COMMON RIVERBANK WEEDS
OF THE HAWKESBURY RIVER, LOWER NEPEAN
RIVER AND TRIBUTARIES
Riverbanks of the lower Hawkesbury Nepean covered by this guide
COMMON RIVERBANK WEEDS
OF THE HAWKESBURY RIVER, LOWER NEPEAN RIVER AND TRIBUTARIES

A Practical Management Guide

RIVER RESTORATION PROJECT

HAWKESBURY NEPEAN CATCHMENT MANAGEMENT AUTHORITY
Contents

Introduction 6

Common riverbank weeds
  Vines, scramblers and groundcovers 7
  Trees and shrubs 25
  Aquatic weeds 53

Weed control methods
  Control of vines and scramblers 61
  Control of small hand-pullable plants 62
  Control of woody weeds 63
  Control of weeds with underground reproductive structures 65

Other sources of information 67

Contacts for information and advice 68
WEEDS

Weeds are plants that grow out of their place of origin. They can become so dense that they exclude all other species, including those that were there originally. Weeds pose a serious threat to Australia’s biodiversity, as well as to primary production. The cost to the environment is very high, with weeds second only to land clearing as a cause of biodiversity loss. The estimated cost to the Australian economy is $4 billion per year.

The weeds included in this booklet are those most commonly found near waterways in the Hawkesbury River, the Lower Nepean River, and their tributaries. The most effective methods of control for each weed are listed and demonstrated.

THE RIVER RESTORATION PROJECT

The River Restoration Project is a flagship program of the Hawkesbury Nepean Catchment Management Authority, funded by the Natural Heritage Trust. It aims to assist landowners conserve, restore, rehabilitate and revegetate their river and creek banks and waterways in practical terms, by providing advice and some financial assistance.

For further information please contact the River Restoration Project: Phone: (02) 4577 4243 or email riverbank@cma.nsw.gov.au.
General information
Common name: Asparagus Fern.
Scientific name: Protoasparagus aethiopicus.
Where do I find it? Occupies a wide range of soils and habitats, including sandstone and alluvial sands. Favours disturbed areas, roadsides, riverbanks and can tolerate light conditions ranging from direct sunlight to deep shade. Also tolerates saline conditions.

Why is it a problem?
It is a persistent plant spread primarily by birds that eat berries and distribute it over a large area. The thick mat of tuberous roots suppresses the natural regeneration of native plants and reduces habitat for native fauna.
Identification and description

Growth Form: Multi-branched, spiny perennial herb. Forms a thick mat of tuberous roots. Reproduces vegetatively and by seed.

Height: To 2 metres high.

Stem: Green-brown, ridged, often twisted and 30 - 60cm long with spines 5-10mm long.

Leaf: Leaves are bright green spiny flattened stems (called cladodes) up to 2.5cm long with a distinct midrib.

Flower: 3-5 mm long, white, or pale pink with a bell shape.

Fruit: Globular berry 5-8mm in diameter, green when immature and red when mature. Berries occur during late winter to early spring.

Note: Berries can germinate in soil after five years. Seed is often spread by birds and animals and in garden waste. Seed also germinates after fire.

Best control methods (see pages 61-66 of this booklet)

Treatment:
• Hand remove or crown rhizome using “crowning” treatment method. The tuberous roots can be left in the ground.
• Small plants can be treated using a knife blade. Larger plants may be removed using a mattock or peter lever.
• Spot spray (requiring repeated applications) using glyphosate. Use of surfactant is recommended.
• Follow up inspection every three months and treatment of seedlings may be necessary.

Disposal:
• Remove seed from site.
• Leave rhizomes to dry, and regularly inspect for resprouting.

Native species similar in appearance
• Scrambling Lily (Geitonoplesium cymosum) a hairless branching climber, which can climb to several metres high. Leaves are alternate narrow, 5-8cm long, shiny above, with a distinct mid-vein. Flowers are white and it has black-blue berries. Flowers October to December.
General Information

Common name: Balloon Vine
Scientific name: Cardiospermum grandiflorum

Where do I find it? Weed of coastal wastelands and riverbanks, often found growing into tree canopies.

Why is it a problem?
This weed forms a dense layer of leaves smothers the host plant and starves it of light. This weed has been declared noxious in some local government areas of the catchment. Check with your Council or the Department of Primary Industries about the noxious status and its implications.
Identification and description

**Growth Form:** A climbing vine. Height: Up to 8 m high.

**Stem:** Sturdy brown stem covered with soft golden hairs.

**Leaf:** Dark green leaves consisting of nine toothed leaflets.

**Flower:** Small and white with tendrils at the base.

**Fruit:** An inflated paper-like spherical capsule pointed at one end. The capsule is divided into three partitions, each containing a glossy black seed.

Best control methods (see pages 61-66 of this booklet)

**Treatment:** Cut off at shoulder level and leave in tree to die. Pull up or scrape and paint stem with glyphosate. Seeds germinate prolifically and re-shooting of taproot may occur so follow-up is necessary.

**Disposal:** Remove all capsules if possible.

Native species similar in appearance

- Slender Grape Vine (*Cayratia clematidea*) has 5 leaflets and no hairs.
**General information**

**Common name:** Crofton Weed.

**Scientific name:** *Ageratina adenophora*.

**Where do I find it?** Usually found on moist disturbed sites in a variety of soil types. Commonly found growing close to watercourses.

**Why is it a problem?**

Crofton Weed is a medium sized herb capable of forming dense infestations and completely altering vegetation communities. Dense stands of Crofton Weed occurring along watercourses can cause sediment to build up and choke channels, which destroys habitat for many important aquatic organisms.
Identification and description

Growth Form: Perennial herb to 2m.

Stem: Multiple stems with distinctive red/brown colouring.

Leaf: Triangular leaves with toothed margins.

Flower: Densely arranged small white flowers.

Seed: Small seeds dispersed by wind and water.

Note: Crofton Weed was formerly planted as an ornamental garden plant, before being recognised as a highly invasive species. Crofton Weed is declared as a ‘noxious weed’ in many local government areas and is poisonous to horses. If this weed occurs on your property, you are advised to contact your local council to discuss your control obligations.

Crofton weed may also be found with a closely related weed species Ageratina riparia (Mist Flower). Mist flower can be distinguished from Crofton Weed by its more slender leaves.

