Weed surveillance – when to search for new weeds?

Systematic searching, casual sightings

Early detection of new weeds

Prompt weed control

Saves dollars, protects biodiversity

The Department of Conservation's weed surveillance involves:

- Systematic searching of valuable and vulnerable sites for new weeds
- Follow-up on casual sightings of new weeds

We want to find new weeds early; that is when:

- Eradication is feasible
- Ecological damage is minimal

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Factors influencing search effort

Site factors

High biodiversity value

Disturbed site

Close to town or road

Increase search effort

Weed factors

Hard to spot

Expensive to control

Spreads fast

Where to search?

Road ends, rubbish dumps, or wasteland near towns may be of low conservation value but often that's where weeds *first* appear. We need to search both:

- Places of high conservation value
- Sites vulnerable to weed invasion

Search frequency model

To consider all the relevant factors, we developed a model to recommend when to search. We assumed a standard search intensity of 2 hours per 10 ha. Based on field experience, we estimated the growth, spread and visibility of different weeds in different habitats. We also determined the weed growth form most likely to be of concern in each habitat.

Searches every two years are needed in short vegetation to find and control a short weed early; the interval between searches may be 5 years if a whole week of control work can be scheduled.

Heather *Calluna vulgaris*

Wetland surveillance can be as infrequent as every 10 years for shrubs and trees, but short weeds are hard to spot so search for them every 3 years to be 80% certain of finding them; search every year to be 95% sure.

Hemp agrimony
Eupatorium cannabinum

Climbing spindleberry
Celastrus orbiculatus

It is difficult to spot a vine early: young plants can be spindly but grow rapidly. Once in the canopy vines are easier to spot but they may then seed widely.

Recommended search frequencies

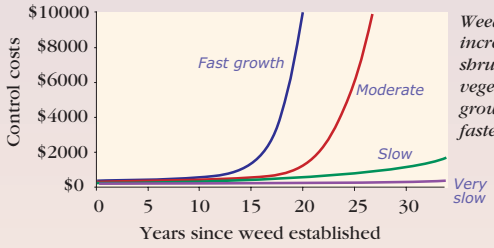
Habitat type	Weed growth form	Years between searches before control takes	
		Half a day	One week
Forest	Climbing vine	1	3
	Ground creeper	3	7
	Shade tolerant shrub	6	10
Shrubland	Vine	1	9
	Tree or tall shrub	2	9
Short vegetation	Short weed	2	5
	Shrub or tree	5	10
Wetland	Short weed	3	7
	Shrub or tree	10	10
Open ground	Short weed	1	6
	Taller weed	4	9

Recommended search frequency by habitat type, weed growth form and control effort with 80% certainty of finding a new weed if it is present.

These surveillance intervals ensure weeds are found when control costs can readily be accommodated. If it is important to find new weeds with 95% certainty, then surveillance must be more frequent than suggested above.

Early control makes sense

The faster the weed spreads, the quicker the control costs rise. All environmental weeds have moderate to fast growth and spread. The cost of environmental weed control increases exponentially over time. (In the graph, future costs are expressed in today's dollar values.)



Weed control costs increase as a weedy shrub invades short vegetation. The faster growing the weed, the faster the costs rise.

Weeds won't wait

It is always cheaper to control environmental weeds early rather than late. Weed surveillance at the right frequency is a sound investment.

Department of Conservation
Te Papa Atawhai

Reference: Simon Harris, Jennifer Brown, Susan Timmins 2001: Weed surveillance – how often to search? *Science for conservation 175*. Department of Conservation, Wellington.

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