

EnviroTEACH

An environmental education resource for teachers

Term 3 – 2018



▲ Students tackling tradescantia threatening native bush. Photo: WeedBusters

What is a weed?

A weed is any plant that is growing where it is not wanted and that is causing a negative impact. Weeds cost New Zealand's economy billions of dollars annually, through lost productivity and from the cost of controlling them.

From the editor

Kia ora! This issue of *EnviroTEACH* focuses on weeds. It contains information about some weedy plants commonly found in Southland and activities that will complement a range of learning areas. I've selected species that school children are likely to encounter in their school grounds or natural areas and a range of "child-friendly" weed control methods, so that children of all ages can participate in getting rid of weeds to help our native plants and ecosystems to flourish.

Environmental weeds are weeds that have a detrimental impact on our natural ecosystems and waterways.

Two-thirds of New Zealand's environmental weeds were deliberately introduced as ornamental plants and are encouraged to grow in gardens because they look pretty and have brightly coloured flowers. Unfortunately they have not stayed in gardens, but have spread into wetlands, bush, forests and coastal areas where they are damaging ecosystems and destroying habitats of native plants and animals.

It's up to all of us to do what we can to stop the spread of weeds and allow Southland's natural biodiversity to regenerate. I hope this publication will inspire you to introduce your students

to this interesting and important topic and encourage them to explore and take action in their local environment.

Contact Environment Southland for information and advice, or for assistance with teaching and learning about weeds or any other environmental topic.

Pat Hoffmann

*Environmental education officer,
Environment Southland*



What harm do weeds cause?

Weeds may seem harmless - and some are even quite attractive - but they have the potential to destroy ecosystems when they invade natural areas and compete with native plants for nutrients, water, sunshine and space. If we know how to recognise which plants are weeds, then we can take action to remove them and prevent them from spreading further.

Here are some examples of weeds that Southlanders are likely to come across at home, in the school grounds, or in nearby natural areas. If you come across something you're not sure about, get in touch with Environment Southland, the Department of Conservation, Landcare Research, or look it up on the Nature Watch NZ website.

Vines



Common ivy



Chilean flame creeper



Bittersweet

Weedy vines like ivy, Chilean flame creeper and bittersweet grow up the trunks of other trees and climb into the canopy of the forest where they smother the tops of trees and prevent light from reaching plants below. They can grow into such a heavy mass that they cause the canopy to collapse.

Shrubs & trees



Darwin's barberry



Elderberry



Holly

Weedy shrubs and trees like Darwin's barberry, elderberry and holly can alter the way the forest functions by replacing native plants that usually form the understorey of the forest.

Ground covers



Periwinkle

Ground covers like periwinkle can form a thick blanket on the ground. They displace native plants by smothering them and preventing their seeds from germinating.

Wilding conifers



Douglas fir

Some weeds can change the landscape completely, e.g. wilding conifers have changed some of Southland's native tussock grasslands to conifer forests.

Aquatic weeds



Lagarosiphon

Aquatic weeds like duckweed and lagarosiphon can form a floating mass in streams and lakes, killing plants and fish and blocking waterways.

Why are weeds so effective at invading natural areas?

Many of the plants that we think of as weeds are very good at competing with native plants. Features that make weeds good competitors include: producing a large number of seeds, the ability to produce seeds even when they are very young or growing in very poor conditions, seeds that are designed to disperse far and wide, seeds that germinate quickly, or seeds that can survive in the ground for a long time. Many weedy plants are not too fussy about where they grow and their seedlings have the ability to grow quickly before native plant seedlings have a chance to establish themselves. Some weeds, especially vines and ground covers, don't require seeds to spread as they are able to regrow from tiny stem fragments of roots or stems left in the soil.

How do weeds spread?

Many weeds produce fruits that are eaten by birds which then spread the seeds far and wide in their droppings. Some weed seeds have hooks or barbs that stick to your shoes, socks and clothing, or the fur or wool of animals. Some seeds have parachutes or wings and can be carried long distances by the wind and water. People spread weeds too by dumping garden waste in natural areas, or by inadvertently transporting seeds on vehicles, trailers and boats.