Best control methods (see pages 61-66 of this booklet)

Treatment:
• Remove and bag seed heads to prevent further spread. Plants may be removed manually by hand pulling or using a mattock, although this method is not recommended on unstable soils. Plants may be sprayed using glyphosate herbicide. Follow up spraying is often required after approximately three months.

Disposal:
• After seed head has been removed and disposed of carefully, and the control method applied; the weed may be left on the site.

Native species similar in appearance
• Crofton Weed shows little resemblance to any native species.
Japanese Honeysuckle

General information

Common name: Japanese Honeysuckle.

Scientific name: Lonicera japonica.

Where do I find it? Moist, fertile locations usually on disturbed sites, close to rivers, creeks and drainage lines.

Why is it a problem?

Japanese Honeysuckle is a fast growing woody vine, capable of covering large areas of ground or extending into the tops of trees. The vine smothers and destroys native vegetation and prevents bushland regenerating. The plant is very hardy, tolerating full or part sun, frost, drought and salinity.
**Identification and Description**

**Growth Form:** Climber with multiple stems.

**Height:** To 10m.

**Stem:** Young stems have a distinctive red colour. Older stems are brown in colour and have a ‘woody’ form. Stems may root at the nodes when in contact with the soil.

**Leaf:** Bright green opposite leaves (up to 8cm long) with hairs along the veins and margins.

**Flower:** Flowers 4cm long in pairs, forming near branch tips. White, cream yellow or orange in colour, sweetly scented.

**Fruit:** Shiny poisonous black berries to 10mm.

**Best control methods (see pages 61-66 of this booklet)**

**Treatment:**
- Small plants may be hand removed, taking care to ensure stems do not have contact with the soil. Larger plants can be controlled using the ‘scrape and paint method’ or the ‘cut and paint method’ along major stems. When using the cut and paint method, be sure to cut the stem as close to the base as possible. Where significant amounts of stem are buried underground, the scrape and paint method is recommended.
- Honeysuckle may also be sprayed with glyphosate, where there is no risk of overspray affecting nearby waterways and native vegetation.

**Disposal:**
- After treatment, it is not necessary to remove the whole vine from trees and shrubs. However, it is possible for small pieces of stem to establish as new plants when they are left in contact with the soil. Therefore all cut pieces of the vine should be removed from contact with the soil.

**Native species similar in appearance**

Shows little resemblance to any local native species.
General Information

Common name: Madeira Vine, Lambs Tails
Scientific name: Anredera cordifolia
Where do I find it? Garden escape now widespread and common in coastal NSW and Qld.

Why is it a problem?
This is a serious weed that will invade rainforest margins smothering small trees and shrubs. It produces both underground and aerial tubers along the stem, which easily break off when disturbed, making it difficult to control.

This weed has been declared noxious in some local government areas in the catchment. Check with your Council or the NSW Department of Primary Industries about the noxious status and its implications.
Identification and description

**Growth Form:** A hairless perennial climber.

**Height:** Stems can extend for 20m or more.

**Stem:** Fleshy, sometimes woody, producing aerial tubers.

**Leaf:** Thick and fleshy with alternate, bright green, heart shaped leaves 4-13cm long.

**Flower:** Small, fragrant, cream flowers are arranged in slender racemes 7 – 13cm long, which droop from the leaf axils. Flowering mostly summer to autumn.

**Fruit:** Produces one seed per fruit.

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Best control methods (see pages 61-66 of this booklet)

**Treatment:** Scrape and paint stems with glyphosate, leaving aerial part intact. This should kill aerial tubers as well as above ground parts. If removal from mature trees is required, ALL parts of the plant should be bagged and removed off sight, including stems, aerial tubers and below ground tubers.

**Disposal:** Take care to remove all above and below ground tubers as the tiniest piece can re-shoot.
**General Information**

**Common name:** Blue Morning Glory.

**Scientific name:** *Ipomoea indica*

**Where do I find it?** Found in bushland, in moist regions, such as creeks, rivers or where urban runoff has increased soil moisture levels.

**Why is it a problem?**

The vigorous twining stems smother trees in bush land, putting pressure on the tree canopy. This weed has been declared noxious in some local government areas of catchment. Check with your Council or the Department of Primary Industries about the noxious status and its implications.
Identification and description

**Growth Form:** Vigorous climbing vine.

**Height:** Height of the tree canopy.

**Stem:** Tough and twining stoloniferous stem which roots at the nodes.

**Leaf:** Alternate, light green, hairy, heart-shaped leaves, often having 3-5 lobes.

**Flower:** Large funnel-shaped violet-blue flowers in groups of 3-12 opening in the morning for only a few hours.

**Fruit:** Blue Morning Glory is not known to set seed in Australia.

Best control methods (see pages 61-66 of this booklet)

**Treatment:** Cut at shoulder level and allow stems to die off in tree. Treat on-ground stems by scrape & paint with glyphosate.

**Disposal:** Prevent stems from contact with ground, as they can re-shoot.

Native species similar in appearance

• *Ipomoea pes - capra subsp. brasiliensis* grows on coastal sand dunes.
**General Information**

**Common name:** Moth Vine, White Moth Plant.

**Scientific name:** *Araujia sericiflora*

**Where do I find it?** Weed of coast and tablelands. A wasteland weed found in orchards and lightly forested areas.

**Why is it a problem?**

Smothers existing vegetation and considered poisonous to livestock. This weed has been declared noxious in some local government areas of catchment. Check with your Council or the Department of Primary Industries about the noxious status and its implications.
Identification and Description

Growth Form: A woody climbing plant often attaching to existing trees.

Height: Vine extending to top of trees

Stem: Twining stem with woody base & thickened tap root. Oozes latex when cut.

Leaf: Opposite leaves. Upper surface dull green, lower surface white to grey. Oozes latex when cut.

Flower: White to pink tubular flowers arranged in loose clusters or singly in summer.

Fruit: Large green Choko shaped fruit containing many seeds, each having long silky hairs at one end.

Best control methods (see pages 61-66 of this booklet)

Treatment: Hand pull removing all of tap root, leaving vine to die in canopy. Scrape and paint base of stem with glyphosate.

