wide. **Fruit**: Fruit is an oblong capsule, which is thin-walled with orange valves within. Seeds are bright scarlet, shiny and numerous.

Ecology: A significant transforming weeds of a range of forest types including wet sclerophyll, swamp sclerophyll, subtropical rainforest and freshwater wetlands. It can invade into in-tact (undisturbed), fully shaded environs where it forms monocultures, interfering with critical ecological processes.

Dispersal: Capable of spread over short to long range by arboreal and terrestrial animals, flowing water of riparian systems or as a contaminant of dumped garden waste. Sections of rhizome can re-shoot after a period of dormancy and partial desiccation.

Control:
HAND: Dig or hand-pull and remove fruit and rhizomes off-site for disposal. Rhizomes can be crushed after digging up and stock-piled for rotting. **CHEMICAL:** Horizontally cut stems close to the rhizome, then paint with metsulfuron methyl (eg Brushoff) at 6g L^{-1} (winter) or 1g L^{-1} (spring and summer).

Native look alike: Native Ginger: Alpinia caerulea

Common name: Glory Lily/Gloriosa/Flame Lily *Latin name: Gloriosa superba*
FAMILY: COLCHICACEAE
ORIGIN:
Noxious Weed Category: Class 4 (Locally Controlled)

Description
Habit: Perennial scrambler/vine with underground tuber and climbing stems up to 4 m long. Leaves have an extended tip functioning as a tendril. Capsules contain small red seeds. **Flowers**: Flowers are showy, yellow, orange or red, with "petals" turned back to expose the stamens **Leaves**: Leaves simple, alternate/pseudo-whorled, entire, stem-clasping. **Fruit**: Fruit is an oblong capsule, green – drying to brown – with numerous hard, red seeds (see photo).

Ecology: A significant transforming weed, particularly of dunes and dune-scrub, but will also grow readily in clay soils. Grows from seed or tuber fragments and forms dense monocultures that exclude desirable vegetation. Seeds are bird attracting and capable of spreading over long range, but most spread appears to be short-distance seed-drop and rhizome growth. Foliage and stems die off after fruiting (Autumn) and re-emerge in late Spring/Summer. A second emergence of stems is common in January/February.

Dispersal: Capable of spread over long range by birds and short range by seed drop and rhizome. Soil contaminated with seed or tuber parts.

Control:
Note: All plant parts are poisonous if ingested and can cause severe skin irritation upon contact. Use appropriate PPE.
HAND: Dig small infestations and remove all plant parts. For larger infestations, control any outlying plants before moving into the core area. Because of the seasonal window of opportunity for control, if all plants can not be removed, prevent seed production and integrate with chemical control. **CHEMICAL:** Difficult to kill with single application of herbicide, but repeat treatments of metsulfuron methyl (eg Brushoff) at 1.5g L^{-1} + glyphosate (eg RoundUp Biactive) at 20mL L^{-1} + a non-ionic penetrant (eg Pulse or Rygel) at 1mL L^{-1}.

Common name: Golden Wreath Wattle *Latin name: Acacia saligna*
FAMILY: FABACEAE
ORIGIN: AUSTRALIA (W.A.)
Noxious Weed Category: n/a

Description
Habit: Large shrub to small tree to 8m with distinctive 'wattle' flowers; dull blue-grey drooping foliage; flattened seed pods. Usually single trunked, but will coppice freely. **Flowers**: Yellow, globular (spherical), appearing in Spring **Leaves**: Not true leaves, but phyllodes (modified stems); pendulous (drooping), dull blue-grey, up to 3cm wide and 20cm long, obvious midvein. **Fruit**: A brown, flattened pod that can vary from straight to strongly curled.

Ecology: A native of Western Australia, but widely planted as an ornamental and to a greater degree as a tree of erosion control. Tolerant of dry conditions, poor and compacted soils and exposure. Fast-growing and capable of rapid spread as it grows freely under generally poor conditions where other species struggle. Now a common invader of dune scrub and similar systems, ruderal areas, roadsides and easements etc.

Dispersal: Seed, spread by humans, water, insects, birds, contaminated soil on machinery, footwear etc.

Control:
HAND: Hand pull small plants. Larger trees strongly rooted and difficult to control manually. **CHEMICAL:** Dense infestations of seedlings or small plants can be foliar sprayed with glyphosate @ 10mL L^{-1} + metsulfuron methyl (eg Brushoff) at 1g $10L^{-1}$. Plants too large for hand pulling – but up to 100mm diameter - can be cut close to ground level and immediately painted with undiluted glyphosate (eg RoundUp Biactive). Chisel or drill and inject larger trees with undiluted glyphosate @ 2mL per cut/hole, holes 100mm apart and as close to the ground as possible (also treat any dominant surface roots).

Common name: Green Amaranth *Latin name: Amaranthus viridis*
FAMILY: AMARANTHACEAE
ORIGIN:
Noxious Weed Category: n/a

Description
Habit: Semi-erect, spreading herb to 0.5m, mealy green rhombic (resembling 4-sided) leaves, terminal inflorescence a spike. **Flowers**: Inconspicuous, densely crowded into terminal spikes. **Leaves**: Rhombic, ovate to lanceolate, to 15 cm long; long-petiole. **Fruit**: Tiny, hard, brown to black seeds shed from a small, thin skinned 'berry'.

Ecology: A minor weed, principally a plant of disturbed areas, poorly managed farmland, roadsides, ruderal areas. Fast-growing with aggressive tap-root which can reshoot after cutting, grazing, fire etc. Prolific seeder. Seed very persistent in soil.

Dispersal: Seed, spread by humans, water, contaminated soil on machinery, footwear etc.

Control:
HAND: Hand pull or grub out small plants, removing the tap root. Larger plants will prove difficult to control manually. **CHEMICAL:** Dense infestations of seedlings or larger plants can be foliar sprayed with glyphosate @ 10mL L^{-1}.

Common name: Groundsel Bush *Latin name: Baccharis halimifolia*
FAMILY: ASTERACEAE
ORIGIN:
Noxious Weed Category: Class 3 (Regionally Controlled)

Description
Habit: Groundsel bush is a densely branched shrub usually no more than 3 m high. Stems are green, maturing to brown and woody. Bark of mature plants is deeply fissured. **Flowers**: Male and female flowers are borne on separate plants. Male flowers are pale yellow and open around mid to late March, slightly earlier than the female flowers. Female flowers are white and inconspicuous at the end of branches until seeds are fully developed. Then the plant has a fluffy appearance, with tufts of white hair (around late March to early April) that begin to blow the fluffy seeds in the breeze from mid to late April. **Leaves**: Leaves are dull green, alternate, wedge shaped, 2.5–5 cm long and 1–2.5 cm wide, with a few lobes in the upper part. **Fruit**: Seed is a small and hard-coated (achene) with a tuft of hairs (pappus) for wind dispersal.

Ecology:
Groundsel bush rapidly colonises disturbed areas, especially overgrazed pastures. It competes with pasture species for water and nutrients. It spreads rapidly from windborne seed groundsel bush can form a dense understorey, suppressing growth of native plants and interfering with the natural ecosystem. Groundsel bush can become abundant in the vegetation along watercourses and in coastal woodlands and forest areas if not controlled.

Dispersal: Seeds are readily transported by wind, running water, vehicles and machinery. Soil disturbance in infested areas usually leads to substantial germination. Further infestation occurs unless the ground is sown to pasture, other competitive ground cover or native vegetation sown or encouraged. Seeds germinate in partial shade so long-term maintenance of sites is essential.

Control:
HAND: Hand pull if practical, ensuring the main root mass is removed. Larger bushes can be mattocked out, but trees will require machinery or chemical control. **CHEMICAL:** Dense or large infestations should be reported to Council's Noxious Weeds Officer. Sparse or individual plants can be controlled by cut-stump application of undiluted glyphosate (eg RoundUp Biactive).

Common name: Hen and Chickens/Phyllanthus *Latin name: Phyllanthus tenellus*
FAMILY: PHYLLANTHACEAE/EUPHORBIACEAE
ORIGIN:
Noxious Weed Category: n/a

Description
Habit: Annual or short-lived perennial herb to 50cm, delicate fern-like foliage, open-branched appearance. **Flowers**: Inconspicuous, green/cream in leaf axils hanging pendulously, to 3mm. **Leaves**: Simple, entire, alternate, obovate, 2-ranked (arranged on opposite sides of the branch but in the same plane), to 25mm. **Fruit**: Small greenish berry to 3mm hanging pendulously on long peduncle (flower/fruit stalk).

Ecology: Typically a weed of gardens and neglected areas, P. tenellus is an inconsequential pest. Fast-growing and capable of rapid spread, the seeds are released explosively over short distances and can remain persistent for several years in the seed bank.

Dispersal: Over short distances by the explosive release of seeds from the fruit. Longer range dispersal as the result of contaminated garden waste, soil, footwear, tools etc.

Control:
HAND: Hand pull any age plant as it is shallowly rooted. **CHEMICAL:** Light overspray with glyphosate (eg RoundUp Biactive) at 10mL L^{-1}.

Common name: Himalayan Ash *Latin name: Fraxinus griffithii*
FAMILY: OLEACEAE
Noxious Weed Category: n/a

Description
Habit: A quick growing, very hardy, drought tolerant, evergreen small tree (to 15m), single greyish trunk, dense foliage. **Flowers**: Spring-flowering, small and white in panicles. **Leaves**: Opposite, compound, 9-15 leaflets to 25mm, wavy margins and slightly toothed and glossy in seedlings and juveniles but becoming entire and dull with age. **Fruit**: A single, winged samara, in drooping bunches which persist for months on the tree. Each fruit contains a single seed.

Ecology: A serious emerging threat to a range of vegetation communities. It has been widely planted as a street and ornamental tree for its rapid growth and hardy nature. Seed germinates *en mass* in full sun to deep shade. The winged seed tends not to fall far from the parent tree but it is highly mobile in water, green waste and as a contaminant of mulch. It exploits creek or stormwater pathways into bushland where infestations can quickly start. It forms dense thickets and can out compete native and other desirable vegetation.

Dispersal: Short range by local seed drop and wind-blow. Longer range dispersal in water and deliberate planting, and as the result of contaminated garden waste, soil, footwear, tools, etc.

Control:
HAND: Hand pull young plants. Dig out larger plants. Use caution on steep ground or friable soils. Trees will require chemical control or heavy machinery. **CHEMICAL:** Infestations of seedlings or juveniles to 1m can be foliar sprayed with glyphosate (eg RoundUp Biactive) at 10mL L-1 + metsulfuron methyl (eg Brushoff) at 1.5g L-1. Plants too large for hand pulling – but up to 100mm diameter - can be cut close to ground level and immediately painted with undiluted glyphosate (eg RoundUp Biactive). Chisel or drill and inject larger trees with undiluted glyphosate @ 2mL per cut/hole, holes 100mm apart and as close to the ground as possible (also treat any dominant surface roots).

Common name: Impatiens/Busy Lizzy *Latin name: Imaptiens walleriana*
FAMILY: BALSAMINACEAE
Noxious Weed Category: n/a

Description
Habit: Bushy, succulent-stemmed tender perennial that grows in a spreading mound 15-60cm tall depending on variety. Shade tolerant, favouring moist conditions. Fibrous root system tolerant of a wide range of soil types from sand to clay. **Flowers**: Large (to 5cm across), fleshy, with 5 petals. Pink, rose, red, lilac, purple, orange, white & bicolors. Spring-Autumn. **Leaves**: Ovate to elliptic leaves light to dark green, sometimes with a bronze-red cast and serrated edges. The opposite leaves are arranged spirally around a thick, green or brownish, brittle stem. Fragments of stem re-root readily. **Fruit**: Explosive capsules contain hundreds of small, viable seeds, which are expelled some distance when ripe.

Ecology: Readily sold at most nurseries and local markets, these colourful plants spread easily by seed and fragments. Commonly found along drains and water courses.

Dispersal: Seed and vegetation is spread by water, humans, contaminated soil (earthmoving equipment, car tyres etc) and garden refuse dumping.

Control:
HAND: Hand pull/dig, bagging all plant parts and removing from site. **CHEMICAL:** Infestations of seedlings or juveniles to 1m can be foliar sprayed with glyphosate (eg RoundUp Biactive) at 10mL L^{-1}. Inspect and re-treat for new germinations.

Common name: Indian Hawthorn *Latin name: Rhaphiolepis indica*
FAMILY: ROSACEAE/MALACEAE
Noxious Weed Category: n/a

Description
Habit: Drought hardy, evergreen, low growing, spreading shrub to 1-1.5 m high. **Flowers**: Panicle of star shaped flowers 10 mm diam. Petals are white or pink, with five petals, and may be lightly fragrant. **Leaves**: Dark green on top, paler below; thick, leathery, serrated, ovate to elliptic or obovate, 3–7 cm long, 5–30 mm wide, pubescent or hairy at first, sharply toothed. **Fruit**: Blue-black fruits each containing 1 or 2 seeds.