Once they become established weeds can be very difficult to kill, so the best thing for our environment and economy would be to prevent weeds from becoming established in the first place. A simple thing schools can do to help prevent the spread of weeds is to remind students to check their socks and clothing for seeds before going on field trips or camps to reserves and special places like Stewart Island and Fiordland.



ACTIVITY

Do an experiment to measure how slowly a sycamore seed falls. How does this compare with other kinds of seeds? What are the advantages of falling slowly?

Right – Sycamore seeds are sometimes called helicopters because they have wings that cause them to slowly twirl towards the ground when they fall.



ACTIVITY

Find a weedy shrub or tree that has seeds or berries on it. Count how many seeds are growing on one branch. Now count the number of branches on the plant and estimate the total number of seeds. Compare with a similar-sized native plant. Look around for more weeds of the same species. Do all of them have seeds? How tall is the smallest one which has seeds on it? How old do you think the weed needs to be before it can produce seeds? Estimate the number of seeds on each plant. Work out an average. Graph your results with height along the x-axis and number of seeds on the y-axis. Is there a pattern in the data? Do an experiment to find out what conditions are needed for weed seeds to germinate. Make sure you destroy any seedlings afterwards! *Note: These activities are best done in late summer or autumn when seeds or berries are present.*



ACTIVITY

Go for a walk in your school grounds or a natural area and collect a range of fruits and seeds e.g. cleavers, dandelions, sycamores or blackberries. Try to work out how they are dispersed, e.g. do they have hooks, parachutes or wings? Does the fruit seem colourful, juicy and attractive to birds?

What can kids do to control weeds?

Some weeds can be pulled out by hand or dug up, but others are best dealt with using herbicides, potentially dangerous tools or heavy machinery. If your students want to do some weed control, it's probably best to focus on smaller weeds such as ground covers, vines, shrubs and young trees.

Remember that some weeds have thorns, poisonous berries or sap that irritates the skin – so do a bit of research before you begin.

WEED CONTROL

Child-friendly methods of weed control include:

- ▶ Digging or grubbing
- ▶ Hand-pulling
- ▶ Rolling up ground covers
- ▶ Cutting vines
- ▶ Removing flowers or seed heads



▲ Ivy smothering trees

Vines

Controlling weedy vines growing on other trees, e.g. ivy, Chilean flame creeper and bittersweet: Cut the vines at ground level and then make a second cut higher up.

Leave the cut vines hanging in the tree where they will wither and die well above the ground. If you try to pull them down you could damage the trees they are growing on.

If possible, dig the stump out of the ground. Any stems or fragments left touching the ground could take root, so check that no vines are able to reach the ground.



▲ Californian thistle

Shrubs & young trees

Controlling small weedy shrubs and young trees, e.g. thistles, sycamore, Darwin's barberry, elderberry and holly: Small plants can be pulled out of the ground by hand, but try not to disturb the soil more than necessary as this will encourage weeds seeds in the ground to germinate.

Regular cutting is an effective way to kill Californian thistles. The best time to do this is when the flower buds are present but not yet opened. Children can use hedge shears to cut the plants down, or a grubber and heavy gloves to dig the plants out.

If they have already flowered, you'll need to collect the flower heads and dispose of them.



▲ African club moss

Ground covers

Controlling weedy ground covers, e.g. ivy, cleavers and African club moss: If you have just a small infestation of weeds, you can dig them out with a spade or grubber, or pull them out by hand. Some ground covers can be rolled up like a carpet to avoid breaking the plants in too many places.

Many ground covers can regrow from tiny fragments, so make sure you remove all weed material including tiny pieces of stem, leaves, underground rhizomes, corms and roots. Put the weed waste in a plastic bag and make sure you don't drop any pieces on the ground as you carry the weeds away from the site. Afterwards, dispose of the bag appropriately, e.g. in the red council rubbish bin, or drop it off at the waste transfer station as general waste, not green waste.

Design your own weed control programme

Once you have introduced students to environmental weeds they may become very motivated to do something about weeds in your school grounds or a nearby natural area. The following pages contain tips for designing and running your own weed control programme.