Disposal: Bag all fruits if possible.

Native species similar in appearance

Silkpod (Parsonsia straminea) - no white latex sap if leaf is pulled off.
**General Information**

**Common name:** Turkey Rhubarb.

**Scientific name:** *Acetosa sagittata*

**Where do I find it?** Weed of mainly disturbed sites in deep moist gullies, rainforests and sandy riverbanks.

**Why is it a problem?**

A climbing vine which can smother native plants, blocking out light and competing for nutrients.
Identification and Description

**Growth form:** Perennial, robust scrambling climber. Climbing stems greater than 1m long.

**Height:** Vine can cover other vegetation to a considerable height.

**Leaf:** Soft, hairless, alternate, and have both stalks and stipules.

**Flower:** Cream. Spring.

**Fruit:** Papery with three wings, straw colour at maturity.

Best control methods (see pages 61-66 of this booklet)

**Treatment:** This plant has large tubers which need to be removed. This often takes considerable digging. Chemical controls are available. Spraying with glyphosate is the most effective, though stem scraping has been known to work well.

Native species similar in appearance

- None locally.
General Information

**Common name:** Wandering Jew  
**Scientific name:** *Tradescantia albiforma*

**Where do I find it?** Weed of gardens and shaded areas. Also naturalised along N.S.W coastline on moist fertile soils along creeks and drainage lines.

**Why is it a problem?**
Invasive weed, capable of covering entire ground surface preventing any other species from establishing. The stem fragments, if broken, are capable of re-sprouting and forming a new plant. Often spread during floods along drainage lines.
Identification and description

Growth form: A weak trailing perennial succulent herb.

Height: Low creeping herb.

Stem: Hairless, green, crisp and watery, rooting at nodes along stolon.

Leaf: Shiny, alternate, broadly lanceolate, and hairless except for fine hairs at the base.

Flower: 3 white petals subtended by 2 unequal leaf-like bracts in sessile terminal clusters.

Fruit: Not produced in Australia.

Best control methods (see pages 61-66 of this booklet)

Treatment: Remove by hand, with knife or trowel or with rake. Roll into blankets and compost in sunny area under thick black plastic. If no natives present, spray with glyphosate on cloudy days in winter. Follow-up is essential, as stolons will re-shoot.

Disposal: Remove from site if possible.

Native species similar in appearance

• Native Wandering Jew (*Commelina cyanea*) has longer hairy sheaths, longer & narrower lance-like leaves, fleshy roots & blue flowers.

• *Aneilema biflorumis* similar to *Commelina* & has a white flower.
General information

**Common name:** African Olive.

**Scientific name:** *Olea europaea subsp. africana*.

**Where do I find it?** On a wide range of soils and habitats, including clay soils, sandstone and alluvial sands. African Olive prefers riverbanks and disturbed areas and is also found on road sides in south-western Sydney on the Cumberland Plain. Tolerates high temperatures and dry conditions.

**Why is it a problem?**

Medium to fast grower, producing fruit readily eaten by birds who are largely responsible for its dispersal. It forms a dense canopy which suppresses the growth and natural regeneration of native vegetation below.
Identification and description

Growth Form: A large evergreen shrub or small tree with spreading branches and a dense rounded crown. It is often multi-trunked.

Height: 2 - 15m.

Stem: White-grey bark dotted with pores.

Leaf: Simple, opposite, narrowly elliptic, 6 - 10cm long and 1 - 2.5cm wide. Glossy grey-green above and green or yellowish-brown below. A distinctive yellowish mid-vein and a hooked tip are distinguishing features.

Flower: Small and creamy-white or greenish.

Fruit: Purplish-black succulent fruit when ripe, seeding from May to October.

Best control methods (see pages 61-66 of this booklet)

Treatment:
- Remove small seedlings by hand.
- Larger plants need to have stem cut and painted with undiluted glyphosate.
- Remove fruit from tree.
- Treated plants may re sprout from the base. Follow up inspection and treatment maybe necessary.

Disposal:
- The stems can be cut up and left as mulch.
- Bag and remove fruit and seeds from site if possible. Either bury or burn seeds.

Native species similar in appearance

- Tree Violet (Hymenanthera dentata) a shrub to 3m tall with glossy, toothed leaves and branches ending in thorns. Flowers September to December.
- Blackthorn (Bursaria spinosa) a shrub usually 2 - 3m tall with light foliage and side branches ending in thorns. Leaves are notched at the tip and has fragrant white flowers (January to April).
General Information
Common name: Black willow
Scientific name: Salix nigra

Where do I find it? Occurs in open and sunny areas on sand/gravel/silt/ beds in the riparian zones of rivers, streams, waterways, drains and wetlands.

Why is it a problem?
This fast growing tree displaces native riparian vegetation and quickly forms dense stands where no other plants grow. It spreads aggressively by seed both on water and in the wind. The root mats collect silt and change stream flow. Large numbers of this species together can collect debris and effectively divert flow into the bank, causing erosion.
Identification and description

**Growth form**: Upright tree usually with single trunk, deciduous in winter.

**Height**: Up to 20 metres.

**Stem**: Deeply fissured dark bark.

**Twigs**: Slender, not drooping, shiny red-brown, fragile at the base, mostly hairless.

**Leaf**: Thin, equally (bright) green on both sides.

**Flower**: Males and females equally common. Pale yellow catkins 6-12 cm long and widely spaced 6mm along flowers.

Best control method (see pages 61-66 of this booklet)

**Treatment**: Drill or frill and inject large trunks with undiluted glyphosate. Smaller stems, cut and paint, paint cut-off end as well. Hand-pull seedlings.

**Disposal**: Any cut/broken pieces can establish as a new tree, so remove and burn. Do not leave where they can be washed into the waterway or where they can take root. Bag seeds if cut at flowering time.
General information

**Common name:** Box Elder, Ash-leaved Maple.

**Scientific name:** *Acer negundo*.

**Where do I find it?** On the banks of rivers and streams and in wetland areas in sheltered situations. Once a popular garden species before being recognised as an invasive weed.

