

# Waterway Technote

## Pest plants

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### Benefits of pest plant control

Pest plants can cause havoc on your farm, ruin your planting and cause major problems in and around waterways. When it comes to good waterway management, keeping on top of weeds is important.

#### Benefits of pest plant control around waterways

Well-executed plant pest control is beneficial as it will:

- Reduce the likelihood of disease transmission (e.g TB)
- Improve the chance of a successful riparian management project
- Reduce the likelihood of pests entering other farm areas from fenced off waterways
- Reduce maintenance time and costs in planted areas and reduce replacement planting costs
- Speed up the time it takes to achieve an established riparian planting project
- Improve native biodiversity and habitat.

# Common pest plant species found in riparian areas and control methods

## Vines & creeping weeds

Weed	Treatment methods (see control methods section page 9)	
<p><b>Wandering Willie/ Wandereing Jew or tradescantia</b></p>  <p>Source: Copyright C. Howell <a href="http://weedbusters.co.nz/weed_info/detail.asp?WeedID=105">http://weedbusters.co.nz/weed_info/detail.asp?WeedID=105</a></p>	<p>A dark green, creeping ground cover. It has shiny, fleshy leaves and small white flowers. It forms dense mats, smothers all native ground cover and prevents seedlings from establishing.</p>	<ul style="list-style-type: none"> <li>• Rake and roll up (usually only in small spots, to minimise the initial spray) – this is best done in times of drought. A follow-up spray is usually required. Note – tradescantia presents major disposal problems, as dropped fragments can spread infestation.</li> <li>• Foliage spray with triclopyr (Grazon or equivalent) or Hydrocotyle Killer + penetrant. Follow up within two to three months. You need two to three treatments for total control and are likely to achieve limited results during colder months.</li> <li>• Weed wiper – triclopyr (Grazon or equivalent) or Hydrocotyle Killer + penetrant. Follow up after two to three months.</li> </ul>
<p><b>Japanese honeysuckle</b></p>  <p>Source: <a href="http://www.waikatoregion.govt.nz/PageFiles/3599/weeds%20and%20riparian%20margins.pdf">http://www.waikatoregion.govt.nz/PageFiles/3599/weeds%20and%20riparian%20margins.pdf</a></p>	<p>A climbing shrub capable of climbing up the canopy to 15m. It can smother your riparian plantings, attract animal pests and reduces protection from erosion. From September to May, tube-like white to yellow flowers appear in pairs, followed by glossy black berries.</p>	<ul style="list-style-type: none"> <li>• Dig out small sites. Dispose of roots and stems.</li> <li>• Foliage spray with Tordon Brushkiller or equivalent or metsulfuron-methyl (Escort or equivalent) at old man's beard rates in summer to autumn. In sensitive areas use glyphosate + penetrant.</li> <li>• Stump swab with metsulfuron-methyl (Escort or equivalent), or Tordon Brushkiller or equivalent+ penetrant.</li> <li>• Check for new sprouts six-monthly until clear.</li> </ul>
<p><b>Blackberry</b></p>  <p>Picture &amp; info source: Copyright C. Howell <a href="http://weedbusters.co.nz/weed_info/detail.asp?WeedID=88">http://weedbusters.co.nz/weed_info/detail.asp?WeedID=88</a></p>	<p>Blackberry infestations will smother most low growing species, inhibiting the establishment of native plant seedlings and impeding access.</p>	<ul style="list-style-type: none"> <li>• Foliage spray with an appropriate herbicide e.g Tordon Brushkiller or equivalent + penetrant.</li> <li>• Cut stump and treat with metsulfuron-methyl (Escort or equivalent) at label application rate or Tordon Brushkiller or equivalent. Gels may also be used on the cut stump (e.g Vigilant gel, Picloram gel, Cut n paste).</li> </ul>

## Weed

## Treatment methods (see control methods section page 9)

### Old man's beard



Source: DOC website

Old man's beard is a deciduous woody vine producing small, creamy flowers from December to February, followed by masses of fluffy seeds. It can smother large areas of native forest remnants including the tallest trees.

**Note:** There are many species of native clematis, be sure you positively identify your plant as old man's beard before controlling it.

- Foliage Spray with Tordon Brushkiller or equivalent + penetrant in spring to autumn.
- Stump swab – cut stems at ground level and treat with metsulfuron-methyl (Escort or equivalent), Tordon Brushkiller or equivalent, triclopyr (Grazon or equivalent), Banvine, Picloram gel or Vigilant gel. Leave stems in the air to dry. Dispose of cut-away segments.