Ecology: A commonly cultivated garden plant especially in coastal areas due to its ability to tolerate drought conditions. It has an aggressive root system and growth habit, enabling it to out compete abutting vegetation. It produces masses of palatable fruit which are dispersed over long ranges by arboreal animals, but seed will also germinate locally after dropping from the bush. Hence, it can readily spread in water, soil and downslope with gravity.

Dispersal: Seed spread by animals (mainly birds), humans (deliberate planting), contaminated soil (earthmoving equipment, car tyres etc) and garden refuse dumping.

Control:
HAND: Hand pull/dig seedlings and small plants. Remove fruit also if practical to do so. **CHEMICAL:** Dense infestations of seedlings or small plants can be foliar sprayed with glyphosate @ 10mL L^{-1} + metsulfuron methyl (eg Brushoff) at 1g $10L^{-1}$. Plants too large for hand pulling – but up to 100mm diameter - can be cut close to ground level and immediately painted with undiluted glyphosate (eg RoundUp Biactive). Chisel or drill and inject larger trees with undiluted glyphosate @ 2mL per cut/hole, holes 100mm apart and as close to the ground as possible (also treat any dominant surface roots).

Common name: Inkweed *Latin name: Phytolacca octandra*
FAMILY: PHYTOLACCACEAE
Noxious Weed Category: n/a

Description
Habit: Erect, short-lived perennial herb with woody base, growing to 2m tall with an open branching habit. Stems are green with a reddish tinge, smooth and hairless. Often found in moist areas but may be found in any disturbed area where birds have dropped the seed. **Flowers**: Flowers are small, greenish-white and arranged in dense spikes, spring to summer. The stalks are 1-2cm long. **Leaves**: Leaves are elliptic to pear or lance shaped, green turning red. The hairless leaf to 16cm long has an entire margin with petiole (stem) to 40mm long. **Fruit**: Fruit is a berry with reddish-purple juice when ripe and crushed. The colour of the fruit changes from red to purple-black when ripe. The fruit is 8-lobed and 8-seeded.

Ecology: A weed of ruderal areas, degraded land, unmanaged stockyard areas, degraded natural areas. It is primarily a bird dispersed weed over long range, but contaminated soil is also a vector of spread. Seeds can also be spread in flowing water. The plant can take on a more prostrate form if trampled or damaged and continue to flower and fruit. The tap-root will reshoot after slashing or burning.

Dispersal: Seed spread by animals (mainly birds), humans (deliberate planting), contaminated soil (earthmoving equipment, car tyres etc) and, to a lesser degree, garden refuse dumping.

Control:
HAND: Small plants are easily removed by hand, but larger plants develop a large tap-root from which it can resprout. **CHEMICAL:** Dense infestations or large plants can be foliar sprayed with glyphosate @ 20mL L^{-1} + metsulfuron methyl (eg Brushoff) at 1.5g $10L^{-1}$.

Common name: Japanese Honeysuckle *Latin name: Lonicera japonica*
FAMILY: CAPRIFOLIACEAE
Noxious Weed Category: Class 5 (Restricted Plant)

Description
Habit: Semi-deciduous vigorous climber or scrambling shrub, usually climbing into the canopy. Young stems are pubescent (having short, weak soft hairs). Old stems woody with a flaky bark. **Flowers**: Flowers are paired, white to creamy yellow, fragrant and the nectar is sweet to taste. **Leaves**: Oval to lance shaped, glossy, leathery and deep green with a prominent central vein. The leaves are opposite. The leaf tip may be slightly pointed or broadly rounded. The leaf margins are entire and smooth, but often lobed on juveniles and new growth. Both surfaces are sparsely hairy but upper surface becomes hairless with age. **Fruit**: Oval shaped and shiny black.

Ecology: A significant transforming weed of a range of forest types, including wet and dry sclerophyll, swamp oak and rainforest. It acts as an aggressive groundcover where it interferes with succussional processes and in the mid-story and canopy it constricts and smothers other vegetation, eventually leading to partial or full collapse of the canopy. The fruit are widely spread by arboreal animals as well as in flowing water.

Dispersal: The fruit are widely spread by arboreal animals as well as in flowing water. The plant aggressively roots adventitiously and will form new plants if layering stems are broken off. Stem fragments are also capable of re-layering – particularly in riparian environments – thus leading to new infestations.

Control:
HAND: Seedlings and small plants can be hand pulled. Cut vertical stems at a height that ensures no re-rooting with the ground can be made. Trace back the stem and where it roots adventitiously, grub out, including – if possible – the main root system. This is likely to be time-consuming, but will ensure a good initial knockdown. **CHEMICAL:** Do as for above hand weeding, but cut-scrape-paint adventitious and main stem/roots with undiluted glyphosate. For dense, smothering infestations within foliar spray height, use glyphosate (eg RoundUp Biactive) at 10mL L^{-1} + metsulfuron methyl (eg Brushoff) at 1.5g L^{-1}.

Common name: Kaffir Plum *Latin name: Harpephyllum caffrum*
FAMILY: ANACARDIACEAE
Noxious Weed Category: n/a

Description
Habit: Tree to 15m with single trunk and densely upwardly curving branching habit and shiny sickle-shaped leaflets. **Flowers**: Male and female, small whitish to yellowish colored flowers, are born on separate trees from summertime to autumn near the ends of the branches. **Leaves**: bright green, alternate, pinnate with 9 to 13 curving shiny multiple leaflets, pubescent when young, each up to 8cm long. Leaves are crowded together towards the ends, shaping a thick crown at the top of the tree. **Fruit**: Small, oval formed, dark red fruit with a pleasant, sweet and tart-acid flavor, about 3cm long, with a thin skin, follow the flowers from summertime to autumn.

Ecology: An emerging woody weed of the Hastings region, particularly in the coastal belt where it has been planted as a municipal and private amenity. The fruit are widely spread by arboreal animals as well as in flowing water and seeds can germinate in a little as 7 days. Seeds can germinate in moderate shade but the tree itself can withstand exposed conditions, including salt-laden coastal wind. The tree is vigorous in its habit and can compete with native vegetation.

Dispersal: The fruit are widely spread by arboreal animals, thus leading to new infestations over potentially long ranges. The tree is valued as a human food source and hence can be spread by this vector also, leading to long-range adirectional infestations.

Control:
HAND: Seedlings and small plants can be hand pulled. Cut vertical stems at a height that ensures no re-rooting with the ground can be made. Trace back the stem and where it roots adventitiously, grub out, including – if possible – the main root system. This is likely to be time-consuming, but will ensure a good initial knockdown. **CHEMICAL:** Dense infestations of seedlings or small plants can be foliar sprayed with glyphosate @ 10mL L^{-1} + 1g $10L^{-1}$ metsulfuron methyl (eg Brushoff). Plants too large for hand pulling – but up to 100mm diameter - can be cut close to ground level and immediately painted with undiluted glyphosate (eg RoundUp Biactive). Chisel or drill and inject larger trees with undiluted glyphosate @ 2mL per cut/hole, holes 100mm apart and as close to the ground as possible (also treat any dominant surface roots).

Common name: Khaki Weed *Latin name: Alternanthera pungens*
FAMILY: AMARANTHACEAE
Noxious Weed Category: n/a

Description
Habit: Prostrate, perennial herb arising from a tap root but with sprawling habit that roots at branch nodes. Small axillary flowers give rise to clustered prickly seeds. Generally a weed of unmanaged turf and parkland areas. **Flowers**: Small and grouped together in leaf axils as clusters 8-12 mm long and 6-10 mm wide; flowering occurs from spring to autumn. **Leaves**: The leaf blades are obovate (egg-shaped) or elliptic in shape to 6cm long. Simple, opposite and often differing in size, leaf margins are somewhat wavy. **Fruit**: A prickly burr, about 1 cm long.

Ecology: Well adapted to disturbed and ruderal areas of full exposure on a range of soil types. Prostrate habit, capable of rooting adventitiously to form new plants, but principally spread by prickly seeds attaching to footwear, tyres and in soil to spread over short to long distances. Aggressive layering of branchlets can form a dense groundcover monoculture, excluding desirable groundcovers and impeding seed germination.

Dispersal: Prostrate habit, capable of rooting adventitiously to form new plants, but principally spread by prickly seeds attaching to footwear, tyres and in soil to spread over short to long distances.

Control:
HAND: Grub out and remove all plant parts off site. Solarising will eventually kill plants but not seed. **CHEMICAL:** Dense infestations of seedlings or small plants can be foliar sprayed with glyphosate @ 10mL L^{-1}. Monitor and re-treat as required.

Common name: Lantana *Latin name: Lantana camara*
FAMILY: VERBENACEAE
Noxious Weed Category: W4 (Noxious) for 'Red Lantana'/W5 (Environmental Weed) for all other.

Description
Habit: Lantana is a heavily branched shrub that can grow in compact clumps, dense thickets or as a climbing vine. **Flowers**: Throughout most of the year in clustered, compact heads about 2.5 cm in diameter. Flower colours vary from pale cream to yellow, white, pink, orange and red. **Leaves**: About 6 cm long and are covered in fine hairs. They are bright green above, paler beneath and have round-toothed edges. Leaves grow opposite one another along the stem. When crushed the leaves produce a distinctive odour. **Fruit**: Round, berry-like fruit to 5mm that turn from glossy green to purplish-black when ripe.

Ecology: Lantana is native to the tropical and subtropical regions of Central and South America. It is found throughout most coastal and subcoastal areas of eastern Australia, from Far North Queensland to southern New South Wales. It grows in a wide variety of habitats, from exposed dry hillsides to wet, heavily shaded gullies. An aggressive plant which rapidly colonises canopy gaps and the margins of native forests and can form impenetrable thickets. It grows so densely that it inhibits the survival of native species. It is often seen in *monocultures* where it is the only plant species surviving. Lantana is also *allelopathic*, which means it secretes chemicals into the soil which can inhibit the growth of other species. The berries are eaten by birds and other vertebrates and seed is spread over short to long distances this way but also in flood waters or contaminated soil. Stem fragments will strike and root under favourable conditions.

Dispersal: The berries are eaten by birds and other vertebrates and seed is spread over short to long distances this way but also in flood waters or contaminated soil. Stem fragments will strike and root under favourable conditions.

Control:
Note: See also the Lantana Best Practice Mangement guide for detailed information.
HAND: Generally shallowly rooted, so seedlings and small plants can be hand-pulled. Larger plants can be dug or mattocked. **CHEMICAL:** Foliar spray only when plants are healthy and follow label directions regarding seasonality. Use glyphosate (eg RoundUp Biactive) at 10mL L^{-1} for foliar spray or undiluted for cut-stump.

Lantana Native Look a Likes

Trema aspera, Poison Peach

Lantana Seedling

Common name: Liriope *Latin name: Liriope sp.* (Inc. *L. spicata*)
FAMILY: ASPARAGACEAE/RUSCACEAE
Noxious Weed Category: n/a.

Description
Habit: Clump-forming, strappy-leaved plant to 0.4m. **Flowers**: Racemes (spikes) of lilac (and variant) flowers to 5mm held terminally on a stalk within and above the foliage. **Leaves**: Strap-like to 1cm wide to 50cm long drawn to a blunt point. **Fruit**: Black berries to 6mm.

Ecology: Plants flower and fruit after 2 years to produce abundant berries which are capable of germinating in deep shade. The plant is tolerant of a range of soils and can crow in fully exposed situations including coastal hind-dunes, riparian areas and ruderal areas.

Dispersal: The berries are eaten by birds and other vertebrates and seed is spread over short to long distances this way but also in flood waters or contaminated soil. Infestations also spread locally from fruit dropped around the parent plant

Control:
HAND: Seedlings and small plants can be hand-pulled. Larger plants can be dug or mattocked. **CHEMICAL:** For spot-spraying or dense infestations use glyphosate (eg RoundUp Biactive) at 20mL L^{-1} +/- 1.0g L-1 metsulfuron methyl (eg Brushoff).

Seedlings from 2 mature plants

Common name: Madeira Vine/Lamb's Tail ***Latin name:*** *Anredera cordifolia*
FAMILY: BASELLACEAE
Noxious Weed Category: W5 (Environmental Weed)

Description
Habit: A hairless perennial climber; producing tubers on roots and at nodes on aerial stems; stems usually herbaceous with aerial tubers, but sometimes stems woody. **Flowers**: Long, white spikes, similar to a 'lamb's tail'. **Leaves**: Simple, alternate and entire, heart-shaped and fleshy. **Fruit**: Not known to set viable seed in Australia.

Ecology: A significant transforming weed and aggressive climber which overtops forest canopy and eventually leads to canopy collapse and ecosystem failure. Tends to favour disturbance to trigger propagule dormancy such as flooding, earthmoving work, woody weed removal and anything that increases light penetration to the ground layer. It is often a successor to deep-shade tolerant vine weeds such as cat's-claw creeper (*Macfadyena unguis-cati*) which open forest gaps from within by similar overtopping methods. Capable of germinating in partial shade, but well suited to forest edges and ecotones, ruderal areas, unmanaged gardens etc. It can grow as much as 1 metre/week under favourable conditions and is very difficult to control. It is not known to set viable seed in Australia, but the tuber bank is persistent for up to 10+ years in the soil. Flourishes under a wide range of conditions from hind dunes to dry sclerophyll to rainforest.