**Why is it a problem?**

Box Elder is a fast growing, long lived tree native to North America. It has effective wind and water dispersal with winged seeds. Box Elder displaces native vegetation and degrades habitat for native animals.
Identification and description

**Growth Form**: A deciduous small to medium-sized tree.

**Height**: Up to 8m high.

**Stem**: Trunk usually divides into several stout and wide-spreading branches forming a rounded, asymmetrical crown.

**Leaf**: 3-7 leaflets attached to a central stem. Light green and smooth on the upper side, paler and smooth under leaf.

**Flower**: Small greenish-yellow insignificant flower.

**Fruit**: Yellowish-green fruit with distinctive wings.

Best control methods (see pages 61-66 of this booklet)

**Treatment**:

- Pull out young seedlings. Cut and paint adults with glyphosate when actively growing between September and April.

**Disposal**:

- Leave cut stems / trunks in situ.

Native species similar in appearance

Shows little resemblance to any local native species.
General Information

Common name: Castor oil plant.

Scientific name: Ricinus communis

Where do I find it? Widespread weed of wastelands, railway embankments, river banks and roadsides on medium-enriched nutrient soils.

Why is it a problem?

Seeds are poisonous to livestock and humans. Juice, leaves and stem can cause contact dermatitis. This weed has been declared noxious in some local government areas of catchment. Check with your Council or the Department of Primary Industries about the noxious status and its implications.
Identification and description

**Growth Form:** A large perennial shrub.

**Height:** Up to 3 metres high.

**Stem:** Hollow, pale green branches occasionally tinged with red. Milky sap.

**Leaf:** Leaves alternate, glossy reddish brown to green with 7-9 triangular lobes. Disagreeable odour when crushed.

**Flower:** In stout erect bisexual spikes (female flowers above male flowers) in the axils of the upper branches. Flowers December-May.

**Fruit:** Burr-like, containing 3 smooth mottled seeds. Long viability in soil. Explode violently when ripe.

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**Best control methods (see pages 61-66 of this booklet)**

**Treatment:** Cut & paint with herbicide.

**Disposal:** Remove all fruit spikes, but leave cut material in situ.

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**Native species similar in appearance**

- None locally.
False Bamboo

General Information
Common name: Giant reed, false bamboo
Scientific name: *Arundo donax*
Where do I find it? In wasteland and irrigation ditches, creeks and rivers in all states.

Why is it a problem?
Can grow in large beds, but gives little value for bank stability. Similar in appearance to the native reed *Phragmites australis* that prefers a wetter habitat. This weed has been declared noxious in some local government areas of catchment. Check with your Council or the Department of Primary Industries about the noxious status and its implications.
**Identification and Description**

**Growth Form:** Perennial, an erect stem, similar in appearance to bamboo.

**Height:** Up to 6 m high.

**Stem:** Resembles bamboo; about 5-7 cm diameter.

**Leaf:** Strap like, stem-clasping, evenly spaced in 2 rows along length of the stem. Indented midrib. No constriction at leaf base.

**Flower:** A dense, erect silky plume-like inflorescence up to 60 cm long.

**Fruit:** A grass-like grain.

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**Best control methods (see pages 61-66 of this booklet)**

**Treatment:** Spreads by rhizome so all stems must be treated. Cut & paint with glyphosate. If not near rivers or creeks can brush cut in late winter & spray regrowth in spring. Follow-up required for re-shooting rhizomes.

**Disposal:** Bag all seed heads and rhizomes.

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**Native species similar in appearance**

- *Phragmites australis* (Native Reed) is a smaller plant and has upright leaves, and its inflorescence plume will droop. *Arundo donax* plumes tend to be erect.
**General Information**

**Common name:** Fennel.

**Scientific name:** *Foeniculum vulgare*

**Where do I find it?** Weed of wastelands, alluvial flats, riverbanks, roadsides, railway embankments and irrigation channels.

**Why is it a problem?**

Rapid coloniser, capable of forming dense infestations, which can exclude other vegetation. Frost resistant.
**Identification and Description**

**Growth Form:** Stout, erect, much-branched, hairless perennial herb.

**Height:** Up to 2 metres high. Stem: Striated, smooth, green-grey stem filled with a white spongy pith.

**Leaf:** Finely divided, lacy, thread-like leaves with a strong characteristic smell of aniseed.

**Flower:** Flower heads are compound umbels at the end of the branches with yellow petals rolled inwards, appearing from November - May.

**Fruit:** Ovoid-oblong, grey-brown to yellowish-brown aromatic seed with 5 prominent ribs. Seed germinates after disturbance.

**Best control methods (see pages 61-66 of this booklet)**

**Treatment:** Hand pull seedlings, mattock out larger plants or cut and paint with herbicide.

**Disposal:** Dispose of seed heads and crowns.

**Native species similar in appearance**

- None locally.
**Green Cestrum**

**General Information**

**Common name:** Green cestrum, green poison berry.

**Scientific name:** *Cestrum parqui*

**Where do I find it?** A garden escape, occurring in NSW on the coast, plains and slopes.

**Why is it a problem?**

This long-lived shrub is toxic to stock, birds and bees and is a ready coloniser of bushland. This weed has been declared noxious in some local government areas of catchment. Check with your Council or the Department of Primary Industries about the noxious status and its implications.
Identification and Description

**Growth Form:** Perennial, many-branched shrub, partly deciduous in winter.

**Height:** Up to 2 metres high

**Stem:** Older branches woody & striated at base, newer branches whitish.

**Leaf:** Alternate and lanceolate. Unpleasant odour when crushed.

**Flower:** Greenish yellow, in terminal clusters. Unpleasant odour by day, fragrant by night.

**Fruit:** Purplish-black berry containing 1-2 seeds. Spread by birds.

Best control methods (see pages 61-66 of this booklet)

**Treatment:** Inject root ball with neat glyphosate. Hand pull seedlings, mattock out larger plants to remove suckering roots. Cut and paint at swollen with glyphosate when actively growing in spring. May need follow-up.

**Disposal:** Bag all berries.

Native species similar in appearance

- None locally.
**General Information**

**Common name:** Honey Locust.

**Scientific name:** Gleditsia triacanthos

**Where do I find it?** On riverbanks, flood plains and in backswamp areas in the Hawkesbury-Nepean.

**Why is it a problem?**

Honey locust is a rapidly growing, aggressive tree that can smother pastures and out compete native vegetation. It is capable of forming dense thickets and can inflict painful injuries to humans and livestock with its long spines. The seed pods are eaten by cattle and this promotes the spread of the plants.
Identification and Description

Growth Form: A deciduous, leguminous tree.

