WEED MANAGEMENT

What are the goals of weed management?

In most cases, weeds are managed to reach an overall conservation or economic goal, e.g., 'to improve the ecological state of the reserve' rather than 'to control weeds.' Establish your goals and objectives early in your programme and be specific. It is important to keep these goals in mind throughout your weed management programme.

Replacement weeds

If you fail to keep your goals in mind and kill weeds without much thought, you may get replacement weeds. Replacement weeds are weeds that colonise the bare ground that has been left as a result of weed control. Weeds are usually faster at colonising bare ground than native plants. The replacement weed may be worse than the original weed!

Disturbance promotes weed invasion. Using control methods that cause the least disturbance to the site is the best way to minimise the risk of replacement weeds. The term used for this is Method of Least Disturbance (MOLD). MOLD allows for the surrounding vegetation to replace the weed. However, in many situations, you may have to replant bare sites with native plants or pasture species, depending on your goals.

Weed management programmes

Weed management programmes can be either 'weed-led' or 'site-led'.

Weed-led control:

- A weed species is controlled wherever it occurs.
- This type of programme is used when there are very small infestations of one or more weeds.

Site-led control:

- Used when protecting a valuable site from a whole suite of weeds.
- All weed species are controlled throughout a site.
- This type of programme reduces the risk of replacement weeds invading by controlling more than one weed species.
- If you can't possibly control all the weeds in your site, at least control all the species that have the same growth form/habitat that might be competing with each other (e.g., tradescantia, watsonia, arum lily, etc.). This will at least reduce the risk of replacement weeds.

Photo: Hamish Reid, DOC

Cutting the flowering heads off Russell lupins at Arthur's Pass to prevent seeding.

Prioritise – which weeds?

You will often have to prioritise weed control because resources are usually limited. Prioritisation can be based on impacts. For example, controlling vines that smother the existing vegetation might have priority over ground cover plants that stop regeneration. It is important to protect existing vegetation of value before worrying about regeneration. However, be aware that chopping out vines from the canopy, or standing trees, may stimulate ground weeds, so in any long-term operation, it may be better to control the under-

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storey species before you let more light in.

Priority weeds include:

Vines – can invade intact forest and overtop the canopy (e.g., moth plant, banana passionfruit, climbing asparagus, old man's beard)

Shade tolerant species – weeds that won't disappear when your canopy is closed (e.g., sycamore, acmena/monkey apple, figs, privet)

Woody weeds in wetlands/shrublands – weeds that can overtop low-growing plants (e.g., alder, grey willow).

Order of control priorities

Satellite vs core infestations:

Always treat the smallest infestations (satellite infestations) first and work towards the largest (core) infestations. The satellite infestations have the greater potential to become bigger, faster (Fig. 1). Controlling all the small, outlying satellite infestations is the best way to contain the weed, even though it is tempting to attack the largest infestation or largest seed source first. Keep uninfested areas free of weeds.

1. Prevention: keep uninfested areas free of weeds
2. Control small, outlying satellite infestations
3. Control the large, core infestations

Know your weed!

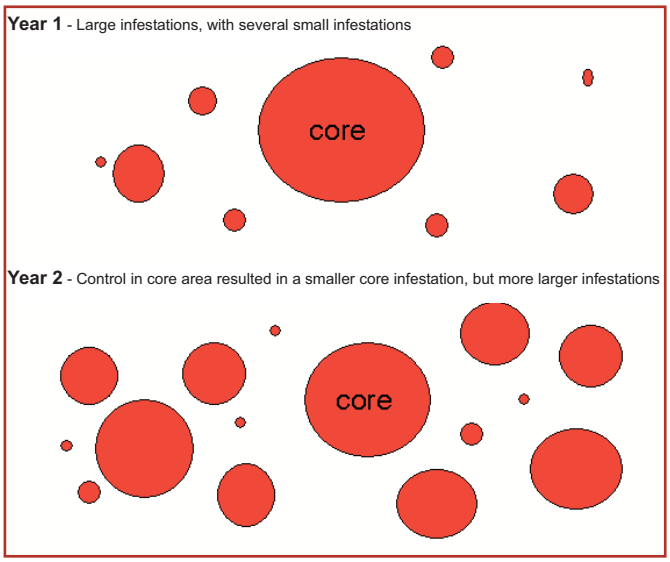
Know your weed – its biology and how it spreads! This information can be found on regional council/DOC weed fact sheets. Make sure you have correctly identified the weeds before controlling them. Field guides and regional council/DOC biosecurity officers can help with identification.

The best way to manage a weed may depend on its biology and dispersal system.

For example:

- Try to control weeds before they fruit/set seed. If this is not possible, try to remove flowers/fruit (without spreading them!).
- Some weed species, such as wild ginger, fruit prolifically only when on the edges of forest remnants (i.e. more light available). Begin control of these species from the edges and work in towards the center of the remnant.