Dispersal: A riparian system specialist, it thrives on the disturbance of water flow and flooding to disperse tubers and stem fragments downstream. It also moves steadily downslope in forest situations by the gradual over-topping and tuber rain. Tubers often spread in dumped garden waste and during civil construction.

Control:
Note: A wide range of control options are available. For volunteer bushcare, only a couple of the many techniques are described. For large infestations, report to Council's Noxious Weeds Officer.
HAND: Under most situations, tubers can be dug out and removed off-site – it tends to be just the scale of the problem that is the limiting factor. All effort should be made to prevent the plant from climbing and producing stem tubers. Pulling vines from trees tends to lead to tubers stripping off and can damage the host tree. **CHEMICAL:** Vertical stems can be scraped from ground level on alternate sides for 50cm sections and painted with undiluted glyphosate (eg RoundUp Biactive); ground-level infestations can be foliar sprayed with either **Option 1)** glyphosate at 20mL L^{-1} +/- metsulfuron methyl (eg Brushoff) at 1.5g $10L^{-1}$ **or Option 2)** fluroxypyr (eg Starane200) at 15mL L^{-1} + a non-ionic surfactant (eg Pulse) at 1mL L^{-1}.

Common name: Madeira Winter Cherry *Latin name: Solanum pseudocapsicum*
FAMILY: SOLANACEAE
Noxious Weed Category: n/a.

Description
Habit: Low-growing perennial shrub to 1.5m. **Flowers**: White and similar in appearance to the common tomato. 5 petals fused together (a calyx tube) and yellow stamens in the centre. **Leaves**: Simple, alternate and entire with slightly wavy margins, drawn to a blunt point, to 6cm long and 1.5cm wide. Mid and lateral veins distinct. **Fruit**: Spherical orange berry to 1.5cm with multiple seeds.

Ecology: Capable of germinating in partial shade, but well suited to forest edges and ecotones where seed is often deposited by birds. As for many Solanaceae plants, the seed bank is persistent for several years in the soil and can withstand relatively high temperatures. Readily dispersed by birds attracted to the colourful fruit.

Dispersal: Readily dispersed by birds attracted to the colourful fruit. As seed can often survive composting temperatures (55+ degC), it can be spread in this material or dumped garden waste.

Control:
HAND: Generally shallow rooted, so seedlings and small plants can be hand-pulled. Larger plants can be dug or mattocked. **CHEMICAL:** For spot-spraying or dense infestations use glyphosate (eg RoundUp Biactive) at 10mL L^{-1}. Cut-paste with undiluted glyphosate close to ground level.

Common name: Mexican Feather Grass *Latin name: Nassella tenuissima*
FAMILY:
Noxious Weed Category: W1 (Noxious throughout the State of NSW)

Description
Habit:
Mexican feather grass is a densely tufted perennial grass. It is almost identical to serrated tussock, except when it is in seed. **Flowers**: The flower head is 15–25 cm long and is green or purplish. A leaf-like sheath encloses the lower section of the flower head. The flower head does not detach from the plant. This is one of the identifying features that differentiate it from serrated tussock. With serrated tussock the flower head fully projects from the leaf sheath and detaches at maturity. **Leaves**: The leaves are tightly rolled so that the edges overlap, 0.25–0.5 mm wide, up to 60 cm long; outer surface roughened, with a ligule (membrane at leave blade and stem junction) 0.5 to 2.5 mm long, opaque, papery and usually smooth and hairless. The leaves roll smoothly between the fingers like a needle. **Fruit**: The awn (bristle-like appendage) is 4.5–9 cm long and is attached to the end of the seed. The seed is 2–3 mm long encased by two purple or reddish-brown, 6–10 mm long glumes (clasping 'sheaths'). By comparison, serrated tussock awns are 2–3.5 cm, and are offset in their attachment to the seed.

Ecology:
Mexican feather grass (*Nassella tenuissima*), is a potentially serious new weed. It is feared that if Mexican feather grass becomes naturalised it has potential to infest up to 65% of NSW. It is closely related to serrated tussock (*Nassella trichotoma*), a major pasture and environmental weed in temperate Australia. The two species can only be distinguished from each other when flowering. Mexican feather grass is also related to Chilean needle grass (*Nassella neesiana*) which is highly invasive in native grasslands. Mexican feather grass is a highly adaptable grass species, and could spread throughout most of Australia, causing major economic and environmental damage. It is capable of surviving in extremely variable climates and soil types, and is able to tolerate prolonged periods of drought. Naturalised populations will be difficult to identify, as it is similar to other weedy grass species.

Dispersal: In mid spring to summer, Mexican feather grass propagates freely from seed on well-drained soils where competition from other vegetation has been reduced. Seed spreads by wind and in contaminated fodder, soil and on vehicles, but also readily attaches to animals and livestock.

Control:
Note: If you suspect the presence of this plant, do not attempt to remove it, but instead contact Councils Noxious Weed Officer or the NSW Department of Primary Industry immediately.

Common name: Mist Weed/Mistflower *Latin name: Ageratina riparia (Eupatorium riparium)*
FAMILY: ASTERACEAE
Noxious Weed Category: W5 (Environmental Weed)

Description
Habit:
An upright or sprawling herb to 1 m. **Flowers**: Flowers are small, white and daisy-like, clustered in heads. **Leaves**: Simple, opposite and entire with finely toothed margins; lance-shaped or narrow oval to 15cm, sometimes slightly hairy and with obvious venation. **Fruit**: A small achene (hard-coated seed) with a bristly 'tail' (pappus).

Ecology: Spreads by wind and water-born seed, but also as a contaminant of soil and on people, animals and vehicles. Favours shaded, damp places where seedlings and layering (vegetative) spread rapidly outcompete desirable species. Plants can reproduce before 1 year of age and infestations can grow rapidly. Stem fragments will root to form new plants.

Dispersal: Wind and water-borne over short-long distances, but also as a contaminant of soil and on people, animals and vehicles. Stem fragments will root to form new plants.

Control:
HAND: Dig out and remove off site. **CHEMICAL:** Dense or large and diffuse infestations can be foliar sprayed with 1.5g $10L^{-1}$ metsulfuron methyl (eg Brushoff) or glyphosate (eg RoundUp Biactive) at 10mL L^{-1} during good growing conditions, but prior to flowering. Cut and paste when required with undiluted glyphosate. Ensure plants do not remain in contact with the ground to avoid layering or re-rooting.

Common name: Montbretia *Latin name: Crocosmia x crocosmiiflora*
FAMILY: IRIDACEAE
Noxious Weed Category:

Description
Habit:
Montbretia is a perennial tufting herb to 1m which dies back annually. It is strappy-leaved – almost grass-like in appearance - and often mistaken for Watsonia (*Watsonia* spp.). **Flowers**: Bright orange, trumpet-shaped to 5cm dia. with approx. 6 petals, which form in two rows along each stem. **Leaves**: Strap-like up to 3x90cm, drawn to a blunt tip, originating at the base of the clump. **Fruit**: A dry, 3-lobed, brown capsule that produces few seeds.

Ecology: Emerges in Spring (after dying back previous Autumn) usually along with new plantlets that have spread from the creeping, underground rhizome as well as seedlings. The plant can over-run gardens, bushland, roadside areas and stream sides. It tolerates a wide range of conditions and can take over and displace indigenous grasses, groundcovers and block the regeneration of overstory species.

Dispersal: Primarily vegetative with the creeping rhizome that forms a dense infestation, but seed and bulbs are also readily spread in flowing water, by people propagating and distributing the plant and as a contaminant of soil on footwear, machinery etc and in dumped garden waste.

Control:
Note: In all instances, repeat treatments will be required to exhaust the soil bank of bulbs.
HAND: Dig out and remove off site, ensuring the network of bulbs and rhizomes are removed. Bulbs can be rooted deeper in sandy soils. **CHEMICAL:** Dense or large and diffuse infestations can be foliar sprayed with glyphosate (eg RoundUp Biactive) at 10mL L^{-1} during good growing conditions, but prior to fruit-set. Wick-wipe with glyphosate at 100mL L^{-1}.

Common name: Morning Glory *Latin name: Ipomoea indica*
FAMILY: CONVOLVULACEAE
ORIGIN:
Noxious Weed Category: W5 (Environmental Weed)

Description
Habit: A fast-growing, perennial vine to 30m with trailing and twining stems, rooting at the nodes. **Flowers**: Funnel-shaped and hairless, violet-blue violet with a darker throat. **Leaves**: Leaves simple, alternate, varying from heart-shaped to 3-lobed. **Fruit**: A dry capsule to 15mm with 4-5 hard brown seeds.

Ecology: A significant transforming weed across a range of vegetation types as well as ruderal areas, roadsides and untended gardens etc. Widely regarded as an environmental weed, Morning Glory is still valued by some for its showy flowers and quick-growing hardy habit, but it is seldom propagated. However, as a transforming weed, non-management on this weed provides opportunities for continued spread. It is a fast grower and capable of spreading quickly by overtopping vegetation and dropping seed ahead of the parent plant (to expand the infestation) and by rooting adventitiously which allows the creeping stems to move through the understory for 20m or more before ascending a host. It can also behave as a groundcover, smothering native grasses, herbs and canopy seedling regeneration.

Dispersal: Seed disperses readily in riparian systems in flowing water. On roadsides it rapidly spreads by grading and slashing machinery as well as short-range vegetative spread when the ground-running stems root adventitiously.

Control:
HAND: Seedlings and small plants can be hand pulled. Cut vertical stems at a height that ensures no re-rooting with the ground can be made. Trace back the stem and where it roots adventitiously, grub out, including – if possible – the main root system. This is likely to be time-consuming, but will ensure a good initial knockdown. **CHEMICAL:** Do as for above hand weeding, but cut-scrape-paint adventitious and main stem/roots with undiluted glyphosate. For dense, smothering infestations within foliar spray height, use 1.8mL L^{-1} 2,4-D amine (eg Amicide 625) **or** 5mL L^{-1} 2,4-Dichlorprop (Lantana600) **or** glyphosate (eg RoundUp Biactive) at 10mL L^{-1} +/- metsulfuron methyl (eg Brushoff) at 1.0g L^{-1}.

Common name: Moth Vine *Latin name: Araujia sericifera (*Syn *A. hortorum)*
FAMILY: APOCYNACEAE/ASCLEPEDIACEAE
ORIGIN:
Noxious Weed Category: W5 (Environmental Weed)

Description
Habit: A fast-growing, perennial vine to 10m with pendulous, spearhead-shaped (hastate) leaves, all plant parts exude copious milky sap when cut/broken. **Flowers**: White, funnel-shaped to 15mm. **Leaves**: Simple, opposite, entire, spearhead (hastate) shaped to 15cm; upper surface dull dark-green, lower surface paler. **Fruit**: Choko-shaped to 12cm. Green at first, then ripening to brown and woody at which time it splits down both sides to release wind-borne seeds. Seeds are an elongated achene (hard-coated) with a tuft of hairs (pappus) at one end to facilitate wind-dispersal.

Ecology: A significant transforming weed across a range of vegetation types as well as ruderal areas, roadsides and untended gardens etc. Smothers host vegetation from ground-covers to small trees. Produces abundant wind, water and soil dispersed seeds. Does not handle deep shade but favours disturbed edges and gaps or semi-shade understory with little competition.

Dispersal: Seeds released in the mid-story and canopy are wind-dispersed over short to long range by use of the tuft of parachute-like hairs. Seeds spread readily in water and as a contaminant on footwear and clothing, contaminated soil on machinery etc.

Control:
Note: Wear gloves when handling this plant and avoid getting the sap on the skin or in the mouth or eyes. **HAND:** Young plants are easily hand-pulled if growing in loose soil. Large plants can be dug out. When removing any species of vines, be careful about pulling them down, as this can damage the supporting plant. Try to control vines before seed has formed to avoid this problem, but if fruits are present (even if they are still green), they should be collected and removed off site. **CHEMICAL:** Cut-scrape-paint with undiluted glyphosate (eg RoundUp Biactive). Seedlings and young plants can be spot-sprayed with glyphosate @ 13mL L^{-1}.

Native Look a Like: The native climbers *Marsdenia rostrata* (below left)and *Parsonsia straminea (below right* may be confused with Moth Vine, but both have greener foliage and clear instead of milky sap.

Common name: Mother of Millions *Latin name: Bryophyllum* spp. (Including *B. pinnatum, B. delagoense*)
FAMILY: CRASSULACEAE
ORIGIN:
Noxious Weed Category: W3 (Regionally Controlled)

Description
Habit: Erect, smooth fleshy succulent stems to 2 m, with green- pink grey stems.**Flowers**: Produced in a cluster at the tip of long stems. Flowers are drooping, bell-shaped, orange-red to scarlet, 4-lobed to 2-3 cm long. Flowers mainly Winter-Spring. **Leaves**: Leaves vary depending on the species, but all are succulent either cylindrical or boat shaped and have many small teeth on the leaf tip or margins that produce new plantlets (vegetative reproduction).**Fruit**: Dry capsule, producing hundreds of tiny black seeds. Prolific seeder.