Height: Commonly 3-4 metres high but can grow up to 25 metres.

Stem: Dark grey bark, divided into thin tight scales. Tough thorny spikes growing on the trunk and branches, up to 50mm long, make this species easy to identify.

Leaf: Pinnate or feather like, with 18 to 28 leaflets.

Flower: In October-November it bears creamy, yellow hanging flower stalks.

Fruit: A large pod, 10 to 18 inches long, often twisted, 1 to 1 1/2 inches wide, flat, dark brown or black when ripe and containing yellow seeds.

Best control methods (see pages 61-66 of this booklet)

Treatment: Cut stump and paint with glyphosate. Larger specimens can also be stem injected by frilling or drilling.

Disposal: Leave cut material in situ but bag and remove all seed pods.

Native species similar in appearance

- None locally.
Lantana

General Information

Common name: Lantana (Pink, Red and White).

Scientific name: Lantana camara

Where do I find it? Weed of pastures, forestry areas, roadsides, gullies, waterways and wastelands of NSW and QLD. Also found in NT.

Why is it a problem?

Garden escape, now a widespread and common pest, capable of forming dense thickets in disturbed areas. Before removing, check that it is not being used for habitat by native birds and possums. This weed has been declared noxious in some local government areas of catchment. Check with your Council or the Department of Primary Industries about the noxious status and its implications.
**Identification and Description**

**Growth Form:** A rambling shrub able to climb into the canopy.

**Height:** Up to 4 metres high.

**Stem:** Prickly, square in cross-section and usually have a pithy centre. Canes are capable of rooting if in contact with moist soil.

**Leaf:** Opposite, pale green, with slightly rounded toothed margins. Some forms carry backwardly curved prickles. The leaves have a characteristic odour.

**Flower:** Compact heads of several individual flowers each having a tubular corolla with 4 spreading lobes.

**Fruit:** A berry, purplish when ripe. Spread rapidly by birds into pristine bushland.

**Best control methods (see pages 61-66 of this booklet)**

**Treatment:** Hand removal or with larger shrubs cut and paint, stem injection, frilling or chipping methods using glyphosate. Follow-up required for re-shooting stems.

**Disposal:** If material and ground is dry, leave canes on ground as mulch. Bag all fruit if possible. Avoid contact of stems with damp ground. Native bees use dry stems as habitat.

**Native species similar in appearance**

- *Plectranthus parvifolius* (seedling) has a pleasant “herbal odour” to leaves.

- *Trema aspera* (Native Peach) has similar looking leaves but has no odour to leaves.
General Information

Common name: Paddy’s lucerne, Common Sida.

Scientific name: *Sida rhombifolia*

Where do I find it? Weed of mechanically disturbed pastures, gardens and wastelands in high rainfall areas of Australia.

Why is it a problem?

Prolifically fruiting plant with seeds that remain dormant in the soil for long periods. Germinates prolifically after fire. Awns of fruits can harm intestines of humans & chickens. Can be eaten by stock but is of little nutritive value.
Identification and Description

**Growth Form:** Robust, erect, but many branched, perennial herb to small shrub.

**Height:** To 2m.

**Stem:** Woody green stems covered with star-shaped hairs. Strong, deep, kinked taproot.

**Leaf:** Dull green, paler below, diamond-shaped.

**Flower:** Pale yellow and solitary, or sometimes 3-4 flowers at ends of branches.

**Fruit:** A dark brown capsule containing reddish-brown to black seeds, each seed with 2 awns.

Best control methods (see pages 61-66 of this booklet)

**Treatment:** Hand pull small plants; larger ones may be pulled out of soft soil with pliers; woodier plants should be treated using cut & paint with glyphosate.

**Disposal:** Remove all fruit.

Native species similar in appearance

- *Sida corrugata* and *Sida spinosa* live in drier *Eucalyptus moluccana & E. tereticornis* woodland in Western Sydney on Wiannamatta Shale soils.
General information

Common name: Pampas Grass.

Scientific name: *Cortaderia jubata*.

Where do I find it? Usually found on disturbed sites in a variety of soil types. It can also colonise in relatively undisturbed catchments and grow along walking tracks, fire trails and watercourses.

Why is it a problem?

Pampas Grass is a very large perennial grass, capable of forming dense infestations which completely alters a vegetation community. Each plant produces several tall flower spikes, which can produce up to 100,000 seeds each. The wind-distributed seed can travel up to 40km. The plant may also reproduce from rhizomes beneath the soil.
Identification and Description

**Growth Form:** Large grass with multiple flower spikes.

**Height:** To 6m.

**Stem:** Single stem up to 3m, usually covered by leaves.

**Leaf:** Light green basal leaves up to 2m long x 2cm wide. Leaf edges are roughly serrated and often cause skin irritations.

**Flower:** Several flower spikes per plant (each up to 3m long). Flowers are soft white in colour.

**Seed:** Up to 100,000 wind dispersed seeds per flower spike.

**Note:** Pampas grass is declared as a ‘noxious weed’ in many local government areas. If this weed occurs on your property, you are advised to contact your local council to discuss your control obligations.

Best control methods (see pages 61-66 of this booklet)

**Treatment:**
- Remove and bag seed heads to prevent further spread. Small to medium plants may be removed manually using a mattock, with care to remove all root material. Plants may be sprayed using glyphosate.
  * Follow-up spraying is often required after approximately three months.

**Disposal:**
- After seed head has been removed and disposed of carefully the remainder of the grass can be left in place. If the plant needs to be removed from the site completely, make sure to remove all root material including rhizomes.

**Native species similar in appearance**
- This is a very distinctive grass once you become familiar with it. It can appear similar in appearance to *Lomandra spp* and *Xanthorrhoea spp* (Grass Tree).
General Information

Common name: Small-Leaved Privet

Scientific name: *Ligustrum sinense*

Where do I find it? Weed found on the coastal and Tableland areas of NSW. A particular problem in urban bushland of Sydney due to dispersal of berries by Pied Currawongs.

Why is it a problem?