### Greater bindweed, also known as convolvulus



Source: <http://www.envirolink.govt.nz/PageFiles/154/725-GSDC57%20Bindweed%20Control%20Methods.pdf>

This climbing plant will smother small plants and shrubs. It has very large, white, trumpet-shaped flowers and large triangular or arrow-shaped leaves. The extensive underground rhizome system makes the plant difficult to control.

- Foliage spray with Banvine at vine rates, metsulfuron-methyl (Escort or equivalent) + penetrant, or with Tordon Brushkiller or equivalent.
- Stump swab with metsulfuron-methyl (Escort or equivalent), glyphosate, or Banvine. Gels may also be used on the cut stump (e.g Vigilant gel, Picloram gel). Mulch the stems.

## Trees

## Weed

## Treatment methods (see control methods section page 9)

### Tree privet and Chinese privet



Source: Waikato Regional Council

Tree privet and Chinese privet are invasive and will take over if not controlled. It is a small to large evergreen tree with strongly scented creamy white flowers appearing between January and March.

- Hand pull or dig out seedlings and small plants.
- Stump swab with glyphosate or metsulfuron-methyl (Escort or equivalent) + penetrant.
- Frilling – metsulfuron-methyl (Escort or equivalent).
- Stem Injection – metsulfuron-methyl (Escort or equivalent) or undiluted Tordon brushkiller or equivalent.
- Foliage spray in spring to autumn with metsulfuron-methyl (Escort or equivalent) + penetrant.
- Follow-up work may be required.

**Weed****Treatment methods** (see control methods section page 9)**Crack willow (*Salix fragilis*)<sup>1</sup>**

Source: Forest Flora

Crack willow (*Salix fragilis*)<sup>1</sup> will out-compete many native wetland or riparian plants. It is a deciduous tree up to 25m tall, occasionally only shrub size, with spreading rather than hanging branches, and rough, fissured bark.

- Begin willow control at top of catchment as crack and grey willow easily spreads from broken fragments. Treat every stem.
- Frilling (summer-autumn): Make one cut every 100mm around the trunk and squirt undiluted glyphosate (10ml) into each cut.
- Cut stump method: apply herbicide gel (e.g Vigilant gel, Picloram gel). Remove all plant material from site as all cut stems can root where they fall.
- Stem Injection (summer-autumn): Make one hole every 100mm around the trunk and pour undiluted glyphosate (10ml) or metsulfuron-methyl 600g/kg (2ml of 20g/L) or undiluted 2,4-D ester (20ml) into each hole.
- Foliage spray (full leaf stage only): glyphosate (12.5ml/L + penetrant, total coverage needed) or metsulfuron-methyl 600g/kg (35g/100L from January to April before leaf fall begins).

**Grey willow (*Salix cinerea*)**

Source: Waikato Regional Council

Grey willow (*Salix cinerea*) is a deciduous shrub or small tree growing up to 7m tall, often 1-2m, spreading or thicket-forming. Will out-compete riparian plantings.

**Shrubby weeds****Weed****Treatment methods** (see control methods section page 9)**Barberry**

Source: Department of Conservation website

Barberry is a spiny, woody, evergreen or semi-deciduous shrub growing to 3m tall. Small yellow flowers are followed by small purple berries covered in a yellow bloom.

- Spray Tordon Brushkiller or equivalent + penetrant.
- Cut stump and treat with metsulfuron-methyl (Escort or equivalent) at label application rate or Tordon Brushkiller or equivalent. Gels may also be used on the cut stump (e.g Vigilant gel, Picloram gel, Cut n paste).

<sup>1</sup> Environment Southland, Weeds in Riparian Zones factsheet.

## Broom



Source: Waikato Regional Council

Broom is an almost leafless, deciduous shrub growing up to 3m tall. It produces golden-yellow flowers in spring, followed by explosive pods.

- Dig out small plants, while minimising any soil disturbance.
- Foliage spray triclopyr (Grazon or equivalent) + penetrant from spring to summer.
- Stump swab with triclopyr (Grazon or equivalent) or metsulfuron-methyl (Escort or equivalent) at label rates. Gels may also be used on the cut stump (e.g Vigilant gel, Picloram gel, Cut n paste).
- Weed wiper – triclopyr (Grazon or equivalent) from spring to summer.

## Gorse



Source: Waikato Regional Council

Gorse is a very spiny, woody perennial shrub up to 2m tall. It produces yellow flowers, mostly in autumn and early spring, followed by explosive seed pods.