Ecology: In dense infestations, mother-of-millions is a significant transforming weed across a range of vegetation types. It can be mat-forming and will grow under the poorest of conditions in areas such as a crack in a rock, gravel on the side of a road or on cliff faces, sand dunes and pastures. It has been known to recover from >50% cell desiccation.

Dispersal: Prolific seeder, but is best known for its spread by plantlets produced on the leaves which can drop to the ground and take root. If broken away from the parent plant, all plant parts will grow to new individuals. It is by this means that it rapidly spreads along roadsides (slashing/grading/stock movement) and riparian systems (flooding disturbance). In natural areas, its rate of spread is much reduced, but steadily grows by seedling and plantlet drop.

Control:
Note: All plant parts are extremely poisonous so care should be taken when handling.
HAND: Plants are generally shallow rooted and can be easily removed and bagged. Do not attempt to solarise or compost the plants. The challenge for effective control is the persistent seedbank and the sheer volume of tiny plantlets within an infestation. **CHEMICAL:** Foliar spray with glyphosate (eg RoundUp Biactive) at 20mL L^{-1} and/or metsulfuron methyl (eg Brushoff) at 1.5g L^{-1}.

B. pinnatum

B. delagoense

B. delagoense

Common name: Murraya/Mock Orange/Orange Jessamine *Latin name: Murraya paniculata subsp. exotica*
FAMILY: RUTACEAE
ORIGIN:
Noxious Weed Category: n/a

Description
Habit: Shrub or small tree to 12m with glossy foliage. **Flowers**: Fragrant. Flowers irregularly throughout the year but mainly late spring to early autumn. **Leaves**: Opposite, compound with 3-7 leaflets, glossy dark green above, paler below, smelling of citrus when crushed. **Fruit**: A drupe (fleshy and single seeded) to 2cm, ripening to orange-red, olive shaped with a tapered tip.

Ecology: Shade tolerant and dispersed by arboreal and terrestrial animals, *Murraya* is a prolific producer of fruit which can spread readily over long ranges, starting new infestations. Some 'sterile' hybrids have been developed for the horticulture sector but have known to produce viable seed. The plant is a fast and aggressive grower which can out-compete desirable vegetation.

Dispersal: Widely grown for cultivated use, humans are the most significant dispersal vector over short to wide ranges. The fruit are favoured by birds, bats etc which also spread the seeds over long distances. Seeds can also be spread in garden waste and in flowing water of riparian system.

Control:
HAND: Seedlings and small plants can be hand-pulled. Use caution on steep or friable soils as the plant develops a tap-root from a young age. **CHEMICAL:** Foliar spray with glyphosate (eg RoundUp Biactive) at 20mL L^{-1} **or** 1g $10L^{-1}$ metsulfuron methyl (eg Brushoff); cut stump to 100mm with undiluted glyphosate; chisel or drill and inject larger trees with undiluted glyphosate with 2mL per cut/hole, holes 100mm apart and as close to the ground as possible (also treat any dominant surface roots).

Common name: Night Scented Jasmine *Latin name: Cestrum nocturnum*
FAMILY: SOLANACEAE
ORIGIN:
Noxious Weed Category: n/a

Description
Habit: Shrub to 4m (often multiple stems) with long, arching branches covered in raised lenticels. **Flowers**: Tubular to 2.5cm, fragrant and held in elongated clusters. **Leaves**: Simple, alternate with entire margins to 15cm, drawn to a blunt tip. **Fruit**: A white spherical berry to 6mm.

Ecology: Shade tolerant and dispersed by arboreal and terrestrial animals it is a prolific producer of fruit which can spread readily over long ranges, starting new infestations. The plant is a fast and aggressive grower which can out-compete desirable vegetation.

Dispersal: The fruit are favoured by birds, bats etc which also spread the seeds over long distances. Seeds can also be spread in garden waste and in flowing water of riparian systems.

Control:
HAND: Seedlings and small plants can be hand-pulled. Use caution on steep or friable soil. **CHEMICAL:** Foliar spray seedlings with glyphosate (eg RoundUp Biactive) at 20mL L^{-1} **or** 1.5g $10L^{-1}$ metsulfuron methyl (eg Brushoff); cut stump larger plants with undiluted glyphosate; chisel or drill and inject larger trees with undiluted glyphosate with 2mL per cut/hole, holes 100mm apart and as close to the ground as possible (also treat any dominant surface roots).

Common name: Noogoora Burr *Latin name: Xanthium sp.* (Including *X. pungens*, *X. occidentale* et al)
FAMILY: ASTERACEAE
ORIGIN:
Noxious Weed Category: W4 (Locally Controlled)

Description
Habit: Multi-stemmed or single stemmed herb growing up to 2 m high. **Flowers**: separate male and female flowers on the same plant. The cream or creamy green male flowers are clustered at the end of the branches, or in the upper leaf axils while the yellowish green to brown female flower heads occur in the leaf junctions. **Leaves**: Simple, alternate, broad-ovate to triangular, 50-150 mm long, 50-150 mm wide, 3- or 5-lobed, toothed margins. The upper leaf surface is darker green than the under surface and prominently 3-veined with purplish veins. **Fruit**: The burrs are ellipse-shaped, 15-25 mm long, hairy, covered with numerous small hooked spines and with 2 longer stout and straight spines (or 'beaks'). Two seeds formed in each burr, one larger than the other.

Ecology: Major weed of disturbed soil, flood plains and the agricultural land of Australia, particularly in Queensland, the Northern Territory and New South Wales. Grows rapidly after flooding in river systems forming dense thickets. The two seeds within the fruit germinate in different years.

Dispersal: The burrs of Noogoora Burr are covered in hooked spines and transport readily by attaching to livestock, clothing and other fibrous material. They are also spread in mud and soil, road gravel and road making equipment. Air cavities around the seeds assist the burrs to float on water and hence much of the spread in Australia has been along waterways and across flood plains.

Control:
HAND: Seedlings and small plants can be hand-pulled. Use caution on steep or friable soil. **CHEMICAL:** Foliar/spot spray with metsulfuron methyl (eg Brushoff) at 7.5g $100L^{-1}$.

Common name: Norfolk Island Hibiscus *Latin name: Lagunaria patersonia* subsp. *patersonia*
FAMILY: MALVACEAE
ORIGIN:
Noxious Weed Category: n/a

Description
Habit: Tree to 15m, occasionally with multiple stems arising from a fluted trunk. **Flowers**: Pale pink to mauve, 5 petals bending back once mature. **Leaves**: Lance-shaped to oval with a blunt tip, dull-green above, paler and hairy below. **Fruit**: A dry capsule lined with sharp hairs with orange-red kidney shaped seeds.

Ecology: An aggressive habit enables Lagunaria to compete strongly with desirable vegetation and can form dense thickets that exclude other trees. Not particularly well suited to deep shade, but will invade a range of forest types on different soils, and is suited to ephemerally wet areas such as wetlands and swamp sclerophyll but also exposed low-nutrient soils, ruderal areas, abandoned farm-lots, areas of disturbance etc.

Dispersal: Seed dispersed locally by dehiscent fruit, but red seeds also likely to be spread by some bird species. The tree is still widely planted ornamentally and hence humans are a significant dispersal vector.

Control:
Note: Most parts of the plant are covered in sharp hairs that can embed in the skin. Use caution and appropriate PPE.
HAND: Seedlings and small plants can be hand-pulled. Use caution on steep or friable soil. **CHEMICAL:** Foliar spray with 1g $10L^{-1}$ metsulfuron methyl (eg Brushoff); cut stump to 100mm with undiluted glyphosate; chisel or drill and inject larger trees with undiluted glyphosate with 2mL per cut/hole, holes 100mm apart and as close to the ground as possible (also treat any dominant surface roots).

Common name: Ochna/Mickey Mouse Plant *Latin name: Ochna serrulata*
FAMILY: OCHNACEAE
ORIGIN:
Noxious Weed Category: W5 (Environmental Weed)

Description
Habit: Dense shrub to 2m, often with multiple trunks, stems with many lenticels (raised spots). **Flowers**: Bright yellow, surrounded by green sepals that turn bright red and curve backward when young fruits develop. **Leaves**: Simple, alternate, finely serrated, drawn to a blunt tip; tough, glossy green above and paler below; hairless. **Fruit**: A drupe (fleshy and single seeded) to 7mm that ripens from green to black.

Ecology: An extremely aggressive and significant transforming weed which competes strongly with desirable vegetation and can form dense and impenetrable thickets that exclude other understory vegetation and inhibit canopy species regeneration. Not particularly well suited to deep shade, but will rapidly invade a range of forest types on different soils as well as ruderal areas, abandoned farm-lots, areas of disturbance, rainforest edges/gaps etc.

Dispersal: Seeds which drop from a parent freely germinate, helping create dense monocultures. Fruit are dispersed over long ranges in the gut of animals as well as riparian systems, contaminated mulch, dumped garden waste etc. The rootstock readily and aggressively suckers when damaged.

Control:
HAND: Plants very early develop the characteristic S-shaped root structure. Often when hand-pulling is attempted it breaks away and enable the plant to re-shoot from below ground, further complicating non-chemical control. However, in soft and sandy soils, small plants can often be hand-pulled, but care should be taken to avoid snapping the root. Digging is not recommended as the root anchors deeply. **CHEMICAL:** For seedlings and plants to 50cm, foliar spray with glyphosate (eg RoundUp Biactive) at 20mL L^{-1} + 1.5g $10L^{-1}$ metsulfuron methyl (eg Brushoff); larger plants with a basal diameter to 20mm can be treated by stem-scrape and paint with undiluted glyphosate. From ground level up to at least 30cm, scrape back the thin bark (on <u>all</u> stems if multi-stemmed) to expose the green vascular tissue (cambium) for at least ½ the circumference. Immediately paint the green tissue – it dries very quickly which will impede the translocation of the poison. Use caution not to scrape too deeply which will result in poisoning tissue that does not translocate to the roots. For larger plants, **either** treat by chisel or drill and inject with undiluted glyphosate with 2mL per cut/hole, holes 50mm apart and as close to the ground as possible (also treat any dominant surface roots) **or** basal bark with fluroxypyr (eg Starane200) in diesel at a rate of 35mL L^{-1}. Basal spray can be applied with a paint-brush or low-pressure spray nozzle from ground level to 30cm around the entire trunk and treating <u>all</u> stems.

Ochna Native Look a Like
Streblus brunonianus: Whalebone, has a small green/yellow fruit and more finely tapering leaf tips.
Elaeocarpus reticulatus, Blueberry Ash.

Common name: Paddy's Lucerne/Sida *Latin name: Sida rhombifolia (*Syn. *S. retusa)*
FAMILY: MALVACEAE
ORIGIN:
Noxious Weed Category: n/a

Description
Habit: Erect, perennial shrub to 1.5m high. **Flowers**: Yellow to off-white to 15mm, solitary in the axis' of leaves. **Leaves**: Simple, alternate, coarsely serrated, drawn to a blunt tip; thin, dull green above and paler below; to 4cm. **Fruit**: A schizocarp (split into pie-like segments) which dehists (releases) hard, angular seeds to 3mm.

Ecology: A common weed of a range of untended or degraded areas including gardens, roadsides, farm-lots, ruderal areas etc. The persistent seedbank also makes *Sida* common in the early stages of 'greenfield' revegetation sites. It prefers disturbance conditions and can reproduce in its first year. Produces abundant hard-coated seed with long viability. Long taproot for moisture-seeking. Will re-shoot from the crown if slashed, grazed, burnt etc.

Dispersal: Seeds which drop from a parent freely germinate, helping create dense infestations. Fruit are dispersed over long ranges as a contaminant of garden waste, soil on machinery, vehicles etc.

Control:
HAND: The long tap-root can make hand-pulling difficult. Soil disturbance from hand pulling can also trigger further germination from the soil seed bank. Use caution on steep or friable soils. From a broader management perspective, the plant can be shaded out and germination inhibited by competition from native groundcovers and/or canopy. **CHEMICAL:** Large, woody plants can be cut-paste with undiluted glyphosate (eg RoundUp Biactive). For any spray control, plants most importantly need to be healthy. Use glyphosate at 20mL L^{-1} or picloram+triclopyr (eg Grazon Extra) at 5mL L^{-1}. Repeated applications may be necessary.

Common name: Palm Grass/Highland Pit-Pit *Latin name: Setaria palmifolia*
FAMILY: POACEAE
ORIGIN:
Noxious Weed Category: n/a

Description
Habit: Perennial grass to 1.5m. **Flowers**: Inflorescence (grouping of flowers) is a large open panicle (roughly pyramidal in shape) presented at the end of the culm (stem), shows strong red-purple tinge when in flower. **Leaves**: Broad and prominently veined longitudinally with a strong pale-green midvein; strap-like and drawn to a point. **Fruit**: Abundant seed dropped from the panicle; small to 2mm.