Medium to fast grower, producing thousands of berries eaten by birds and capable of being introduced into pristine bushland. Suspected of being poisonous. Pollen may cause hay fever & asthma. This weed has been declared noxious in some local government areas of catchment. Check with your Council or the Department of Primary Industries about the noxious status and its implications.
Identification and Description

**Growth Form:** Densely-branched leafy shrub.

**Height:** Grows up to 4m high.

**Stem:** Woody light brown stem covered with lenticels.

**Leaf:** Small, opposite, glossy, thin textured and soft, up to 7cm long with a wavy margin.

**Flower:** Dense clusters at the end of stems, beginning as white buds opening to fragrant flowers with protruding stamens.

**Fruit:** Dense clusters of black berries in winter.

Best control methods (see pages 61-66 of this booklet)

**Treatment:** Cut & paint, frill or inject with glyphosate. May coppice from base & sucker from roots so follow-up may be required. Removal of large groups of trees often encourages germination of short-lived seed bank.

**Disposal:** Dispose of all berries if possible and leave killed plant in situ.

Native species similar in appearance

- Morinda (*Morinda jasminoides*), which is a creeper and small pits may be found where the veins meet the midvein.

- Grey myrtle (*Backhousia myrtifolia*) has a pleasantly scented leaf when crushed and the leaf veins run out to the leaf margin.
General Information

**Common name:** Tree of Heaven

**Scientific name:** *Ailanthus altissima*

**Where do I find it?** Throughout NSW and Victoria as a weed of wasteland and degraded pasture and along inland rivers and creeks.

**Why is it a problem?**

The leaves and bark are possibly toxic to animals. This weed has been declared noxious in some local government areas of catchment. Check with your Council or the Department of Primary Industries about the noxious status and its implications.
**Identification and Description**

**Growth Form:** An erect, deciduous shrub or tree with a deep taproot and several lateral roots that sucker freely forming clumps of stems.

**Height:** Commonly 3-4 metres high but can grow up to 20 metres.

**Stem:** Grey bark, slightly roughened and pitted, becoming smooth and speckled toward the tips.

**Leaf:** Large up to 80cm, with up to 20 pairs of opposite leaflets and 1 terminal leaflet. Base of each leaf is lobed and contains a gland that has a very unpleasant odour.

**Flower:** White or greenish in terminal clusters up to 6-12 cm long.

**Fruit:** Seeds surrounded by a large wing, yellow to green becoming red.

**Best control methods (see pages 61-66 of this booklet)**

**Treatment:** Hand pull seedlings, mattock out larger specimens ensuring removal of all suckers. Cut & paint or inject with herbicide when actively growing in mid-late summer. Follow-up treatment of suckers may be necessary.

**Disposal:** Leave cut material in situ, unless it is seed bearing.

**Native species similar in appearance**

- *Toona australis* (Red Cedar) lacks the terminal leaflet and the glandular lobes.
- *Polyscias murrayi* (Pencil Cedar) lacks the odour of Tree of Heaven.
General information

**Common name:** Wild Tobacco Tree.

**Scientific name:** *Solanum mauritianum*.

**Where do I find it?** A common weed found in disturbed areas such as roadsides and pasture and also in intact native plant communities. It enjoys wet margins of forests and riverbanks and tolerates both shade and full sun.

**Why is it a problem?**

People can suffer serious allergic reactions after contact with the hairs on stems and leaves. This plant acts as a coloniser, growing quickly, out-competing native plants and suppressing natural regeneration by changing light conditions beneath its canopy.
Identification and description

Growth Form: Perennial shrub or small tree.

Height: To 4 metres or more.

Stem: Grey-green, woody (to 15cm in diameter) and hairy.

Leaf: Simple, alternate, ovate to 30cm long and 15cm wide. Grey-green colour on top and pale underneath. Felt-like texture.

Flower: 1cm diameter, purple/violet to white, with distinctive yellow stamens. Flowers spring to summer.

Fruit: Succulent 1 - 1.5cm diameter berry (green maturing to dull yellow). Berries observed at the end of summer.

Note: The plant's berries can stay viable in the soil for many years and only requires light for germination. Seed is spread by water, birds, humans and dumped garden waste. This shrub coppices at its base once disturbed. Seed also germinates after fire.

Best control methods (see pages 61-66 of this booklet)

Treatment:

• Cut and paint larger plants with glyphosate and hand pull smaller ones. Use of surfactant is recommended.

• Remove seedlings by hand as they appear.

Disposal:

• Leave treated trunks on the ground or mulch.

Native species similar in appearance

• Flannel Leaf (Astrotricha flocossa; Astrotricha latifolia) — erect shrubs 2-3m tall. Soft woolly hairs cover the stems, leaf stalks and under surface of leaves. Leaves are large (10-20cm long and 2-7 cm wide), ovate to lanceolate in shape. Flowers are whitish to grey. Flowers October - January.

• Seringia (Seringia arborescens) — an erect or spreading shrub usually 2-4m tall. Leaves are broadly lance shaped, droopy, 8-12 cm long, hairless above with rusty-brown hairs below. Flowers are a cream colour and occur in short stalked clusters. Flowers spring - summer.
General Information

Common name: Alligator Weed

Scientific name: *Alternanthera philoxeroides*

**Where do I find it?** It grows in both water and on land and is usually found in stationary, slow moving waters, or damp paddocks.

**Why is it a problem?**

A small piece of stem is enough to start a new alligator weedplant. It is capable of choking waterways in a single season, smothering native plant communities and disrupting waterflow. Soil containing alligator weed fragments can not be sold or moved by law.

This weed has been declared noxious in some local government areas of catchment. Check with your Council or the Department of Primary Industries about the noxious status and its implications.
Identification and Description

Growth Form: Generally a floating aquatic, but sometimes a terrestrial perennial herb.

Height: On land, plants can grow to 50cm using adjacent plants for support.

Stem: Hollow.

Leaf: Leaves are 2-5cm long and 1-2cm wide. They are arranged in opposite pairs at regular intervals along the stem. Leaves are shiny dark green in summer, pointed at the ends with obvious veins and smooth edges.

Flower: White compact papery flower on a short stalk. Flowering time is late spring to autumn.

Fruit/Seed: Produced, but rarely viable under Australian conditions. Reproduction is entirely vegetative.

What to do if you find Alligator Weed?

