



Weed Control

Options for planting natives on sand dunes

INTRODUCTION

There are many instances where restoration efforts by local Coast Care groups are being severely compromised by invasion of weeds, particularly exotic grasses and introduced garden plants on backdunes. The most common maintenance required following planting native species on a range of ecosystems including sand dunes is suppression of weed growth (e.g. Porteus 1993; Bergin and Gea 2007).

Many of our native trees and shrub species are relatively slow growing especially for the first year or two after planting (Davis et al. 2009). It is during this time that vigorous fast-growing exotic species can out-compete planted native seedlings for light preventing growth and contributing to mortality. Poor or inadequate weed control adversely affects plant survival, vigour and growth of planted natives. Weed control, often referred to as ‘releasing’, is essential with any planting project using natives.

STRATEGIES FOR WEED CONTROL

There are several factors that need to be considered when undertaking weed control (Davis et al. 2009).

Quality of site preparation

The type and degree of weed growth after planting and the weed control requirement is often determined by how well the site was prepared before planting. Poor site preparation invariably leads to a rapid return of competing weed species. Effort and time spent in ensuring weed cover is well under control before planting will be rewarded with the need for less intensive and less costly weed control operations after planting.

Guidelines for good quality site preparation of grass sites using herbicides are given in Section 12 of this Technical Handbook. The ‘whole of dune’ approach to site preparation for weedy dune sites is an option demonstrated in the Coromandel Case Study Article No. 1 in this Handbook.



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Woody weeds such as this coastal wattle (*Acacia sophorae*) can dominate backdunes as much as exotic grasses and garden escapes.

Weed species and site characteristics

Weed composition and growth will vary from foredunes to backdunes and from region to region. It will also depend on history of site management such as early plantings of exotics and local seed sources. Exotic species such as kikuyu and ice plant often colonise foredunes. On more landward backdune sites there are many exotic species including garden escapes and woody weed species that can grow as scattered plants or dense cover over backdunes competing with native plants.

It is essential to become familiar with which plants are native and exotic and the degree to which some exotics are more aggressive colonisers than others. Control options will depend on weed species present and the zone that they occur, as well as the proportion of weed cover compared to native plants. This will allow assessment of the weediness of your dunes and prioritise the weeds that need to be controlled. Major weeds on coastal sand dunes will vary throughout the country and are highlighted in local council websites. Refer also to articles in Section 13 of this Handbook for some of the major weed species on our dunes.

Timely weed control

Regular inspections after planting will ensure that weed control operations can be carried out before planted natives become overtapped by regrowth of weeds. Leaving weed control too late often

leads to difficulties in locating planted seedlings which is time consuming and increased losses of planted natives. Weed control options are more difficult to undertake where weeds are swamping planting natives making application of herbicides without spray drift issues.

Scale of planting and resources

The cost and intensity of weed control operations will be dependent on the scale of planting, resources available and whether the work is carried out by the local Coast Care group on a voluntary basis or by contractor or management agency staff. Planting programmes should be tailored to ensure that sufficient resources will be available for up to two years after planting to ensure adequate weed control. There are many instances where planting programmes have partially or largely failed as the focus has been on planting large numbers of seedlings. Inadequate resources and lack of commitment to maintenance often results in substantial losses within the first year.

WEED CONTROL OPTIONS

Weed control options that are successfully used by Coast Care groups and management agencies are listed below with brief notes. Further articles in Section 13 of this Handbook will provide details and guidelines for their use.

Application of herbicides

- Widely used and considered a practical method over large areas of dunes;
- Requires skilled contractors or trained members of Coast Care groups;
- Require different herbicides for different weed species; most commonly used herbicides for grass and herbaceous exotics are broad spectrum glyphosate and grass-selective herbicide haloxyfop;
- The most common method of application of herbicide on foredunes is knapsack spraying; weed wipers are an option but not widely used to date.



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Hand weeding

- Not practical on a large scale for extensive areas of dunes with vigorous exotic grass species; labour intensive but suitable for some weeds, fragile sites or small infestations;
- Weeds with the potential to root from fragments or germinate from attached seed will require removal from site;
- Hand cutting of brush weeds such as blackberry and gorse labour intensive; regrowth from cut stumps will require herbicide treatment.

Mechanical site preparation

- Practical for large scale cover of vigorous weed cover and where capping material such as clay or gravel needs to be removed;
- Involves removing dense exotic vegetation cover by machines to create a 'clean' site to allow planting of natives;
- Spraying of the weed cover is carried out before clearing of the vegetation and reshaping;
- Less weed invasion than similar sites prepared by hand clearing methods.

Dense planting of natives

- Planting natives at high density to encourage rapid canopy cover to reduce open spaces for weed establishment;
- Will require weed control until dense native cover established.



Planting natives at high density will provide a quick cover of vegetation and reduce the time required for weed control.



Knapsack spraying of herbicide is the most widely used option to control grass and herbaceous weed growth on sand dunes.

Using tolerant plants as spray buffers

- Involves establishing a buffer of non-grass groundcover species (e.g. pingao, wiwi pohuehue) between mowed exotic grassed areas and spinifex foredunes;
- Allows use of grass selective herbicides along buffer to prevent invasion of aggressive exotic grasses that can spread from mown reserves into adjacent restored foredunes with spinifex;
- Regular herbicide spraying of 30-50 cm strip along boundary between foredune vegetation and mown grass reserve to prevent invasion.

Gradual removal of tall exotics

- Where tall exotics occur on backdunes, may be scope on some sites to ring bark or poison trees in-situ as temporary shelter for inter-planted natives;
- Scope to use slash from cut exotic trees to reduce weed control and provide shelter.



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These multi-functional plant protectors with coconut matting reduce weed competition immediately around planted natives while deterring rabbit browsing and providing shelter on exposed dune sites.

Plant protectors

- Plant protectors that include matting can help reduce weed competition at the same time as preventing rabbit browse, providing shelter and allowing easy relocation of planted seedlings for monitoring and maintenance.

REFERENCES

Davis, M.; Douglas, G.; Ledgard, N.; Palmer, D.; Bhubaneswor, D.; Paul, T.; Bergin, D.; Hock, B.; Barton, I. 2009: *Establishing indigenous forest on erosion-prone grassland: land areas, establishment methods, costs and carbon credits*. Scion Contract Report for the Ministry of Agriculture and Forestry No. MAF POL 0809-11192. (Unpubl.). 90p.

Bergin, D.O.; Gea, L. 2007: Native trees – planting and early management for wood production. *New Zealand Indigenous Tree Bulletin No. 3*. New Zealand Forest Research Institute. 44p.



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Mulching, weedmats

- Use of materials such as bark, wood chip, mulch, synthetic and coconut weed matting, newspaper around each planted seedling to reduce weed growth;
- Supply of materials can be expensive and application can be labour intensive for large scale planting programmes.

Davis, M.; Meurk, C. 2001: *Protecting and restoring our natural heritage – a practical guide*. Department of Conservation, Christchurch. 94p.

Porteus, T. 1993: *Native forest restoration. A practical guide for landowners*. Queen Elizabeth II National Trust. Wellington

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'To see the majority of New Zealand dunes restored and sustainably managed using indigenous species by 2050'.