Ecology: An escaped ornamental that produces prolific seed. The plants are strongly rooted and form tussocks that exclude other vegetation. It is tolerant of shade and prefers damp areas.

Dispersal: Seeds which drop from a parent freely germinate, helping create dense infestations. It is dispersed over long ranges in riparian water flow and during grass cutting.

Control:
HAND: Chip, crown or mattock out clumps, being careful to exacerbate erosion risk. **CHEMICAL:** Spot spray with glyphosate (eg RoundUp Biactive) at 10mL L^{-1} or wick-wipe with glyphosate at 100mL L^{-1}. Use caution in riparian situations to minimize runoff.

Common name: Pampas Grass *Latin name: Cortaderia selloana*
FAMILY: POACEAE
ORIGIN:
Noxious Weed Category: W4 (Locally Controlled)

Description
Habit: Large, long lived perennial tussock-forming ornamental grass to 4.5 m tall. **Flowers**: Large feathery heads on stems (culms) to 3 m tall; white-beige (*C. selloana*), or pink-mauve (*C. jubata*). Up to 50 plumes formed on one mature plant. Both single sex and bisexual plants exist; Summer-Winter flowering. **Leaves**: Light green, up to 2 m long and finely tapering with prominent midrib and sharp edges that will cut the skin. A rim of hairs (to 3 mm long) at leaf base (ligule). **Fruit**: Small (2 mm), short-lived, up to 100,000 seeds set per plume.

Ecology: Produces masses of wind and water-borne seed that can spread over long ranges. Forms dense monocultures that exclude other vegetation. Fires burn with intense heat and interfere with ecological processes including regeneration/succession. Well suited to waterlogged and damp areas particularly coastal heath and floodplains.

Dispersal: Seed, primarily by wind, but also as a contaminant of soil on people, tools, machinery etc.

Control:
HAND: Small plants can be chipped or crowned out. **CHEMICAL:** Foliar spray with glyphosate (eg RoundUp Biactive) at 13mL L^{-1}.

Common name: Panic Veldt Grass/Ehrharta *Latin name: Ehrharta erecta*
FAMILY: POACEAE
ORIGIN:
Noxious Weed Category: n/a

Description
Habit: Perennial grass to 0.5m. **Flowers**: Inflorescences borne on stems, 10-80 cm long and grow at any time during the year. The stem can be upright or curved, often branched near the base and sometimes tinged red. **Leaves**: Bright green, flat leaf blade with soft hairs on surface, to 5-20 cm long, 2-10 mm wide, stems rounded, prominent mid-vein on the underside of leaf. **Fruit**: Profuse and rapid production of 3 mm long and oval-shaped, shiny seeds. They range from immature green to a bleached, dry appearance. Seeding can occur every 6 weeks and viability approaches 100%. Seed thought to have a viability of up to 4 years.

Ecology: An aggressive, perennial grass almost constantly in seed, *Ehrharta* spreads rapidly excluding many small native ground cover species. Vigorous, shade-tolerant, with a network of fine, dense, water-hogging roots; can out-compete native ground covers in nearly all soil conditions. Once disturbed – or if competition is removed (eg spray-outs of other weedy groundcovers) – dormant seedbank immediately flushes up and creates a dominant monoculture.

Dispersal: Seed is spread over long ranges by contamination of footwear/clothing, soil on tyres, tools, machinery, grass-cutting equipment and also in flowing water of riparian systems. Over short distances, the seed is spread by wind, animals and human activity including bush regeneration. The breaking down of wind rakes and storm shutters facilitates higher wind velocities which aggravates the spread.

Control:
Note: Do not underestimate the impact of this seemingly innocuous grass. Develop a strategy for limiting and reducing the infestation before rushing in. Exercise good weed hygiene by cleaning off tools and clothing before leaving a contaminated site, working from clean areas toward infested areas and avoiding movement through infested areas on the way to clean areas.
HAND: Remove seed ('dead-head') then crown out or spray outlying individuals to contain spread, then work toward the core infestation working from 'bad' to 'good'. **CHEMICAL:** Spray with glyphosate (eg RoundUp Biactive) at 10mL L^{-1}. Repeated applications essential to exhaust seed bank.

Common name: Parrot Alstroemeria *Latin name Alstroemeria pulchella*
FAMILY: ALSTROEMERIACEAE
ORIGIN: Brazil
Noxious Weed Category: n/a

Description
Habit: Erect perennial with numerous unbranched stems with spoon-shaped leaves to 1 m high. Tuberous underground roots. **Leaves**: Twisting from the base, to 1m **Flowers**: Loose clusters 4-5cm across, red and green with black spots, at tops of stems. **Fruit**: Approximately-spherical capsule with prominent ribs to 15mm diameter. Reddish brown seeds to 3mm.

Ecology: Spreads from seed and colonises a range of soil types under varying conditions including shade to full sun. Spreads vegetatively via underground tubers. Dense infestations can outcompete desirable vegetation, particularly species dependent on germinating seed rather than vegetative spread.

Dispersal: Seed drops locally and germinates and also can be dispersed in flowing water. Also as a contaminant of dumped garden waste, soil etc.

Control
HAND: Remove the entire plant including the roots. **CHEMICAL:** Cut individual stems near ground and paint with undiluted glyphosate (eg RoundUp Biactive). Follow up usually required to exhaust seed bank and dormant tubers.

Common name: Pennywort *Latin name: Hydrocotyl bonariensis*
FAMILY: APIACEAE
ORIGIN:
Noxious Weed Category: n/a

Description
Habit: Perennial herb with rhizomes, stems creeping and rooting at the nodes; to 50cm **Leaves**: Fleshy, peltate (leaf stalk (petiole) attaches to leaf blade (lamina) in from the margin); lamina mostly 30–120 mm diam., shallowly lobed, margins or lobes crenate (rounded 'serrations'). **Flowers**: White to creamy yellow in umbels (multiple 'branches' of flowers arise from a single point) to 6cm diameter. **Fruit**: A small ellipse to 3mm with prominent ribs.

Ecology: Coloniser of coastal dunes and on sandy soil on cliff faces, along creeks and swamps near the coast, weed of coastal lawns. Dense infestations can outcompete desirable vegetation, particularly species dependent on germinating seed rather than vegetative spread.

Dispersal: Spreads primarily via creeping rhizome. Seed drops locally and germinates.

Control
HAND: Very difficult to control manually. Remove the entire plant including the roots. **CHEMICAL:** Trial wick-wiping with glyphosate (eg RoundUp Biactive) at 100mL L-1 or foliar spray with metsulfuron methyl (eg Brushoff) at 1.5g $10L^{-1}$.

Common name: Peruvian Summer/Ribbon Bush *Latin name: Hypoestes aristata*
FAMILY: ACANTHACEAE
ORIGIN: Southern Africa
Noxious Weed Category: n/a

Description
Habit: Erect shrub to 1.5m. **Leaves**: Simple, opposite, entire, thin with a soft covering of hairs, prominent venation. **Flowers**: Pale pink to lilac in clusters held in leaf axils; obvious 2-lipped and long stamens. **Fruit**: A flattened oblong capsule which splits down both sides to explosively dehist seeds. Seeds hard and flattened.

Ecology: A weed of riparian vegetation, forest margins, urban bushland, open woodlands, roadsides, disturbed sites and waste areas. Tolerant of deep shade but prefers some disturbance (edges and gaps) to take hold. Can reproduce from seed as well as stem fragments and layering when it can form dense thickets that exclude other vegetation by aggressive, shallow roots and shade.

Dispersal: Seed is dispersed locally when released explosively from the fruit. Seed, stem and root fragments can be spread in soil, contaminated garden waste, and in flowing water of riparian systems. .

Control
HAND: Seedlings and small plants - remove the entire plant including the roots. Plants will re-root if left in contact with the soil. **CHEMICAL:** Cut-paste with undiluted glyphosate (eg RoundUp Biactive); foliar spray with glyphosate at 20mL L^{-1} + metsulfuron methyl (eg Brushoff) at 1.5g L^{-1} + a non-ionic surfactant (eg Pulse). Repeat applications may be necessary.

Common name: Pink Tephrosia *Latin name: Tephrosia glomeruliflora*
FAMILY: FABACEAE
ORIGIN: Southern Africa
Noxious Weed Category: n/a

Description
Habit: Erect shrub 1–2 m high, branches hairy. **Leaves**: Leaves compound, alternate, 5–12 cm long; leaflets 11–21, oblanceolate to oblong, 15–40 mm long, 5–10 mm wide. **Flowers**: Pale pink to mauve in racemes up to 15cm long. **Fruit**: Pod straight and flattened when green, twisted once seeds dehist and pod dries, 5–7 cm long, 7–9 mm wide.

Ecology: Widely naturalised in eastern Australia (i.e. in south-eastern, central and northern Queensland and in the coastal districts of northern and central New South Wales). Typically a plant of poorly managed gardens, roadsides, ruderal areas, forest margins etc. Shallow rooted, but does not root adventitiously or layer from prostrate stems.

Dispersal: Seed is dispersed locally when released from the fruit. Seed, can be spread in soil, contaminated garden waste etc.

Control
HAND: Hand pull seedlings and small plants and remove seed pods if practical to do so. Use caution on steep or friable soils. **CHEMICAL:** Cut-paste with undiluted glyphosate (eg RoundUp Biactive); foliar spray with glyphosate at 10mL L^{-1}.

Common name: Polygala *Latin name: Polygala myrtifolia*
FAMILY: FABACEAE
ORIGIN: Africa
Noxious Weed Category: n/a

Description
Habit: Erect shrub, usually 1–2.5 m high, densely leaved. **Leaves**: Leaves simple, alternate to pseudo-whorled at ends of branches, usually elliptic to broad-elliptic, 10–50 mm long, 4–15 mm wide, apex obtuse, hairless to sparsely hairy. **Flowers**: 'Pea'-type, in racemes to 5cm long, lilac. **Fruit**: A circular capsule to 10mm diameter.

Ecology: Favours disturbance including fire, but flourishes on degraded forest edges and in gaps. Seeds have long viability and disturbance of other weed control activities may trigger germination. Dense infestations compete with the regeneration of other native species.

Dispersal: Seed is dispersed locally when released from the fruit. Seed, can be spread in soil, contaminated garden waste etc.

Control
HAND: Hand pull seedlings and small plants and remove seed pods if practical to do so. Use caution on steep or friable soils. **CHEMICAL:** Cut-paste with undiluted glyphosate (eg RoundUp Biactive); foliar spray with glyphosate at 20mL L^{-1}. Repeat applications may be required.

Common name: Potato Weed *Latin name: Galinsoga parviflora*
FAMILY: ASTERACEAE
ORIGIN:
Noxious Weed Category: n/a

Description
Habit: A small, short-lived, herbaceous plant with upright or semi-upright stems growing 10-60 cm tall. **Leaves**: Paired leaves (25-60 mm long) have variously toothed to almost entire margins. **Flowers**: Presented on long peduncles (flower stalks); 5 tiny white 'petals' (ray florets) and a yellow centre. **Fruit**: Small and hard to 1.5mm long; held within the dry inflorescence.

Ecology: A common weed of gardens, footpaths, parks, crops and disturbed sites. It can sometimes also be found growing in riparian vegetation and disturbed natural vegetation, but it is not a significant environmental weed. Prefers areas of disturbance where the abundant seed readily germinates. Shallow-rooted.

Dispersal: Reproduces only from seed which is spread in contaminated soil, garden mulch, dumped garden waste etc. Locally dropped seed germinates forming dense infestations.

Control
HAND: Hand pull seedlings and small plants. Use caution on steep or friable soils. **CHEMICAL:** Foliar spray with glyphosate (eg RoundUp Biactive) at 10mL L^{-1}. Repeat applications may be required to exhaust the seed bank.

Common name: Purple Top *Latin name: Verbena bonariensis*
FAMILY: VERBENACEAE
ORIGIN: South America
Noxious Weed Category: n/a

Description
Habit: Long-lived herbaceous plant with upright stems growing 60-200 cm **Leaves**: Simple, opposite and toothed; a slightly sandpapery texture; stems four-angled in cross-section. **Flowers**: Clustered at the ends of long branchlets; lilac to purple. **Fruit**: A schizocarp (fruit divided like segments of a pumpkin) with 4 mericarps (individually seed cases – a segment of the 'pumpkin').

Ecology: A common weed of roadsides, pastures, grasslands, open woodlands, riparian vegetation, crops, orchards, gardens, disturbed sites and waste areas in warmer temperate, sub-tropical and occasionally also tropical environments. A prolific seeder capable of forming dense infestations.

Dispersal: Reproduces only from seed which is spread in contaminated soil, garden mulch, dumped garden waste, during grass cutting/slashing etc. Locally dropped seed germinates forming dense infestations.

Control
HAND: Hand pull seedlings and small. Use caution on steep or friable soils. **CHEMICAL:** Foliar spray with glyphosate (eg RoundUp Biactive) at 10mL L^{-1}. Repeat applications may be required to exhaust the seed bank. Larger plants can be cut-paste with undiluted glyphosate.