- Pull or dig out small plants.
- Cut stump and treat with triclopyr (Grazon or equivalent), Tordon Brushkiller or equivalent or metsulfuron-methyl (Escort or equivalent).
- Foliage spray with triclopyr (Grazon or equivalent), Escort or Tordon Brushkiller or equivalent at label rates.

## Aquatic weeds

Controlling weedy aquatic plants is difficult. There are also strict rules in place regarding the use of herbicides around waterways. If you wish to tackle weeds in streams/lakes/ponds/wetlands, ask for advice from your regional council first.<sup>2</sup>

Controlling aquatic weeds is tough but doable. Here's what to do if you're a<sup>3</sup>:

+ **Farmer/ Landowner** – don't allow diggers or drainage equipment, eel nets or boats into your waterways without checking they're free of weeds.

+ **Drainage and machinery contractor** – stop the spread of weeds by cleaning down machinery before and after use.

+ **Fisherman or eeler** – remove any weed fragments from all nets, lines, and equipment, including waders, before you go. A salt bath and/or mild bleach will sterilise fishing nets overnight.

+ **Boat operator** – check hulls, props, trailers and anchor lockers for tag-along weeds before entering waterways.

+ **Aquarium owner** – don't dispose of aquarium contents into or near a waterway, and avoid flushing plants or fish (they can end up in waterways).

+ **Duck shooter** – check dogs, boots and boats for weed before you leave the area.

<sup>2</sup> Weedbusters (2014). Weedbusting A guide to recognising and controlling invasive weeds. Weedbusters. New Zealand

<sup>3</sup> Department of Conservation. (2014). Stop the spread of freshwater pests. Retrieved from <http://www.doc.govt.nz/stopthespread>

**Alligator weed**

Picture Source: <http://www.waikatoregion.govt.nz/Services/Regional-services/Plant-and-animal-pests/Plant-pests/Farm-weeds/>

Alligator weed does not set seed in New Zealand but spreads aggressively from even the smallest stem fragments. It can double in area in less than two months. It can out-compete pastures and crops, affecting farm production and profit.<sup>4</sup>

- If you think you have this plant pest, contact your regional council for information on control.
- In some regions your council will undertake the control.

**Manchurian wild rice**

Source: Copyright NIWA  
<http://www.nrc.govt.nz/Environment/Weed-and-pest-control/Pest-plants/Freshwater-weeds/Manchurian-wild-rice/>

Manchurian wild rice forms dense stands that can block drains, destabilise stop banks, and cause flooding. It also invades flood-prone pastures and wetlands. Broken fragments are easily spread to new sites, through water movement or contaminated machinery.

- If you think you have this plant pest contact your regional council for information on control.
- In some regions your council will undertake the control.

**Reed sweet grass  
(*Glyceria maxima*)**

Source: Northland regional council

Aggressive, perennial, mat-forming grass up to 1.9m tall. Forms dense mats on water and in damp areas, replacing most other species. Causes silt accumulation and flooding.

- Weed wipe (spring-autumn): glyphosate (200ml/L + penetrant).
- Foliage Spray (spring to autumn) with glyphosate (10ml/L + penetrant) or use Gallant NF (5ml/L + 5ml crop oil).

<sup>4</sup> Waikato Regional Council. (2011). Biosecurity series – pest plant factsheet BIOSECURITY FACTSHEET Alligator weed. Retrieved from <http://www.waikatoregion.govt.nz/PageFiles/3606/Biosecurityfactsheet10-Alligatorweed.pdf>

## Maintaining a pest plant (weed) free riparian area

### Active control of plant pests

The best pest control methods target different weeds on land (terrestrial) or water (aquatic).

Follow our steps below to keeping your waterways weed-free<sup>5</sup>.

- 1. + Work out which weed it is:** If in doubt ask your regional council (biodiversity officer) for help to identify the type of weed and which treatment is needed. Or check these websites:
  - <http://www.weedbusters.org.nz>
  - <http://pestweb.co.nz/>
- 2. + Start small.** Avoid creating large cleared areas – this encourages more weeds to take hold from seed and it ensures you don't bite off more than you can chew.
- 3. + Work in stages.** To keep your tasks down, plan the work in stages. It's best to ensure each area is clear before moving onto the next. Start at the edges before starting on the worst areas.
- 4. + Plant up.** Replace weeds with natives or non-weedy plants as you go. It'll help prevent weeds returning (but keep an eye out to help your plantings).
- 5. + Take care.** Avoid over-spraying and avoid spraying your sensitive plantings. Only spray on wind-free days. Consider using a spray guard on the nozzle to avoid drift.
- 6. + Removal.** Seeds and stalks can grow again. Use fabric or rubbish bags, or solid containers to carry away weeds.
- 7. + Disposal.** Many weeds will die back and can be left in place after spraying but some will need removal or composting.

