

Dune planting guide

We can all be part of protecting, restoring and connecting Auckland's biodiversity.

Dunes

Vegetation plays an important role in the formation and stabilisation of coastal sand dunes. Residential development, recreational activities, farming practices and sand mining have contributed to the modification of coastal dunes. Dune vegetation has been damaged or destroyed, and this has led to dune instability and wind erosion. Introduced plant species such as marram (*Ammophila arenaria*) have been planted to try and stabilise these areas and in some areas have displaced native species. It is now recognised that native dune plants provide the best protection.

Coloniser foredune plants, spinifex (*Spinifex sericeus*) and pingao (*Ficinia spiralis*), trap wind blown sand in the frontal dune (foredune) and have adapted to grow through accumulations of wind blown sand. The leaves and runners of these plants cause a reduction in the surface speed of wind. The reduction in wind energy results in the deposition of sand on and around these plants, naturally rebuilding dunes after erosion.

The backdune area is the more stable area behind the foredune. In this area, conditions are slightly more sheltered and a wider range of species may be grown.

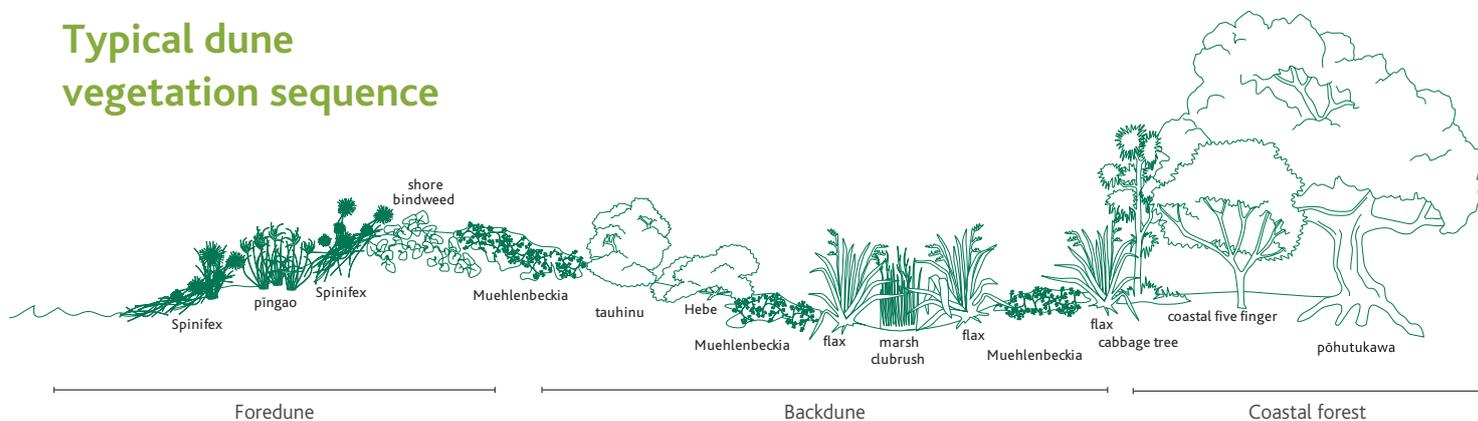
Planning your coastal planting

See Coastal planting guide 1 for detailed information on planning your coastal planting, site preparation and ecosourcing plants.

Spacing of plants will differ depending on their growth form. For example, sand binding species and sedges need to be planted 0.5m apart to encourage vegetation cover, while trees and shrubs will only need to be planted at 1.0-1.5m centres. Larger trees such as pōhutukawa need to be planted more than 5m apart. Set plants out in groups and plant closely to each other to provide sheltered environments.

Protect. Restore. Connect.

Typical dune vegetation sequence



| Dune vegetation | |
|---|--|
| Can: | Cannot: |
| Provide habitat and increase biodiversity | Prevent direct wave erosion |
| Prevent wind erosion by decreasing wind speed at ground level | Tolerate excessive physical damage caused by people, stock or vehicles |
| Build up sand dunes and reduce the extent of erosion during storms | Tolerate mismanagement such as mowing |
| Tolerate a hostile environment with high winds, salt spray, sand blast, covering by sand, sandy soil and little water | Tolerate top soiling |
| Accept massive movements of the dunes | Tolerate introduction of unsuitable plant species |
| | Tolerate burning |

Planting list

Some species which are successful on dunes, and readily available at Auckland garden centres/nurseries are listed in the following table. Where practicable plants/seeds should be obtained from local sources (e.g. eco-sourced) and will therefore be able to cope with local environmental conditions. Plant in autumn for best results, so that the plants can become well established before the dry summer months.

To stop the spread of invasive pests **please check all mulch, plants, their soil and containers (before you move them to your planting site) for contaminants, eggs and live animals** e.g. Rainbow skinks and Argentine ants. Please avoid using contaminated soil and plant material in your restoration planting.



Species abundance

The **species abundance (+)** in the table indicates the approximate proportion that should be used within the planting. By following these recommendations the planting will replicate natural species abundance and groupings.

Did you know?