Common name: Running Bamboo *Latin name: Phyllostachys spp.* (Including *P.aurea*, *P. nigra*)
FAMILY: POACEAE
ORIGIN: China
Noxious Weed Category: W4 (Locally Controlled)

Description
Habit: Running bamboos with tall woody stems (culms) and feathery leaves from side-shoots and growing tips. Culms have a groove down one side of the stem between the internodes, alternating side to side. **Leaves**: Long and narrow, tapered to a point, golden yellow, giving a feather appearance. **Flowers**: Flowers and seeds produced after long irregular intervals. **Fruit**: Long, narrow and tapered to 15mm, only sporadically produced.

Ecology: Thickets compete with native vegetation, roots form dense mats up to 60cm deep. Can regrow vigorously after slashing, fire, digging.

Dispersal: Generally by vegetative expansion, occasionally from wind dispersed seeds. Humans are the primary source of dispersal as the plant transplants easily to form new infestations.

Control
HAND: Only attempt digging out if shallow-rooted. This will result in significant disturbance, potentially causing a flush of other weeds. **CHEMICAL:** Cut and paste individual stems close to the ground and poison the outer ring of vascular tissue with undiluted glyphosate (eg RoundUp Biactive). Brush-cut to ground level and spray with glyphosate at 20mL L^{-1}. Repeat treatments required.

P. aurea

P. nigra

P. aurea

P aurea

Common name: Silver Leaf Desmodium/Velcro Vine *Latin name: Desmodium uncinatum*
FAMILY: FABACEAE
ORIGIN: South America
Noxious Weed Category: n/a

Description
Habit: Sprawling or climbing vine with stems to about 1.5 m long. **Leaves:** Compound, alternate, three leaflets on stalks 2.0-5.5 cm long. Leaflets (2-10 cm long) have pointed tips and their upper surfaces have a distinct silvery stripe, hairy on both sides. **Flowers**: Pea-type, in elongated clusters at the tips of the stems or in the upper leaf axils. Pink or purplish flowers (7-10 mm long) usually turn bluish or bluish-green as they age. **Fruit**: Elongated pods (1-3 cm long) are covered in hooked hairs, and readily separate into 3-10 small one-seeded segments.

Ecology: A weed of pastures, riparian vegetation, forest margins, open woodlands, roadsides, parks, lawns, footpaths, disturbed sites and waste areas. Grows rapidly and produces flowers and fruit within first year. Smothers low-growing vegetation, competing for light and competes with native vines, shrubs and groundcovers. Hooked hairs can entrap small wildlife eg lizards and frogs.

Dispersal: This species reproduces mainly by seed, but its creeping stems may produce roots when they come into contact with moist soil. The fruit separate into one-seeded segments, that readily become attached to animals, clothing and vehicles. Seeds may also be dispersed by water and in contaminated agricultural produce.

Control
Note: The fine, hooked hairs enable plant parts to adhere to clothing, so check clothing before moving from infected areas toward clean to avoid spreading the pest.
HAND: Grub out seedlings and small to medium-sized plants. Use caution on steep or friable soils
CHEMICAL: For larger-stemmed plants, cut-scrape-paint close to ground-level with undiluted glyphosate (eg RoundUp Biactive). For infestations, foliar spray with metsulfuron methyl (eg Brushoff) at 1.5g $10L^{-1}$+ 1mL L^{-1} of non-ionic surfactant (eg Pulse).

Common name: Singapore Daisy *Latin name: Sphagneticola trilobata*
FAMILY: FABACEAE
ORIGIN: Pan-Central/South America
Noxious Weed Category: W5 (Restricted Plant)

Description
Habit: A long-lived (i.e. perennial) herb with a creeping (i.e. prostrate), scrambling or climbing habit. This mat-forming (i.e. stoloniferous) plant often creates a dense ground cover (usually 15-30 cm tall but occasionally up to 70 cm tall) that crowds out the growth of other species. It may also climb a short distance up trees or over other vegetation. **Leaves:** Simple, opposite, lobes with toothed margins; glossy green above, duller beneath. **Flowers**: Yellow and daisy-like with prominent ray florets, to 3.5cm diameter. **Fruit**: Viable seed is only sparingly produced; narrow and tapered to 5mm.

Ecology: Singapore daisy (*Sphagneticola trilobata*) is regarded as a significant environmental weed in Queensland, and a minor or potential environmental weed in New South Wales and Western Australia. It is also listed in the Global Invasive Species Database (GISD) and is among the top 100 of the world's worst invasive alien species. Left unmanaged, it forms monocultures inhibiting the germination and establishment of all other species. It is not well suited to deep shade and this should be considered as part of a restoration strategy.

Dispersal: This plant usually reproduces vegetatively by stem fragments, while viable seeds are rarely produced. Stem fragments readily take root where they come into contact with the ground and can develop into new plants. Such segments are commonly spread in dumped garden waste, by mowing and slashing, and during floods

Control
HAND: small infestations can be hand-weeded for removal off site. Adopt a staged removal to mitigate erosion risk as Singapore Daisy often performs the function of groundcover. **CHEMICAL:** For large infestations foliar spray with metsulfuron methyl (eg Brushoff) at 1.5g $10L^{-1}$+ 1mL L^{-1} of a vegetable-based adjuvant (eg Synetrol).

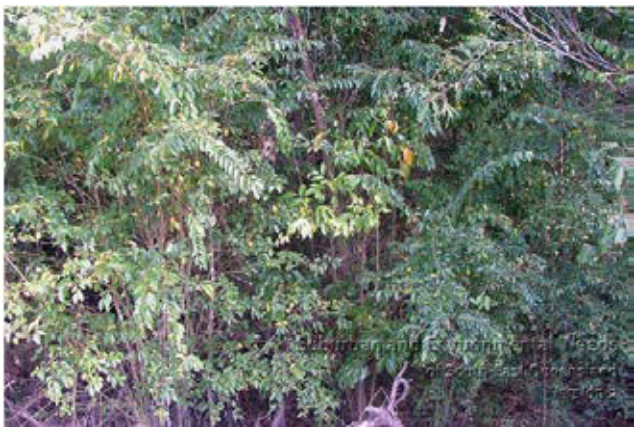
Common name: Small Leaved Privet/Chinese Privet *Latin name: Ligustrum sinense*
FAMILY: OLEACEAE
ORIGIN: China/South-East Asia
Noxious Weed Category: W4 (Locally Controlled)

Description
Habit: A large shrub or a small tree usually growing less than 3 m tall, but occasionally reaching 4-5 m in height. **Leaves:** Simple, opposite, slightly hairy on the underside midvein; no oil dots (which separates it from 'lily-pillies'; to 7cmx3cm but usually smaller. **Flowers**: Small and white and produced in dense clusters. **Fruit**: Abundant, bluish black to 6mm.

Ecology: Chinese privet (*Ligustrum sinense*) is most commonly found in wetter tropical, sub-tropical and temperate regions. It is a particularly common weed of rainforest areas and waterways, but is also a weed of urban bushland, gullies, open woodlands, waste areas, disturbed sites and roadsides. Privet tends to grow in more fertile soils and forms dense thickets that enable it to shade out other plants. Its root system reduces the availability of water and nutrients for competing native species, and when the roots or stems are damaged or cut they sucker prolifically.

Dispersal: This species reproduces by seed, root suckers, and it also resprouts after its stems are deliberately cut or otherwise damaged. Its seeds are readily dispersed by fruit-eating (i.e. frugivorous) birds and other animals. They may also be spread by water or in dumped garden waste.

Control
HAND: Privet is generally shallowly rooted but has a dense network of surface roots. Therefore, seedlings and small plants can be hand-weeded, but use caution of steep or friable soils. **CHEMICAL:** For large infestations foliar spray with metsulfuron methyl (eg Brushoff) at 1.0g $10L^{-1}$. Plants too large for hand pulling – but up to 100mm diameter - can be cut close to ground level and immediately painted with undiluted glyphosate (eg RoundUp Biactive). Chisel or drill and inject larger trees with undiluted glyphosate @ 2mL per cut/hole, holes 100mm apart and as close to the ground as possible (also treat any dominant surface roots).



Small Leaved Privet Native Look a Like

May be confused with the native Backhousia Myrtifolia: Grey Myrtle. They grow in similar habitats, but the native myrtle has oil glands in its leaves (clearly visible when the leaf is held up to the sun). Also, when crushed Grey Myrtle leaves smell similar to their relatives, the eucalypts.

Syzygium smithii or Lilly Pilly seedlings may be confused with the Small Leaf Privet.

Breynia oblongifolia or Coffee Bush can also be confused with this weed.

Syzygium smithii seedling

Native Look a Like Breynia oblongifolia or Coffee bush

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Common name: South American Clover / **Mexican Clover** *Latin name: Richardia brasiliensis*
FAMILY: RUBIACEAE
ORIGIN: South America
Noxious Weed Category: n/a

Description
Habit: A short-lived (i.e. annual) herbaceous plant with creeping (i.e. prostrate) or sprawling stems. **Leaves:** The oppositely arranged leaves are simple and borne on stalks (i.e. petioles) 4-12 mm long. These leaves (8-50 mm long and 3-28 mm wide) are oval (i.e. elliptic) in shape with entire margins and pointed tips (i.e. acute apices). They are also hairy and rough to touch (i.e. pubescent and scarbous), especially along the edges. **Flowers**: Clusters of minute, white flowers 1-3mm long at the ends of branches and in leaf axils. **Fruit**: The mature fruit split apart into three one-seeded segments (i.e. mericarps) when mature. These 'seeds' (2.5-3 mm long) are brown in colour.

Ecology: A common weed of parks, gardens, footpaths, lawns, roadsides, disturbed sites, waste areas, crops and degraded pastures. Richardia spreads via abundant seed production as well as by its layering stems that can form new plants if broken from the parent.

Dispersal: Seed and stem fragments that can take root if damaged and dispersed. They can also spread in soil, contaminated garden waste and as a contaminant of machinery, tools etc.

Control
HAND: Seedlings and small plants can be hand-weeded. Use caution of steep or friable soils. **CHEMICAL:** For foliar spray, use glyphosate (eg RoundUp Biactive) at 10mL L^{-1} or wick-wipe at 100mL L^{-1}.

Common name: Spanish Bayonet *Latin name: Yucca aloifolia*
FAMILY:
ORIGIN:
Noxious Weed Category: n/a

Description
Habit: A shrubby plant with upright (i.e. erect) stems usually growing 1-3 m tall, but occasionally forming colonies up to 7 m in height. **Leaves:** Succulent; long and narrow and densely alternately arranged along the stems. These leaves (70-100 cm long and 2.5-6 cm wide) have entire or very finely toothed margins and a pointed tip ending in a sharp blackish coloured spine 1-2 cm long. They are hairless and dark green or bluish-grey in colour. **Flowers:** Autumn-flowering; arranged in large branched clusters (0.5-2 m long) at the top of flowering stems 1-3 m tall (i.e. in terminal panicles). The individual flowers are borne on stalks (i.e. pedicels) 2-4 cm long and hang downwards (i.e. they are pendant). These flowers (5-7 cm long) have six white or cream coloured 'petals'. **Fruit:** Large fleshy capsule (3.5-9 cm long and 2-4 cm wide), oblong in shape.

Ecology: A hardy plant that forms impenetrable thickets of tough leaves, spiny leaves. Seed that drops near the plant can form new individuals enabling the patch to spread, but seed and plant parts such as stem segments and rosettes can be spread through the dumping of garden waste and as a contaminant of soil etc.

Dispersal: Spread by humans as a horticultural plant. Seed that drops near the plant can form new individuals enabling the patch to spread, but seed and plant parts such as stem segments and rosettes can be spread through the dumping of garden waste and as a contaminant of soil etc.

Control
HAND: Dig out or use machinery. Remove and destroy all plant parts off-site. Use caution of steep or friable soils. **CHEMICAL:** Use cut-paste or drill/chisel and inject with undiluted glyphosate (eg RoundUp Biactive).

Common name: Spider Plant/Ribbon Plant *Latin name: Chlorophytum comosum*
FAMILY: ANTHERICACEAE
ORIGIN: Africa
Noxious Weed Category: n/a

Description
Habit: A long-lived herbaceous plant usually growing 25-35 cm tall, but occasionally reaching up to 60 cm in height. It forms dense tufts of leaves and has tuberous roots 5-10 cm long Stems arch over and root where they contact the ground, forming a new plant. **Leaves:** Succulent; strap-like to 45cm long, often green/white striped. **Flowers:** Arranged in small clusters along the flowering stems. **Fruit:** Small, three-sided, leathery capsule (4-10 mm long).

Ecology: Plants become established in native habitats when they are introduced to the area in discarded garden refuse. Once established they spread by plantlets and individual clumps can spread quite extensively, excluding native plants in the ground layer of natural vegetation.

Dispersal: This species reproduces by seed and also vegetatively via the small plants (i.e. plantlets) that develop along the flowering stems. Seeds and plantlets are most commonly spread in dumped garden waste.