### Tips for protecting planted sites from pest plants

Riparian maintenance involves ongoing weed control – it's often overlooked but can come back to bite you. Although its often labour intensive, good control early on pays dividends later when plantings become well established.

Check your riparian plan has pest plant maintenance included. ([link to planning technical guide](#))

To help maintain a pest-plant free environment you may wish to consider the following when planning your riparian planting:<sup>6</sup>

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<sup>5</sup> Weedbusters. (2014). 7 top tips for control. Retrieved from [http://www.weedbusters.org.nz/resource\\_centre/control.asp](http://www.weedbusters.org.nz/resource_centre/control.asp)

<sup>6</sup> Waikato Regional Council. (2012). Controlling weeds in riparian margins A guide to restoration projects and other plantings. Retrieved from <http://www.waikatoregion.govt.nz/PageFiles/3599/weeds%20and%20riparian%20margins.pdf>

### Weed mats



You can stop weed germination by putting weed mats around plants, either as a blanket over the entire area or around individual plants.

#### How to implement

For individual plants each mat should be at least 1m<sup>2</sup>.

Use biodegradable products including woollen carpet, woollen weed matting, coconut fibre, cardboard and wet newspaper.

If using carpet, make sure plants don't rub against the hard edge.

***Do not use plastic weed mat or polythene because it is not biodegradable.***

Make sure matting is pegged down to stop it moving in flooding or high winds.

#### Advantages:

Matting helps to retain moisture and offers some weed control, depending on the material you use.

#### Disadvantages:

In windy conditions, matting can blow around and damage the plants.

### Mulch



You can spread organic material (at least 100mm thick) around the base of your plants. This helps prevent weeds and stops the soil drying out.

#### How to implement

Ideal mulch materials are bark and untreated sawdust.

It's a good idea to add fertiliser as the mulch decomposition process takes nitrogen from the soil, depriving the plants.

Avoid putting mulch near streams – if it floods, the material might be washed away and cause downstream blockages.

#### Advantages:

Mulch helps to retain moisture and provides long-term weed control depending on the material you use.

#### Disadvantages:

Weeds will penetrate mulch if you lay it too thinly. It can also be blown away by wind, disturbed by birds, dogs and other animals, and washed away by rain or in high stream flows.

### Plant protectors



Protect the plant from weeds as well as exposure to cold and windy conditions. Many come with a biodegradable weed mat.

#### How to implement

Install at time of planting.

They are re-usable so look after them as you may get several plants underway during the life of the plant protector.

Ensure you remember to remove the protector once the plant is above the height of the protective sheath as they can hinder later growth.

#### Advantages:

Gives plants a protection against weeds, rabbits, possums and hares.



## Regional pest plant information

Visit your regional council website for information on identifying and controlling common pest plants or go to [weedbusters.org.nz](http://weedbusters.org.nz).

## Pest plant control methods

### Pest plants growing on land


The table below outlines several different methods for controlling plant pests

#### Non-chemical control<sup>7</sup> methods:


Hand weeding or mechanical control			
Suitable for:	How to implement:	Advantages/ Disadvantages	Disposal method:
Small infestations of weedy herbs, grasses and ground covers.	Hand weeding can be done with tools such as weed-eaters and grubbers, or by digging up the weeds by hand.  Some weeds can sprout from fragments, so all plant material – including roots – should be removed from the site.	<b>Advantages:</b>  No persistent chemicals used.  <b>Disadvantages:</b>  Labour intensive and can still lead to regrowth of the target weed.	If you wish to compost the weeds, put them in plastic shopping bags and leave them tied up to rot for 12-18 months before adding them to your compost. You can also dry or burn weeds, but make sure there is no objectionable smoke beyond your property boundary and that smoke doesn't cause a hazard.