1 – Start with a weed survey

- ▶ Find or make a map of the area you're interested in.
- ▶ Clearly define the area you want to work in and divide it up into smaller, more manageable units.
- ▶ Identify any zones that will require special treatment and mark them on the map, e.g.:
 - Zones where people have been dumping green waste containing weeds. This will be a source of fresh weed seeds, so you may decide that cleaning up this area is a priority. You'll need to take extra care in this zone to pick up every fragment of weed material and avoid dropping weeds behind you as you carry them through the other zones to your collection point.
 - Zones where special native plants need to be rescued from vines that are smothering them. You'll want people to work very carefully so they don't damage the native plants. You might plan to have older students or additional adult supervisors working in this zone.
 - Zones where weeds are already mature and are about to start producing seeds.
 - Zones containing wildlife (e.g. birds' nests, skinks or native bee burrows) that you'll want to disturb as little as possible.

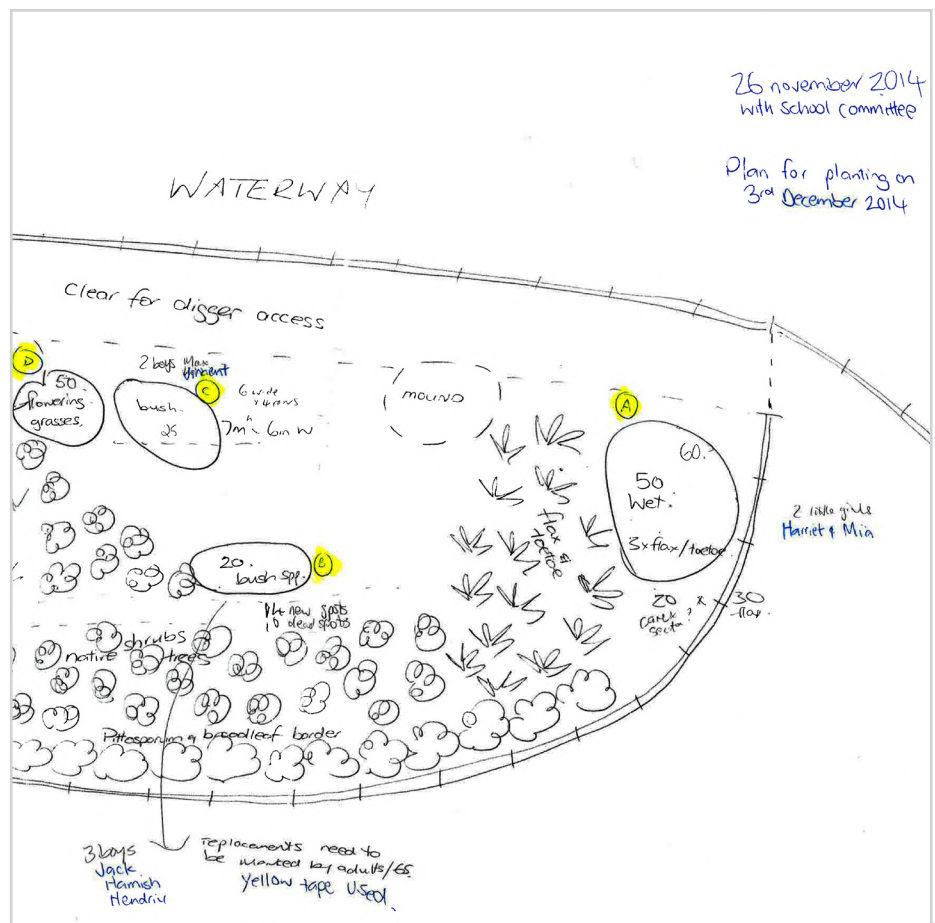
- You can also identify pathways, areas that are out-of-bounds and areas with hazards (like thorns, poisonous plants, rotten trees, eroded banks or old fences).

2 – Select your target species

- ▶ Decide which species you are going to tackle first.
- ▶ Walk through the area you want to work in first and mark on your map where infestations of these species are located. This will help you to estimate how much time it will take to remove these species and how many people you will need to help you. You can repeat the survey afterwards to compare weed numbers before and after your event.

3 – Research your target species

- ▶ Find out how the weeds you have chosen are spread and the best way to control them.
- ▶ Find out whether you will need any special tools or protective gear when handling them. For example, are they prickly, poisonous or irritating to the skin?
- ▶ Choose the most suitable control method for those weed species.
- ▶ Find out the best way to dispose of the weed waste (see page 7 for more information).
- ▶ Find out which native plants you could plant once the weeds have been cleared. Choose fast-growing natives like manuka, coprosma and wineberry.