Control
HAND: Dig out and remove off-site. Use caution on steep or friable soils. **CHEMICAL:** Foliar spray with glyphosate (RoundUp Biactive) at 10mL L^{-1} + metsulfuron methyl (eg Brushoff) at 1.5g $10L^{-1}$. Follow up required.

Common name: Stinking Roger *Latin name: Tagetes minuta*
FAMILY: ASTERACEAE
ORIGIN: South America
Noxious Weed Category: n/a

Description
Habit: An erect annual herb to 2.5m. All parts of the plant give off a strong fragrance when crushed or disturbed. **Leaves:** Thin and compound with a 'feathery' appearance. The leaflet margins are serrated. Stinking Roger is often mistaken by the those unaccustomed to seeing it for *Cannabis sativa* – marijuana/Indian hemp. **Fruit:** Grouped in clusters of small, erect open-ended capsules. The seed is similar to that of Cobbler's Pegs (*Bidens pilosa*).

Ecology: The germination of seed is highly light-dependent and plants do not usually establish in healthy, intact ecosystems with leaf litter or shade. Hence, Stinking Roger is often found on the margins of bushland, ruderal areas, untended garden areas etc.

Dispersal: Although seed is presented at the top of the mature plant (well placed for wind-dispersal) the seed does not have a pappus ('parachute'-like hairs) and is quite dense, so most seed falls in the vicinity of the parent, eventually leading to dense seed banks and mass-germinations which readily outcompete other species. Seeds are therefore also commonly spread in soil and on contaminated tools and machinery, but also occasionally on people and in the hair/fur of livestock.

Control
HAND: Hand-pulling is easy and effective but the disturbance often triggers a further mass germination. Brushcutting of dense stands will kill the adult plants (annuals) and enable better access for follow-up spraying. **CHEMICAL:** Foliar spray with glyphosate (RoundUp Biactive) at 10mL L^{-1} when the plants are up to waist height. Above this height, off target damage is difficult to manage. For selective control that leaves grasses unaffected use metsulfuron methyl (eg BrushOff) at 1g L^{-10} and lightly overspray.

Common name: Sweet Viburnum *Latin name: Viburnum odoratissimum*
FAMILY: ADOXACEAE/CAPRIFOLIACEAE
ORIGIN: Northern hemisphere pan-asian.
Noxious Weed Category: n/a

Description
Habit: A shrub to small tree with dense, glossy foliage and fragrant white flowers. **Leaves:** Thick and opposite with finely toothed margins, to 15cm. **Fruit:** Olive-shaped and grouped in clusters, black to red.

Ecology: Sweet viburnum seed germinates in a range of soil types and from partial shade to full sun. It is well suited to colonising forest edges and ecotones. Fruits develop after a few years and are readily eaten by birds which can disperse them over long distances, often depositing them from a perch on the edge of bushland, continuing the spread.

Dispersal: Primarily spread by people as a popular feature and hedging plant, sweet viburnum fruit are highly visible and sought-after by birds which pass the seed in a new location for possible germination.

Control
HAND: Hand-pull seedlings. Use caution on steep or friable soils. **CHEMICAL:** Cut and paste or drill/chisel and inject with undiluted glyphosate (eg RoundUp).

Common name: Thickhead *Latin name: Crassocephalum crepidioides*
FAMILY: ASTERACEAE
ORIGIN: Africa and Madagascar.
Noxious Weed Category: n/a

Description
Habit: An annual herb to 1.0m high with thin leaves and apical clusters of nodding pale red flowers. **Leaves:** Thin and pale green, often simple but also deeply dissected into lobes with toothed margins. **Fruit:** Similar to many thistles, it is an achene with a pappus of hairs which enable easy wind dispersal. The flowers nod over when unpollinated, but become erect as the seeds mature and dry.

Ecology: Like many other daisy family annuals (thistles, fleabane etc), thickhead thrives in disturbed areas, particularly with elevated light and heat levels (edges, gaps, gardens, overgrazed pasture, post-flooding). It grows rapidly and produces abundant seed which can lay dormant in the soil for the next disturbance event.

Dispersal: Seed disperses over medium to long range by wind and as a contaminant of machinery and vehicles, and over short distances by the above means and also by local seed drop.

Control
HAND: Hand-pulling seedlings is effective but the disturbance can often trigger another mass germination. Mulching over hand-pulled areas is effective for the short-to-medium term. Ensure the root mass is shaken free of soil and either elevated or piled where roots can not strike. **CHEMICAL:** A light overspray of glyphosate (eg RoundUp) at 10mL L^{-1} will control thickhead.

Common name: Torpedo Grass *Latin name: Panicum repens*
FAMILY: POACEAE
ORIGIN: Mediterranean.
Noxious Weed Category: n/a

Description
Habit: Perennial grass with dull-green foliage, pale-to-white florets (flowers) and an aggressive, creeping rhizome, particularly in sandy soils. The habit is distinct as the culms (stems) often lay on the ground and curve upward to 1m long. **Leaves:** Dull-green 2-6mm wide and to 25cm long. **Fruit:** The inflorescence (entire flower 'head') is 7-15cm long and each floret is whitish (an uncommon feature in grasses as most are green) 2-3mm long).

Ecology: Spreads mostly by the aggressive creeping rhizome but also, less commonly, produces viable seed. Plant is dormant during cooler months and re-emerges with vigor in warmer weather. Dense infestations outcompete other species.

Dispersal: Once considered to be a possible ponded pasture species (ie human dispersal). Fragments of rhizomes may be inadvertently spread on heavy machinery. Main method of spread is vegetative.

Control
Note: Very difficult and time-consuming to eradicate due to the deeply-rooted rhizome and sheer extent of some infestations.
HAND: Recommended for small infestations. Use trowels or garden forks to chase the root system, then dispatch into green waste. Consider weed succession from major disturbance such as this (particularly *Acetosa* in coastal areas). **CHEMICAL:** Also difficult, but a trial application of glyphosate (eg RoundUp Biactive) @ 10mL L^{-1} + metsulfuron methyl @ 1.5g $10L^{-1}$ + vegetable-based adjuvant (eg Synetrol Horti-Oil) @ 1mL L^{-1} Has so far given good results nine months after application.

Common name: Trad / **Wandering Jew** *Latin name: Tradescantia fluminensis* (Syn. *T. albiflora*)
FAMILY: COMMELINACEAE
ORIGIN: South America.
Noxious Weed Category: n/a

Description
Habit: Perennial, ground-covering herb with fleshy leaves, rooting aggressively at the nodes. **Leaves:** Dark green, fleshy, elliptical and drawn to a blunt tip, to 3cm, *the sheath which clasps the stem is very short*. **Fruit:** A small capsule, usually with 6 seeds. **Flowers:** White and 3-'petaled'.

Ecology: Shade tolerant and capable of invading undisturbed forest. It spreads rapidly by adventitious rooting at the nodes. Not widely considered to spread by seed, but viable seed is known to form. Dense infestations outcompete and smother other species and will climb to approximately 1 metre.

Dispersal: Water and vegetative spread are the two main methods. However, bush turkeys can also rake up and spread the plant over short distances. No longer a popular garden ornamental, it is often found in dumped green waste from which new infestations can begin.

Control
Note: Can be difficult and time-consuming to eradicate due to persistence and sheer extent of some infestations.

HAND: Recommended for small infestations. Use a rake to pile up dense mats then trample and solarise. For small infestations, hand weed into a bucket for green waste disposal. **CHEMICAL:** Also difficult, but 2 to 3 applications of fluroxypyr (eg Starane Advanced 333gL^{-1}) @ 9mL L^{-1} + a non-ionic surfactant (eg Pulse) @ 1mL L^{-1} is very effective. Monitor and hand-weed regrowth. At Rushcutter we have had good success using Roundup Biactive @ 5ml to 1L with follow up.

Common name: Commelina / **Scurvy weed** *Latin name: Commelina diffusa* (Syn. *C. cyanea*)
FAMILY: COMMELINACEAE
ORIGIN: South America.
Noxious Weed Category: n/a

Description
Habit: Perennial, ground-covering herb with fleshy leaves, roots freely at the nodes. **Leaves:** Light green, fleshy, lanceolate and drawn to a blunt tip, to 5cm x 2cm, *the sheath which clasps the stem is quite long compared with Wandering Jewt*. **Fruit:** A small capsule. **Flowers:** Pale blue and 3-'petaled'.

Ecology: Similar ecology to Wandering Jew but not as aggressive.

Dispersal: Water and vegetative spread are the two main methods. However, bush turkeys can also rake up and spread the plant over short distances.

Control
n/a.

Common name: Turkey Rhubarb / **Acetosa** *Latin name: Acetosa saggitata*
FAMILY: POLYGONACEAE
ORIGIN: South America.
Noxious Weed Category: n/a

Description
Habit: Perennial scrambling vine to 3m with reddish stems and arrowhead-shaped leaves. **Leaves:** Light green and arrowhead-shaped (ie saggitate), alternate on stem, to 7cm. **Fruit:** A small, dry papery capsule with 3 lobes and 3 hard seeds. **Flowers:** In large, open-branching terminal clusters to 50cm, individual flowers are small and green-to-cream-to-reddish. Flowers and fruits more aggressively in warmer months.

Ecology: Seeds are presented terminally on the stems (well suited to wind dispersal) and the papery fruiting body can be blown over open ground for considerable distances. From an early age the root develops into a swollen tuber and then can sprout new underground stems that creep and form new tubers and often a new above-ground stem – effectively a new plant. This starchy reserve is an impediment to a high percentage chemical kill. The ascending stems smother low-growing host vegetation and exclude other species.

Dispersal: By wind and water but also as a contaminant of soil on people, tools, machinery and vehicles, garden mulch and green-waste dumping. Tubers (and tuber fragments) are also spread in contaminated soil.

Control
Note: Eradication can be very time-consuming and expensive. Identify high-priority assets to protect and either aim to contain or gradually reduce the core infestation size. The breaking down of woody weeds such as bitou and lantana can allow accelerated seed spread and needs to be carefully considered.
Hand: Seedlings can be hand-pulled. Use a trowel or garden fork to dig up larger tubers. Remove all plant material off site for deep burial at landfill. **Chemical:** Foliar spray with metsulfuron methyl (eg BrushOff) 1.5g $10L^{-1}$ or picloram+triclopyr (eg Grazon Extra) @ 2mL L^{-1} with kill off all above-ground material (not seed) and part of large tubers – these often re-sprout and will require ongoing treatment.

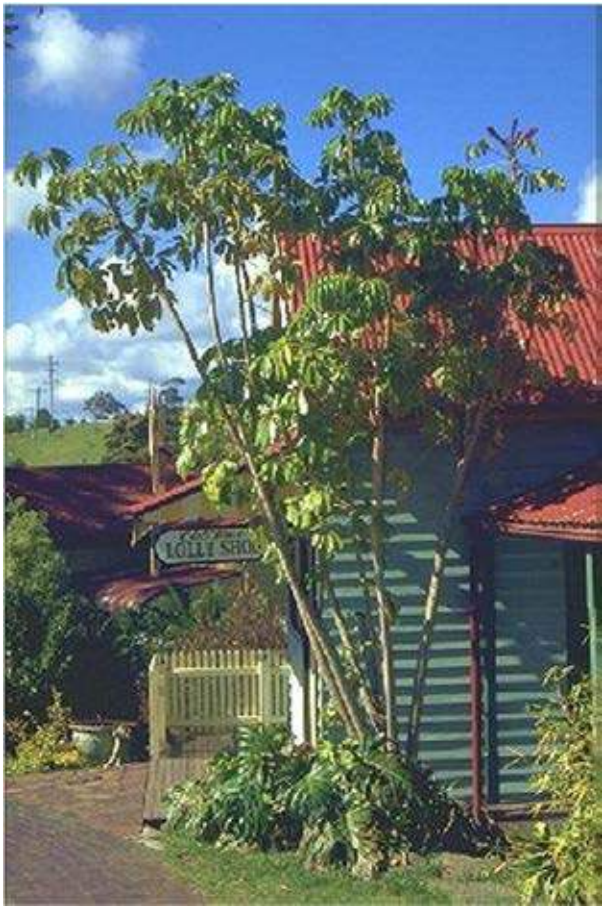
Common name: Umbrella Tree *Latin name: Schefflera actinophylla*
FAMILY: ARALIACEAE
ORIGIN: Eastern Australia, north of the Tropic of Capricorn
Noxious Weed Category: n/a

Description
Habit: Tree to 15m with prominent large, palmate leaves, grey-white trunk and long, deep-red inflorescence spikes protruding from the crown. **Flowers:** Deep red and held in long, arching 'spikes' to 75cm long. **Leaves:** Palmate (ie compound with multiple leaflets radiating from the end of the petiole (leaf stalk)) and up to 10 leaflets per leaf. Leaflets have smooth margins and are up to 40cm long and 10cm wide.

Ecology: In its native range, Umbrella Tree plays a balanced role in the natural landscape. However, in southern regions (particularly south-east Queensland and north of the Hunter Valley NSW), the tree is troublesome and displaces native vegetation. It is also an aggressive rooting plant and can interfere with building foundations and water/sewerage pipes. Trees are fast-growing and produce abundant fruit which are spread in waterways but more commonly by birds and flying foxes. They are tolerant of semi shade to full sun and often colonise forest edges and ecotones.

