

## Natural succession

Undisturbed stands of gorse or broom can be retained to act as 'nurse' plants for the regeneration of native forest. This ecological process is called NATURAL SUCCESSION and is a promising and realistic land management option for gorse and broom infested areas of Banks Peninsula and much of the Canterbury foothills.

### History

Gorse and broom were introduced as fencing and stock food plants during the early days of European settlement but the weed potential of these plants was not anticipated. Our environment proved very favourable to these exotic shrubs and they have invaded large areas of land cleared of its original forest for timber and pasture.

### Existing methods of control

Fire, mechanical, chemical and grazing combinations can subdue gorse and broom but they do not remove the threat of reinvasion. Disturbances caused by burning or mechanical clearing strongly favours the re-establishment of dense, young gorse or broom stands and continued intensive management is necessary for effective control.

The economics of conventional weed control should be examined on marginal pastoral land where good grazing is only obtained by fertilising.

**Natural succession is not a cheap escape from weed control.**

It will always cost less than control operations but there will be no increased production to offset the costs.

## The natural succession exercise

Best results arise from sites with gorse or broom stands that have not been controlled for 10 years or more. Undisturbed stands progressively exclude grasses and herbage, often under a nitrogen enriched layer of litter, and are ideal site conditions for the germination and growth of native flora.

Currently Environment Canterbury's Regional Pest Management Strategy (RPMS) requires broom and gorse control on clear land. An exemption from the rules of the RPMS is required if you wish to encourage the presence of gorse or broom on pasture as a nurse crop for natives.

## Withdrawal from grazing

The total exclusion of domestic stock is very important. Fencing costs will probably represent the project's largest expense.

## Noxious pests

The control of browsing feral animals, such as rabbits and possums, may need to be addressed. ECAN staff can advise on animal control techniques.

## Biological control of weeds

Bio control agents can reduce the vigour of gorse or broom stands and so encourage the secondary succession of native flora. Environment Canterbury Biosecurity Officers can advise on local releases of biocontrol agents.



## Seed sources

The principle agents of seed spread are birds and it is helpful if a seed source is present within 10km of the site. Wind spread is generally less significant except for invading beech forest. Advancement of the forest margin is much slower for beech forest than for native shrub-hardwood forest.

## Enrichment planting

If desired, local species may be planted on the site margins. Comprehensive enrichment planting may only be required on difficult sites, particularly drier sites with sparser natural sources.

Plants propagated from local seed sources are better adapted to local site conditions and help retain the botanic uniqueness of each area.

## Woody species helpful for invading gorse and broom

### Native shrub-hardwood species

Broadleaf	Griselinia littoralis
Bush lawyer	Rubus spp.
Fivefinger	Pseudopanax arboreous
Fuchsia	Fuchsia exorticata
Kaihua/NZ Jasmine	Parsonia heterophylla
Karamu	Coprosma robusta
Kohuhu/Black matipo	Pittosporum tenuifolium
Koromiko	Hebe salicifolia
Kowhai	Sophora microphylla
Lancewood	Pseudopanax crassifolius
Lemonwood	Pittosporum eugenoides
Mahoe	Melicytus ramiflorus
Manuka	Leptospermum scoparium
Mapou	Myrsine australis
Pate/Sevenfinger	Schefflera digitata
Putaputaweta	Carpodetus serratus
Shining karamu	Coprosma lucida
Small leaved coprosma	Coprosma spp. eg rotundifolia
Tauhinu	Cassinia leptophylla
Tree daisy	Olearia spp. e.g. paniculata

### High forest species

Totara	Podocarpus totara
Hall's totara	Podocarpus hallii
Matai	Prumnopitys taxifolia
Kahikatea	Dacrycarpus dacrydioides
Rimu	Dacrydium cupressinum
Red beech	Nothofagus fusca
Black beech	Nothofagus solandri

## Bird species important for seed spread

Thrush	Silvereye
Hedge sparrow	Bellbird
House sparrow	Blackbird
Goldfinch	NZ Pigeon
Greenfinch	Chaffinch
Redpoll	Yellow hammer

## Scoring for succession potential

It is possible to classify land according to its potential. Secondary successions can be developed from dense gorse and broom through to native forest. A scoring system can be created to indicate potential for success with the following key factors. High total scores indicate good potential for success, low scores, low potential.

### Rainfall

>1200 mm, wet	Score 5	
700 - 1200 mm, moderate	Score 3	<input type="text"/>
<700mm, dry,	Score 1	<input type="text"/>

+

### Aspect or exposure

E,S,W, cool, moist	Score 5	<input type="text"/>
NW, N,NE, dry, warm	Score 1	<input type="text"/>

+

### Distance from a suitable seed source

<2km, close,	Score 5	<input type="text"/>
2-10km, moderate,	Score 3	<input type="text"/>
>10km, distant,	Score 1	<input type="text"/>

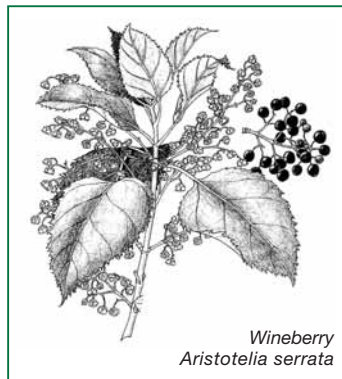
TOTAL



- Scores of:
- 15-11 = high potential for succession to occur quickly and effectively. Enrichment planting is unnecessary.
  - 10- 6 = good potential for succession, enrichment planting may be necessary, but only after the natural process has been given a reasonable trial.
  - 5-3 = succession will occur only if seed sources are at a moderate distance and will be very dependent on favourable seasons. Enrichment planting may be essential.

The lower the score of succession potential, the more important it is that farm and feral grazing animals are excluded.

A factor that affects the rate of succession is the density of gorse or broom. Dense stands that have crowded out grass and herbaceous competition will move quickly to succession. Open stands of gorse or broom with denser grass or other groundcover will be slower to develop succession.



Wineberry  
*Aristotelia serrata*

If gorse and broom are sufficiently dense to eliminate grass and herbaceous ground cover, and rainfall is adequate, emergence of native shrub-hardwood species takes as little as 3-5 years in the absence of all grazing animals. Complete smothering and replacement of gorse and broom by native shrub-hardwood forest could take place within 10-30 years.



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Natural regeneration of shade tolerant native forest species under 15-19 year old gorse following the removal of grazing animals. Photos - Hugh Wilson.



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# The natural succession option

A strategy to replace gorse and broom on Canterbury's marginal pastoral lands with native forest



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