4 – Find out what others have done

Talk to other people and groups that have been involved in weed control in Southland. There are plenty of examples including:

- ▶ Beggs Bush Landcare group and Menzies College at Beggs Bush, Fortification.
- ▶ Hokonui Tramping Club at Croydon Bush
- ▶ Manapouri WeedBusters at Frazers Beach
- ▶ Myross Bush Landcare Group and Myross Bush School at Kerr Bush
- ▶ Otatara Landcare Group at Bushy Point
- ▶ South Invercargill Lions at Kew Bush
- ▶ St John's Girls' School at Thomsons Bush
- ▶ Stewart Island/Rakiura Community and Environment Trust at Ackers Point
- ▶ Woodlands Scouts at Kingswood Bush Scenic Reserve



▶ Environment Southland biosecurity officer, Adam Brown, pulling out wilding conifers on Mid Dome.

▶ Students planting natives at Beggs Bush, near Fortification, after gorse has been killed.

5 – Plan your weed control event

- ▶ Refer to your weed survey and the map you have developed. Decide which area you want people to focus on at your event.
- ▶ Decide what you can realistically achieve in the time available and with the people and funding available to you. Be realistic about the size of the area you will work in and the number of weeds you are going to target at your event.
- ▶ Identify the best time of year/season to do your weed control work, e.g. some weeds are easier to identify when flowering. Definitely plan to remove the weeds before they produce seeds.
- ▶ Work out how you will dispose of the weed waste after your event.
- ▶ Identify all the different kinds of tasks that will need to be completed and the most suitable person for each job, e.g. children may be able to use secateurs, loppers and spades. Another team can plant natives in the areas cleared of weeds.
- ▶ Identify who you will need to ask for help. Will you need funding, tools or transport? Will you need extra parent help or a professional contractor to help you with some tasks?
- ▶ Plan to take photographs so you can write a “before and after” story later. You can even set up photopoints so that you always take photos in exactly the same location.
- ▶ Make a health and safety plan and ensure that everyone is aware of the risks.
- ▶ Contact Environment Southland, DOC or Weedbusters for advice.

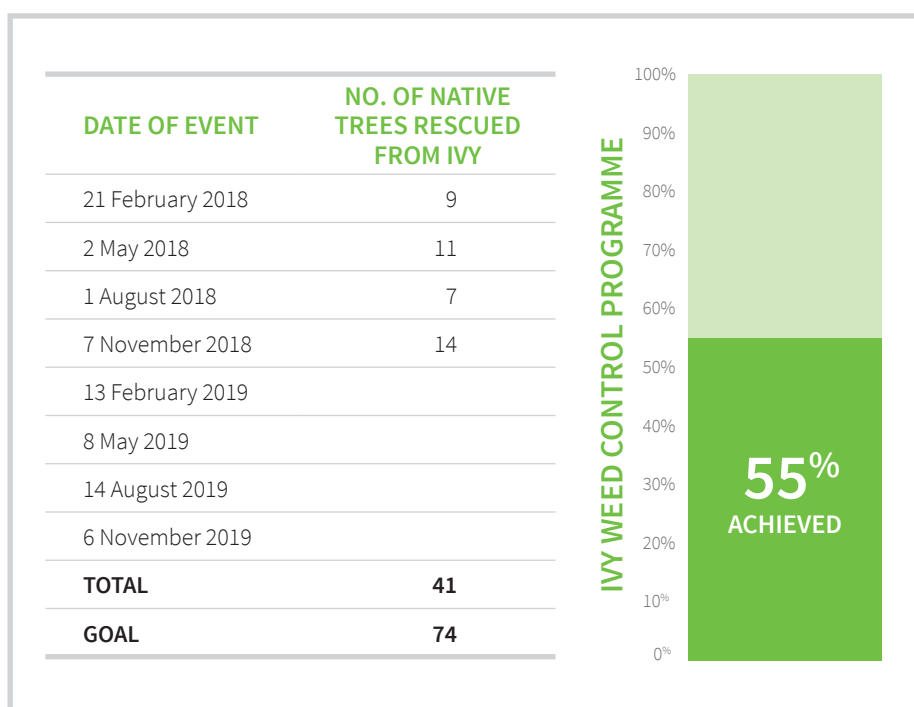
6 – Take action

- ▶ Implement your plan!
- ▶ Remember to record your efforts, e.g. which weed species you removed, the number of weeds removed, total area cleared of weeds, the number of native plants you rescued, the number of people who participated and any costs involved.
- ▶ Your data can be displayed graphically and used to analyse your progress e.g. a thermometer chart
- ▶ Remember to take photographs.