Coastal sand dunes are threatened habitats. Over the last 50 years, 85 per cent of Auckland's dunelands have been lost.



| Maori name/ common name | Botanical name | Lifeform | Height | Abundance | Comment |
|-------------------------------|----------------------------------|---------------------|------------|--|---|
| kōwhangatarā/spinifex | <i>Spinifex sericeus</i> | grass | 0.5m | (+++ use plentifully, ++ use commonly, + use sparingly) +++ | Silvery sand binding grass. It is important to bury at least 1/3 of leaves below sand surface. |
| pingao/golden sand spiralis | <i>Ficinia spiralis</i> | sedge | 0.5 - 1.0m | +++ | Grows on naturally moving sand dunes. It is important to bury at least 1/3 of leaves below sand surface. Will grow in a garden with good drainage. Golden leaved. Also used for weaving. Threatened plant. |
| pohuehue/wire vine | <i>Muehlenbeckia complexa</i> | vine | 1m | ++ | Hardy, ideal for banks and other difficult sites. Vigorous shrubby ground cover. Dense tangled mass along rocky coast and dunes. Plant in zone immediately landward of sand binders. |
| harakeke/flux | <i>Phormium tenax</i> | herb | 2-3m | ++ | Very hardy, tolerant of salt exposure. Grows in a range of conditions. Excellent shelter, erect leaves. Upright in habit with tall flower heads that attract birds. |
| oiioi/jointed rush | <i>Apodasmia similis</i> | rush | 1m | ++ | Bordering salt marshes and estuaries, or in dune hollows. |
| tauhinu/cottonwood | <i>Ozothamnus eptophyllus</i> | shrub | 5m | ++ | Grows in sand dunes and will tolerate dry cottonwood conditions and wind. Grey/green foliage. Very hardy. More common on west coast sites. |
| taupata | <i>Coprosma repens</i> | shrub or small tree | 2-4m | ++ | Large shrub or small tree with dark green, glossy, rounded leaves. Very hardy, excellent wind and seaspray shelter. Orange berries attract birds. |
| toetoe | <i>Austroderia splendens</i> | large grass | 3m | ++ | Tolerates drought and salt wind. Can grow on dry disturbed sites. Tall dense creamy-gold flowering plumes. Not to be confused with the invasive pampas grass from South America which is later flowering. |
| sand coprosma | <i>Coprosma acerosa</i> | ground cover | 0.5m | + | Small orange leaves with pale blue translucent berries. Rare in Auckland region. |
| rauparaha/shore bindweed | <i>Calystegia soldanella</i> | ground cover | 0.2m | + | Pink flower, grows on foredunes, shingle and backdune. Also a ground cover for coastal gardens. Establishes naturally. |
| giant umbrella sedge | <i>Carex testacea</i> | grass | 0.3m | + | Orange grass found in backdune. Attractive plant for coastal gardens. |
| kukaraho/pūrua marsh clubrush | <i>Cyperus ustulatus</i> | sedge | 0.8m | + | Good in damp areas such as backdune hollows. Forms large dense clumps. |
| mākaka/NZ broom | <i>Bolboschoenus fluviatilis</i> | sedge | 1-2m | + | Can grow in dune hollows. Fast growing. Stems die back over winter. |
| houpara/coastal five finger | <i>Carmichaelia australis</i> | small tree | 2-5m | + | Small bush with lavender flowers. |
| karo | <i>Pittosporum crassifolium</i> | small tree | 7m | + | Good colonising plant in damaged coastal areas. Grows to a large tree. Glossy leathery leaves. Responds well to pruning. Very hardy. |
| ngaio | <i>Myoporum laetum</i> | small tree | 10m | + | Vigorous coastal shrub/tree with grey-green foliage and dark red flowers that are scented at night. Tolerates strong wind, salt and poor soil. Flowers attract birds. |
| akeake | <i>Dodonaea viscosa</i> | tree | 8m | + | Very wind hardy, grows well in sandy soil. Fleshy gland dotted leaves. Good shelter tree. Frost tender. |
| tī kōka/cabbage tree | <i>Cordyline australis</i> | small tree | 10m | + | Hardy. Attractive pale green seed (summer). Requires shelter from salt laden winds. |
| pōhutukawa | <i>Metrosideros excelsa</i> | tree | 17m | + | Erect tree with crown of narrow leaves tufted at the end of branches, white flowers in spring. Requires some protection when young. Moderate tolerance to salt and wind. Plant back from the estuarine edge and in damp dune hollows. Fruit attracts birds. |
| | | large tree | 25m | + | Tolerates tough conditions but requires protection from browsing when young. Crimson flowers at Christmas attract birds. |



Need more information?

The Auckland Council's biodiversity team can provide further information on ecological restoration, please contact biodiversity@aucklandcouncil.govt.nz or 09 301 0101. Many of the native plants listed in the coastal planting guidelines are on display at the Auckland Botanic Gardens in Manurewa. Please feel free to visit the gardens to familiarise yourself with these plants.

For further information on coastal planting, pest control, funding opportunities, coastal management and ecological restoration please contact Auckland Council on 09 301 0101 or visit our website www.aucklandcouncil.govt.nz

Other factsheets in this series:

- 01 Coastal planting guide
- 03 Coastal forests
- 04 Coastal cliff tops
- 05 Coastal wetlands, saltmarshes and estuaries
- 06 Coastal clay banks

References

- Auckland Council, Riparian Zone Management Guidelines, TP 148.
- Bergin, D. & Herbert, J. (1998). Pīngao on Coastal Sand Dunes. Coastal Dune Vegetation Network Technical Bulletin No. 1.
- Bergin, D. (1999). Spinifex on Coastal Sand Dunes. Coastal Dune Vegetation Network Technical Bulletin No. 2.
- Bergin, D. (2000). Sand Tussock on Coastal Sand Dunes. Coastal Dune Vegetation Network Technical Bulletin No. 3.
- Cranwell, L.M. (1981). The Botany of Auckland. Auckland War Memorial Museum.
- Crowe, A. (1995). Which Coastal Plant? Viking Publishers.
- Hesp, P. (2000). Coastal Sand Dunes – Form and Function. Coastal Dune Vegetation Network Technical Bulletin No. 4.
- Hilton, M.; MacAuley, U.; Henderson, R. (2000). Inventory of New Zealand's active dunelands. Science for Conservation 157. 30p. + 124 maps.
- Morton, J. (1993). A Natural History of Auckland. Bateman in association with ARC.