Figure 1. Controlling satellite vs core infestations



- For riparian weeds with resprouting fragments (e.g., tradescantia and willow species), start control upstream and work your way down. This ensures any control work that results in fragments getting into the waterway won't re-infest areas downstream that you've already controlled.

BUT when in doubt, control small, satellite infestations first! Involve others in the hunt for these too, and tell your neighbours what you are up to.

Control methods

- Physical control includes pulling the weeds out by hand (manual weed control) or by machine (mechanical weed control).
- Chemical herbicides ("chemicals that are toxic to plants") are the most common form of weed control.
- Biological control uses one living organism (biological control agent) to control another: i.e., natural enemies of the weed.
- Integrated weed management uses a combination of control methods to give the best control. Combining control methods can work to target different parts of the weed or different parts of the weed's life cycle.

For more information on these control methods see: www.landcareresearch.co.nz/education/weeds/weedinfob-1.asp

For information on how to control specific weed species, see the weed fact sheets produced by your regional council or local DOC office.

Weed hygiene

- When controlling weeds be aware you could be spreading weeds within or among sites, e.g., fragments or seeds on boots, clothing, digging equipment or vehicles.
- Try to maintain some sort of hygiene regime (at least boot cleaning). Don't undo all the control work you've done.
- Weed disposal – check with your council on best ways to dispose of weeds (for most deep burial/landfill is appropriate)

Follow-up control

It is critical to revisit any weed control area and control 'the bits you missed' or regenerating seedlings. Removal of mature plants often results in a flush of seed germination. Follow-up visits and ongoing control must be carried out regularly and persistently – you must be in for the long haul!

Monitoring

Monitoring shouldn't be an afterthought! A good weed management programme is one that maps weeds, systematically records their density and distribution, and re-maps and records over time (every 6 months to a year) to evaluate how successful the management programme has been and to detect new weeds.

Monitoring doesn't have to be complex. You can use a simple index to classify density, e.g., for ground-cover weeds, 1 = sparse, 2 = 25% cover, 3 = 50% cover, 4 = 100% cover. Photo points (taking photos from clearly marked points in the site on a regular basis) are a quick, easy way to monitor success. Whatever method is used, ensure you monitor regularly and systematically throughout the site.

Recording this data gives you:

- Changing trends in weed infestations.
- Some measure of success of your goals (it helps funding applications if you have numbers to show that you are having a successful impact on weed density).
- The ability to detect new invasions rapidly and make quick decisions to eradicate the small infestation before it gets too big!
- The ability to alter weed management strategies, including changing your priorities, according to what is happening at your site.

Make sure a detailed record of control work is maintained. This can be used to evaluate control success and refine methods. Recording success as it relates to your goal (e.g., improvement in condition of native vegetation) is also important for the above reasons. For example, recording the number of native seedlings in a defined area before and after weed control will give you a measure of success.

Remember surveillance for new or small infestations is critical. It is much easier and more cost-effective to control and eradicate weeds when they are scarce.

Site management

If your site is very weedy, there may be underlying reasons why this is so. Understanding these may help improve the site to stop weed reinvasion.

Key questions you should be asking:

- Why is this site weedy?
- Why are conditions favourable?
- Is there too much light?
- Are water availability, nutrients and disturbance (bare ground) issues?

Photo: DOC

Clearing weeds at Okareka Reserve (home of native mistletoe) for replanting.

Jenny Williams, Environment Canterbury.

Volunteers control boneseed at Godley Head, Christchurch.

How could you change site conditions to exclude weeds or reduce their density?

For example:

- Address human-mediated weed dispersal issues (e.g., rubbish dumping)
- Stop nutrient runoff into site
- Maintain natural water flows
- Maintain canopy closure (reduce light)
- Keep tracks narrow and well shaded, with dense shrubs on the borders. Open spaces will be high weed maintenance.

Weedy advice

Your regional council or local DOC office are your best ports of call for advice. They usually have fact sheets on all the common weeds in your regions that contain information on the weed and the best ways of controlling them (manual, chemical, biological).

For information on weeds and weed control in New Zealand and to find weed resources, see: www.landcareresearch.co.nz/education/weeds

Make your weed management programme part of Weedbusters (advice and resources available) and get your community more involved (www.weedbusters.org.nz). Most weeds come from seed sources in people's gardens. By involving your community and encouraging them to control the weeds in their gardens and replace them with native plants, your site will have more chance of staying weed-free.

References:

Department of Conservation 2000. Weed Manager: A guide to the identification, impacts and management of conservation weeds of New Zealand. Department of Conservation, Wellington.

Williams, P.A. 1997. Ecology and Management of Invasive Weeds. Conservation Sciences Publication No. 7. Department of Conservation, Wellington. 67 pp.

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