7 – Dispose of weed waste wisely

After your event, dispose of the weed waste appropriately. Don't leave it lying around where it might regrow and create future problems:

- ▶ If it's just a small amount of weed waste, put it in your red council rubbish bin so it can be taken to landfill.
- ▶ Larger amounts can be taken directly to the waste transfer station. Be careful to cover your load with a tarpaulin to avoid spreading weeds all along your route.
- ▶ Trees and branches (without seeds, fruits, pods, corms, rhizomes etc.) can be dropped off at your local transfer station's greenwaste area. The maximum branch thickness accepted at transfer stations is 150mm because this is what the mobile chippers can handle.
- ▶ Some material can be dried out onsite and then burned.
- ▶ Ground covers can be stuffed into black plastic bags or covered with a sheet of black plastic and left in the sun to rot for a few months. You can speed up this process by adding water every now and then.



Weed disposal

Weeds with tubers, rhizomes (e.g. great bindweed) or corms (e.g. montbretia) should not be placed in the compost heap or in the greenwaste area as they could regrow.

The best option for this kind of weed waste is to drop it off at the general waste area of your local transfer station.



▲ Montbretia

- ▶ You can bury or compost many weeds, but before doing so, be sure to exclude all parts of the plant that could survive to grow again, including seeds, berries, tubers and roots. You can increase the rate of breakdown by finely shredding weeds in a garden mulcher before burying or composting them.

8 – After your event

- ▶ Tell people about your event and encourage them to get involved.
- ▶ Seek funding, if needed, for your next event.
- ▶ Restore the cleared area by planting native species.
- ▶ Revisit the area regularly to monitor re-invasion by weeds.



Resources

- ▶ Weedbusters is an interagency weeds awareness programme that aims to get New Zealanders to deal with weeds that threaten environments in their local area. Visit their website for more information and resources – www.weedbusters.org.nz.
- ▶ iNaturalist is a citizen science project and online social network of naturalists, citizen scientists, and biologists built on the concept of mapping and sharing observations of biodiversity across the globe. If your students are keen weed spotters, sign them up to Nature Watch and help collect more data on where the weeds are in New Zealand – www.inaturalist.org/pages/about-naturewatch
- ▶ Download a pdf of the *Plant Me Instead* booklet to find out which locally-sold non-weedy species, both native and non-native, can be used to replace the weeds in your garden. www.weedbusters.org.nz/resources/plant-me-instead-booklets/
- ▶ Environment Southland's website offers fact sheets about some of our region's common pest plants. www.es.govt.nz/environment/pest-animals-and-plants/pest-plants
- ▶ The Department of Conservation offers information and resources for schools – www.doc.govt.nz/get-involved/conservation-education/resources/investigating-plant-pests-in-your-green-space/
- ▶ Landcare Research has a key for the identification of weeds in New Zealand on their website: <https://keys.landcareresearch.co.nz/nzweeds/>

Help stop the spread of weeds

Weed control is costly and time-consuming. The best way to stop weeds is to prevent them from getting established in the first place.

- ▶ Work towards making your school garden a weed-free space.
- ▶ Make sure that garden waste from the school grounds is not dumped in the countryside, but disposed of appropriately.
- ▶ If you have a fish tank in your classroom, never pour the dirty water into a waterway as the plants growing in your aquarium could easily become weeds. It's better to let the plants rot away in your compost heap.
- ▶ Wilding conifers cover about 1.8 million hectares of the country, which is about six percent of New Zealand's total land area. If your old Christmas tree is a real conifer tree, don't dump it in the countryside, especially if it still has cones on it. Take it to the waste transfer station, burn it, or cut it up for green waste.