If you have a plant you think might be alligator weed, you are required to notify your local council or Department of Primary Industries immediately.

DO NOT ATTEMPT TO REMOVE IT YOURSELF. Under the Noxious Weeds act it is an offence to spread Alligator weed, including plant fragments. Offenders are liable to a significant fine. Disturbing the plant can cause it to spread further as a small broken piece of stem is enough to start anew plant.

Native species similar in appearance

- Water Primrose - Ludwigia peploides ssp.montevidensis. Flowers are yellow not white, leaves are alternate not opposite, and the stem is not hollow.
- Smart weed - Persicaria decipiens. Flower head consists of multiple pale pink flowers along a common stem. Leaves are usually slightly wavy and are alternate not opposite.
**General Information**

**Common name:** It is commonly known as Ludwigia, but can also be known as Peruvian Primrose or Water primrose. This is not to be confused with the native species of Water primrose *Ludwigia peploides ssp. montevidensis*.

**Scientific name:** *Ludwigia peruviana*

**Where do I find it?** Found in shallow, still or slow moving streams, wet marshy soils, drying mud and on creek banks. It's current distribution is in and surrounding the Sydney region, however it is spreading, and has the potential to spread throughout Australia.

**Why is it a problem?**

Ludwigia is capable of filling and blocking waterways, reducing the flow, and limiting navigation and recreational activities. This weed has been declared noxious in some local government areas of catchment. Check with your Council or the Department of Primary Industries about the noxious status and its implications.
Identification and Description

Growth Form: Perennial wetland Shrub.

Height: Up to 3 m high.

Stem: Dark green or brownish green. Hairy when young.

Leaf: Usually alternate, 5-10cm long, 1-3cm wide and hairy. Leaves die back in winter (in Sydney).

Flower: Yellow with 4 petals and a diameter of 2-4 cm. Flowering from late summer to autumn.

Fruit/Seed: Seeds light brown.

What to do if you find Ludwigia?

If you have a plant you think might be Ludwigia notify your local Council or Department of Primary Industries. They can provide advice and assistance to suppress and destroy the infestation.

Native species similar in appearance

- Water Primrose (native) Ludwigia peploides. Has a similar flower to Ludwigia (Ludwigia peruviana) but has a completely different growth form. The native Water Primrose has floating stems which lay on top of the water and are relatively short, whilst Ludwigia (weed) is a shrub which grows to 3m.
General Information

Common name: Salvinia

Scientific name: *Salvinia molesta*

Where do I find it? Found floating on still or slightly flowing water.

Why is it a problem?

It grows very rapidly and can completely cover waterways as a dense mat. This mat seriously affects navigation, light penetration and dissolved oxygen levels. This weed has been declared noxious in some local government areas of catchment. Check with your Council or the Department of Primary Industries about the noxious status and its implications.
Identification and Description

Growth Form: A free-floating perennial aquatic fern that can form dense mats.

Stem: Stems are slender, jointed and very branched. Invading plants have stems, up to 30 cm long. Where plant numbers are higher the stems are usually much shorter than this.

Leaf: Leaves are in groups of 3, the upper 2 are folded and float on the water surface, whilst the 3rd remains submerged and is divided, root-like and hairy.

Flower: No flower

Fruit/Seed: Does not produce fruit. Reproduces vegetatively.

What to do if you find Salvinia?

If you have a plant you think might be Salvinia, you are required by law to notify your local Council or Department of Primary Industries immediately.

**DO NOT ATTEMPT TO REMOVE IT YOURSELF.** Disturbing the plant can cause it to spread further as a small broken piece of Salvinia is enough to start a new plant. It is illegal to spread Salvinia.

Native species similar in appearance

- *Azolla*: Is also a free floating fern which can form dense mats. These plants have very different leaf forms to salvinia. The leaves are much smaller, and are usually tinged red, particularly during summer and autumn.


**General Information**

*Common name:* Water Hyacinth  
*Scientific name:* *Eichhornia crassipes*  
*Where do I find it?* Found within still or slow moving freshwater bodies.

**Why is it a problem?**

It is capable of blocking waterways, interfering with water flow, navigation and fishing. Dense infestations can reduce oxygen levels in water; alter pH and temperature, increase carbon dioxide levels and can increase water loss through transpiration. This weed has been declared noxious in some local government areas of catchment. Check with your Council or the Department of Primary Industries about the noxious status and its implications.
Identification and Description

**Growth Form:** An erect floating Perennial herb.

**Height:** Up to 1 m high.

**Stem:** Either erect, to 60 cm long, or horizontal and about 10 cm long.

**Leaf:** Leaves either long and thin (up to 60 cm long), or circular (up to 30 cm diameter). They are smooth and glossy. The leaf stalks have bladder-like swellings which consist of large air cells which enable the plant to float on water.

**Flower:** Flowers are bluish purple, funnel shaped, 4-7 cm diameter, with 6 petals. The top petal has a yellow blotch in the centre surrounded by darker purple. Flowering begins in January or February and continues into Autumn.

**Fruit:** A narrow capsule 1 to 1.5 cm long.

What to do if you find Water Hyacinth?

If you have a plant you think might be Water Hyacinth, notify your local Council or Department of Primary Industries. If Water Hyacinth is categorised as W1 in your area, you are required to notify these agencies by law.

Native species similar in appearance

- None
METHODS OF REMOVAL

HAND REMOVAL

Step 1 – Take hold of one runner and gently pull it along the ground towards you.

Step 2 – Checkpoints of resistance where fibrous roots grow from the nodes. Cut roots with a knife or dig out with a trowel and continue to follow the runner.

Step 3 – The major root systems need to be removed manually or scrape/cut and painted with herbicide.

Step 4 – Bag any reproductive parts.

STEM SCRAPING

Step 1 – With a knife, scrape 15 to 30 cm of the stem to reach the layer below the bark/outer layer.

Step 2 – Immediately apply herbicide along the length of the scrape.

Considerations

A maximum of half the stem diameter should be scraped. Do not ring bark. Larger stems (>1 cm) should have two scrapes opposite each other.