<sup>7</sup> Waikato Regional Council. (2012). Controlling weeds in riparian margins A guide to restoration projects and other plantings. Retrieved from <http://www.waikatoregion.govt.nz/PageFiles/3599/weeds%20and%20riparian%20margins.pdf>


**Chemical control<sup>8</sup> methods:**

Foliage spraying			
Suitable for:	How to implement:	Advantages/ Disadvantages	Disposal method:
<p>Best suited to low weed growth or for re-sprouting stumps, and can be used to control weeds before planting and/or around established plants.</p>	<p>You can either spray the entire area or spot spray – but to be successful, you must spray the entire plant.</p> <p>Before spraying consider:</p> <ul style="list-style-type: none"> <li>• how long the chemical will stay in the soil (residual herbicides)</li> <li>• how close to the stream you can spray</li> <li>• the weather conditions</li> <li>• whether you're using a 'broad spectrum' (which affects all plants) or 'selective' (which doesn't affect desirable plants) herbicide. You can get this information from the manufacturer's product label.</li> </ul> <p>Add a wetting agent ('surfactant') to the mixed herbicide. This will help it stick to the weed and increase the amount of herbicide it absorbs.</p> <p>When applying the herbicide, place a shield around the plants to protect them from spray drift. Shields are simply two pieces of material at right angles to each other, with a handle protruding from the top.</p> 	<p><b>Advantages:</b></p> <p>Foliage spraying provides long-term weed control if you use a residual herbicide. You can also use selective herbicides. It is usually less labour intensive than other weed control methods.</p> <p><b>Disadvantages:</b></p> <p>You can damage the non-target plants if you don't apply herbicides carefully and correctly.</p> <p>Chemicals can leach into the waterways.</p>	<p>See weedbusters.org.nz for disposal methods</p> <p>Spray during fine weather with little wind.</p> <p>Usually spring and summer is the best time for herbicide control.</p>

<sup>8</sup> Waikato Regional Council. (2012). Controlling weeds in riparian margins A guide to restoration projects and other plantings. Retrieved from <http://www.waikatoregion.govt.nz/PageFiles/3599/weeds%20and%20riparian%20margins.pdf>

Cut stump method or stump swab (often called cut and paste)			
Suitable for:	How to implement:	Advantages/ Disadvantages	Disposal method:
Trees or shrubs	<p>The cut stump method involves cutting the tree or shrub as low as possible and applying the herbicide immediately to the stump.</p> <p>If you don't do it immediately, a protective skin will form over the wound (usually within five minutes) and the stump will need re-cutting.</p> 	<p><b>Advantage:</b></p> <p>Stump cutting destroys standing trees and allows a natural breakdown.</p> <p>It requires only small amounts of herbicide and poses minimal risk to desirable plants or water. It is also simple to use.</p> <p><b>Disadvantages:</b></p> <p>Stump cutting opens areas to light, which can trigger weed germination.</p> <p>Felling large trees can also damage desirable understory plants.</p> <p>Felled trees make future access into weed control areas.</p>	See <a href="http://weedbusters.org.nz">weedbusters.org.nz</a> for disposal methods

Stem injection			
Suitable for:	How to implement:	Advantages/ Disadvantages	Disposal method:
Larger trees or shrubs	<p>Drill holes sloping down into the trunk at regular intervals around the base of the tree or shrub. You can use a disused animal drench pack and gun, or a plastic squeeze bottle with a long nozzle, to place the herbicide into each hole as soon as possible.</p> 	<p><b>Advantages:</b></p> <p>Useful for trees or shrubs where their removal is difficult or would cause damage to surrounding vegetation. Avoids overall spraying of large plants.</p> <p><b>Disadvantages:</b></p> <p>Stem injection opens up areas to light, which can trigger weed germination. There are also dangers from dead trees falling, including into streams where they can obstruct the flow.</p>	See <a href="http://weedbusters.org.nz">weedbusters.org.nz</a> for disposal methods

Frilling			
Suitable for:	How to implement:	Advantages/ Disadvantages	Disposal method:
Trees	<p>Frilling involves making deep cuts into tree trunks at regular intervals around the base. Herbicide is applied to the fresh cut using a paintbrush or low pressure sprayer (such as a knapsack). It is important not to ring bark (that is, to remove a ring of bark from the tree), as this reduces the herbicide absorption.</p> 	<p><b>Advantages:</b> Frilling stops the plant from seeding almost immediately. Avoids overall spraying of large plants.</p> <p><b>Disadvantages:</b> Frilling opens areas to light, which can trigger weed germination. There are also dangers from dead trees falling, including into streams where they can obstruct the flow.</p>	See <a href="http://weedbusters.org.nz">weedbusters.org.nz</a> for disposal methods

Weed wiping			
Suitable for:	How to implement:	Advantages/ Disadvantages	Disposal method:
	Weed wipers are herbicide applicators that disperse herbicide by wiping it onto the plant.	<p><b>Advantages:</b> Removes the risk of spray drift.</p> <p><b>Disadvantages:</b> You can damage the non-target plants if you don't apply herbicides carefully and correctly. Chemicals can leach into the waterways.</p>	See <a href="http://weedbusters.org.nz">weedbusters.org.nz</a> for disposal methods