Dispersal: Primarily by birds and flying foxes, but also capable of layering from sections of the trunk if felled trees are left on the ground.

Control
Hand: Seedlings and small plants quickly develop a strong tap root, so hand-pulling can be difficult. Use caution in steep or friable soils. Elevate the trunk sections of felled or pulled plants to avoid layering or re-rooting. **Chemical:** Cut-paste or chisel/drill and treat with undiluted glyphosate (eg RoundUp Biactive).



Common name: Variegated Arrowhead Vine *Latin name: Syngonium podyphyllum*
FAMILY: ARACEAE
ORIGIN: Mexico to Panama
Noxious Weed Category: n/a

Description
Habit: Scrambling fleshy vine with large, alternate, deeply lobed leaves. **Flowers:** Green and tubular, but largely indistinct. **Leaves:** Alternate and very fleshy, but tough. Stems aggressively root to the substrate where they contact, including trees, timber, soil and rock. Not a parasite, but smothering, heavy, dense foliage can collapse trees and restrict understory native species establishment.

Ecology: The plant spreads rapidly by vegetative means which is the primary method of spread. It is tolerant of full sun to full shade (though grows less quickly in the latter) and thrives in waterlogged areas or with permanent soil moisture. In natural systems it outcompetes native understory plants (including woody regeneration) and is a serious ecological brake in rainforest, wet sclerophyll and swamp sclerophyll and the ecotones thereof.

Dispersal: Primarily humans, historically, but is still transplanted or sold as a hardy, shade-tolerant groundcover or 'plant of interest'. New populations start through the dumping of green waste into and on the edges of forests or by yarded plantings being allowed to 'escape' into adjacent bush.

Control
Note: Exercise caution when handling the plant as all parts should be considered poisonous and/or irritable to the skin. It is difficult and time-consuming to eradicate, but with concerted follow up success can be achieved.
Hand: Rogue out the rooting stems with a mattock, fork or boning knife. Use caution in steep or friable soils. Remove the stem sections to avoid layering or re-rooting and dispose of in municipal green waste.
Chemical: Small infestations: Prise off tree trunks and destroy or paint foliage with metsulfuron methyl & water at 1g/L + surfactant or scrape and paint stem with metsulfuron methyl at 1g/L &/ or glyphosate & water at 1:1.5.Scrape stem but do not sever. Large infestations: foliar spray with glyphosate & water at 1:50 (20ml/L) & metsulfuron methyl & water at 1.5g/10L + non ionic surfactant, and scrape & paint aerial stems.

Common name: Vasey Grass / **Giant Paspalum** *Latin name: Paspalum urvillei*
FAMILY: POACEAE
ORIGIN: Argentina and Uruguay
Noxious Weed Category: n/a

Description
Habit: Large, clumping, perennial grass to 2.5m with long 'nodding' seed heads. **Flowers:** Small, green and nondescript, but numerous. Each raceme (an asymmetrical spike) has up to 25 florets. **Leaves:** Long and narrow (55cmx1.5cm). Culms (stems) become thick and tough with age.

Ecology: The plant spreads rapidly by seed and is capable of colonising in semi-shade to full sun. Larger tussocks shade out other species in the inter-tussock spaces. Produces abundant seed that can spread in water, contaminated soil, dumped garden refuse or on people, machinery and tools. Plants tend to go thick and rank in winter if not slashed or grazed, but will renew their aggressive growth habit in warmer months.

Dispersal: Anecdotally reported as anything from a deliberate pasture introduction to a roadside batter stabilising grass, Vasey grass is now widely naturalized on a range of soils. In urban and peri-urban bushland areas, it's main method of invasion is by grass cuttings ejected into adjacent bushland, walkers unwittingly carrying it on footwear and creeks and waterways penetrating into the bush.

Control
Hand: Hand-pull small plants, using caution on steep or friable soils. Larger plants can be mattocked out but ensure the root mass is shaken free of soil and the elevated to prevent regrowing. **Chemical:** Spot spray when healthy with glyphosate (eg RoundUp Biactive) @ 10mL L^{-1}. For large infestations, patch-burning once the plants have browned off will destroy much of the seed bank.

Common name: Whiskey Grass **Latin name:** *Andropogon virginicus*
Family: POACEAE
Origin: Eastern USA and California

Description
Habit: A perennial tufted grass to 1.3m with culms and leaves drying off seasonally to a whiskey colour. **Leaves:** Thin and loosely tufted, tend not to stand tall with the inflorescences. **Flowers:** Non-descript, but held closely along the main stem. **Fruit:** Presented with a cottony tuft of 'hairs' for wind dispersal.

Ecology: After a winter dormancy, new leaf growth appears in Spring. Shortly after, culms and inflorescences grow and by summer, the plant is producing seed and beginning its characteristic browning off. Whisky grass grows on a wide variety of soils, preferring loose, sandy, moist sites with low fertility and is an indicator of low phosphorus soils. It also is a shallow rooted plant. It does particularly well in areas of high soil moisture and in ephemeral wetland areas it can form dense stands out-competing native grasses, sedges and similar.

Dispersal: Seed is blown over short to medium range by virtue of its fine tuft of hairs. It is also a contaminant of hay, soil on machinery and on vehicles which have driven through infestations.

Control:
Hand: The plants are shallow rooted so can be chipped, crowned or hand-pulled. **Chemical:** Use glyphosate (eg RoundUp Biactive) @ 10mL L^{-1} but ensure treatment is done before the setting of seed. Prior to formation of inflorescences the plants can be difficult to spot.

Common name: White Passionfruit/White Passionflower **Latin name:** *Passiflora subpeltata*
Family: PASSIFLORACEAE
Origin: Eastern USA and California

Description
Habit: A perennial vine 10m with dull-green 3-lobed leaves. **Leaves:** 3-lobed and alternate on the stem, covered in a fine powdery bloom offering some moisture repellancy. **Flowers:** Showy – typical of the family of plants – and white. **Fruit:** A spherical green 'passionfruit' with white pith and seeds to 50mm dia. Inedible. Stems: The lower base of older stems tends from green to whitish.

Ecology: White passionfruit is a very adaptable and widespread species. It is tolerant of partial shade (in deep shade it struggles but still survives) to full sun and a range of soils. It can also withstand harsh salt-laden wind. It rapidly climbs its host plant, covering it in a blanket of foliage. The fruit are conspicuously presented although only ripening to green, unlike many edible passionfruit varieties.

Dispersal: Fruit are readily eaten off the vine by birds and possibly flying foxes and dispersed of short to long distances. It seems likely also that rats and other terrestrial animals also aid its spread by ingesting and later passing the seeds. Fruit which simply falls to the ground and rots often gives rise to multiple seedlings. The plants can spread by forming root suckers.

Control:
Hand: Small plants can be hand-pulled. Larger plants can also be pulled but ensure all of the main lateral root matter is removed (the base of the plant has a tendency to split at the two main root sections).
Chemical: Foliar spray with glyphosate (eg RoundUp Biactive) @ 20mL L^{-1} **or** metsulfuron methyl (eg BrushOff) @ 1.5g 10 L^{-1} + a non-ionic surfactant @ 1mL L^{-1} (eg Pulse). Cut/scrape/paint with undiluted glyphosate any plants too large to hand-pull or spray.

White Passionfruit:

Native look alike: Passiflora aurantia

Common name: Wild Tobacco / Tree Tobacco **Latin name:** *Solanum mauritianum*
Family: SOLANACEAE
Origin: South America

Description
Habit: Very fast growing small tree to 5m with broad crown and large, dull-green foliage, branches and trunk. **Leaves:** Simple and alternate, lanceolate to 40cm wide, with a dense covering of hairs. **Flowers:** 'Typical' nightshade flower, pale lilac in colour with 5 fused petals that curve back at the tips. Held in numerous clusters at the perimeter of the foliage. Flowers all year round. **Fruit:** A spherical berry to 10mm, ripening from green to yellow, with many seeds (like its relative the tomato).

Ecology: Wild tobacco is a pioneer plant that quickly colonises open or disturbed ground on the edges of forests, degraded pastures, gullies, riparian zones, easements, rights-of-way etc. The seed germinates under all conditions except full shade, and can tolerate a wide range of soils and variable moisture. The tree can grow up to 3 metres in the first year, thereafter tending to develop a larger trunk and more spreading crown. The shade that it casts is still sufficient for the continued germination of other tobacco trees, but its water-hogging root system appears to outcompete many native species of the same niche.

Dispersal: Typically spread by birds, but also easily spread as a contaminant of mulch and garden waste or in soil on machinery and vehicles, particularly on sites where infested land has required the use of such machinery.

Control:
Note: The dense covering of hairs all over wild tobacco can be extremely irritable to the skin and respiratory system, so avoid unprotected contact and consider wearing a particle mask if working intensively on it.
Hand: Young plants quickly develop a strong root system, but seedlings can generally be hand-pulled. The stems (and all branches of the plant generally) are brittle and so snapping of the stem at ground-level is common if the plant is well-rooted. For monoculture infestations, a tractor or bobcat with a bucket or blade is ideal as they will also remove most of the root matter. **Chemical:** Foliar spray plants to 2.5m with picloram/triclopyr (eg Grazon Extra) @ 5mL L^{-1} **or** cut-stump or chisel/drill-fill any sized plant with undiluted glyphosate (eg RoundUp Biactive).

Common name: Wild Watsonia / Bulbil Watsonia **Latin name:** *Watsonia meriana* var. *bulbillifera*
Family: IRIDACEAE
Origin: South Africa

Description
Habit: An erect perennial herb to 1m. **Leaves:** Long and lanceolate and arising from the base like a tuft, to 60cm. **Flowers:** Held in a single flower 'spike' arising from the centre of the 'tuft'. Flowers are red/orange, 'trumpet'-shaped and showy. **Fruit:** No fruit is set, but 'bulbils' are produced on the stems near the flowers which – once ripe – fall and give rise to new plants.

Ecology: Watsonia emerges from is over-wintering around September/October by producing a new flush of foliage and shortly thereafter the characteristic flower spike and bulbils. If left unmanaged, wild watsonia can quickly form dense infestations that exclude other desirable species. It is not full-shade tolerant, but will persist in partial shade and flourishes in full-sun positions.

Dispersal: A classic garden 'escapee', humans have historically done the long-range dispersal work for watsonia. However, once gardens are left untended or rural properties abandoned or neglected, the plant rapidly spreads in adjoining bushland. Also, it is a common weed of dumped garden waste. It's natural dispersal is aided by flood-waters, however the bulbils may also be a contaminant of soil on machinery and vehicles.

Control:
Note: In both cases, wait until November/December before commencing treatment as the flowers should be visible by then. It takes more than 1 year for the plant to mature and produce bulbils, so if the infestation is dense and resources scarce, control only the adult plants.
Hand: Physical removal is very effective, but the disturbance may trigger the germination of other dormant bulbils, so be sure to follow up. Use a trowel or garden fork and remove the bulbs and any bulbils for green waste disposal. Foliage and stems will not re-strike. **Chemical:** Foliar spray with glyphosate (eg RoundUp Biactive) @ 10mL L^{-1} **or** wick-wipe/sponge-wipe (all foliage) @ 100mL L^{-1}. Plan for annual follow-up.

Common name: Winter Senna / Arsenic Bush **Latin name:** *Senna septemtrionalis*
Family: CAESALPINIACEAE
Origin: Mexico

Description
Habit: A perennial shrub to 3m. **Leaves:** Alternate and compound with up to 8 pointed leaflets arranged oppositely on the rachis. **Flowers:** Yellow and held in terminal clusters. **Fruit:** A cylindrical pod to 18cm long with hard, black seeds.

Ecology: Winter Senna flourishes on forest edges and in areas of disturbance where there has been a temporal reduction in other competition from other plants. It generally does not don well in deep shaded environments, but will persist once shade closes in over it. The seed is very long-lived and disturbance events such as flooding, grading, clearing or over-stocking will allow it to germinate and grow. It produces flowers and fruit from its second year onward and is capable of surviving cool fire, repeated slashing, livestock browsing etc. If left unmanaged it can form dense thickets.

Dispersal: Easily spread as a contaminant of mulch and garden waste or in soil on machinery and vehicles and in flood-waters. Rats are considered to be a likely vector of short-range dispersal as a result of hording the seeds for food supply.

Control:
Hand: Young plants quickly develop a strong root system, but seedlings can generally be hand-pulled. The stems (and all branches of the plant generally) are brittle and so snapping of the stem at can occur.
Chemical: Foliar spray dense infestations with picloram/triclopyr (eg Grazon Extra) @ 3.5mL L^{-1} **or** cut-stump or chisel/drill-fill any sized plant with undiluted glyphosate (eg RoundUp Biactive). In all cases – if practicable – remove any mature seed pods for burning or off-site disposal.

Winter Senna Native Look a Likes, Senna acclinis and Breynia oblongifolia

Senna acclinis in flower

Senna acclinis showing seed pods

Breynia oblongifolia