Aerial tubers on Madeira vine should die with the plant when stem scraping is used. Those that fall from the plant in the scraping process need to be bagged. Vines can be left hanging in trees after treatment.
Control of Small Hand-pullable Plants

To Control: Small soft weeds e.g. Fleabane, crofton weed, small grasses
Seedlings of any weeds including privet, lantana, moth vine

METHODS OF REMOVAL

HAND REMOVAL (Minimal Disturbance)

**Step 1** – Gently remove any seeds or fruits and carefully place into a bag.
**Step 2** – Grasp stem at ground level.
**Step 3** – Rock plant backwards and forwards to loosen roots, and pull out gently.
**Step 4** – Carefully tap the roots to dislodge any soil. Replace disturbed soil and pat down.

Considerations

Leave weeds so that roots do not make contact with soil e.g. on a rock – a small amount of debris can be hung in a tree or removed from the site.

Vary your body position to avoid fatigue when using hand removal continuously.
Control of Woody Weeds

Examples of woody weeds include: Lantana, bitou bush, cotoneaster, privet (cut and paint) Camphor laurel, Mickey Mouse bush (ochna) and cassia/senna (stem scrape)

Methods of Removal

1. CUT AND PAINT – Useful for small to medium sized woody weeds up to 10cm basal diameter.

Make a horizontal cut as close to the ground as possible with secateurs, loppers or a bush saw.

Immediately apply herbicide to the exposed flat stump surface.

SAFETY CONSIDERATIONS

The following general precautions should be made when using herbicides:

Read the label before opening the container and follow the instructions.

Wear protective clothing as directed on the label.

Wash hands after use and before eating or smoking.

Considerations

Cuts should be horizontal to prevent herbicide from running off the stump. Sharp angle cuts are hazardous.

Herbicide must be applied immediately before the plant cells close and translocation of herbicide ceases.

If plants resprout, cut and paint the shoots after sufficient regrowth has occurred.

Stem scraping can be more effective on some woody weeds.
Control of Woody Weeds

METHODS OF REMOVAL

2. STEM INJECTION
3. FRILLING OR CHIPPING

Step 1 - INJECTION: At the base of the tree drill holes at a 45 degree angle into the sapwood at 5 cm intervals.

OR

FRILL/CHIP: Make a cut into the sapwood with a chisel or axe.

Step 2 - Fill each hole/cut with herbicide immediately.

Step 3 - Repeat the process at 5 cm intervals around the tree.

Considerations
Plants should be healthy and actively growing.
Deciduous plants should be treated in spring and autumn when leaves are fully formed.
For multi-stemmed plants, inject or chip below the lowest branch or treat each stem individually.
Herbicide must be injected immediately before the plant cells close (within 30 seconds) and translocation of herbicide ceases.
Control of Weeds with Underground Reproductive Structures

Examples: Weeds with
Tap roots – cats ear, dandelion
Rhizomes – asparagus fern, ginger plant
Bulbs and corms – oxalis, onion weed, watsonia, freesias, montbretia
Tubers – Madeira vine, arrowhead vine

METHODS OF REMOVAL

HAND REMOVAL OF PLANTS WITH A TAPROOT

Step 1 – Gently remove and bag seeds or fruit.
Step 2 – Push a narrow trowel or knife into the ground next to the taproot. Carefully loosen soil. Repeat this step around the taproot.
Step 3 – Grasp stem at ground level, rock plant backwards and forwards and pull gently.
Step 4 – Gently tap the roots to dislodge soil. Replace disturbed soil and lightly pat down.

CROWNING (Many grasses can be crowned)

Example: asparagus fern
Step 1 – Gently remove and bag stems with seed or fruit.
Step 2 – Grasp the leaves or stems together so that the base of the plant is visible.
Step 3 – Insert, at an angle, a knife or lever, close to the “crown”.
Step 4 – Cut through all the roots around the crown
Step 5 – Remove and bag the crown.
Control of Weeds with Underground Reproductive Structures

REMOVAL OF PLANTS WITH BULBS, CORMS OR TUBERS

Examples: onion weed, watsonia, arrowhead vine, montbretia

**Step 1** – Move leaf litter away from base of plant.

**Step 2** – Dig down next to the stem until the bulb or tuber is reached.

**Step 3** – Remove plant and carefully bag the bulb or tuber.

HERBICIDE TREATMENT – STEM SWIPING

**Step 1** – Gently remove any seed or fruit and carefully place into a bag.

**Step 2** – Using a herbicide applicator, swipe the stems/leaves.

**Considerations**

Further digging may be required for plants with more than one tuber (e.g. arrowhead vine).

Some bulbs (e.g. oxalis, onion weed) may have small bulbs attached or present in the soil around it. These need to be removed.

It may be quicker and more effective to dig out the weed.

Make sure native plants and seedlings will not be affected.

Learn and understand how the herbicide works – for bulb and corm species the most effective time is after flowering and before fruit is set.

Have you addressed all safety issues?
Other Sources of Information

• Visit these web sites
  www.sydneyweeds.org.au
  www.weeds.org.au
  www.rivers.gov.au
  www.hn.cma.nsw.gov.au
Hawkesbury Nepean Catchment Management Authority

For information on rehabilitating and caring for river and stream banks contact the River Restoration Project at the Hawkesbury Nepean Catchment Management Authority (CMA) on (02) 4577 4243. The CMA also offers a variety of environmental funding programs to protect river health and biodiversity. You can also visit the Authority’s web site at: http://www.hn.cma.nsw.gov.au or email the River Restoration Project: riverbank@cma.nsw.gov.au.

The Catchment Management Authority can also provide guidelines and permits for removing weeds on riverbanks. Contact the CMA to find out if you need a permit.

NSW Department of Primary Industries

This Department incorporates the former NSW Agriculture and NSW Fisheries. It can provide information on weeds, weed control (including noxious weeds) and sustainable agriculture. The Department can also provide information on in-stream biota and habitat. For agriculture or weed related inquiries contact the Richmond office on (02) 4588 2100. For fisheries information contact the Cronulla office on 1300 550 474

NSW Department of Natural Resources

The Department is responsible for issuing permits to carry out any excavation or development works in or beside river channels. Phone (02) 9228 6111.

Local council

Your local council can provide local knowledge and advice relating to many different river issues. Local council also manages ‘Bushcare’, an initiative that gives community volunteers the opportunity to work on projects regenerating local riverside parks.